N. HINGLEY & SONS LIMITED
Black Country Anchor Smith and Chain Cable Maker

A Study of the World's Premier Manufacturer of Ships' Anchors and Cables in the period

1890 - 1918

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ABBREVIATIONS

BMMC	British Machine Made Cable Co. Ltd.
CMA	Chain Makers' Association
CTB	Chain Trade Board
HPAC	Halls Patent Anchor Co. Ltd.
GWR	Great Western Railway
LBTC	Lloyds British Testing Co. Ltd.
LMS	London Midland & Scottish Railway
LNER	London North East Railway
LNWR	London North West Railway
MISWB	Midland Iron & Steel Wages Board
MRC	Modern Records Centre, Warwick University
WHC	Wright Hingley Collection

UNITS OF MEASURE

TON	2240 Imperial pounds weight, made up of 20 cwts., each of 112 pounds
cwt	one hundredweight or 112 Imperial pounds
£ s d	Pounds, shillings, and pence, in the former British currency

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- Dr Charles Jones for his continuous encouragement and support

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PREFACE

This study originated in work I did for The Black Country Museum in 1991. In the course of this research my attention was drawn to the Wright Hingley Collection of business records. These records, covering the period from 1890 to the 1970s, appear to be the sole surviving business papers of N. Hingley & Sons Limited. They are held by the Archives & Local History Service of the Metropolitan Borough of Dudley.

The material was gifted to the Borough in October 1974 by F H Lloyd Limited, another Black Country firm, that had acquired Hingleys in its dying days in 1966. Dr Charles Jones, my friend and academic mentor, had included a reference to newly acquired material on Noah Hingley's firm in his 'Britain and the Dominions, a guide to business and selected records' published in 1978. It was, however, July 1991 before the Dudley archivist was able to allow public examination of the Hingley papers, mainly due to the massive task of sorting that was required. Even now the records of Hingleys' twenty three associated and subsidiary companies are not available for examination. Charles Jones and I were allowed a one day preview of the records and we were able to establish that there was sufficient primary source material now available to permit a worthwhile study of this remarkable firm.

The name 'Noah Hingley' is part of the heritage, and is written large in the folklore, of the Black Country. Although all trace is now lost of the famous ironworks where the anchors and cables for the navies of the world were made, the abiding memory of the awful fate of the S S Titanic in 1912 guarantees that the name of Hingley is not forgotten. This is because the anchors for this vessel were made in Netherton and the town turned out 'en fete' when the principal 15.5 ton anchor was drawn on a 20 horse dray from the works to the Dudley Port railway station.

Pictures of that great day figure in every local library, and a photograph of the event is included in the pictorial records included in this study.

During my research for my booklet I discovered that nothing of any consequence had ever been written about this famous firm. Apart from a reference in the Victoria County History for Staffordshire, and short paragraphs in various local publications, there is absolutely nothing of substance about the Hingley firm or the Hingleys themselves on the written record. Indeed, Neil McKendrick must have had families like the Hingleys in mind when he wrote: 'In their search for a usable past, few historians have thought to make heroes of British businessmen'.[1] It is the aim of this study to show that the three generations of Hingleys were industrial heroes of the first rank in the Black Country and in the industrial economy of Britain of the time.

Noah Hingley worked for his father as a journeyman ironworker before founding his own business with a substantial workforce in 1838. In its heyday the firm provided a livelihood for 3000 people. It became the No. 1 producer of large size ships' cables and anchors for the navies of the world. My study covers the unique period of the 'Belle Epoque' from 1890 to 1918 during which this medium size provincial firm established a position of virtual hegemony in a wrought iron trade that was already in terminal decline. It will examine the almost providential way in which the firm found a channel through the shoals of the new imperialism, the second industrial revolution, extensive national industrial and economic strife, major social change, and finally a world war from 1914 to 1918.

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[1] C Trebilcock, The Vickers Brothers Armaments and Enterprise 1854-1914 (London : Europa Publications, 1977), ix of General Introduction.

ABSTRACT

The principal objective of this dissertation is to position the firm of N Hingley & Sons Limited in its rightful place in the economic history of the Black Country and of Britain in the period 1890 to 1918.

As an original contribution to knowledge of the subject, the study focuses on a modestly sized firm of ironmakers in the Black Country that achieved a position of almost total hegemony in the provision of anchors and ships cables to the navies and merchant fleets of the world. This was at a time when 90 per cent of all chain manufactured in Britain came from the Black Country and when the bulk of the ships of the world were constructed in British yards. The success of the firm was based on the solid foundation built by Noah Hingley in harnessing natural resources to a cooperative labour force under the direction of a paternalistic family of marked goodwill.

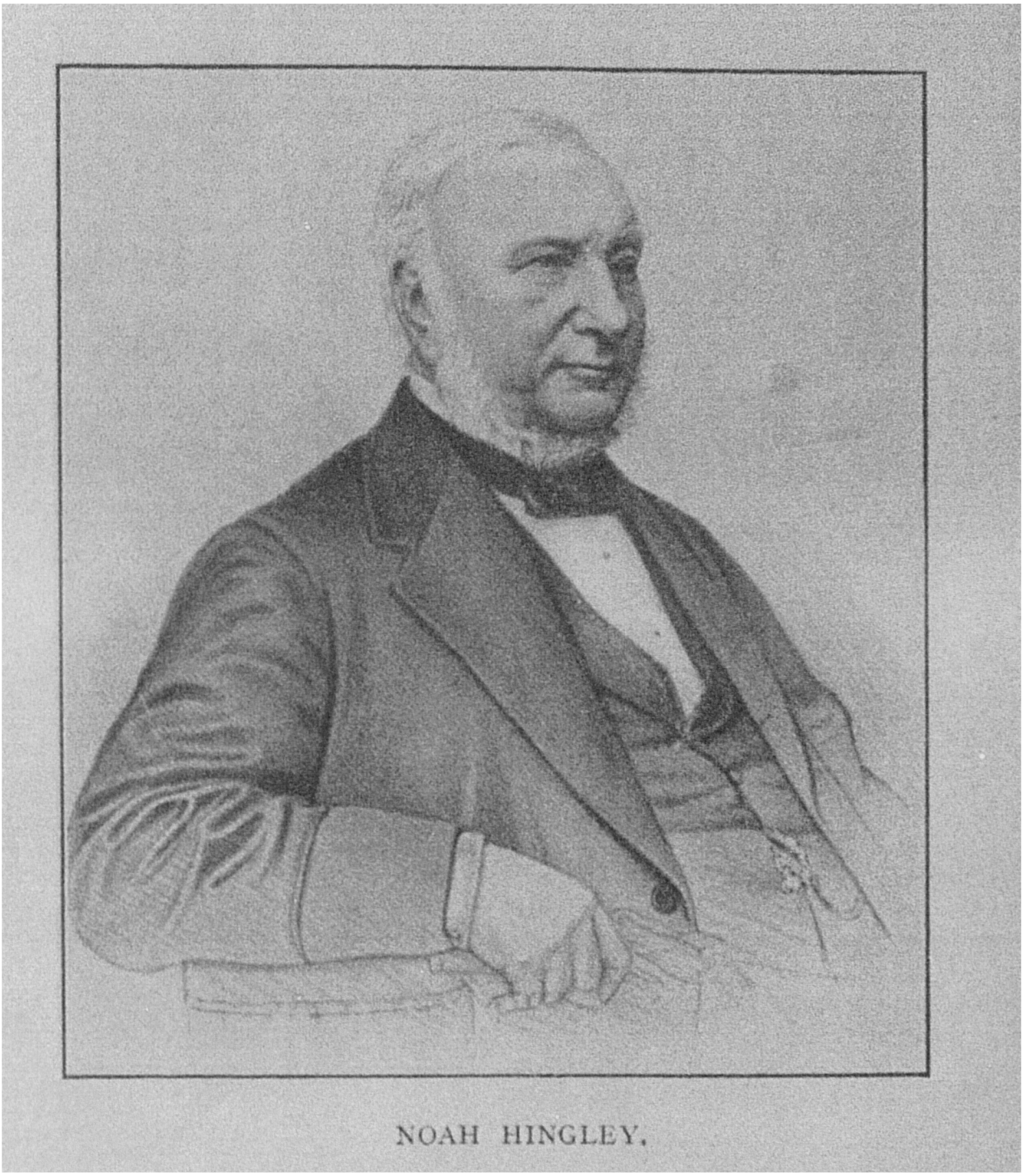
Chapters two and three place the Hingley firm in the economic context of the times. Particular attention is given to how well the enterprise conforms to M^{c}Closkey's analysis that in this period British industry did well and did all that could have been reasonably expected of it.

Chapter four draws heavily on the Hingley archival material to establish an outline of the firm's trading activities during the period under review. This process is extended to the limits of the files in chapters five, six and seven. Chapter five examines the evolution from a family partnership to a closely held family company to a broadly held private company demonstrating the continuing ability of the Hingley family to adapt, developing an appropriate structure at each stage. Chapter six examines the basis of Hingleys' hegemonic position : the excellence of its wrought iron, its ability to fashion large diameter cable (up to 6"), and its state-of-the-art anchors. Chapter seven examines the form and development of Hingleys' highly efficient method of marketing. This was a method that ensured that the entirety of its production was always sold year on year and regardless of the fluctuations of business activity.

Chapter eight is supplementary to chapter seven and examines Hingleys' greatest achievement. This was the firm's ability to create combinations of manufacturers and mini-cartels in order to capture the lion's share of the production of large diameter ships' cables and anchors for a selected list of firms. This was not a simple rigging of the market. Rather, it was a precondition of sustained high quality that provided a first class product at a fair price. The navies of the world benefited from this strategy. The provision of first class products allied to excellent marketing was the key to Hingleys status in the industry.

Chapter nine, dealing with relations with governments, examines the growing levels of state control in the period under review. Beginning with the unstoppable momentum for social and political change, the emergence of the military-industrial complex world wide ensured a greater degree of involvement by the state in matters of business and commerce. In the latter stages of the chapter, the way in which the Board coped with the command economy of the Great War is examined in the context of the resilience of the firm in adapting to the economic and cultural changes of the first quarter of the current century. It was this ability that enabled it to trade on successfully for a further fifty years after the end of this story.

My dissertation endeavours to show that Noah Hingley's firm was a fine example of solid achievement within the parameters of what was sensible and economically achievable in Britain at that time.



NOAH HINGLEY.

PART ONE : THE FIRM IN CONTEXT

CHAPTER ONE : INTRODUCTION

The objective of this study

The objective of this study is to guarantee a place in the economic history of this country for the Black Country firm of wrought iron manufacturers known as N Hingley & Sons Limited. Hingleys traded as a firm between 1838 and 1965, having been developed from a colony of workman built up by Noah Hingley and his father Isaac Hingley in Cradley in the early 1800s. In 1852 the firm moved to Netherton. This move proved extremely providential as, by a distance measured in furlongs rather than miles, the firm was able to separate itself from the dreadful practices of sweated labour and generally curmudgeonly industrial attitudes that had given the Cradley area a bad name by the end of the century.

The underlying strength and the fundamental soundness of Noah Hingley's enterprise lay in the judicious mix of activities in which he took part. In this he achieved vertical integration years before the phase entered general usage. After beginning as a worker in iron, he then went on to lease mining areas from the Earl of Dudley in order to raise his own coal, limestone, and iron ore. He then went into the production of pig iron, in the process producing the first class pig on which his world class wrought iron depended. He was thus able to deal in coal, ores, pig iron, wrought iron, and finished iron in all its forms.[1] This integration was to help him ride out successive business depressions.
The period under study, from 1890 to 1918, is the one in which the third and final generation of Hingleys managed the firm. It is also the

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[1] Dudley Herald, 28 February 1891.

period in which the Hingley firm established a hegemonic position among the anchor and cable makers of Britain, and indeed of the world. This period was one in which a quantum leap took place in the size of ships. Vessels of unprecedented displacement appeared on the drawing boards. Examples include White Star's SS Olympic at 45 000 tons and SS Britannic at 52 000 tons; the SS Aquitania at 50 000 tons and the SS Lusitania and the SS Mauretania, both at 30 000 tons, built for Cunard; and Hamburg Amerika's SS Imperator and SS Bismarck both at 50 000 tons. All of these vessels, and many more, had massive anchors often weighing up to 15.5 tons and all were manufactured by Hingleys.[2] In addition, the Hingley hegemony extended to the production of outfits for these vessels, comprising the set of cables required for mooring, steering, and manoeuvring.

The dissertation will examine and analyse the way in which a medium size provincial firm with a core payroll of some 700 workers, supplemented by up to 2 300 outworkers, was able to achieve its hegemonic position in the provision of outfits and anchors for all the navies and merchant fleets of the world, save that of the United States of America.

The study will further examine how this hegemonic position was achieved during a period when the international wrought iron trade was effectively in terminal decline from 1896 onwards, and when Britain lost its world lead in the new industrial era of the 1890s and 1900s.

The study will demonstrate how Hingleys was able to make the transition from the iron masters' traditional 'man to man' style of management on the workshop floor to the professional management style of outsiders specifically recruited for that purpose. This transition enabled the company to trade effectively for a further forty-five years after the

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[2] Hingley's Catalogue, circa 1910.

death of the last managing Hingley, and for thirty-three years after the 'official' demise of the international wrought iron trade.

The study will look at the firm's distinctive marketing techniques, based on the traditional British method at the time of doing business through merchants, together with the more modern practice of placing official agents in various places in the world, after personal exploration by one or other of the Hingleys. The Germanic method of controlling the market through cartels, and the American method of effecting this through vertical integration, were not highly developed in Britain in the early years of this study and will only be looked at in passing.

Method

In writing about a firm that figures so strongly in the folklore of the Black Country, yet about which so little has been written, much dependence has had to be placed on the Wright Hingley Collection as the principal primary source of information on the Hingley firm. The high-mindedness of the directors of F H Lloyd Ltd, in ensuring that all business records that came into their possession on the acquisition of companies should be offered to Local History archives, was in marked contrast to the many acts of archival vandalism that were committed over the municipal records of the many small local authorities that disappeared in the local government reorganisation of 1972-74. It also compares well with Hingleys' own act, on moving to new offices on the same site in 1904, of consigning all of the company records from 1852 to 1890 to the refuse tip.

Those parts of the Wright Hingley Collection used in this study are shown in the bibliography. The collection is extensive, but very

incomplete. For instance, no in-coming letters have been kept. So, for the period from 1895 when the directors' letter books begin, until 1934 when they cease, all dialogues are one sided. Also, there are no accounts or production records of any note. In the case of the company accounts, recourse to the successors of Messrs A J Williams and to Messrs G C T Parsons, who acted as auditors to the company, for relevant documents has drawn a blank. The same applies with the Registrar of Companies, and with the Inland Revenue, with neither body being able to assist with individual company accounts from the period under review. Likewise the successor firm to William Shakespeare, solicitors, has been unable to help.

Of all the material in the collection, the most valuable proved to be Sections 2, 3, and 8, in Part I.

Section 2: Articles of Association and Shares, gives a very clear picture of how the company was formed, and of how the Hingleys kept a close control through their shareholdings right up to 1918.

Section 3: Inventory and Valuation, 1890, provides an extremely detailed picture of the business built up by Noah Hingley in a long life from 1795 to 1877. It shows a solidly based business, free from debt or encumbrance of any kind. It will be reviewed in detail in Part 3: Chapter 5, on the ownership and control of the company formed in 1890.

Section 8: Correspondence and Papers, provides copious information on the life of the company, and on how its business was conducted. The directors' letter books were begun in 1894, coincident with the emergence of George Benjamin Hingley and his brother Henry Montagu Hingley as the day to day operators of the company. These letter books number sixteen in all from 1894 to 1934 of which twelve cover the period

to 1918 with 500 folios in each book, and, until 1910 were monitored by Alfred Hilton Legge, the long serving accountant and company secretary. In 1902 George Benjamin Hingley began his private letter books. These ran to five volumes each with 1 000 folios, finishing with his death in 1918, and were monitored by George Blakey Rumford, the long serving assistant accountant and Hingley's personal clerk. They contain a wealth of business correspondence, but also provide a useful insight into G B Hingley's other activities as a magistrate, as a county councillor, and with the Territorial Army. They also provide an intimate picture of G B Hingley's role in providing a home for his mother, brother, three sisters, and himself. The third set of letter books of 500 folios each in five volumes was begun by A H Legge in 1909 towards the end of a long career in Hingleys that went back to 1862. He probably decided to split all the files in the interest of confidentiality as he knew that his successor would have to be a complete outsider. As it happened, George Cyril Edwards, who took over from Legge, was a model professional company secretary. His keeping of the secretary's letter books, and as continued during his wartime absence, provides the only coherent picture of the international portfolio of agents and representatives who acted for Hingleys. Sections 1, 4, 5, 6, and 7, are in the main working papers without summaries, such as profit and loss accounts or balance sheets. Sections 9 and 10 are miscellaneous in nature and of no value to the study, Section 9 being mainly twentieth century catalogues and Section 10 a portrait of Noah Hingley.

Part II of the Collection comprises a mass of papers to do with some twenty-three subsidiary or associated companies after 1920. Access to these papers is not allowed until they have been properly sorted and classified.

Secondary sources vital to this study fall into two distinct groups. The first group comprises material that is directly relevant to the wrought iron industry in the Black Country. The second group comprises relevant literature on the economic, industrial, social, and welfare developments of the period that determined the context in which the Hingley firm worked and prospered.

In the first group, the transcript of the lecture given at the University of Birmingham on 30 October 1902 by Daniel Jones, the employers' secretary to the Midland Iron and Steel Wages Board, has provided a penetrating insight into why Hingleys enjoyed industrial peace for fifty years at a time when labour relations often verged on open warfare in industry at large. This insight was supplemented by the records of the Board held at the Modern Records Centre, University of Warwick. S Blackburn has provided a fascinating study of the chain masters who gave the Black Country a bad name, and at the same time highlighting how the Hingley firm set itself above the low benchmark of the time.[3]

In the second group, the general economic context of the period from 1890 to 1918 has been examined by reference to R S Sayers, Peter Mathias, and to Frank B Tipton and Robert Aldrich.[4] These writers' works have been supplemented by the extremely informative histories of Vickers and John Brown.[5] The position of Hingleys during the period

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[3] S Blackburn 'Employers and Social Policy : Black Country Chain Masters, the Minimum Wage Campaign and the Cradley Heath strike of 1910,' Midland History 12 (1987).

[4] R S Sayers, A History of Economic Change in England, 1880-1939 (London : Oxford University Press, 1967).
Peter Mathias, The First Industrial Nation. An Economic History of Britain 1700-1914 (London : Methuen, 1969).
Frank B Tipton & Robert Aldrich, An Economic and Social History of Europe, 1890-1939 (London : Macmillan, 1987).

[5] Sir Allan Grant, Steel and Ships The History of John Brown's (London : Michael Joseph, 1950).
C Trebilcock, The Vickers Brothers Armaments and Enterprise

that saw the final decline of whole sections of British industry, as the first Industrial Revolution ran its course, is examined in the context of comparatively recent economic and historical studies of that period. Especially useful in this process have been the works of N F R Crafts, D N McCloskey, D H Aldcroft, M Edelstein, C K Harley, R C Allen, P Berck, S Webb, Asa Briggs, W P Kennedy, and H Pelling.[6]

The unique achievement of Hingleys in surviving and prospering against the tide of world events in the wrought iron industry has been examined against the background of T H Burnham and G D Hoskins, supplemented by Geoffrey Tweedale.[7] This achievement has also been examined in the

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1854-1914 (London : Europa Publications, 1977).
J D Scott, Vickers A History (London : Weidenfeld & Nicholson, 1962).

[6] N F R Crafts, British Economic Growth during the Industrial Revolution (Oxford : Oxford University Press, 1985).
D N McCloskey, 'Did Victorian Britain fail?', Economic History Review, 2nd ser., (23 1970).
D H Aldcroft, 'The Entrepreneur and the British Economy, 1870-1914', Economic History Review, 2nd ser., (17 1964).
D N McCloskey, Enterprise and Trade in Victorian Britain, (London : Allen & Unwin, 1981).
M Edelstein, 'Realised Rates of Return on UK Home and Foreign Investment in the Age of High Imperialism, 'Explorations in Economic History, (13 1976).
C K Harley and D N McCloskey, 'Foreign Trade : Competition and the Expanding Economy', in R C Floud and D N McCloskey (eds.), The Economic History of Britain since 1700, vol. 2 (Cambridge : Cambridge University Press 1981).
R C Allen, 'International Competition in Iron and Steel, 1850-1913', Journal of Economic History, (39 1979).
R C Allen, 'Entrepreneurship and Technical Progress in the Northeast Coast Pigiron Industry : 1850-1913', Research in Economic History, (6 1981).
P Berck, 'Hard Driving and Efficiency : Iron Production in 1890', Journal of Economic History, (38 1978).
S Webb, 'Tariffs, Cartels, Technology and Growth in the German Steel Industry, 1879 to 1914', Journal of Economic History, (40 1980).
Asa Briggs, History of Birmingham Borough and City - 1865 to 1938, vol. 2 (London : Oxford University Press 1952).
W P Kennedy, 'Foreign Investment, Trade and Growth in the United Kingdom, 1870-1913', Explorations in Economic History, (11 1974).
W P Kennedy, 'Economic Growth and Structural Change in the United Kingdom, 1870-1914', Journal of Economic History, (42 1982).
H Pelling, Modern Britain 1885-1955 (Edinburgh : Thomas Nielson, 1960).

[7] T H Burnham & G D Hoskins, Iron & Steel in Britain 1870-1930 (London : Allen & Unwin, 1943).

context of the general fortunes of the iron and steel trades in the West Midlands, as seen in the unpublished theses of D B Evans, M Le Guillou, and G R W Medley.[8] Reference has also been made to the various histories of Vickers, John Brown, and the like, companies that formed part of the industrial environment in which Hingleys was placed.[9] The area of labour relations in this period, during which Hingleys led a charmed life, has been examined by reference to E H Phelps Brown, George Dangerfield, J E Vichniac, and C Behagg.[10]

By way of redressing the inevitable tendency to concentrate on the demise of British manufacturing industry when considering the period 1870-1914, particular attention has been paid to the studies of M J Wiener, W D Rubinstein and Corelli Barnett.[11] Wiener from America and

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Geoffrey Tweedale, Sheffield Steel and America : A Century of Commercial and Technological Interdependence, 1830-1930 (Cambridge : Cambridge University Press, 1986).

8 D B Evans, 'The Iron and Steel Industry of South Staffordshire', University of Birmingham, 1951.
M Le Guillou, 'Developments in the South Staffordshire Iron and Steel Industry, 1850-1913, in the Light of Home and Foreign Competition', University of Keele, 1972.
G R W Medley, 'The Geography of Industrial Decline : the Black Country Iron and Steel Industry, 1850-1900', University of London (external), 1982.

9 Sir Allan Grant, Steel & Ships The History of John Brown's (London : Michael Joseph, 1950).
C Trebilcock, The Vickers Brothers Armaments and Enterprise 1854 - 1914 (London : Europa Publications, 1977).
J D Scott, Vickers A History (London : Weidenfeld and Nicholson, 1962).

10 E H Phelps Brown, The Growth of British Industrial Relations (London : Macmillan, 1965).
G E Dangerfield, The Strange Death of Liberal England. (London : McacGibbon & Kee, 1939).
J E Vichniac, The Management of Labour : the British and French Iron Industries, 1860-1918 (Greenwich, Conn. : JAI Press Inc., 1990).
Clive Behagg, Labour and Reform, Working Class Movements 1815-1914 (Sevenoaks, Kent : Hodder & Stoughton, 1991).

11 M J Wiener, English Culture and the Decline of the Industrial Spirit, 1850-1980 (Cambridge : Cambridge University Press, 1981).
W D Rubinstein, Capitalism, Culture, and Decline in Britain, 1750-1990 (London : Routledge, 1993).
C Barnett, The Audit of War (London : Macmillan, 1986).

Rubinstein from Australia have brought a measure of perspective to the whole issue of Britain's apparent decline. This, is with particular reference to the fact that during the period covered by this study, and for half a century afterwards, Britain's real hegemonic influence lay in international commerce and international finance.

Especially useful in assessing the significance of the incorporation of the firm in the style of N Hingley and Sons Limited in 1890 were works by Lloyd Bonfield, P L Payne, and H A Shannon.[12] Studies by G Carpenter and Bentley B Gilbert on changing attitudes and policies on unemployment and sickness clarified the broad social context within which Hingleys operated.[13]

A source of particular interest in this study was the specifications forming part of the patents taken out by the British anchor makers in the early 1900s. At a time when Germany and the USA were leading developments in the new industries, British innovative designs still led the world in solving problems, the outcome of which were critical for the safety of the massive ships that were constructed in that era. Examples of these specifications are contained in Appendix 3.

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12 Lloyd Bonfield 'Affective Families Open Elites and Family Settlements in Early Modern England', Economic History Review, 2nd ser., 39 (3 1986).
P L Payne 'The Emergence of the Large-scale Company in Great Britain, 1870-1914', Economic History Review, 2nd ser., 20.
H A Shannon 'The coming of general limited liability', Economic History, (2 1931).

13 G Carpenter 'National Health Insurance 1911-1948 : a case study in the use of non-profit organisations in the provision of welfare benefits, Public Administration 62, (1 1984).
Bentley B Gilbert, The Evolution of National Insurance in Great Britain (London : Michael Joseph, 1966).

The period under study ended with the traumas and changes imposed by the need to adopt industry for The Great War from 1914-1918. Here, extensive reference has been made to Gerry R Rubin[14].

An original contribution to knowledge

The Black Country passed a milestone in the production of chain and chain cable in the year 1909. In that year some 90 per cent of all Britain's production of chain took place in some two or three square miles of the North Worcestershire enclave in the South Staffordshire region, encompassing Netherton and Cradley.[15] Thus the region not only held a world monopoly in the production of chain cables, it also held an hegemonic position in the production of the ships' anchors that were manufactured in Hingleys' works. This study, therefore, has as a principal objective the development of a clear understanding and appreciation of how one firm above all the others came to be the world leader in this field of endeavour.

The leading characters

The leading family characters in this study are Noah Hingley, the founder of the firm, Benjamin Hingley, his youngest son, who took over direction of the family firm from his father in 1877, and George Benjamin Hingley and Henry Montagu Hingley, Noah's grandsons by his Liverpool based son, Hezekiah. Lesser but vital figures are Alfred Hilton Legge, the redoubtable company secretary who served the Hingleys from 1862 to 1910, and William Blakey Rumford, the assistant company

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14 Gerry R Rubin, War, Law, and Labour. The Munitions Acts, State Regulation, and the Unions, 1915-1921 (Oxford : Clarendon Press, 1987).

15 S Blackburn, 'Employers and Social Policy : Black Country Chain-Masters, the Minimum Wage Campaign and the Cradley Heath strike of 1910,' Midland History 12 (1987) : 87.

secretary who served from about 1884 to 1918; in reality Rumford was personal assistant to George Benjamin Hingley and a life long confidant.

George Cyril Edwards was the first professional administrator to be appointed by the Hingleys, joining the firm in 1910. His major roles were to manage the mass of administration stemming from the financial, social, and industrial legislation brought in by the Liberal government and to control the wide proliferation of agents used by Hingleys.

Last but certainly not least is Cyril Edward Lloyd, brought in as a director in 1908. Lloyd was a civil engineer who became an ironmaster of equal standing with the Hingleys. Within two years of becoming a director Lloyd had a hands-on involvement in every aspect of the business. He became indispensable and was the obvious choice as chairman of the company when Sir George died in 1918.

Figure 1.1 provides an abbreviated family tree based on one prepared in 1952 by Colonel G P L Weston at a time when descendants of the Hingleys were endeavouring to sort out a complicated legacy. The family tree shows that few of Noah Hingley's sons were permitted to join him in the business. Eli, James, and John do not appear again in this study.[16] Likewise, Joseph Hingley although a minor shareholder from 1890 until his death in 1900, certainly took no part in the business during the period covered. The three brothers who were involved in the family business were Hezekiah, Samuel, and Benjamin. Hezekiah died while Noah Hingley was still in his prime, but he left two sons. These were George Benjamin Hingley and Henry Montagu Hingley. Together with their uncle Benjamin Hingley they became the principal shareholders in the company that was formed in 1890. This study is focused on George Benjamin

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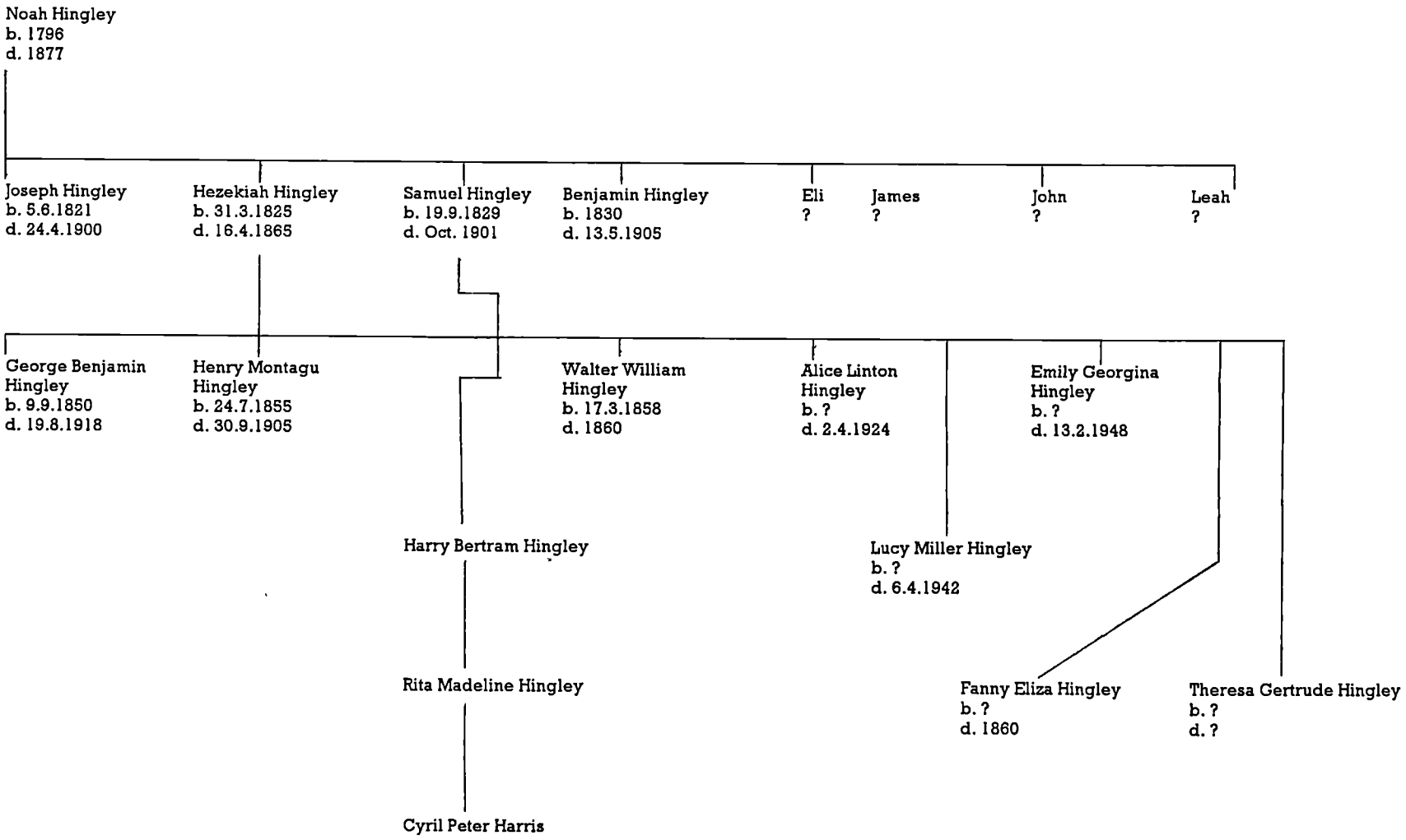
[16] Colonel G P L Weston, DSO, OBE, (later Major-General Weston) to five close relatives, 1 April 1952, personal files of Mr C P Harris.

Hingley and Henry Montagu Hingley, the third and last generation to manage the firm and who took it to its pre-eminent position in the market for anchors and ships' cables.

Figure 1.1 : Noah Hingley's decendants



Noah Hingley's son Samuel Hingley was the one who missed out. He was totally devastated in the 1860s by the death of his first wife, followed by the death of his young daughter following a ducking in the sea by a bathing attendant at Bognor.[17] He suffered a breakdown and was sent to the south of France to recover. There he met his second wife by whom he had six children who in turn produced a dazzling array of descendants. Samuel was never given any great responsibility or any significant equity stake in the firm. He was installed at Harts Hill Iron Works in Brierley Hill under the direction of his brother Benjamin, as was his own son Harry Bertram Hingley after him. This was an arrangement made within the family to provide a livelihood for one of its weaker members.

For all practical purposes Noah Hingley's business on his death passed to Benjamin Hingley, his youngest son, and to Hezekiah Hingley's sons, George Benjamin Hingley and Henry Montagu Hingley. The actual dispositions would appear to have been made under the 'Noah Hingley Family Settlement'. This was made before his death and no trace has been found despite enquiries to solicitors and the public record offices. Indeed its very existence only came to light from a passing reference to it in 1910 by Sir George Benjamin when clearing up the affairs of a female relative. However, Noah Hingley's last will and testament as proved on 29 November 1877 left an estate worth less than £2 000. The legatees were Benjamin, Samuel, the two sons of Hezekiah, and Noah's daughters Leah and Mary. The estate consisted of purely domestic items and his famous ironworks were not included. At that time, as long as the contents of the settlement were open knowledge, there was no need even for formal written registration. This probably accounts for the fact that the original document drawn up by A Humfrey, a solicitor in Halesowen, has not come to light.

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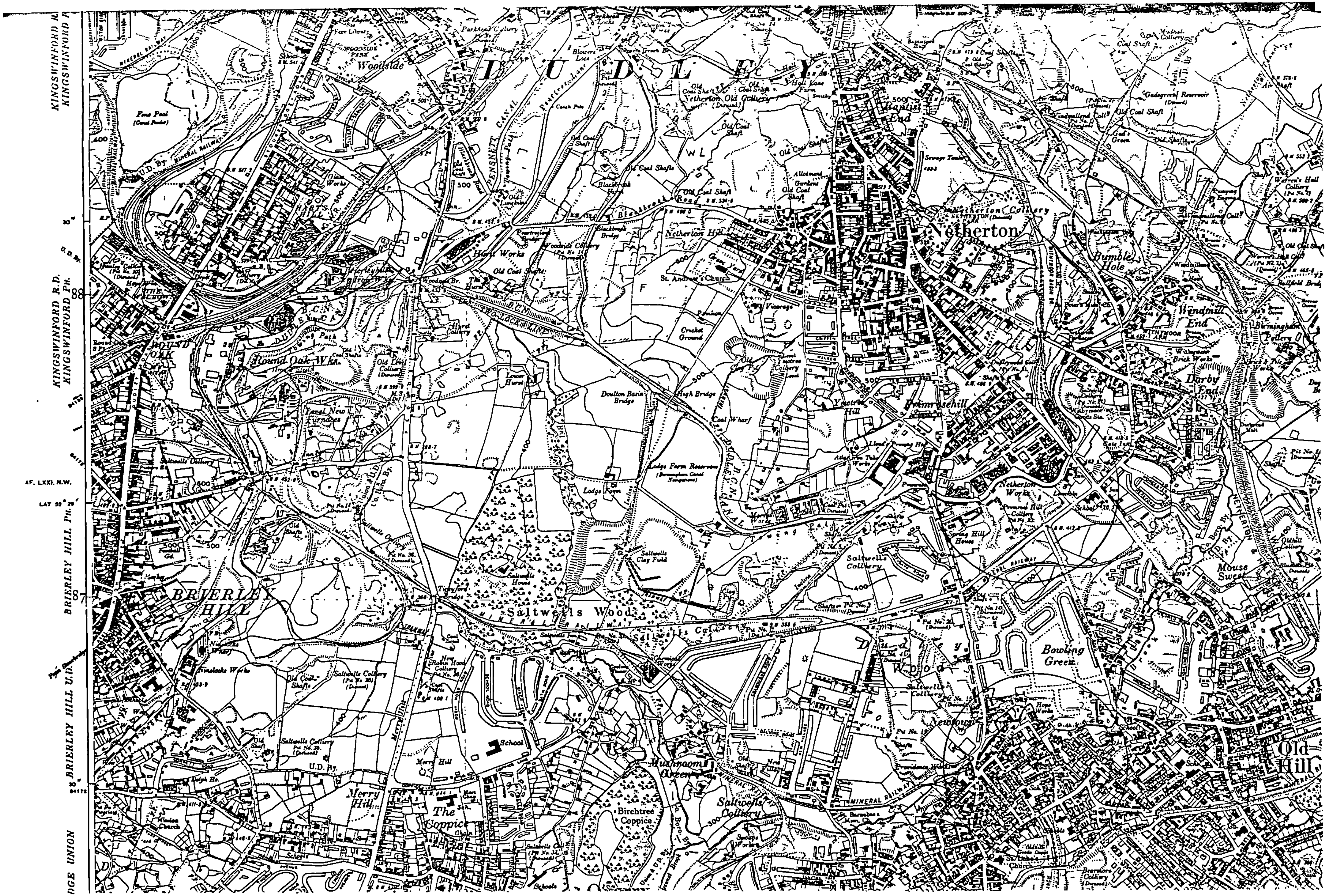
17 Rumer Godden writing to Rita (Hingley) Harris, 29 January 1986, personal files of Mr C P Harris.



KINGSWINFORD R.D.
KINGSWINFORD Pн.
BRIERLEY HILL Pн.
BRIERLEY HILL U.D.
DUDLEY
Woodside
Fens Pool
Netherton
Bumble Hole
Windmill End
Darby End
Primrosehill
Round Oak Wks.
Saltwells Wood
BRIERLEY HILL
Bowling Green
Mouse Sweet
Old Hill
Merry Hill
The Coppice
Birchtree Coppice
Saltwells Colliery
Mushroom Green
Newtown
Lodge Farm Reservoir
Doulton Basin Bridge
High Bridge
Coal Wharf
Cricket Ground
St. Andrew's Church
Netherton Hill
Blackbrook Road
Hurst Works
PENSNETT CANAL
Netherton Works
Spring Hill House
School

Further reference to settlements has been made in the chapter on the structure of the company incorporated in 1890. There, attention has been drawn to Lloyd Bonfield's article on family settlements with particular reference to the distribution of wealth as effected by Noah Hingley.[18]

Noah Hingley was born on the 7 March 1796, the son of Isaac Hingley and his wife Esther. With his father he set up a forge and small chainmaking factory on the banks of the River Stour in Cradley, North Worcestershire, in the early 1800s. The key to their early success lay in developing a colony of skilled Cradley men and women on which the enterprise was based. By 1845 the Cradley workshops were too small and new commodious purpose built works were erected at Netherton on the banks of the Birmingham Canal at the location shown on the map that follows this page. These were opened in 1852. Having established his reputation with chains and anchors, Noah Hingley then set about making the pig iron required in the manufacture of wrought iron. He also raised his own coal, leasing properties from Lord Ward of Dudley. His activities encompassed the Netherton Ironworks, The Harts Hill Iron Works, The Old Hill Furnaces, and various collieries. Until 1820 Noah Hingley was a nail master and maker of small chains. It was during his regular trade visits to Liverpool that he accepted an initial order to make ships' cables. This work had been pioneered on Tyneside, where the manufacture of wrought iron cables had begun in or about 1808. Hingley had no knowledge of cable making techniques, but he and his workers made the cable to the satisfaction of the Liverpool merchant. This first cable was 1.5" in diameter, the size of a cable being the diameter of the wrought iron rod from which it was fashioned.[19] In 1848 Hingley

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[18] Bonfield, '...Settlements...', 341-354.

[19] Charles Fogg, Chain & Chainmakers (n. p., Shire Publications Ltd, 1981), 3, 6, 8.

introduced the making of anchors to the Black Country and within fifty years the area was the world centre for the manufacture of anchors and cables. Under the Acts of Parliament making the testing of cables and anchors compulsory, where they were to be used on British ships, testing machines were established at Netherton and at Tipton.[20]

Although very much against the incorporation of Netherton into Dudley in 1865, Noah Hingley became Mayor of Dudley in 1869 at the age of 74.[21] He died in 1877, full of years, but not before standing as a Parliamentary Candidate in 1874 at the age of 79, using as his manifesto the Contract of Employment he had with his work force as a proof of his fair play and open dealings. His candidature arose from the cancellation of the General Election victory of H H Sheridan over F S Shenstone because of riots and intimidation!

Benjamin Hingley was the most prominent of Noah Hingley's sons. He was born in 1830 and died in 1905. He succeeded his father as the head of business in 1877 when he was 47 years of age and he was sole manager until 1890. He was a prime mover in the formation in 1890 of the private limited company of N Hingley & Sons Limited, which effectively placed ownership, control, and operation of his father's chain and anchor business in his hands and those of the two sons of his older brother Hezekiah. Hezekiah was born in 1825 and died in 1865 at the early age of 40 years. He was based in Liverpool and on his death his widow Fanny Georgina together with their children George Benjamin Hingley, Henry Montagu Hingley, Alice Linton Hingley, Emily Georgina Hingley, and Lucy Miller Hingley came to live in North Worcestershire.

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20 F H Hackwood, Oldbury and Round About (Birmingham : Cornish Bros, 1915), 267.

21 Dudley Herald, 28 February 1891.

Benjamin Hingley belonged to that first generation in the gentrification of the manufacturing classes. He was essentially an ironmaster of international repute, responsible for the business ethics and the quality of product for which his firm was renowned. He never married and nor did any of the children of his brother Hezekiah. Indeed, Cyril Peter Harris, who is descended from Benjamin's brother Samuel Hingley, tells of his mother's recollection that the three redoubtable Hingley girls would not let any girl near their two brothers! Here one has to speculate which was the sadder aspect of the gentrification process : the fear of marrying beneath or the inability to marry above one's station. This did not appear to affect Samuel Hingley who, through a Merseyside marriage, gave rise to a large group of middle class descendants, among them solicitors, a much decorated general, and the author Rumer Godden. As for Hezekiah, his line died out as none of his five children married and with it the management of the Hingley firm passed out of the family. Benjamin Hingley, in addition to his work as an ironmaster, was also active in public life. He was a Justice of the Peace in Worcestershire, Staffordshire, and the County Borough of Dudley. He joined in the successful resistance to the incorporation of Dudley into Staffordshire, thus maintaining its status as an island of Worcestershire. He was Mayor of Dudley in 1887 and 1888 and he became the High Sheriff of Worcestershire in 1900. He was also a Deputy Lieutenant of that County. He was created a Baronet on the recommendation of Gladstone in 1893 and was Member of Parliament for North Worcestershire from 1885 to 1895, when he was compelled to retire from public life and from active management of the business by a serious illness.[22] At this point, effective control passed to Benjamin's nephews, the two grandsons of Noah Hingley, forty-five year old George Benjamin Hingley and forty year old Henry Montagu Hingley.

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[22] E Blocksidge's, Dudley Almanac, (n.p., 1906), 87-115.

George Benjamin Hingley, later Sir George Benjamin Hingley Bt., is the principal player in this study. He was involved on a day to day basis in the top level management of N Hingley & Sons Limited from the day of its incorporation in 1890 until his death, worn out by his efforts in the Great War, in August 1918. Under his uncle, Benjamin, he was effectively managing director of the company by 1895, becoming chairman in 1905. He must have been very highly regarded by his bachelor uncle, who arranged that George should succeed to the baronetcy under a remainder.

George Benjamin Hingley, known in the business as 'Ben' Hingley, was born in 1850, and lost his father Hezekiah in 1865 when he was 15 years of age. Following the move to Worcestershire in 1865 he attended the Halesowen Grammer School. He travelled extensively on behalf of the firm and was responsible for setting up the network of agents in the Orient and in Australasia.[23] Without doubt George Benjamin Hingley was a workaholic and as this study will show there was no aspect of the business in which he was not involved. He took very short holidays and was perpetually involved in short distance travel to London, Liverpool, Glasgow, and other British cities on behalf of the business, while depending on his brother Henry Montagu to undertake much of the necessary continental and intercontinental travel. The year after becoming chairman in 1905, he had a resolution passed ensuring the concentration of the share ownership into the hands of his brother and himself. This matter is referred to in detail in a later chapter, but the effect of the manoeuvre was dramatic. Both brothers were bachelors and Henry Montagu did not enjoy good health. Before the latter's death in 1909, at the age of 54, George Benjamin Hingley was compelled to bring in competent ironmasters from outside the family. With his own death in 1918 management of the company passed out of the family on an

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[23] WHC : Sec. 8 : Newscuttings, vol. 1.

amicable basis, the once tight shareholding having been dispersed in his later years among dozens of holders.

'Ben' Hingley was a Victorian entrepreneur of the highest reputation and standing. His dedication to his enterprise, workforce, and region was exemplary. Unlike his uncle and grandfather he took no part in political activities at representational level, reserving his spare energies for trade associations. An obituary in 'The Dudley Telegraph' of 21 August 1918 noted his long membership of the Midland Iron and Steel Wages Board. He also served as vice-chairman of the South Staffordshire Ironmasters' Association. This Board secured industrial peace in the trade for fifty years, while the Association inculcated fair play in industrial relations.[24]

'Ben' Hingley died on 19 August 1918 at a time when the British nation was locked in the trauma of the great and final counter-offensive that ended the Great War. This continuous counter-offensive lasted from April to October 1918 and totally dominated the year. However, the entire national press ran obituaries to mark his remarkable career. In addition the whole of the provincial press in the West Midlands joined the tribute, together with the local papers in Liverpool, Glasgow, the north east, etc., where he was particularly well known.[25] Inside and outside of the trade he was known as the man who made the anchors and cables for the navies of the world. In this study, George Benjamin Hingley is referred to as 'Ben' Hingley until he succeeded to the baronetcy in 1905. Thereafter, he is referred to as Sir George Hingley, as was the custom in his firm.

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[24] Ibid.

[25] Ibid.

Henry Montagu Hingley was born in 1855 and he died in 1909 at the early age of 54. Like his brother he remained unmarried and was dedicated to the business. Whereas his brother had a particular interest in Australia, the Far East and Italy, Henry Montagu covered South Africa and Northern Europe in a harmonious and complementary approach to their world marketing activities. The files show that Henry Montagu had a very profound grasp of the finer techniques of making their world famous wrought iron. Although anchors and cables were the high profile products of N Hingley & Sons Limited, Netherton bar iron was an original and major item in the export portfolio of the firm. Many of the technical innovations in the firm were due to him as later sections in the study will show. His premature death left his brother with no alternative but to bring in outsiders to help in the running of the firm.

Of the outsiders, four stand out for their contribution to the business. Alfred Hilton Legge served the firm from 1862 to 1910, acting as company secretary from its incorporation in 1890 and no doubt in a similar capacity well before 1890. He was particularly well informed on all aspects of the business and he had the standing and the authority to represent the Hingleys on most trade matters. His control over the reporting of weekly production provided the key to the reliability with which the Hingleys could enter into their contractual obligations. George Blakey Rumford, whose name first appears in the records in 1895 was assistant company secretary and personal assistant to 'Ben' Hingley. He appears to have been passed over in the appointment of the new company secretary in 1910, but in August 1914, when G C Edwards went to the War, it was left to Rumford to carry out both sets of duties. The files show that by 1917 his health too was completely shattered and he died in December 1918. George Cyril Edwards, appointed company secretary in 1910 on the retirement of Alfred Hilton Legge, soon

acquainted himself with the intricacies of the business. He had the clearest view of the Hingley network of agents and marketing techniques, but as an officer in the territorial army, he left the firm on the outbreak of war in 1914 and did not return until 1919.

However, the most important of all the outsiders was Cyril Edward Lloyd. Only 32 years of age when brought into the firm by Sir George Hingley on 30 January 1908, he went on to become the grand old man of the enterprise, dying in harness as president of the company in 1963 after fifty five years service. Lloyd was a member of the well known banking family, but instead of going into banking he had qualified as a chartered civil engineer. Within two years of joining Hingleys he became the de facto managing director with a personal involvement in every aspect of the company's marketing and sales activities. In this he enjoyed the support of the technical directors in the works namely G F Simms, E H Smith, and C E Howell. As Sir George's right hand man he quickly developed into one of the leading ironmasters in the West Midlands. Later he served as a Conservative MP for Dudley in the years 1922-29 and 1941-45. He was a member of the Birmingham Committee of Lloyds Bank and a director of the Great Western Railway.

The central argument

The main thrust of the dissertation will be to demonstrate that, during the whole of the period under review, the firm of N Hingley & Sons Limited was an industrial anachronism harnessed to a paradox. Hingleys was an anachronism because its basic product, high quality wrought iron, was in terminal decline as an industrial metal from 1886 when world production of steel first exceeded that of wrought iron. By 1930, wrought iron was no longer considered to be a commercially significant metal. The changing fortunes of the two products are discussed in more

detail in chapter two, but a general indication may be shown as follows[26].

Table 1.1 : World production of wrought iron and steel between 1885 and 1930

	World production of wrought iron in tons	World production of steel in tons
1885	7 110 000	6 190 000
1890	8 560 000	12 280 000
1920	2 310 000	71 120 000
1930	500 000	93 330 000

The Hingley works consistently produced some 20 to 25 per cent of the British output of wrought iron and the paradox arose from the fact that, against the general trend, steel was no match for the finest wrought iron for the manufacture of large size ships' cables and anchors. This paradox enabled Hingleys to target and then to dominate this market by the skilful blending of several critical factors.

The first three of these factors were the basic product itself, the workforce, and the business ethics of the proprietors. Hingleys produced wrought iron of the highest quality, a fact that gave them benchmark status in specifications. Excellent labour relations prevailed in the workplace, based on the mutual accords reached in the Midland Iron and Steel Wages Board. Third came an absence of greed on the part of the owners, whose business ethics were based on the notion of a good product at a fair price.

The fourth factor was the ability of Sir George Hingley, in particular, to form trade combinations involving many of his British competitors working in tandem with his own firm in order to balance the market, especially in times of boom. The outstanding achievement in trade

[26] Burnham & Hoskins, Iron & Steel in Britain 1870-1930, 26-27.

combinations, that of the clandestine commercial alliances with German firms, belongs however to Sir George's brother, H M Hingley. The way in which those German alliances featured in the well being of the firm will be examined in detail later in the text. The fifth factor was the system of world wide marketing, developed initially by 'Ben' Hingley and his brother H M Hingley, and further extended by C E Lloyd. This system took the Hingley products to the heart of the shipbuilding industry in northern Europe; and also to the mining and industrial areas of the Colonies and Dominions and to the new States in South America, as well as Japan.

The study will also demonstrate how a family firm that converted to company status in 1890, after an existence of more than seventy years, was able to effect a transformation from management by the gaffer, to management by a professional board. This transformation enabled it to survive the virtual extinction of wrought iron as a world metal, and continue to trade successfully for a further half century after the death of Sir George, the last Hingley to manage the company, in 1918.

PART ONE : THE FIRM IN CONTEXT

CHAPTER TWO : THE BROAD ECONOMIC ENVIRONMENT, 1890-1920

A general overview

The years covered by the study have often been referred to as the 'Belle Epoque'. They were years during which the elites of Europe lived in a style that was in marked contrast to that endured by the working populations on which industrial prosperity relied. It was a period of constant social turmoil, but it was also one in which the Hingley firm enjoyed a charmed existence. This was due to the presence of two critical factors. The first was the long term industrial harmony in the works stemming from Benjamin Hingley's promotion of The Midland Iron and Steel Wages Board from the 1870s onwards. The second was a set of circumstances that allowed Hingleys' part of the wrought iron trade to flourish, when the industry as a whole was in terminal decline. Both of these factors are examined later.

It was also a new age of imperialism. Britain and France extended their existing overseas dominions. Portugal and the Netherlands held on to their long-established empires. Belgium, Italy, and Germany, as newcomers in the European state system, hurried to stake their claims. Only Spain lost ground, in the war of 1898, to an expansionist United States. Economically, too, an unprecedentedly integrated world economy was dominated by Western Europe and the United States as the century drew to a close. Yet by this date, a second industrial revolution was already under way that was to bring marked changes in the balance of power. The new growth industries were steel, machine tools, chemicals,

and electrical engineering. These were fields in which Germany and the USA were to take the leading positions.[1]

In a general overview of the period, Peter Mathias has highlighted the various factors that led to the shifts in balance among the world leaders in the various economic activities of the era. By 1890 Europe was emerging from the long period of stagnation, also known as the Great Depression, that lasted from 1873 to 1896. It had been a period of doubt, self-questioning, and disenchantment. During the next thirty years Britain still dominated certain of the old heavy industries, but it lost its general position of world hegemony. Shipbuilding, so central to this dissertation, was the one area in which Britain maintained a world wide hegemonic position. As shipping adopted steam power, Britain established coaling stations all over the world. Exports of Welsh steam coal rose from 36 million tons in 1890 to 100 million tons in 1913. Heavy engineering prospered, as did the armament trade, food processing, and brewing. Large companies producing branded consumer goods for a newly emerging mass market, such as Beecham, Lever, Cadbury, Fry, Guinness, and Bass, flourished, demonstrating that Britain did have a capacity for entrepreneurship. Many of these activities, however, had a downside in that they were there to satisfy the growing purchasing power of the more affluent of the working classes. As a result, these major economic activities did not initially contribute significantly to exports. In the newer industries of the second industrial revolution Britain did not fare as well. Relative to the USA, Britain fell away in the world competition for machine tools and motor cars in the period from 1890 to 1900. While leading Germany in the production of motor cars, Britain trailed in dye-stuffs and cameras. Indeed, by 1900 world leadership in metals technology, mining,

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[1] Tipton & Aldrich, History of Europe, 1890-1939, 1-5.

electrical engineering, optics, chemicals and chemical engineering, had passed to Germany.

When looking at reasons for the relative deterioration of Britain's position in the world economic league, Mathias identified three critical factors. The first was that a relative failure by Britain to maintain innovation and development allowed the newly industrialised nations in Europe and the USA to catch up. The second was the management structure in British Industry where the prevailing pattern was the family firm or partnership, or the public company where the family held most of the controlling shares. This gave rise to the well known commercial phenomenon where by the third generation an enterprise was regarded more often as a source of income for a landed gentleman than as a continuing source of working capital. The third, and perhaps the most significant factor, was the issue of higher education. Neither Germany nor the USA encouraged a retreat from business among those blessed with higher education. By 1870, the USA had 70 universities that were actually sponsored by local businessmen and agriculture. Likewise, Germany developed a nationwide system of higher education.[2]

Viewed in relation to the technologically innovative leaders of the second industrial revolution, Hingleys initially appeared to be something of an anachronism. Such innovation as took place was evolutionary rather than revolutionary. It was, however, an anachronism that was particularly well suited to take advantage of its position. As an industrial activity the manufacture of large scale ships' anchors and large size ships' cables was one of the few fields in which top class wrought iron was far superior to the best of the mild steels on offer at the time. Additionally, the best anchors and cables had to be fashioned mainly by hand.

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[2] Mathias, The First Industrial Nation, 395-423.

Within the limits of its operations, and throughout the whole of the period under review, Hingleys was a significant force in the economic life of Britain. The firm gave employment to between 2500 and 3000 people. Its role was played out in two associated but parallel fields. The first was in its production of top class wrought iron. At this time the three top producers were Hingleys with its Netherton Crown Special Best Best Iron, Henry Wood of Chester with its Snedshill Extra Best Best, and Barrows & Hall of Tipton with its BBH Special Best Best. After the demise of Barrows & Hall in 1906 Hingleys became the leading producer of top class wrought iron. In 1909 it was producing 1000 tons per week.[3] The second was its commanding presence in the field of ships' anchors and in the fabrication of large diameter (up to 6") ships' chains and cables.

Hingleys in the context of debate on the Industrial Decline of Britain

Earlier in this study particular reference was made to the economic histories of T H Burnham and G D Hoskins, R S Sayers, F B Tipton and R Aldrich, and P Mathias. This section now draws heavily on N F R Crafts for his work on bringing together the strands of the debate on industrial decline, on Derek Aldcroft for his indictment of British entrepreneurial endeavour, on D N McCloskey for his spirited defence of the late Victorian and Edwardian businessmen, and on R C Allen, P Berck, and S Webb for their particular studies of total factor productivity in the context of industrial decline. Other writers are also introduced to illuminate the text.

In order to redress the inevitable tendency to concentrate on industrial decline when discussing Hingleys' place in the economic order, especial reference has been made to the works of M J Wiener and W D Rubinstein.

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[3] WHC : Sec. 8; GBHLB, 3 : 25 October 1909, 40.

Wiener addresses the place of elitism in the sphere of secondary education, an elitism that contributed to the north south divide in Britain, especially over the status of industry as a proper occupation for the newly gentrified classes. Rubinstein brings some much needed realism to the whole debate by demonstrating that Britain's industrial pre-eminence was a relatively short lived fact of economic history when compared with its much longer domination of world commerce and finance.

Crafts, dealing with some of the legacies of Britain's early start in the first Industrial revolution, highlights the extent of the controversy surrounding Britain's alleged decline in this period.[4] Essentially the controversies revolve around the very differing opinions of Derek Aldcroft writing in 1964 and D N McCloskey's major responses in 1970 and 1981. Aldcroft's indictment, spelled out without equivocation, stated that British entrepreneurs:

- failed to adopt the best available techniques of production
- under-estimated the growing importance of science, investing little in laboratories or research
- over-invested in the old staples of cotton and iron, ignoring chemicals, automobiles and electrical engineering
- were bad salesmen, especially abroad
- were insufficiently aggressive in organising cartels to extract monopoly profits from the world at large[5]

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[4] Crafts, British Economic Growth during the Industrial Revolution, 155.

[5] Aldcroft, 'The Entrepreneur and the British Economy, 1870-1914', 113-134.

Hingleys' defence against these charges will shortly be discussed. More generally, a rebuttal exists for each, supported by empirical evidence. The strong move by neo-classical economic historians to defend the performance of the British economy during the late nineteenth and early twentieth century, has among its strongest supporters D N McCloskey whose paper of 1970 contributed a very robust defence. McCloskey's main thrust was that the economy was not stagnating during this period, but was growing as rapidly as was permitted by the growth of resources and the effective exploitation of available technology. He also endeavoured to show that at the macro-economic level, productivity growth was creditable compared with other advanced economies. He also contended that no gains would have resulted from redirecting Britain's large foreign investment into the domestic economy.[6] The significance of Britain's large foreign investments, as the backcloth against which her manufacturing sector must of necessity be viewed, is treated more fully a little later in the text.

As Aldcroft admitted when commentating by invitation in McCloskey's book, McCloskey's opinions rejected the conventional history of climacteric or retardation being the norm for the late Victorian and Edwardian economies.[7] Indeed, McCloskey reiterated his earlier view that the growth performance of the British economy was reasonably satisfactory, stating that there was little potential for further growth through either home demand or exports because of the inelastic supplies of labour and growth capital. He further stated that as total growth was fixed by the availability of resources and productivity gains, that faster growth was inhibited by the rate of productivity growth.[8]

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[6] McCloskey, 'Did Victorian Britain fail?', 451-459.

[7] McCloskey, Enterprise and Trade in Victorian Britain, 111.

[8] Ibid., 111.

McCloskey's view that Britain did not over-invest overseas at the expense of the domestic economy, receives support from M Edelstein whose view was that the London capital market generally allocated funds efficiently and did not exhibit a tendency to invest too much abroad.[9] In addition McCloskey, writing with Harley, agreed that Britain was correct to continue to exploit her comparative advantage in the old industries right up to the Great War in 1914. He argued further that her relative slowness to expand new industries was in line with her skills and factor endowments.[10] The matter of factor endowments will be considered when considering certain of the dissenting views from McCloskey's defence of the late Victorians and the Edwardians.

Crafts, in his analysis of comparative manufacturing advantages in the last year before the outbreak of war in 1914, schedules the status of the four principal manufacturing countries in accordance with Table 2.1[11]

Table 2.1 : The status of four principal manufacturing countries in 1914

United Kingdom	Germany	France	United States
Rail and Shipping	Electricals	Spirits/Tobacco	Non-ferrous metal
Textiles	Cameras	Motor Cars	Agricultural equipment
Iron and Steel	Leather	Apparel	Industrial equipment
Spirits/Tobacco	Industrial equipment	Cameras	Motor Cars
	Chemicals	Leather	Electricals
	Metal manufacturers	Textiles	Metal manufacturers
	Iron and Steel	Chemicals	Leather
	Non-metal materials		Rail and Shipping
	Apparel		Iron and Steel
			Cameras

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9 Edelstein, 'Realised Rates of Return on UK Home and Foreign Investment', 283.

10 Harley and McCloskey, 'Foreign Trade : Competition and the Expanding Economy', 68-69.

11 Crafts, British Economic Growth during the Industrial Revolution, 162.

The table, which in turn was based on research by Tysznski in 1951, would appear to add weight to McCloskey's view that Britain was right to concentrate on the manufacturing industries where it held an advantage right up to the Great War in 1914. This is of particular relevance to Hingleys' activities that were focused on the shipbuilding and iron trade. The table appears to show that Britain was wholly neglectful of the manufacturing industries dominated by Germany, France, and the United States. This, however, overlooks the tremendous advances in new industries that were a feature of the Second Industrial Revolution in Britain. These advances are considered later.

Total factor productivity

Turning now to the dissenters from McCloskey's defence of British economic performance in the period under review. Without exception, all of McCloskey's critics were writing with the 20 : 20 vision that comes with the benefit of hindsight some 70 years later, or two generations after the event. Allen, Berck, and Webb, have demonstrated that total factor productivity (or the way in which the resources of land, capital and labour were utilised) was lower in Edwardian Britain than in the United States or in Germany. Kennedy in two different views on investment strategy, cites mis-direction, while Richardson maintains that something close to a sclerosis of the economic arteries or constitutional inertia prevented Britain from accommodating change.

In developing his total factor productivity hypothesis in 1979, Allen was able to show that, while Britain had the most efficient iron industry in the world in 1850 by 1913 it had been overtaken by the United States and by Germany.[12] However, in 1981 he conceded that British firms in the north east of England had acted rationally, but may

[12] Allen, 'International Competition in Iron and Steel', 911-937.

have been held back by entrepreneurial failure.[13] Berck's main thrust was that Britain fell behind the United States in terms of total factor productivity in the iron and steel trades due to its non-acceptance of the hard driving techniques pioneered by US firms. Hard driving is the technique of virtually doubling output from the furnaces by blowing hot air at nine pounds per square inch, as against the UK usage of five pounds per square inch.[14] Having pioneered the technique, the US had a marked advantage as UK firms could not afford the capital outlay that was required for the higher pressure working.[15] This was of particular relevance to the Hingley enterprise. Much of its furnace equipment dated back to the middle of the century. Although a private limited company, it was still until 1908 a family partnership that financed all development out of revenue. Debt or commercial borrowing was contrary to the culture of the enterprise, and was never used as a means of replacing equipment. Webb's emphasis is rather different from the studies of Allen and Berck, in that he concentrated on Britain's failure to control the market. Indeed, Webb stressed that total factor productivity was influenced by the working of tariffs and cartels. A marked feature of the growth of German manufacturing industry after 1870 was the use of the cartel and the tariff to restrain competition.[16] For the British manufacturer, the cartel was often pictured as part of a foreign and often distasteful alien culture. Hingleys was wedded as a firm to free trade and Sir George Hingley had the gravest doubts about the great movement for tariff reform that was launched by Joseph Chamberlain on 15 May 1903. Chamberlain, who had been a free trader in the 1880s, used the clamour for an answer to German tariffs dating back

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13 Allen, 'Entrepreneurship ... in the Northeast Coast Region Industry,' 35-71.

14 Berck, 'Hard Driving and Efficiency', 879.

15 Ibid., 883.

16 Webb, 'Tariffs, Cartels, ... in the German Steel Industry', 309.

to 1870 and 1876, together with the McKinley tariffs of 1890 and 1897 that enshrined protectionism in the US, to advance his ideas on the Empire. His Tariff Reform Commission, when reporting in July 1904, recommended a tariff of 5 per cent on pig iron, 6 1/4 per cent on partly manufactured iron and steel; 7 1/2 per cent on wire rods and plates; and 10 per cent on sheet iron and steel.[17] These were very significant tariff proposals, the essence of which only saw the light in 1914 when, following the outbreak of war, the McKenna tariffs were introduced to protect British industry. Sir George, with his extensive trade in Germany and Italy was quite content to fight his own battles over tariffs. Indeed, he conceded defeat over the US market as will be shown in greater detail later, but after 1914 the penetration of that market by his colleague C E Lloyd with the Hingleys' vastly superior ships cables and anchors, more than justified Sir George's belief that the market would sort out its priorities if left free from controls.

In addition to dissenting from McCloskey's view on total factor productivity, Kennedy provides a more conventional dissent with his views on the way in which resources were deployed in this period, and also on the question of attitude. Kennedy argues that the problem in the period 1870 to 1913 was not that British resources were incapable of more rapid growth, but that these resources were not deployed to exploit the opportunities that were there.[18] He also identified an attitude or structural problem that tilted Britain away from modern technologically orientated manufacturing, when compared with the United States. In particular he cited the vigorous developments there in electrical engineering, organic chemicals, and telecommunication equipment.[19]

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17 Briggs, History of Birmingham, 33-36.

18 Kennedy 'Foreign Investments ... 1870-1913', Explorations in Economic History, 440.

19 Kennedy 'Economic Growth ... 1870-1914', Journal of Economic History, 105.

Aldcroft's five indictments and the Hingley defence

Returning now to the defence of Hingleys' endeavours in the light of the five indictments of Aldcroft's analysis of 1964. The first of these was that British entrepreneurs failed to adopt the best available techniques of production. In Hingleys' case this was probably true, but neither more sophisticated furnaces, nor hard driving, could have improved the fact that Hingleys produced perhaps the finest wrought iron in the world. Also, its optimum production over two decades was 1000 tons of iron per week. The firm could use or sell that quantity, but it could not exceed that figure until the extraordinary demands of the Great War intervened. Insofar as the manufacture of large diameter (4") cables was concerned, the firm did invest heavily in the 1900s in state of the art Belgian manufacturing equipment. This investment arose from a panic reaction by Hingleys to the news that John Brown, to whom it was the major supplier of ships' cables, had decided on a policy of direct manufacture. Fearful of losing the sub-contracts, Hingleys persuaded John Brown to form a joint venture for the express intention of manufacture of ships' cables by machine. The firm that was formed, British Machine Made Cables, achieved great success on paper, even obtaining the orders for the cables for ships such as White Star's 'Olympic' and 'Titanic'. However, in the event the machinery could only handle metal up to 2" diameter and the enterprise was wound up as will be described later in the text. The fact remains however that Hingleys did make a major commitment to modernisation.

The second of Aldcroft's indictments concerns the under-estimate of the growing importance of science, with too little investment in laboratories or research. On the face of it, this indictment is hard to refute when considered against the tremendous emphasis placed by the United States on its A & M (agricultural and mechanical) Universities at

this time, and on technical education in Germany. Within the trade, however, Hingleys were not laggards. Apprenticeships and on-the-job training ensured a highly skilled core workforce. Development played a major role in its activities, especially in connection with anchor design. The patents that are included in Appendix Three give ample proof of the professional design expertise that was part of the firm's strength. In the wider public domain Hingleys was the captive of a culture in which education was, and remains, a political football. Consider the Education Act of 1902 that opened up the expansion of secondary education with state assistance. Under this Act a national system of Grammar Schools and Technical Schools was created that enabled Britain to produce moderately well educated boys and girls for two generations. At the time, it gave rise to a furore of opposition and wrath from the non-conformists who saw it as a way of providing financial assistance to the hard pressed Church of England schools.[20]

The system was virtually abolished in the 1960s, and the debate still continues as to whether the importance of education in national prosperity is fully understood. The Hingley boys were educated at the highly regarded Halesowen Grammar School and would have had a knowledge of science commensurate with the School Certificate of that time. Sir George Hingley was sufficiently aware of the value of scientific methods to recruit J E Fletcher, who was a mechanical engineer, in the 1900s to ensure that the Hall's Patent Anchor represented the state of the art. This was proved by its enormous success among the shipping lines of the world. Sir George's protégé and successor, C E Lloyd, was educated at a public school (Uppingham) and qualified as a chartered civil engineer before joining Hingleys. He saw to it that Sir George's endeavours in professional management and design skills were continued.

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[20] H Pelling, Modern Britain 1885-1955, 47.

Concerning Aldcroft's third indictment that British entrepreneurs over-invested in the old staple industries, this was not generally true in the Birmingham and Black Country areas as will be demonstrated later. It would have been irrational for Hingleys to have done otherwise. Over the course of a hundred years the firm had developed the production of a particularly fine class of wrought iron that remained in great demand, notwithstanding the fact that the wrought iron industry was in decline. Using its own iron, Hingleys created a position of hegemony and profitability in the cable trade serving the great ships of the world in the 1900s and 1910s.

Aldcroft's fourth indictment, that British entrepreneurs were bad salesmen, especially abroad, does not hold water as far as Hingleys was concerned. As will be demonstrated later, Hingleys had a sales organisation that conformed to and was probably in excess of the best standards of the times. It had progressed from mercantile houses to dedicated agents and its agents were located in every key location where wrought iron, ships' cables and ships' anchors were required. The entirety of its overseas sales organisation was under the day to day control and supervision of the Hingley brothers, and later by C E Lloyd.

Aldcroft's fifth and final indictment was that Britain was insufficiently aggressive in organising cartels to extract monopoly profits from the consumer. However, Hingleys' business ethic of a good product at a fair price did not prevent it from operating within the cartel principle. This topic is addressed at greater length in chapter eight. Comment is restricted here to a brief reference to the marked bar association and the cable makers' collaboratives that operated throughout the 1900s. In all things Hingleys was always concerned with a fair price. Indeed, one of the more serious quarrels that the firm had with Hochfelder Walzwerk during their highly successful albeit

clandestine commercial arrangements, was over the latter's propensity to use the alliance to overcharge the German customers.

New enterprises of the Second Industrial Revolution

Turning now to the region of Birmingham and the Black Country in which the Hingley enterprise was based : the works were located in the Black Country, while the Hingley men transacted their business on the Birmingham Exchange. The massive decline in the industries and activities of the first Industrial Revolution is an economic fact. However, the region was well represented in the new industries of the second Industrial Revolution. As Briggs has pointed out in his history of the region, following the evolution of manganese steel in 1888 and silicon steel in the 1890s, factories were developed to use manganese steel with its remarkable tensile strength and hardness for the machinery and the machine tools on which the new industries depended. Silicon steel was a vital component for the new electrical engineering industry. Although this latter industry does not even figure in Craft's table (see Table 2.1) the General Electric Company that was set up in Witton, north Birmingham, in 1901 had 7 000 employees in 1914. Its production alone was one third of that of Germany. While admittedly France had a head start in motor cars with a production of 500 in 1893, the region had Wolseley in 1895 and soon afterwards Lanchester in 1896. The Wolseley story is one of striking innovative diversification. The Wolseley Sheep Shearing Machine Company went into motor cars in 1895 and led the market in its class for two generations. The major event, however, was the opening of Herbert Austin's Longbridge works in 1905. By 1910 production of Austin cars was 576 per year, rising to 1 500 in 1914. Also, it is often overlooked that the cycle trade alone employed

no less than 10 000 workers in Birmingham and neighbouring Aston in 1914.[21]

These industrial activities, along with many others, gave rise to hundreds of smaller support operations for the manufacture of wheels, of braking systems, of suspensions, of lighting systems, etc. and give the lie to the rather general condemnation by Aldcroft whose focus was on the past. Certainly, the West Midlands was not in a state of stagnation as it had the key industrial asset of skilled craftsmen and small masters. Its greater social mobility as some went up and some went down meant it could adapt faster than most to the needs of the time.

For Hingleys, the period from 1890 to 1914 was one in which profound structural change took place around it as the second Industrial Revolution took over from the first. The company itself remained, however, an industrial anachronism rooted in the declining industry based on the manufacture and use of wrought iron. However, by the very excellence of its product it maintained its hegemonic position in the market for ships' cables and anchors. It was an efficient company both in its acceptable level of profitability and in its employment ethos. Modernisation, although sought in the 1900s, was frustrated by two separate factors. The first was the premature acclaim given to the much vaunted Belgian technology for the manufacture of large ships' cables that proved insufficiently developed for the big league in which Hingleys played. The second was the total intransigence of a work force in the face of mechanisation of a trade in which they had no equals in the world. This intransigence was only hardened by the long established culture of a forum of collective bargaining that sought to achieve a consensus acceptable to both sides in the use of land, labour, and capital, the essential factors of production.

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[21] Briggs, History of Birmingham, 38-46.

The Industrial decline of Britain in the wider context of Britain's continuing commercial and financial power

Since the end of the Second World War in 1945, entire academic careers have been built on the study of Britain's industrial decline after 1870. While the decline did in fact take place relative to the growing economies of the United States and Germany in particular, it has fallen to authors writing since 1980 such as Corelli Barnett, M J Wiener, and W D Rubinstein to focus attention on the specific matter of the British culture as a key determinant and explanation for this decline. Barnett and Wiener have stressed the part played by an elitist public school system in creating an anti-industrial ethos in British society. On the other hand Rubinstein has speculated that, apart from the years 1760 to 1850 when Britain was the premier industrial nation, Britain's real place in the world was that of a leader in international commerce and finance. Thus, against a background of nearly two centuries of pre-eminence in this field, Britain's rise and fall from industrial domination can be seen from a different perspective.

As Barnett has reminded us, dire warnings of the consequences of inadequate technical and scientific education were given as early as 1835 by Richard Cobden after his visit to early industrial America.[22] From more or less the same period, and from the 1820s onwards, Germany had paid particular attention to the establishment of technical high schools and to university courses with a particular relevance to chemistry, metallurgy, and engineering. Britain did not match these developments notwithstanding the excellence of its crafts and artisans systems that were based on apprenticeships. Even the great Henry Bessemer, who revolutionised the production of steel in the mid 19th century, was more a practical man than a scientist. Thus in most steel

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[22] Barnett, Audit of War, 205.

works, as late as the 1890s, a chemist was rarely a development specialist and more often a routine tester.[23] By adding chemistry and metallurgy to the process of mass steel-making, the Americans and Germans were able to overtake Britain in the quarter century before the Great War of 1914-18.

Wiener, writing in the 1980s and finding a ready audience in the Thatcher following, has been especially critical of Britain's education system for its monied classes as a main contributory factor in its industrial decline. Wiener's view was that, although less than one boy in twenty attended a public school, the cultural emphasis that school was not a preparation for a career in business, had the effect of creating an ethos in which manufacturing was for the separated brethren in the Midlands and the North. He notes that the whole late Victorian system of public school education militated against the study of scientific subjects.[24] Barnett has endorsed this view by quoting from a book written by the headmaster of Harrow in 1929 no less, in which Dr Norwood extols the ideals of chivalry and service and on an education based on religion, games, and out-door prowess.[25]

Thus it was probably inevitable, that when the red brick universities of Birmingham, Leeds, and Sheffield were created at the turn of the century, with the expectation of a strong technical basis, that London University should insist on literature and classics being a vital part of the curriculum.[26] Wiener sees the style of English education, with its emphasis on forming policy formers, as being the root cause for the desire to work for production's sake, for the desire to drive for

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[23] Ibid., 97-98.

[24] Wiener, English Culture, 21-23.

[25] Barnett, Audit of War, 218.

[26] Ibid., 222.

profits, and for the desire to be innovative, to become increasingly regarded as being less important. This style, with its inculcation of aristocratic, religious, professional, and bureaucratic values, was seen as the major inhibiting factor in the quest for expansion, productivity and profit.[27] The result of this educational conditioning of the monied and policy making classes was, in Wiener's opinion, the root cause of the emergence of two nations, the commercial and financial grouping based on London, and the manufacturing grouping based on the Midlands and the North.[28]

This polarisation goes a long way in explaining Britain's inability to improve on total factor productivity. Wiener has highlighted the fact that the critical factors of capital, labour, and natural resources in Britain were more than adequate for a hundred years from 1850 to 1950, but the inclination to increase domestic investment was just not there. In commentating on Eric Hobsbawn's view that capitalism by its very nature was self-defeating because it was only concerned with profit, Wiener makes the crucial point that as long as satisfactory profits were being made, there was no incentive to modernise.[29]

This disinclination to increase domestic investment fits quite well with McCloskey's various analyses that industry did as well as it could have done. The economy was never actually stagnating, rather it was growing as rapidly as the economic system into which it was locked would permit. Thus, the issue of where and why the great City of London invested its funds leads naturally to Rubinstein's analysis of the situation. He takes note of the conventional view of Britain's decline from 1870 to 1914 citing the failure of British business to invest in the new

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[27] Wiener, English Culture, 24, 127.

[28] Ibid., 128.

[29] Ibid., 167-168.

technology of the Second Industrial Revolution, coupled with the increasing tendency for British investment funds to be directed overseas. These funds were aimed at the development of primary industries such as minerals, rubber, gold, diamonds, etc., and also in civil engineering infrastructure works in the Empire, the United States, and Argentina.[30] As far as the City was concerned a correct balance had been struck. The domestic economy had all the funds it could absorb as is supported by the earlier account of new industries in the Midlands. Thus, the dominant part of the economy remained as it had always been that of invisible earnings emanating from London.

Rubinstein takes note of the extraordinary economic growth of the United States between 1870 and 1913. By that year she outpaced Britain and Germany combined in the production of pig iron and was the world leader in coal production and in cotton consumption.[31] During these years it was the United States economy that determined the ebbs and flows of the world's economic activities. Although still full of memories of past grandeur there was little that Britain could do at the time but go along with the moods of the new economic superpower. Thus, the gentrification of the Victorian entrepreneurs and businessmen through the medium of the public school ethos had two consequences. The first was the development of an anti-industrial and anti-urban prejudice among the monied elite. The second was that the enormous funds held by this elite were increasingly invested in lucrative overseas ventures. As Rubinstein has it, the concept of an Industrial Britain in decline after 1870 is a distortion. Britain always was, in its pomp, a commercial, financial, and service based economy. Its long term comparative advantage always lay in commerce and finance and did so for two hundred years.[32]

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30 Rubinstein, Capitalism, Culture, and Decline, 4.

31 Ibid., 9.

32 Ibid., 21-24.

Britain's decline from 1870 to 1913 was simply a working out of the first industrial revolution. Notwithstanding the general decline of parts of British manufacturing industry when compared to the United States, this period saw the maintenance of the hegemonic position of British ship building for the whole period between 1889 and 1914. This hegemonic period had its day just as did the participants in the first industrial revolution in the period from the 1780s to the 1850s. In both cases Britain was initially first in the field and its superiority merely ran a normal course. However, the City of London was the pre-eminent financial capital of the world in 1860. It still had that position in 1914 and even in 1990 it was in the first three along with the United States and Japan.[33] Considerable support for the view taken by Rubinstein was given in a paper presented by Charles Jones in 1994. Although the thrust of the paper is directed at the re-appraisal of the traditional split between overseas portfolio investment and direct investment, the actual sums involved in the period from 1875 to 1913 not only supported the scenario drawn by Rubinstein on the real economic influence of Britain, they also give the lie to the charge that Britain was slothful relative to the United States in the development of opportunities in Latin America in particular. In 1913 Britain had total worldwide investments in the order of £4 000 000 000. Of this, some £546 400 000 was in foreign direct investment in Latin America alone. In 1905 the figure had been £328 800 000, and in 1875 it was £41 500 000. These last three sums were in direct investments mainly in railways and manufacturing. Of particular relevance to question of British decline, these figures show that Britain was not the laggard so often depicted in comparisons with the managerial sophistication of the United States and to that country's penetration of the Latin American market.[34] Martin Kitchen, in his study of the German economy for the

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[33] Ibid., 36.

[34] C A Jones 'The Origins of Modern Multi-National Corporations : British Firms in Latin America, 1850-1930', in Carlos Marichal,

parallel period, has recorded that during the period 1904 to 1914 Britain doubled its foreign investments to the extent of half of its national savings. At the same time, Germany that had suffered a chronic shortage of investment capital from 1873 onwards, had to re-invest almost the entirety of its national savings at home.[35]

Within the context of the consequences for British industry of the gentrification through education of its leaders, the Hingley firm in this period provides a useful vignette. Noah Hingley in his early days worked on the anvil with the other smiths. His son Benjamin, and his nephews George Benjamin and Henry Montagu, certainly attended the independent fee paying Halesowen Grammar School. All three looked and acted as minor gentry, filling public offices and acting as natural chairmen. They took their holidays in fashionable German spa towns and on the Italian Riviera. C E Lloyd was schooled at Uppingham and G C Edwards and J S Trinham, a lieutenant and a colonel respectively in the militia must have been appropriately educated to hold these ranks pre 1914. Further details of these key men are given in chapter four, but none was averse to wearing the mantle of an ironmaster. They remained true to the Midlands tradition; what spare money they had they invested outside the enterprise; and true to McCloskey's assessment they did as well as they possibly could have in the economic system of the time.

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ed., Foreign Investment in Latin America : Impact of Economic Development, 1850-1930. Proceedings of the Eleventh International History Conference, Bio, Universita Bocconi Milan, September 1994.

35 Martin Kitchen, The Political Economy of Germany 1815-1914 (London : Croom Helm, 1978) 273.

Germany in the parallel period

Much of the unfavourable comment on Britain's performance, during the early years of the Second Industrial Revolution, focuses on the achievements of Germany. However, a degree of perspective should be applied as we are dealing with two very different cultures.

In the period under review Britain had a stable and long standing political union and was on the way to becoming a full liberal democracy. It had a broad-based economy, it enjoyed extensive international trade, and it created capital surpluses that were used domestically and overseas in the development of commercial enterprises. Germany on the other hand, as created by Bismarck under Wilhelm I, was a relatively new state that was born in war, consolidated in war, and seemingly dedicated to war. It was a latecomer to the Industrial Revolution and was not burdened by a manufacturing infrastructure that could not be easily modernised. More significantly, in the latter part of the nineteenth century Germany never did have sufficient funds and was always in thrall to its moneylenders. The new state was born in debt in 1866 following its war with Austria-Hungary over, among other things, the division of spoils arising from the 1864 war with Denmark over the duchies of Schleswig-Holstein and Lauenburg. Its contrived war with France in 1871 resulted in reparations of five billion gold francs alone in addition to the annexation of Alsace and Lorraine.[36] However, from 1864 until his overthrow in 1890 by Wilhelm II, Bismarck was always in serious financial trouble due to the legacies of war and the costs of entering the industrial world. For the whole of this period he depended largely on Bleichröder, his Jewish financier, to keep the state afloat. This

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[36] Kitchen, Germany, 132.

Bleichröder, by a succession of highly imaginative schemes, ensured himself a favoured place in the corridors of power.[37]

However, although Bleichröder could produce loans, create banks, and finance railroads, he could not create surpluses in industry and commerce. Thus, from 1873 onwards Germany was not producing surpluses of any magnitude, and a shortage of capital was the principal characteristic of its economy.[38] The accession of Wilhelm II at the age of 29 in succession to Wilhelm I and Frederick III, who died within three months of each other, only worsened Germany's financial problems. Obsessed with delusions of grandeur, Wilhelm II was determined to achieve a 2 : 3 ratio with Britain in naval power. The provisions of the German Navy Act of 1898 were largely funded by loans from France.[39] The Act created a climate of fear. Indeed, in 1903 'Ben' Hingley wrote that : 'This country is being bled financially by the fear of war'.

Thus, at a time when Britain and France were each investing half of national savings abroad between 1900 and 1914, Germany had to re-invest virtually the entirety of its national savings at home.[40] It can be suggested, therefore, that the domestic reinvestment of national savings plus huge foreign loans were the base from which Germany's apparent economic miracle was created. High tariffs and cartels were necessary to project industry and commerce from competition. At the same time the German manufacturers had no qualms about attacking the domestic markets of no or low tariff countries such as Britain.

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37 Fritz Stern, Gold and Iron (London : Allen & Unwin, 1977) 38-126.

38 Kitchen, Germany, 227.

39 Kitchen, Germany, 176.

40 Ibid., 228.

It could be argued therefore that any comparison between the apparent dynamism of the German economy, as contrasted with the comparative sluggishness of Britain's performance, is based on a false premise. Britain was at all times genuinely interested in world trade. The sum of its overseas investment strategies, when coupled with its impressive record in imports as well as exports clearly demonstrates this. As for the German economy, this would seem to have been based on two basic concepts. The first was the maintenance of the lifestyle of the Junkers in Prussia, requiring as it did protectionism for the agrarian way of life. The second was the naked pursuit of militarism, especially in search of parity with the British Navy.[41] It was this militarism, more than entrepreneurial vigour, that seems to have been the motor for the German economic achievements of this period.

It would seem therefore that the British and German economies were playing totally different games under totally different rules. Thus, the achievements of Britain as summarised by M^{c}Closkey should be more a source of pride than of denigration.

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[41] Ibid., 237.

A summary

During the period under review Britain lived through the age of new imperialism. The colonies of Canada, Australia, New Zealand, and South Africa all achieved Dominion status. Britain's position as the foremost industrial nation, a consequence of the first industrial revolution, was eroded by the competition of the newly industrialised Germany and the United States. However, notwithstanding the erosion of its overall industrial status, Britain maintained its leading role as the shipbuilder to the world throughout this period. It also began a diversification into the newer industrial activities of the second industrial revolution.

An examination of the various assessments of Britain's industrial decline points to the conclusion that the public school system by which the sons of the monied elite were educated did result in a north versus south divide. In spite of this, the industrialists of the Midlands and the North did as well as could reasonably be expected. It is evident, however, that the divide did guarantee for the South and London in particular a continued concentration on Commerce and Internationsl Finance, fields in which it was and remained a world leader.

In all this Hingleys led a useful and effective commercial life. It managed its factors of production to optimum effect. It occupied a niche position in the world market for large anchors and ships' cables. Its management moved from the self educated through those educated at the smarter schools without detriment to its ability to remain consummate ironmasters. Here, the directors were in line with the marked distinction that characterised the Midlands and the North in contrast with the South of Britain. North of Watford, almost all the great manufacturing concerns were run by men of considerable education.

In the West Midlands one calls to mind the Cadburys, the Chamberlains, Nettlefold, Herbert Austin, Dunlop, etc. In the last thirty years of wrought iron, as a metal superior to steel, Hingleys maintained its position as a premier user of this very fine metal.

PART ONE : THE FIRM IN CONTEXT

CHAPTER THREE : THE NARROWER ECONOMIC ENVIRONMENT, 1890 - 1920

A general overview

The preceding chapter was concerned with the broader economic patterns of which neither the Hingley family nor C E Lloyd need have been fully aware. They must, however, have been very aware of the economic events and forces that impinged directly on their business. Chief among these were the factors of rapid social change and the emergence of the military-industrial complex a half century before the phrase achieved currency in the United States.

In this period unskilled labour became properly organised for the first time in a confrontational mode, with consequences that were to last for three generations. There was a total change in the attitudes towards social welfare. There was a complete overhaul of the system for secondary education with the creation of municipal Grammar Schools, together with the new red brick universities of the industrial towns. There was extreme volatility in business arising from the influence of the United States, as the new economic superpower, on the affairs of Britain and Europe. Britain's shipbuilding industry, in which Hingleys had a particular interest, was subject to violent swings. In this, the vacillations of government in connection with its naval programme caused endless problems for the members of the new military-industrial complex. This was also the period in which interference from government became a marked feature of business life for all those engaged in manufacturing.

It was also the period when the Great War of 1914-18 resulted in the Hingley enterprise becoming a part of Britain's vast government controlled munitions industry. During the second half of this period management by Hingleys of the Hingley family firm was phased out, to be replaced by a company with a broad shareholding that was dominated by a professional management.

The birth of the military-industrial complex

In 1882 Vickers took the decision to trade itself out of the depression of the 1870s and 1880s by creating a completely new business focused on armaments. From a capitalisation of £750 000 in 1886, the firm grew to a capitalised value of £7 million by 1914. The commercial success of this move can be seen from average dividend figures of 9.1 per cent between 1863 to 1888, rising to 12.23 per cent between 1888 and 1914.[1] By the end of the century there were three British firms in an elite military-industrial complex. They were Vickers, John Brown, and Armstrong Whitworth. These were the three companies to which George Benjamin Hingley hitched the firm's star as will be seen in greater detail in chapter four. As these firms increasingly took over the work of the government ordnance factories and dockyards, they were in the position of creating their own booms and slumps.

The decision by Vickers to focus on the armaments trade was fully vindicated by the furore that followed Queen Victoria's Golden Jubilee naval review in 1887. The review highlighted the inferiority of the British Navy relative to the combined fleets of Russia and France and resulted in the Naval Defence Act 1889. This Act was aimed at restoring the Navy's superiority over all other fleets in the ratio of 5 : 3. £16 million was allocated for the construction of ten battleships and sixty

[1] Trebilcock, Vickers Brothers, 29-30.

other vessels within four and a half years. This was an unheard of timetable, when construction time for a battleship was usually six years. £15 million alone was to be spent in the private sector.[2] There then followed successive drives to update the Navy right up to 1913 and, despite the often erratic nature of the programme, military-industrial work was a key feature of the domestic economy from 1890 to 1920 the period under review.

The emergence of the military-industrial complex in the 1890s was one of two key economic determinants that influenced the fame and fortune of the Hingley firm. The second determinant was the dramatic appearance in the 1900s of the leviathans of the seas, those passenger liners for the north Atlantic passenger trade with displacements up to 50 000 tons. Hingleys' domestic programme from 1890 was, therefore, dominated by its participation in the activities of the military-industrial complex headed by Vickers, John Brown, and Armstrong Whitworth, together with the construction of the new breed of enormous liner in the shipyards of Belfast, the Mersey, and the Clyde. A list of these liners follows this page.

Although the naval programme for procurement from 1889 to 1913 was often erratic it was always there. Whenever cutbacks were in prospect, an international factor would invariably arise to guarantee further enormous expenditure. Prime examples of these were the French naval estimates of 1893 that provoked panic; as did the German Navy Act of 1898 and 1900 envisaging the creation of the Imperial Navy.[3] The British naval estimates for 1896/97 had swelled to £21 823 000 as the result of the decision to lay down a whole new fleet of five battleships, thirteen cruisers, and twenty eight destroyers, all to be

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[2] Ibid., 52.

[3] Ibid., 56.

all conditions in every sea. Gradually, even trifling points of difficulty have been eliminated, till it may safely be claimed that this type is practically perfect. Its best recommendation is the appreciation shown for it by the finest seamen, and the most experienced owners throughout the world.

The **Hall's Latest Improved Patent Anchor** is now in use in at least twelve of the great Navies of the world. It is exclusively adopted by the principal Mail and other Steamship lines, including among its adherents the four largest fleets of to-day. Perhaps the finest tribute to its reliability is to name the ten largest vessels built or building, every one of which is fitted out with this pattern anchor.

The vessels are :—

S.S. Olympic ...	White Star Line	45,000	tons.
S.S. Britannic ...	„ „	52,000	„
S.S. Aquitania ...	Cunard Line	50,000	„
S.S. Imperator ...	Hamburg-American Line ...	50,000	„
S.S. Vaterland ...	„ „ ...	50,000	„
S.S. Bismarck ...	„ „ ...	50,000	„
S.S. Columbus ...	North German Lloyd Line ...	35,000	„
S.S. Statendam ...	Holland-American Line ...	35,000	„
S.S. Lusitania ...	Cunard Line	30,000	„
S.S. Mauretania ...	„	30,000	„

There can be no higher recommendation for the anchor than this.

It should be noted here that the steel used in the manufacture of these anchors is not the common steel of English or Continental make used in cheap stockless anchors, which is a frequent cause of fractures. The **Hall's Latest Improved Patent Anchor** is made of the highest quality of steel precisely as used by the British Admiralty, and with this type trouble with breakages is unknown.

built in private yards. The estimates for 1897/98 provided for a further four battleships and three cruisers.[4] This programme was one in which Hingleys participated as a supplier of ships' cables for mooring, steering, etc., and of the anchors vital to the safety of a ship not under way. As will be discussed in the next chapter, Hingleys' trading fortunes became inextricably linked to the three firms that emerged as the dominant members of the military-industrial complex. These were Vickers that had in 1897 acquired The Naval Construction and Armaments Company of Barrow, and also the Maxim Nordenfelt weapons business. The second was John Brown that had acquired the Clydebank Engineering and Shipbuilding Company in 1898, Thomas Firth (a producer of very high quality steel) in 1902, and a half share in 1905 in the Coventry Ordnance Works that had been set up by a consortium involving Cammell Laird and Fairfield. In 1906 a controlling interest was acquired by John Brown in Harland & Wolff of Belfast.[5] The third firm was Armstrong Whitworth that had been created by the merger of the two famous firms in 1897.[6]

The significance of these three firms to Hingleys came first through the naval work from Vickers and Armstrong-Whitworth. Secondly, from John Brown's subsidiaries came all the work on the Cunard and White Star fleets that ensured the hegemonic position of Hingleys as the major anchor smith and cable maker in the world. This theme is developed more fully in chapter four. In addition, the mere association of Hingleys with firms of this calibre ensured its own commitment to technical development. This was particularly so in the design of its anchors that reached an ultimate state of excellence by 1906. Vickers certainly would have been a source of inspiration in the early 1900s, with its

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[4] Scott, Vickers, 47.

[5] Grant, John Brown's, 38-58.

[6] Scott, Vickers, 46.

8 000 ton presses that were capable of squeezing 36 inch ingots into 6 inch thick ships' plates. And with its 90 feet long lathes for the preparation of heavy gun barrels.[7]

New developments in the Labour market

In the preceding chapter reference was made to American pride in hard driving, especially in the iron and steel industry. It is perhaps as well to note that the United States had a growing pool of immigrant labour in the last part of the 19th century. Furthermore this work-force was grateful for work and was not organised. In Britain, the unskilled work-force was two generations into urbanisation and by the 1870s it was beginning to organise itself more or less along the lines of the artisans' unions that had been established a generation before. There was a vital difference, however. The craft unions depended on the control of skills for their industrial muscle. The new unskilled unions depended on the power of numbers.

In the labour market, as in its position in wrought iron, Hingleys was something of a happy anachronism in an industrial area not known for work place harmony. The infamy achieved by the chainmakers in neighbouring Cradley Heath has become part of the folklore of industrial strife, and will be examined later in this section. On the other hand the good working relations that existed in the Hingley works had their origins in two significant actions on the part of the Hingley family. The first was the promotion by Noah Hingley himself of his famous 'Conditions for Fair Employment'. This document was his sole manifesto when standing in the re-run of the Parliamentary Election of 1874. The second was his son Benjamin's role in the establishment of The Midland

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[7] Trebilcock, Vickers Brothers, 8.

Iron and Steel Wages Board, an organisation that guaranteed fair play for workers based on the success of the firms in which they worked, and which kept the participating members free from strikes for more than fifty years up to the end of this study in 1918. Again, the work of this board will be examined later in this section.

On the wider labour front circumstances were a lot less happy, with the growth of an urbanised workforce having marked divisions between the skilled artisans and the broader mass of unskilled workers. The skilled working classes had long been able to look after their own through the medium of their trades unions. Behagg cites the classic example of the Amalgamated Society of Engineers formed in 1851. This was one of the New Model unions and had a nationwide membership. These unions for the highly skilled had a high weekly subscription of around one shilling. This enabled the unions to build up large funds from which its members could draw sickness and unemployment benefits as well as strike pay if necessary. Indeed, between 1875 and 1879 the ASE paid out £350 000 in unemployment benefit alone.[8]

However, by the 1880s there was a large demand among the unskilled working classes for unionisation, and in the period between 1889 and 1891 the total membership of trades unions doubled notwithstanding a subsequent rapid falling away. These new unions were very different from the New Model unions. They recruited from among the less skilled in the workforce, the subscriptions were lower, often in the order of one penny per week, and even more significantly they tended to be led by people whose style was confrontational. A major commitment of these latter day unions was that of taking strike action.[9] The period from 1890 to 1920 saw major industrial confrontations, with industrial unrest

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[8] Behagg, Labour and Reform, 81-82.

[9] Ibid., 106.

in the ports, in the mines, and on the railways, becoming almost normal feature of industrial life.

Significantly for the future of unrest on the railways, and for its impact on the movement of Hingleys' products, the railway companies consistently refused to recognise the Amalgamated Society of Railway Servants formed as long ago as 1871. This was part of the employers' reaction after 1890 to mass unionisation, resulting in an era of extensive industrial unrest that was exacerbated by the volatility of the economy right up to the outbreak of war in 1914. The Shipping Federation of 1890 was created by the employers to fight the new Dock, Wharf, Riverside and General Labourers' Union in the ports and it largely succeeded. The Federation of Master Cotton Spinners was formed in 1891 to confront the workers in the cotton industry. The lock-outs in 1892-93 resulted in the Brooklands Agreement that established a process of collective bargaining for the cotton industry. This agreement survived until 1908 when the employers arbitrarily lowered wages at a time of dramatic slump. The Miners' Federation was confronted in an unprecedented show of unity by the mine owners. The lock-out of 1893 led eventually to interventions by the Government and a Conciliation Board was created, but the miners' demand for a minimum wage was not conceded. These boards were formalised by the Conciliation Act of 1896 that enabled the Board of Trade to appoint conciliators, but the efforts depended on the goodwill of both sides. Also in 1896, the Engineering Employers' Federation was formed with the specific intent of reducing the controls over production exercised by the skilled workers in the Amalgamated Society of Engineers. In the lock-out of 1897 that lasted for six months the union was beaten and was forced to concede that it could not interfere with the management of business.

Then, following the Taff Vale case of 1901 when the Taff Vale Railway Company successfully sued the Amalgamated Society of Railway Servants for damages caused to its business during a strike, the whole status of trades unions was dramatically changed. Unions were now considered to be corporate bodies that could be sued. At a stroke, on the exhaustion of all appeals, the unions lost all the gains of the 1860s and 1870s over status and were back in the era before the repeal of The Combination Acts in 1824.[10] Nevertheless the Trades Disputes Act of 1906 gave back to the unions the anomalous indemnity from actions in tort that had been removed by the Taff Vale judgement of 1901. With this came the right, and greater inclination, to strike, bringing with it a decade of confrontation between employers and employees. This led to the politicisation of the union movement, resulting eventually in the formation of the Labour Party from its origins in the Independent Labour Party. Especially serious were the rail strikes of 1907 and 1911. The strike in 1907 resulted in a quite extraordinary intervention by Lloyd George, who imposed conciliation boards on the industry notwithstanding the fact that the railway companies steadfastly refused to recognise unions. These boards, however, did not prevent the Liverpool railway strike of 1911 with its threat of escalation into a national strike.[11] It was a strike that had crippling effects on the movement of goods and materials, and for Hingleys it was the first time that their entire manufacturing output was compromised.

Notwithstanding the emphasis that has been put on the confrontational style of the trades unions catering for the unskilled workers, studies of that era carried out in more recent times have shown that the years from 1899 to 1907 were in fact the quietest in terms of industrial peace from 1891 onwards. John Lovell, quoting H A Clegg, put this down to

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[10] Ibid., 108-113.

[11] Phelps Brown, The Growth of British Industrial Relations, 328-329.

collective bargaining in the well organised trades.[12] Certainly, the form of collective bargaining sponsored by the Hingley family ensured industrial peace for the whole of the period under review.

Later in this study the dramatic economic collapse of 1908 will be examined in greater detail. However, the resulting ups and downs in the economic fortunes of the country led to unprecedented levels of industrial unrest in the years from 1908 to 1914. In 1908 the cotton textile industry, after years of relative industrial harmony from the Brooklands Agreement of 1893, suffered a seven week strike over the arbitrary reduction of wages. Then in 1910 a strike wave broke over British industry. Beginning in South Wales the miners went on strike over an employers' attempt to reduce wages. In June 1911 there was a seamen's strike that led to dockworkers coming out in sympathy. In 1912 there occurred the first ever pit strike on a national basis; and there were strikes in the London docks and among transport workers. In 1913 the Midlands metal working industries suffered strikes with the early years of George V's reign being disfigured by much violence, deaths, and soldiers on the streets. The spectre of Syndicalism, or the control of industry by the workers, raised its head once more, and the sheer scale of numbers involved in industrial disputes was quite remarkable, rising to 1 233 016 in 1912.[13]

Although in the next paragraph the alternative views of Dangerfield and Behagg are contrasted on the significance of organised unskilled labour, the sheer numbers involved deserve mention. An example is the Workers' Union, an important but neglected body. Formed in 1898 its membership

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[12] J Lovell, British Trade Unions 1975-1933 (London : Macmillan, 1977), 41.

[13] Ibid., 130-131.

by 1910 was a mere 4 500. By 1914 it had increased to 143 000 and to 495 000 by 1919.[14]

Much has been made of the level of strikes in Britain during the period 1910 to 1914. George Edward Dangerfield argued in 1936 that only the outbreak of war in 1914 saved Britain from revolution.[15] He saw the combined efforts of massive labour unrest, the suffragette movement, and Home Rule for Ireland, as threatening the very stability of the state. Behagg in 1991 took a very different view, arguing that by 1914 strikes were on the wane, with strikers down to 326 000, and with the level of suffragette militancy having peaked. He does, however, stress that the welfare reforms following the return to power of the Liberal Party in 1906 had not prevented the growing alienation between the various social classes. Full male suffrage came with the Representation of the People Act of 1918, and by 1922 the Labour Party had displaced the Liberal Party.[16]

In the midst of all the industrial turmoil in the period under study from 1890 to 1920, Hingleys' various works were havens of relative peace and harmony notwithstanding their proximity to Cradley Heath and the notorious sweated labour conditions that existed in much of the general chainmaking activities of the Black Country. These conditions were so notorious that out of only four trades made subject to the working of the Trades Board Act of 1909, one was the domestic chain trade with the Black Country particularly in mind.

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[14] Lovell, British Trade Unions, 46.

[15] Dangerfield, The Strange Death of Liberal England, 178.

[16] Behagg, Labour and Reform 1815-1914, 136.

Labour in the particular environment of Hingleys' ironworks

In marked contrast to the troubled industrial relations scene generally, few problems existed in the Hingleys' works. This was due largely to the policy of fair play begun in his lifetime by Noah Hingley, and continued by his son Benjamin Hingley. The axis on which Hingleys' industrial policy rested was The Midland Iron and Steel Wages Board. Modelled on The North of England Board of Conciliation, founded in 1869 following a strike of six months' duration, it became the forum at which masters and men came together for the mutual benefit of themselves and their industry.

The ethos of the Board, its mode of operation, and its success in guaranteeing industrial peace in its participating firms since 1870, was detailed in a lecture given by Daniel Jones, the Secretary of The South Staffordshire Ironmasters' Association and employers' Secretary of The Midland Iron and Steel Wages Board, at the University of Birmingham on 30 October 1902. The main thrust of his lecture was that thirty years of industrial peace in his industry were due to the workings of the Board. He stressed that the ethos behind the Board's work was the avoidance of the destitution for the workers that was often the only tangible result of strikes or of lock-outs.[17]

The Midland Board covered South Staffordshire, North Staffordshire, Shropshire, Lancashire, South Yorkshire, Derbyshire, and South Wales. The key to its success lay in the complementary action of two very different factors. The first was the requirement that every workman should be a fee paying member of the Board, paying a levy of up to four

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[17] Recorded in W J Ashley, ed., British Industries, A Series of General Reviews for Businessmen and Students, (London : Longman, Green & Co., 1903) 38-40.

pennies per quarter towards the running costs, thus inculcating a loyalty to the Board in preference to a trade union. The second factor was that, in addition to the basic rate, wages were settled on a sliding scale based entirely on the selling price of the iron produced. The selling prices were verified by a public accountant of the operatives' choosing who was given full access to the employers' accounting records. The sliding scale had its origins in the work of G B Thorneycroft of Wolverhampton who had formulated this method of payment by giving a share of his prosperity as early as the 1840s. The basis of the arrangement was that marked bars, or those of the best quality of wrought iron, had a uniform selling price among the combination of ironmasters. The ironworkers' wages were then based on a scale that rose or fell in line with the selling price of the iron. As far as the ironworkers in South Staffordshire and Shropshire were concerned they also accepted a Sheet Mill Wages Schedule that was binding on all operatives, thus establishing uniform rates of pay between firms. As Jones emphasised, the whole operation depended on the suppression of self interest and the exercise of common sense. In the Midlands the working of the Board was enhanced by the respect and standing in the industry held by Sir Benjamin Hingley as an arbitrator and unbiased chairman. His efforts, and those of both sides to the Board, avoided the fearful antagonisms between masters and men in this period.[18]

Some rather sketchy records of the working of the Midland Board are held at the Modern Records Centre at the University of Warwick. One file contains information on sliding scales between 1906 and 1940. The Sliding Scale for the Regulation of Ironworkers Wages adopted on 14 June 1906, is of particular interest on two counts. First, it demonstrates the exclusive nature of the participating firms in the agreement.

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[18] Ibid., 43-61.

Second, the composition of the membership was in marked contrast to that of the wider membership of the Chain Makers' Association that was the source of much aggravation for Sir George Hingley, both in the operation of the test houses and in general business ethics. The Chain Makers' Association, based in neighbouring Cradley Heath, although including many members of the Board, had twice the membership, many of them not being genuine cable makers in that their products were less than 1.25" in diameter. The constituent members of the Board in 1906 are shown in Table 3.1.

By reference to the audit reports on selling prices, as prepared by B Smith, Son & Wilkie, chartered accountants, it was seen that the membership of the Board was still fourteen in 1940, although numbers had risen to nineteen in 1933.[19]

Table 3.1 : Members of the Midland Iron and Steel Wages Board in 1906

1	George Adams & Sons Ltd
2	John Bradley & Co
3	Jno. Bagnall & Sons Ltd
4	B Bunch & Sons
5	The Earl of Dudley's Round Oak Steel Works Ltd
6	N Hingley & Sons Ltd
7	The Harts Hall Iron Co Ltd
8	Robert Heath & Sons Ltd
9	J B & S Lees
10	The Lilleshall Co Ltd
11	The Patent Shaft & Axletree Co Ltd
12	E Parkes & Co
13	Roberts & Cooper
14	The Shropshire Iron Co Ltd

Within the same file there is a series of Agreements including one dated May 1911 and signed by J S Trinham for the company and by Benjamin

[19] MRC : mss. 36 ; S37 : Sliding Scales 1906-1940.

Westwood and William Henry Holloway for the men. The essentials of the Agreement were that bar weighers and bundlers were to receive 10 pennies per ton plus the sliding scale payment, that rollers and coggers were to receive 10.5 pennies per ton plus the sliding scale payment, that heaters were to receive 1/11d per ton plus the sliding scale payment, and that labourers were to be provided free of charge.

This emphasis on a person to person management style, in an era when negotiations between masters and men moved to outside negotiating bodies such as trades unions and employers organisations, was a key factor in the harmony achieved in the Hingley work place. This harmony was in marked contrast to the conditions prevailing in the domestic chain trade as practised in the neighbourhoods immediately adjoining Netherton. Writing in 1891, the economist J A Hobson classed chain making as among the most sweated and degraded occupations in Britain, a conclusion endorsed by local historian S Blackburn.[20]

In essence, light domestic chain was made by females in forges attached to the family dwelling houses. The monies earned were regarded as a supplement to the earnings elsewhere of their menfolk. Large chains and cables, those over 1.25" in diameter, were made entirely in factory workshops that were largely free from sweating. Where skilled workers were concentrated in large work units, collective bargaining or agreements reached through the MISWB resulted in good wages and industrial harmony. In the 1900s about 1400 hands were in such an arrangement concentrated in thirty factories. In addition, there were another dozen small factories outside these arrangements where some 200 hands were poorly paid. The activities that gave chain making in the area such a bad name were those of some 140 middlemen who took iron to

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[20] Blackburn, 'Black Country Chain Masters', 87.

the home forge operations and then bought the finished products.[21] These were the men who sweated the female ironworkers and who were targeted by the Trades Board Act of 1909 under which the domestic chain trade was classed with other notorious occupations including tailoring, paper box making, and the finishing of machine made lace.

Of greater significance, however, for the industry in the Black Country were the activities of the Chain Makers' Association after the setting up of the Trade Board for chainmaking. Its actions were invariably in line with the curmudgeonly way in which its members had treated Sir George Hingley after he had set up a test house in Cradley Heath especially for their benefit, as is described later in the text. Initially, the CMA welcomed and supported the Chain Trade Board, but once the Board was established it sabotaged its workings by refusing to settle on the minimum wage that was one of the key principles of the Board's activities. The year 1908 had seen the worst depression in the chain trade for 30 years. The era of the new big ships had resulted paradoxically in fewer cables being required overall. At the same time the Admiralty had reduced its specification for the lengths of ships' cables. The result was that the large chain trade attacked the markets of the small chain trade as a way of keeping busy. The advent of the CTB appeared to be an opportunity for the CMA to drive out competition from the smaller firms. In this it overlooked one key feature of the new legislation where, unlike all the recent welfare provisions of the Liberal Government, the entire financial cost of introducing the minimum wage fell on the employers. So, the CMA through its protracted prevarications caused the Cradley Heath strike of 1910 that led to the exposure of, and the national awareness of, the grotesque conditions in which the domestic chain makers worked and the squalor in which they lived. When the minimum wage was eventually agreed in March 1910 it

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[21] Ibid., 89.

provided for the female workers to be paid 2.5 pennies per hour for a 54 hour week, or 11/3d per week. This was an increase of almost 100 per cent over the prevailing rates.[22] Blackburn noted that the avarice of the CMA continued long after 1910 and was particularly evident between the two world wars.

The total change in attitudes towards social welfare in this period

The Hingley method of management involved a mix of benevolent paternalism, the provision of fair wages, and a requirement to maintain a strict adherence to the weekly production targets set for the works. The skilled workforce was well placed to look after itself through the medium of the Friendly Societies, and unemployment was virtually unheard of in the Hingley workshops. Although the Hingley family had close ties with the Liberal Party, Sir George Hingley was totally unprepared for the scale of social welfare legislation that followed the return to power of that party in 1906. Fortunately, the new generation of non-family directors proved invaluable in coming to terms with the new order, in which the welfare of the workforce was to be regulated by statute rather than conferred by benevolence.

Throughout the whole of the period under review there was a growing awareness of the need to do something about the general health and stamina of the British workforce, especially when compared with those of its continental competitors. This was also the era in which the state led a determined onslaught on pauperism following the realisation that poverty was not necessarily the result of fecklessness, but more often the result of sickness, old age, or the workings of the free market.

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[22] Ibid., 91-99.

G Carpenter has stressed the view held by Lloyd George that 30 per cent of all pauperism stemmed from the inability to earn through sickness. The National Insurance Act of 1911 provided the famous panel doctor system as the key feature of the service, coupled with the sickness benefits they could authorise.[23] This was a direct challenge to a root cause of destitution.

Other social blights that were addressed in this period were the destitution that often followed cyclical unemployment and that occasioned by old age. Regarding the latter problem, Asquith's graduated income tax legislation of 1907 laid the foundations for the non-contributory old age pension scheme of 1908. In achieving these reforms Lloyd George succeeded in breaking down the implacable hostility of the Friendly Societies to any form of state pension for sickness, old age, and unemployment, other than that provided under the Poor Laws. His success rested on two factors : first he knew that the Friendly Societies were compromised financially by the growing longevity of their older members who were bleeding the funds dry; second he harnessed the Friendly Society movement to the task of managing the new sickness provisions. In an unprecedented show of co-operation between state, employer, and employee, the health insurance provisions of 1911 immediately covered 11 million members in 10 000 separate Friendly Societies. Before, 1911, the well known Manchester Unity of Oddfellows and the Ancient Order of Foresters could not achieve a membership of three quarters of a million, while the Hearts of Oak could not achieve a quarter of a million.[24] Once the breakthrough had been made, the principle of state intervention was to become a feature of the British way of life.

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[23] Carpenter, 'National Health Insurance 1911-1948', 71-87.

[24] Ibid.

During this period of reform, the benevolent paternalism of Hingleys became increasingly out of line with events in the outside world. The wider picture was well drawn by Bentley B Gilbert in his analysis of the areas of concern for the social welfare of the British people in the Edwardian era. These were four in number. First was the poor physical shape of the working classes as evidenced by the results of the physical examinations of volunteers for the Boer War. The second was the urgent need to provide a source of income to cover the non-wage earning years after retirement. This was needed to eliminate the spectre of the workhouse and to protect the friendly societies from ruin. The third was the problem of unemployment and its direct consequence of destitution for many in the work force. The fourth was the problem of pauperism, when stemming directly from sickness and ill health.

Efforts to address these areas of concern resulted in the first steps towards the eventual creation of the Welfare State. Government began to assume responsibility for matters that had heretofore been the responsibility of the individual. The drive for greater national efficiency, or a higher level of physical fitness, was addressed by the Education (Provision of Meals) Act of 1906, together with the introduction of medical examinations in state schools under the provisions of the Education (Administrative Provisions) Act 1907. A source of income in retirement for those without means was provided for by the Old Age Pension Act of 1908. The spectre of unemployment had already been addressed on the initiative of Joseph Chamberlain as long ago as 1886 with his encouragement of municipal work schemes. Then, under the Unemployed Workmen Act of 1905 the government took responsibility for the welfare of the unemployed in a form other than the Poor Law. This Act was followed by the Labour Exchanges Act of 1909 under which the Board of Trade at the centre of government took over from the local authorities their role in unemployment provisions. The

crowning achievement of the proponents of social welfare by direct government action was the National Insurance Act of 1911 that directly addressed in its Part I the problem of destitution through incapacity.[25]

The end result of these initiatives was that a culture was established in which government assumed the right to care for the citizens of the country to the displacement of the old order where, to the extent that they were able, family, employer, or charity had exercised this function of care. His files reveal that Sir George Hingley was baffled by the social legislation of this period, especially that dealing with unemployment insurance. This was because unemployment was virtually unheard of in the Hingley works. However, the new professional managers recruited after 1908 had no problems in accepting the new order. The most marked effect, especially after Cyril Lloyd had assumed control as managing director was that the firm that had once been an extended family providing a protected living for several thousands was now converted into a fully commercial enterprise in which the issue of care was transferred to the organisations of state funded by taxation and the contributions of employer and workers.

Lloyd brought a new pragmatism to the enterprise and in 1913 the firm joined the new Midland Employers' Federation, later to become the National Employers Federation in 1917, before emerging as the Engineering Employers' Federation in 1918. Thus Hingleys joined the confrontational blocs that were to dominate the industrial scene in Britain for the next sixty years.

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[25] Gilbert, The Evolution of National Insurance, 39-349.

Volatility in business and economic activity in the period from 1890 to 1920

Sayers's analysis of the period between 1879-1920 provides an uncanny parallel with Hingleys' own experiences. The fluctuations in industrial activity shown in Table 3.2 mirror almost exactly the fortunes of the Hingley firm in this period. The accompanying graph, Figure 3.1, shows the violent changes in industrial activity with which the Hingleys were compelled to cope.

Thus, the major problem confronting Hingleys and indeed all other forms of business in this period was the phenomenon of violent swings in business activity. These swings were a particular feature of the period. The shipping boom of 1881-83, in the wake of the mania for joint stock company formations, quickly faded into the shipbuilding depression of 1884-86. Likewise the spurt in railway construction in the United States tailed off and 1886 saw the lowest point in industrial activity in that decade. A new dawn appeared in prospect in late 1887 with a slight revival in the demand for new ships. In 1888 output in shipbuilding was 50 per cent up on 1887, and by 1889 shipbuilding was forging ahead with one third of all production being for foreign owners. Exports in 1890 were 25 per cent higher than in 1886, and British capital was flooding into Australia and South America. Such frenetic activity could not and did not last. A situation of over investment became evident in both Australia and South America. In the last quarter of 1890, when the Hingley company was formed, over exposure in South America led the great house of Baring Brothers to the brink of disaster. In 1892 the railway boom in South America came to a virtual full stop. With it Hingleys' export of railway iron also ceased. A similar situation obtained in Australia where the financial crisis that peaked

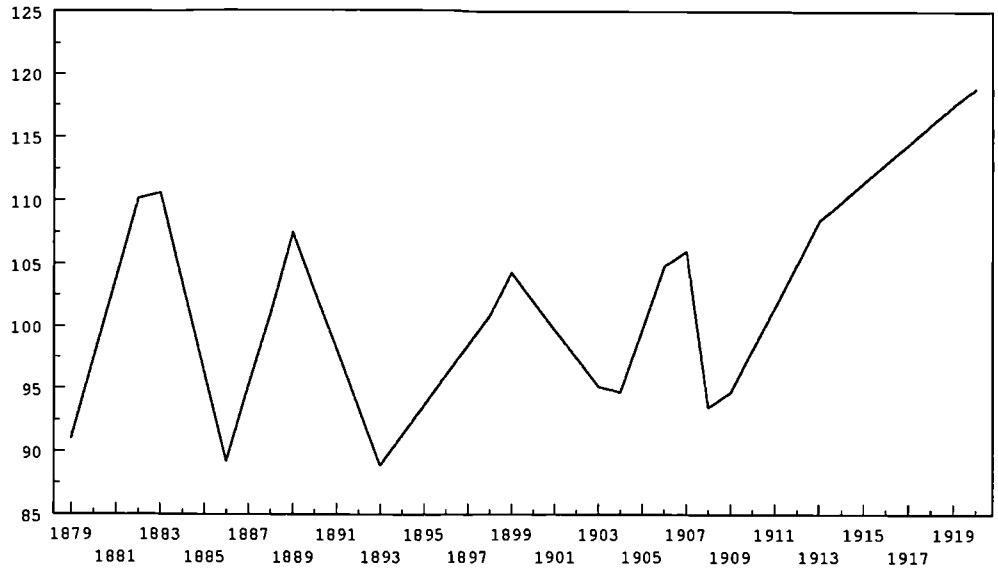
in 1893 effectively crippled development for years. By 1893 shipbuilders in Britain were using at best two thirds of their production capacity.[26]

Table 3.2 : Fluctuations in industrial activity from 1879 to 1920, from a base line of 100 in 1880.

1879	91.0
1882	110.2
1883	110.6
1886	89.2
1889	107.5
1893	88.9
1899	104.4

1903	95.2
1904	94.7
1906	104.9
1907	106.1
1908	93.5
1909	94.7
1913	108.5
1920	118.9

Figure 3.1 : Graph showing the volatility in industrial activity from 1879 to 1920 from a base line of 100 in 1880



[26] Sayers, A History of Economic Change, 32-36.

In the five years to the end of the 19th century shipbuilding and its allied trades did quite well from a combination of pressure to use more efficiently powered and sized ships. This was coupled with the domestic growth in naval construction as international rivalries sharpened. This matter has been treated in more detail in chapter two, as naval construction formed an important part of Hingleys' fortunes from 1890 onwards. Additionally, the Boer War that began in September 1899 brought phenomenal activity to the iron trade. This activity began to slow in 1900 when the boom in America collapsed. This, together with the end of the Boer War in May 1902 led to a collapse in freight traffic with a knock-on effect on shipbuilding. The fall off in industrial activity after 1900 brought a growing awareness of how the British economy was affected by ebbs and flows in the economy of the United States, even where these activities were not apparently in competition with each other. Thus economic activity in the period from 1900 to 1914 was essentially a continuation of the swings that were a feature of the late Victorian era. There was, however, a fundamental difference. The 1890s had seen a long interruption in the flow of investment funds to the developing countries beyond the seas. The 1900s saw a renewed impetus in overseas development fuelled by an unprecedented flow of capital from Britain as has been discussed in chapter two.

Factors often overlooked when examining the depressed state of business activity in the early 1900s was the financial cost of the Boer War from 1899-1902. This war involved 300 000 British troops and cost £250 million. The National Debt rose by £160 million, bank rate fluctuated as dramatically as it had done during the Baring crisis, and taxes rose.[27]

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[27] Trebilcock, Vickers Brothers, 65.

However, a recovery in economic activity had begun in 1905 and from then until the middle of 1907 Britain joined in to the full in what was essentially an international boom. When this boom petered out in the catastrophic collapse of 1908, the dramatic downturn began in the United States. This again confirmed the growing economic reality that all peaks and troughs in British economic activity had become closely tied to events in America. So, when the United States recovered from its financial problems in mid 1909 the revival of export orders from there triggered another and sustained revival. The British boom from 1910-1913 was the more remarkable because ups and downs in United States and German economic activity did not deflate it. The reasons for this were two fold. First, there was the concentration on British shipyards of the construction of vessels to carry the rising volume of world trade. Second, there was the continued flood of lending overseas to finance development in India, Canada, Australia, South Africa, and South America, much of which was actually spent in Britain on equipment and services. Shipbuilding in 1911 surpassed the record outputs of 1906. Then in the years 1911 to 1913, the total of new ships constructed was greater than that of the boom years of 1899 to 1902. Every major nation had embarked on naval construction projects in addition to the demands of the international merchant marine. Inevitably this international boom faltered, and mid way through 1913 when freights collapsed shipping orders were curtailed.[28]

At the end of July 1914 events took place leading to the Great War of 1914 to 1918. The expectations of peace by Christmas 1914 came to nothing. In the five years that followed, the Hingley firm was totally caught up in the demands of the war machine. From the passing of the Defence of the Realm Act in 1914, right through the various wartime Acts that put the industrial might of country under government control,

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[28] Ibid., 40-42.

Hingleys was subjected to the rigours of a command economy every bit as demanding as the regimes that emerged in Russia and in Germany in the 1920s and 1930s. Every facet of Hingleys' activities, whether it was labour relations, nature of products, destination of products, non-military production, etc., etc., was subject to the approval of a growing bureaucracy centred on Whitehall. Sir George Hingley died in August 1918 worn out by his efforts for the war effort, and totally exhausted by his crusade to maintain the quality of his Netherton iron against the dilutive effects of wartime expediencies.

Shipbuilding : Hingleys' immediate environment

By the time Noah Hingley took up the manufacture of cables (1820) and anchors (1848), the transition from sail to steam was under way. Though sailing ships would continue to enjoy an advantage in the carriage of bulk goods up to the end of the century, the balance tipped decisively with the opening of the Suez Canal in 1869 and the development of the compound marine steam engine in the 1860s, which reduced the space occupied by coal relative to cargo. The greater ability of steam liners to work to a schedule gave them an especially strong advantage over sailing ships in the carriage of mails and troops. Government subsidies given to British steamship companies for these services, coupled with the imperial support of secure coaling stations such as Gibraltar and Aden, and a good global network of telegraphic communication effectively cross-subsidised their general freight activities. This helped them to dominate the competition from sail ships and foreign steamship companies.

The development of the reciprocating engine for marine work, followed by the steam turbine, has to be seen as two of the major British achievements of the second half of the 19th century. Beginning with the

work of John Elder that culminated in his marine engine of 1854, and right through to 1912, British steam engines were a major factor in the dominance of the seas. By 1874, A C Kirk had designed a triple expansion engine using cylindrical Scotch boilers instead of the square box used by Elder. Seven years later in 1881, Kirk's engine had become the standard marine engine.[29] In parallel with the steady development of the expansion engine, C A Parsons had devised the basic concept of the steam turbine as early as 1884. The first steam turbine in a marine application was the 100 ton experimental ship the 'Turbinia' in 1897.[30]

The last passenger liner to be powered by the expansion engine was the 'Asturias' constructed by Harland and Wolff in Belfast in 1907. However, merchant ships up to 7 760 gross tonnage were still powered by the quadruple expansion engine right up to 1912.[31] By the early 1900s all British naval vessels were powered by steam turbines, and all the magnificent British and German liners of the 45 000 tons plus classification of the 1910s were similarly powered.[32] Aided by its domination of steam engine technology, British ships had more than 60 per cent of the world's steam tonnage in the period under review. The fleet carried 92 per cent of Empire trade, 63 per cent of trade with foreign countries, and 30 per cent of foreign to foreign trade. British powered ships also carried the millions of souls who emigrated from Britain and Europe to America from 1865 onwards.[33]

By 1880 some 54 000 people were directly employed in Britain's shipyards. In that year 983 ships were completed, 822 of them for

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29 Encyclopedia Britannica, 13th ed., s.v. 'Steam Engine'.

30 Ibid.

31 Ronald Hope, A new history of British Shipping (London : John Murray, 1990), 334.

32 Ibid., 340.

33 Ibid., 307-309.

British owners. At the beginning of the 1890s new steamships were averaging 1600 tons as against 1000 tons for sailing ships. Indeed, in the ten years from 1880 the average size of freighters had risen from 500 tons to 1600 tons. With this came the need for larger ships' cables and more sophisticated anchors. Hingleys was well placed to meet both of these demands. After 1900 the size of ships again rose rapidly and by the middle of the 20th century the average freighter was in the range of 8000 to 12 000 tons. The 1900s was the era of the big liners. An indication of ships' sizes is given in Table 3.3 on the following page.

Table 3.3 : Steam vessels by tonnage under construction on 31 March in the years 1895 to 1905

Year	Under 200	201 to 500	501 to 1 000	1 001 to 2 000	2 001 to 3 000	3 001 to 4 000	4 001 to 5 000	5 001 to 10 000	10 001 to 15 000	15 001 to 20 000
1895	70	29	29	42	43	48	29	19	1	-
1897	94	38	33	49	54	63	15	39	3	-
1898	175	44	42	65	68	102	25	54	4	-
1899	152	64	29	60	40	101	34	73	15	-
1900	117	81	33	51	36	78	43	55	17	-
1901	61	25	24	45	42	90	61	54	13	-
1902	47	42	38	53	37	69	44	56	15	-
1903	81	53	34	59	32	42	22	44	11	4
1904	55	47	23	33	43	77	40	21	6	8
1905	77	52	28	49	40	87	62	35	3	5

Source : Lloyd's Register Shipbuilding Returns 1888-1905

In the period from 1870 to 1910 the world supply of shipping increased from 16.8 million net tons to 34.6 million net tons. Great Britain had about one third of this shipping.[34] Hingleys had shared in this phenomenal growth as suppliers of anchors and cables. Britain's dominant position in the supply of financial services and capital to the world depended on its international earning power. In turn this earning power depended on its merchant navy.

However, in parallel with the general trade swings that were a feature of the years from 1880 to 1914, shipbuilding was affected by a variety of other factors and circumstances. Chief among these was that long lead times did not allow the industry to react quickly to the violent swings in business activity. Booming trade increased the demand for shipping space, as did the need to import food during poor harvests. Often the market swung too far and too many ships were produced in the short term. Thus in the 1880s, the last decade before the quantum leap in the size of ships, construction in one year was as high as 1 300 000 tons. In a bad year it could be one third of that. The years 1899 to 1902 were particularly good for shipbuilding. Record output was achieved in 1906 only to be surpassed in 1911. Then the three years 1911 to 1913 outpaced the boom years of 1899 to 1902.[35] There were, however, years of underemployment and Hingleys looked increasingly to Germany and Italy to fill these voids. The period also saw shipbuilding playing a part in the emergence of large scale companies in the industry. Driven by uncertainties in the demand for ships, which took a long time to construct and even longer to wear out, and coupled with the multitudinous specifications of vacillating officials at the War Office and Admiralty, by 1905 certain of the major players in

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[34] Ashworth, An Economic History, 154.

[35] Ibid., 94-95.

shipbuilding had merged to provide the vital naval shipbuilding capacity required by the British government.[36] Rated as large in 1905, were:

Vickers, Sons & Maxim with a capitalisation of £7 440 000

Armstrong, Whitworth & Co., with £5 316 000

John Brown, with £2 947 000

Cammell Laird, with £2 623 000

British shipbuilders remained at the forefront of construction activity through technical innovation, especially in warship design in the 1900s as will be examined further in chapter four. Speed as well as tonnage was the key to success. In the early 1880s the triple expansion engine made its appearance, followed by the quadruple and quintuple expansion engines in the late 1890s. These were all reciprocating engines fuelled by coal. Further advances came with the introduction of the steam turbine in 1897, a move that by 1907 had displaced the reciprocating engine in the fastest passenger ships. By 1910 the geared turbine engine had been introduced, and in 1907 the internal combustion engine began its competition with the steam turbine, realising its full potential after the Great War. All this change and innovation was but part of the story of the fight by British shipyards to maintain market share. In many ways they were too successful, for in 1913 practically all British ships and one quarter of all foreign tonnage was under construction in British yards for the simple reason that the British yards had the capabilities for construction and the prices that ensured sales. Easy access to cheap steel led to the Clyde, the Tyne, the Wear, the Mersey, and Belfast, becoming the dominating shipbuilding locations in the world. Collectively they had some 580 berths and 200 000 people

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[36] Payne, The Emergence of the Large Scale Company, 533 -539.

were employed.[37] For the Hingley firm the natural sources of work tended to be the Clyde, the Mersey, and Belfast.

During the entirety of the period under review Hingleys maintained a continual search for market share on a world basis. This was in order to even out the highs and lows of the business swings, and the firm achieved a continuity of employment for its work force that was remarkable for the times. This aspect of the study is developed further in the analysis of Hingleys' marketing techniques in chapter seven.

Government intervention before 1914

Intervention by government in the workings of the free market was a developing feature during the period under review. In 1891 the House of Commons passed the Fair Wages Resolution. This resolution required that all men employed on Admiralty contracts should be paid in accordance with wage lists promulgated by the department. In Hingleys' case, the rule was advantageous as it specifically prevented under-cutting on price when tendering. Also, as the Admiralty specifications for cables and anchors were higher than for commercial work, the top men were employed on this activity. Their rate of pay then set a top rate against which the conventional descending differential rates of pay could be fixed.

From the same era came the Factory Acts of 1891 and 1901. These Acts moved from an initial concern over working hours and accidents into an elaborate code affecting most aspects of working conditions and occupational diseases. Further, they enabled the Home Office to devise controls in the light of experience, with administrative orders being used instead of new legislation. This delegation of power to the

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[37] Sayers, A History of Economic Change, 96-99.

executive was a novel and very important innovation in its day. It was a procedural device that grew and grew as governments intervened more and more in the market economy.[38]

However, the classic example of intervention by government in the workings of the free market, as against legislation of an enabling or regulatory nature, was the Railway and Canal Traffic Act of 1894. This Act virtually froze freight rates until the passing of the Railways Traffic Act of 1913. The Act of 1894 was in itself a reaction by government to its perception of abuse by the owners in opting for the maximum end of the freight rates schedule in 1893, by way of taking advantage of Board of Trade regulations promulgated in 1891 and 1892.[39] As a result of the workings of the Railway and Canal Commission, Hingleys had the advantage of steady freight costs, a factor of considerable importance as it was the company's policy to ship its iron for export through London ports only, and not through Liverpool. The downside of this excessive regulation was the resentment of those working in the railways system, especially over pay and trades union representational rights in an industry that was tightly regulated. Eventually, the Act of 1913 gave the railway owners the right to revise freight rates upwards and to accommodate the wage demands of their workers. The realisation, emphasised by a Board of Trade report of 1913, that the cost of living had increased 14 per cent over the preceding seven years, made wage increases and industrial turmoil inevitable.[40]

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[38] William Ashworth, An Economic History of England 1870-1938 (London : Macmillan, 1960), 223.

[39] Ibid., 124.

[40] Phelps Brown, The Growth of British Industrial Relations, 331.

A concluding example of government intervention in the free market economy of the time is provided by reference to the coal mining industry, an industry then relevant to the entire manufacturing process. The long time aim of many coal workers to achieve an eight hour working day came to fruition in 1908. Although the legislation was opposed by most of the owners, and by the colliers in Durham and Northumberland, it came into effect with immediate and controversial consequences. These stemmed from the fact that miners were paid by the tonnage of coal raised and the shorter working day resulted in lower production and thus lower pay. Additionally, entrenched working practices had to change to accommodate shorter shifts. Eventually, matters came to a head with the strike by the entire Miners' Federation in February 1912 in search for a minimum wage of 5/- per day for men and 2/- per day for boys. The government's solution was to create district conciliation boards that had two patent anomolies. The first was that no national minimum wage was set. The second was that there was no compensating move to allow the owners to recoup increased labour costs.[41]

This philosophy of creating conciliation machinery, that only addressed the needs of the men, was carried to the point of absurdity during the Great War from 1914 to 1918. During that conflict the doctrine was developed that any stoppage in an essential industry, justified an extension of the imposition of conciliation into the imposition of a settlement that was acceptable to the men. It was after the War, and 1920, before a balance was restored by the Emergency Powers Act. This Act set aside the doctrine of imposed settlements in disputes that were arguably more political than industrial in nature.

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[41] Ibid., 324.

Some economic consequences of the Great War

For Sir George Hingley the National Insurance Act of 1911 marked the end of the paternalism that was a feature of the Hingley management style. This style was no longer a key factor in the way in which the works and the many employees related to each other. With the advent of the Great War in 1914 there followed in quick succession the Defence of the Realm Act of 1914, and the Munitions of War Act of 1915. The effects of these two Acts totally transformed the Hingley operations. In less than a year an enterprise that was in the front rank of free market entrepreneurship was turned into one that was totally subservient to the dictate of the state under the new command economy introduced by the government in order to prosecute the war. Albert Vickers, from a much grander position as a head of the Government's major defence supplier, summed up government interference in the process of supply as eventually becoming too pervasive to leave any margin for entrepreneurial manoeuvre.[42] The McKenna Tariffs had been introduced in 1914 to protect industries of particular strategic importance, thus breaking the doctrine of free trade that had been such an emotive issue in the 1900s. Early in 1915 Local Armaments Committees had sprung up that raised the spectre of workers' control of factories, while the Munitions of War Act introduced the pass-book system to discourage the movement of labour.[43]

For Hingleys this meant that the products it could make, for whom it could make them, what it could pay the workforce, and indeed every facet of its operations was subject to government approval and direction. Scant regard was given to the excessive depreciation and running down of plant. Licences to renew worn out equipment were often denied or

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[42] Trebilcock, Vickers Brothers, 31.

[43] Alan S Milward, The Economic Effects of Two World Wars on Britain (London : Macmillan, 1970).

delayed, even where the absence of renewal affected the carrying out of war work. A company that had prided itself for almost a century on financing the replacement of plant and equipment out of revenue, found itself caught in a vicious trap of being subjected to notionally assessed excess profits tax on current earnings with plant replacement allowances (if licenses could be obtained) being set at pre-war levels.

The advent of war in 1914 brought a sea change in economic and social attitudes. The very serious tensions that existed in a free market economy and the focus by the Liberal government on social fairness gave way to the far more serious tensions of fighting a world war in which the whole empire was involved. The Liberal government was replaced by a Coalition government in 1915 and immediately introduced draconian levels of taxation. In the Budget of November 1914 income tax was doubled to 2/6 in the pound. In the supplementary Budget of September 1915, McKenna raised the top rate of income tax to 40 per cent. Super tax on income over £8 000 per annum was increased; and an excess profits tax of 50 per cent became payable.[44] The draconian tax increases were indicative of things to come. At the outbreak of war in August 1914, the Chancellor thought that Britain could finance a conflict of five years' duration from the proceeds of its foreign investments alone. By October 1915 the Anglo-French Commission had to raise a loan of US dollars 500 million to finance the purchase of essential war supplies. Immediately prior to the entry of the United States into the war in 1917, Britain's debts to that country ran to hundreds of millions of pounds. Between 1917 and the Armistice of November 1918, Britain borrowed a further £1 000 million for the necessities of life and war. In the period from August 1914 to November 1918, Britain was transformed from a creditor nation on a grand scale to a debtor nation on a vast

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[44] Ashworth, An Economic History, 270.

scale.[45] The Britain that the three generations of Hingleys had known also passed away. At the personal level, this budget, and subsequent budgets, had serious consequences for Sir George. Never highly paid (his director's fee was £500 per annum) he began selling small parcels of shares throughout the war to meet taxes. The very multiplicity of minor shareholdings, referred to later, would appear to stem from the disposals made by Sir George in order to meet taxation.

After the generalised impact of the Defence of the Realm Act of 1914, the measure that had most impact for Hingleys was the Munitions of War Act of 1915. Under the provisions of this Act the Hingley enterprise was designated a 'Controlled Establishment'. As such the bulk of its activities were directed by a government department. G R Rubin, in his analysis of the purpose and the working of the Act, emphasises three basic aims. The first and principal objective was to harness both capital and labour for the war effort. The second was to reorganise industry under collectivist principles with a policy of unitary corporatism. In theory this was supposed to result in the employers having control, but this did not prove to be the case. The third objective was to promote industrial peace and discipline in the factories and shipyards, and to minimise interruptions in the production of war materials. This last objective was to be attained through five provisions specifically relevant to labour. First, work stoppages were declared illegal, and arbitration made compulsory. Second, there was to be statutory wage regulation. Third, there was to be a defined system of factory discipline. Fourth, all working rules, customs, or practices that hindered the war effort were declared illegal. Fifth, turnover of labour was discouraged by the imposition of agreed leaving certificates, without which six weeks of unemployment was imposed.[46]

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[45] Milward, Economic Effects of World Wars, 46.

[46] Rubin, War, Law, and Labour. Intro. ; 13-15.

The impact of this Act on Sir George Hingley resulted in a partial opting out of management in the early part of the War. His industrial ethos was rooted in the voluntarist nature of industrial relations that prevailed before 1914. This concept of voluntarism had as its fundamental characteristic the settlement of terms and conditions of employment without the interference of the state.[47] At a stroke, in 1914, the highly prized employers' initiative over collective bargaining was passed to the state.[48] With its passing, a feature that Clegg and others have seen as one of the most distinctive features of free collective bargaining in the 1890s and 1900s was swept away. In shipbuilding and its associated trades there was a spirit of antagonism by the owners towards trades unions. The war, however, compelled joint action and trades unions first appeared in the Hingley works after 1914.

A summary

The economic factors that could be comprehended and responded to by the Hingley firm, in the period 1890 to 1920, were essentially five in number. First, there was the birth of the military industrial complex in which Hingleys' participation as a supplier of ships' cables and anchors was central to its domestic marketing strategy. As will be described in chapter four, Hingleys' fall from grace from Admiralty work in 1904 was seen as a commercial disaster. An indication of the importance of military and naval contracts to the British economy is given in Table 3.4[49]

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[47] Ibid., 7.

[48] Lovell, Trade Unions 1875-1933, 50.

[49] Trebilcock, Vickers Brothers, 123.

Table 3.4 : Britain's market share of exports of warships and naval ordnance, 1900-1914

EXPORTER	VALUE IN STERLING	PERCENTAGE MARKET SHARE
Britain	35 872 960	63.2
France	5 320 000	9.4
Germany	4 343 000	7.6
Italy	5 130 750	9.0
United States	5 050 000	8.9
Austria	1 070 000	1.9

Second, there was the emergence of the new giant liners designed for the North Atlantic runs. The significance of these ships for Hingleys was that the firm was one of a select few capable of meeting the specifications demanded for anchors and cables. Third, there was the economic consequences of the Boer War with its drain on the nation's resources. Fourth, there was the rapid social change that was a feature of the period. New attitudes emerged that changed the nature of the provisions for education, health, and social welfare. This, together with the mass unionisation of many unskilled trades, led to the demise of the benevolent paternalism practised by Hingleys among others. Fifthly, there was the Great War during which the Hingley firm was a controlled establishment or a privately owned, but government directed, munitions factory.

However, throughout all the ups and downs of the period Hingleys' core business remained intact, with the firm adapting to the economic factors occasioned by each swing in business activity.

PART TWO : A NARRATIVE OUTLINE

CHAPTER FOUR : N HINGLEY & SONS LIMITED 1890 - 1920; AN OUTLINE OF TRADING ACTIVITY

The context in which Noah Hingley's firm achieved its hegemonic position in the trade of ships' cables and anchors

As late as 1873 the firm of Noah Hingley and Sons warranted no more than a brief reference in Samuel Griffiths's classic guide to the iron trade in Britain as a maker of best cable iron.[1] During the 1880s the firm consolidated its position. The quantum leap in status and scale of manufacture came in the following decade.

One very important element in the rise of Hingleys was the Sheffield connection. Hingleys' principal overseas agents were all from Sheffield : B K Morton in Australia; Scott Piercy in South Africa; and A K Rhoden in the Orient and Japan. Hingleys' gifted engineer and designer, J E Fletcher, was a Sheffield man and after they took over the manufacture of the Halls Patent Anchor Company designs in 1888/9, all Hingleys' anchor heads were cast by Charles Cammell of Sheffield. The root of this close association appears to date back to the decision of John Brown & Co to give up the manufacture of wrought iron in favour of steel as early as 1859. Notwithstanding numerous later acquisitions in the shipbuilding industry, John Brown found itself without a manufacturing capacity for the very large diameter ships' cables and the enormous anchors that were needed for the new breed of much larger ships laid down in the 1890s. The new 'Atlas Steel and Spring Works' were opened

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1 Samuel Griffiths, Griffiths' Guide to the Iron Trade of Great Britain (Newton Abbot : David & Charles, 1967 edition), 218.

in 1856 and the company was incorporated with a capitalisation of £1 000 000 in 1864.[2] The managing director, and later chairman, was John Devonshire Ellis. He and his son Charles Ellis were later to develop strong business ties with George Benjamin Hingley. The newly re-financed company went in for armour plate and by 1867 was reputed to have provided the armour plates for three quarters of the iron clads in the British Navy.[3]

Significantly, when John Brown decided in 1908 to go in for the manufacture of ships' cables a company called the British Machine Made Cable Company was formed in joint venture with Hingleys. This joint venture represented the culmination of an accord between the two firms under which a modest sized sub-contractor was able to enter the halls of the great in the shipbuilding world by supplying the vital mooring and anchoring equipment for the most famous vessels of the day.

The other Sheffield iron and steel firm that influenced and affected Hingleys was the notable arms manufacturer Vickers. Vickers, Sons & Company Limited had been incorporated in 1869 with a modest capitalisation of £155 000. Its former agent and partner in New York, the German, Ernst Benzon, was the first chairman of the company into which had been subsumed the assets of the predecessor unincorporated firm created in 1829. Benzon had been made a director of John Brown in 1864. In 1888 Vickers took the decision to move into armaments having, noted as a sub-contractor, how established John Brown had become in this field.[4] In 1897 the firm acquired The Naval Construction & Armaments

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2 Sir Allan Grant, Steel & Ships The History of John Brown's (London : Michael Joseph, 1950), 22.

3 Ibid., 21.

4 J D Scott, Vickers A History (London : Weidenfeld & Nicolson, 1962), 20.

Company Limited of Barrow-in-Furness, a company founded by Sir James Ramsden and which specialised in naval construction.[5] It was the work in Barrow that was of particular interest to the Hingleys, especially in the manufacture of ships' cables and anchors to Admiralty specifications.

Although not a Sheffield firm, the Armstrong Whitworth company had a marked influence on Hingleys' fortunes, both as a naval fabricator and because of the Lloyds British testing house at Low Walker. W G Armstrong & Company was formed in the 1850s as a development of Armstrong's first business venture, the Newcastle Carriage Company. It was located at Elswick on the Tyne, a yard that was to feature prominently in Hingleys' business dealings.[6] It became incorporated in 1883 with a nominal share capital of £2 million pounds and in the style Sir W G Armstrong, Mitchell & Co Ltd, this share capital being increased in 1895 to £3 million pounds. In 1897 it purchased the famous Whitworth company, a name associated with excellence in engineering and became part of the triumvirate in the military industrial complex along with John Brown, and Vickers.[7] Its north east operations were based on the Armstrong yard at Elswick on the Tyne near Newcastle, and on the Mitchell yard at Low Walker on the Wear near Sunderland. Hingleys' work for these two yards provided some profit and a lot of pain, the latter especially in the slump of 1908, a matter treated more fully later in the text.

A point of particular significance for naval shipbuilding was that by 1890 a pattern had developed in the industry whereby the major

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5 Ibid., 23.

6 Ibid., 25.

7 Ibid., passim 25-46.

constructors carried out British Navy work to Admiralty designs, whereas foreign navy work was usually carried out to the contractors' own designs.[8] This led eventually, and possibly due to Admiralty vacillations over its specifications, to the astonishing situation between 1902 and 1904 in which Vickers and Armstrong Whitworth produced state of the art warships completely independently of the Admiralty while working for Chile. This new concept rendered the British battle fleets obsolete virtually overnight as will be seen later in this chapter.[9] These three firms of John Brown, Vickers, and Armstrong, provided the base from which George Benjamin Hingley built his hegemonic position in the supply of ships' cables and anchors to the navies (military and mercantile) of the world.

Trading in the last years of Victoria's reign, 1890 - 1902

Trading in the early 1890s was very much a case of fighting for survival. Reference to Table 3.2, page 3/20, will indicate the severity of the slump in business activity. This was especially severe in respect of Hingleys' markets in the Australian and New Zealand colonies. There, the long standing depression had worsened into the acute financial crisis of 1893. This crisis strained old loyalties between Hingleys and the merchant houses it relied on for overseas distribution to breaking point. As 'Ben' Hingley pointed out to B K Morton, his agent in Melbourne, the network of merchants in Australasia that had been carefully developed during his four visits to the area was on the point of breaking up. George P Harris Scarfe & Co., of Melbourne, who had been supplied exclusively since 1880 was now taking iron from R Heath & Sons of Stoke.[10] In Sydney the merchant W S Friend & Co., was

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[8] Ibid., 36.

[9] Ibid., 53.

[10] WHC : Sec. 8 ; DLB, 1 : 26 April 1895, 40.

no longer taking shoeing iron from Hingleys' London merchant F A Edelston & Co.[11] Likewise, in Queensland, Smellie & Co. was also not repeating orders.[12] In all cases the issue was price, and Hingleys decided not to supply at loss making prices. A major factor was that cheaper iron was easier to work than Hingleys' iron, but it did not last as long. Thus a combination of price and lazy farriers caused 'Ben' Hingley in his first year as managing director to lose his premier position in the local markets, especially when the loss of the New Zealand government contracts was added to the problems in Australia.

1895 was a turning point in the ups and downs of industrial activity. The index of industrial activity had stood at 107.5 in 1889 shortly before the firm was incorporated. By 1893 it had fallen to 88.9, but after 1895 it recovered to a new high of 104.4 in 1899. The reason for this, as far as shipbuilding was concerned, lay in the naval re-armament programmes that took place after 1895 following the perceived unfriendliness of the Franco-Russian naval presence in the Mediterranean in 1894, coupled with the return to power of the Conservatives in 1895. Before the age of mass-communication the Hingleys would not have been aware of the extent of politico/economic activity that was building up in Europe. The firm concentrated on fending for itself. Thus, in 1895, and by way of off-setting its loss of the lion's share of the Australian market, the Hingley brothers addressed the overseas opportunities in Brazil, Chile, Italy, and South Africa with great vigour. 'Ben' Hingley's drive for the anchors and cables for two cruisers building for Brazil at the Armstrong yard at Elswick on the Tyne provided a classic demonstration of the Hingley trading style. Through his agent, Walter Christiansen of Rio de Janeiro, he offered top quality cable at a

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[11] Ibid., 21 May 1895, 65.

[12] Ibid., 26 June 1895, 82.

commission of 5 per cent, a figure twice his normal rate of commission. He added to this without any pretence of subtlety by telling Christiansen : 'You doubtless have your friends and would be able to arrange this matter by instructions given to the naval attaché in London to advise Elswick to prefer N Hingley'.[13]

'Ben' Hingley's spoiling tactics in the market for Italian navy work were even more remarkable. They were also successful, resulting in Hingleys' dominance of this market right up to the outbreak of war in 1914. In essence, Hingley convinced the Italian naval authorities that as far as their new fleet was concerned, specification and reliability were more important than rock bottom prices. Using the influence of Captain Rocca, his agent in Spezia, he succeeded in eliminating all second rate manufacturers from the tender lists. In this he was aided by revelations over the dubious practice of certain second rate British manufacturers of dumping unwanted or inferior cable on the Italian market. Hingley wrote to Rocca : 'Have these other offers put on the fire'.[14] Thus, Hingley was able to concentrate the market in the hands of N Hingley of Netherton, Henry Wood of Chester, and Brown Lenox of Millwall. As Hingley and Wood acted in concert in Italy, that market was virtually assured for years.

In South Africa, the extended visit in 1895 by H M Hingley resulted in two fundamental problems being identified. The first was the distrust in which agents were held by the mining companies. This probably resulted from the transient nature of the population at that time, made up as it was by tens of thousands of men from all over the globe flocking to the gold fields of the Witwatersrand. The second was the invariable practice of the merchants of stocking the lower grades of

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[13] Ibid., 19 March 1895, 19.

[14] Ibid., 12 June 1895, 67.

iron. H M Hingley determined to sell direct to the mining companies as he stressed to a G B Poole of The Rand Mines Limited. The irons needed for mining work were the superior irons such as Netherton Crown Best, Netherton Crown Best Best, or Netherton Crown Special Best Best Loco Iron. The merchants in Johannesburg only stocked Netherton Crown Iron, the most basic of Hingleys' wrought iron.[15]

While the Hingley brothers were fighting to maintain market share for their works in Netherton, much greater events were taking place on the world stage. The pax britannica was under threat. The Navy League, a populist pressure group that had been demanding action on the navy ever since the manoeuvres of 1888 had demonstrated the shortcomings of the navy, was vindicated by events. Mahon's studies of sea power in 1890 and 1892 showed the weaknesses of the British Navy. The Franco-Russian alliance of 1894, the establishment of a Russian squadron in the Mediterranean, and the growing sea power of Japan all threatened the supremacy of Britain on the high seas. The Venezuelan dispute of 1895 that led to poor relations with the USA created a feeling of isolation. Concern grew at the way in which the naval estimates leaped in size. At the time of the Defence Acts of 1888-9, the highest level of annual expenditure was less than £6 million. In 1895-6 this figure was set at £18 823 000, rising to £21 823 000 in 1896-7.[16] As mentioned in chapter three a whole new battle fleet was ordered. Seemingly overnight, Hingleys found itself overwhelmed with orders for the last years of the century. In addition to its normal lines of association with John Brown, Vickers, and Armstrong, it was also called on to cope with direct invitations to tender from all and every source involved in warship construction.

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15 Ibid., : 25 July 1895, 94.

16 Scott, Vickers, 46-47.

No sooner had the overseas order book filled with work for Italy, Brazil, and Chile, than orders came flooding in for British mercantile marine work. 'Ben' Hingley was thus faced with the predicament of having to refuse work from such valued customers as Cairds, Connells, and Russell, all major Scottish constructors. The root cause of the problem was that foreign navy work had filled his works until the autumn of 1896 as Hingley advised Captain Hardie, his agent in Glasgow, in the late autumn of 1895. It was at this point that 'Ben' Hingley made the decision to offer only the Hall's patent anchor in future, and not one of those in the Hingley range.[17] This was a momentous decision as the adoption of the Hall's design, as developed and improved during the next ten years, was the decisive factor in establishing Hingleys as the supreme anchor maker for ships that displaced more than 40 000 tons, which were to dominate the passenger trade after 1905.

Hingleys' inability to accept all the work on offer, after several years of thin orders, was due to the way in which the chain works were structured. The workshops were geared separately to the production of three classes of chain. The first category was small chain less than 2" in diameter. The second was medium chain, being less that 3" in diameter. The large chain was up to 6" in diameter. In the order of things the large cable men would not work on medium size cables, as they were used to working with double strikers. Thus an inability to cope with orders could arise as it did in 1895. The absence of flexibility in the production process resulted in orders having to be turned away, as explained to Caird & Co., of Greenock.[18]

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[17] WHC : Sec. 8 : DLB, 1 : 11 November 1895, 152.

[18] Ibid., : 9 November 1895, 151.

Trading in the Edwardian era from 1902 - 1910

Trading during these years proved to be the most traumatic of the whole period under review because of the extreme volatility of the market. The short sharp slump of 1903 to 1904 following the end of the Boer War was followed by the short sharp boom of 1905 to 1907. This in turn was followed by the abject collapse in business activity that was a feature of 1908 to 1909. The year 1909 was Sir George Hingley's own 'annus horribilis'. Two of his most respected competitors failed in business, several close business friends died, his own brother H M Hingley died, and his mother went into her terminal decline. But, in 1910, there came an even more dramatic upsurge in work that resulted in Hingleys supplying the cables and anchors of many of the most famous ships and liners in maritime history.

The extreme volatility in the market was exacerbated by new developments in naval construction and by the arrival of the huge passenger liners, events that occurred in parallel. In warship construction the most dramatic development resulted from the official Admiralty policy of encouraging British yards to design, construct and export to foreign navies warships of all description. This policy was based on the premise that it would keep the British yards in top form. However, the policy as it worked out resulted in Vickers and Armstrongs producing state-of-the-art battleships that rendered whole existing fleets obsolete. In 1899 Sir William White of Armstrongs had been appointed Director of Naval Construction. In this role he was grossly overworked and his relations with the major constructors was frequently very brittle. He accused them of showing preference to foreign navies and being late on deliveries.[19] However, he had overlooked official Admiralty policy whereby foreign work had been officially encouraged;

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[19] Scott, Vickers, 47-50.

and that vacillations over British orders was a direct cause of the violent fluctuations in workloads that blighted the industry in this period. Quarrels with the Admiralty filtered down to Hingleys' level as will be seen later. Unfortunately, unlike the constructors who had a decisive grip on Britain's shipbuilding capacity, Hingleys' quarrel left them excluded from Admiralty anchor orders for ten years after 1904. With passenger liners, the lead times, construction times, and assessment of their impact on the market, resulted in wild fluctuations in activity. The ten ships in the range of 30 000 to 52 000 (see the plate that follows page 3/3) that were supplied with the Hall's anchor during the 1900s, while being magnificent in their own right, had a debilitating effect on the small constructors' market as fewer small vessels were commissioned. Indeed, the shameful conditions that resulted in the smaller chainmaking workshops in the Black Country in the 1900s, were a direct consequence of the distortion of the market in which the medium size chainmakers resorted to making small chains.

At the turn of the century, and in light of the German Navy Acts of 1898 and 1900, the major political influence on naval shipbuilding had been the growth of the German Imperial Navy. As long ago as 1865 the King of Prussia had had a trade treaty with Britain as part of his international relations with France and Britain.[20] In 1897 Britain decided not to extend the current treaty and the origin of the large German navy can be dated from that year. In 1902 Britain signed a treaty with Japan, and she sealed the Anglo-French agreement in 1904. In 1904, in the wake of the completion of the major reconstruction of the navy, the Channel Fleet was re-created. It was during this period, from 1902-1904 that Vickers and Armstrongs, independently of the Admiralty, pioneered the concept of the Dreadnought battleship, a very high speed ship with very

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[20] Ibid., 46.

great hitting power.[21] This concept rendered the British fleets obsolete and caused major disruption to the planning process. This may well have been a major factor in the catastrophic slump of 1908. In 1909, however, both Vickers and Armstrong stated that after allowing a lead time of three years (a key determinant) they could deliver Dreadnoughts at the rate of one every six months.[22]

After the industrial recovery of 1910, there was strong activity in shipbuilding both naval and mercantile right up to the outbreak of war in 1914. The three major constructors, in whose wakes the Hingley firm was able to sail commercially, took their activities overseas. In 1905 Vickers set up Vickers-Terni Societa Italiana ed Armamente at Spezia, with a capital contribution of £86 625 out of a total capital of £385 000. In 1906 Vickers in joint venture with Armstrongs acquired the Whitehead Torpedo Works in Fiume (now Trieste), Hungary's outlet to the Adriatic. In 1907 Vickers and Armstrongs in Joint Venture contributed £375 000 each in the £1 000 000 capitalisation of Japanese Steel Works.[23] All these developments were part of a network of interests closely shadowed by the Hingley firm. Although Hingleys made its own way overseas, the identity of its interest with the activities of its major principal constructors must have had its influence. The way in which Hingleys achieved this is covered more fully in chapter eight dealing with marketing. In 1908 Vickers, Armstrongs, and John Brown, took a 24.5 per cent stake for £385 000 in La Sociedad Espanola de Contruccion Naval, and subsequently obtained large contracts.

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21 Ibid., 51-53.

22 Ibid., 57.

23 Ibid., 83-85.

Hingleys' reaction to the slump of 1903 - 1904

During the short sharp slump of 1903 to 1904 when the index collapsed to 94.7, 'Ben' Hingley demonstrated his ability to temper the wind to the shorn lamb by moving effortlessly from alliance to alliance literally to suit the needs of the hour. Separate from the major alliances discussed in chapter nine he ran an agreement with W L Byers of Sunderland to corner what was left of the anchor market. Early in 1903 he had a combination involving Hingleys, P Brown Lenox, H P Parkes, R Heath, and the Waverley Iron Company, to arrange work among themselves. Only Henry Wood of the desired grouping of six firms declined to join, possibly because of differences over the Italian market. These adverse trends in trading conditions pushed 'Ben' Hingley into a limited compact with H P Parkes in the middle of 1904.[24] This was a most unlikely pairing in view of past animosities, but desperate times demanded desperate measures. With the pick-up in business activity that came towards the end of 1904, yet another grouping emerged that was distinctive in that both H P Parkes, and Brown Lenox, were specifically excluded from it. 'Ben' Hingley and Henry Wood had got together, notwithstanding differences in Italy, over a very large order for 500 tons of mooring anchors. They decided that this order had to be treated on special lines by only those firms competent to handle such work. Accordingly, Hingley and H B Coltart of Henry Wood put together a group comprising Hingleys, Henry Wood, Jno Green, George Hartshorne, and Samuel Taylor.[25] This was, of course, a tight Black Country group with the exception of Henry Wood who was from nearby Chester.

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[24] WHC : Sec. 8 ; GBHPLB, 1 : 9 July 1904, 638.

[25] Ibid., 15 October 1904, 733.

During these depressing two years there were two other factors that were of great concern to 'Ben' Hingley. The first was the London shipping ring that had a stranglehold on trade with the colonies. As Liverpool was the principal port for America, so more and more of the eastern trade centred on London. The London ring freight rates of 20/- per ton to ship bar iron to Sydney were killing the trade. As 'Ben' Hingley complained to B S Lloyd & Co, the London merchants, he felt that 15/- was a more equitable rate.[26] Then, early in 1904, Hingley expressed his feelings to John Rogerson, who provided his anchor heads, on the second and far more important factor stating that: 'We have spent too much money and exhausted the country through the dread of war'.[27] He was of course speaking against the background of the enormous costs of the Boer War and referring to the recurring threats of conflict between Britain and France, France and Germany, Britain and Germany, that bedevilled this period and the years that followed. Whilst these threats undoubtedly created much ship construction work, the consequences for the economy of so much public money being spent on defence, coupled with the erratic consequences of boom and slump that were the corollaries of naval planning, were very obvious to men like Hingley. As has been mentioned earlier this was also the period that saw the many amalgamations between the major constructors of warships as being the only way to cope with the multitudinous specifications issued by vacillating officials in the War Office and at the Admiralty.

Hingleys' quarrel with the Admiralty

During the sharp slump of 1903 to 1904, 'Ben' Hingley experienced the misfortune of quarrelling with the Admiralty over the failure of anchors on three British warships. This quarrel is treated in greater detail in

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[26] Ibid., 9 September 1903, 345.

[27] WHC : Sec. 8 : DLB, 3 : 5 February 1904, 324.

chapter five in the section dealing with the management style of the Hingleys and in chapter nine dealing with relations with governments. Suffice it to say at this stage that, but for the dramatic upsurge in shipbuilding activity in 1905 to 1907, this quarrel could have had disastrous consequences for the Hingley firm because of the loss of Admiralty contracts it entailed. Fortunately, the Cunard and White Star lines had a major shipbuilding programme in prospect and, as 'Ben' Hingley stressed to Captain Hardie in the spring of 1904, his firm was one of the very few in the world that were capable of making the 3 3/4" cables that were required by Cunard.[28] That Hingleys' problems with the Admiralty at the end of 1904 had been pushed into the background was shown by the euphoria that 'Ben' Hingley exhibited when writing to B J Ackerley his agent in Liverpool. An order had been won for the RMS Caronia outfits and Hingley's letter welled over with pride when stressing that the cables and anchors were so large that they had been entrusted to the celebrated Netherton Iron Works; and that the 3 1/2" diameter cables weighing 100 tons were to be tested at the Lloyds test house in Netherton, the largest and most powerful establishment of its kind in the world.[29] The over-confidence that gripped 'Ben' Hingley at this time, may in some respects explain his astonishing mishandling of the 1904 crisis over anchors supplied to the British Navy.

The short sharp boom of 1905 - 1907

These were the years during which 'Ben' Hingley's capabilities were tested to the full. There was a lot of work in the industry, but it was at very keen prices that required continual shifts in the various manufacturing alliances to which he belonged. The move to new offices in March of 1905 was overshadowed in May by the death of Sir Benjamin

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[28] WHC : Sec. 8 ; GBHPLB, 1 : 17 May 1904, 570.

[29] Ibid., 2 December 1904, 772.

Hingley. From his uncle, Sir George inherited a very onerous responsibility for the Harts Hill Ironworks of Hingley & Smith. This was a small un-marked bar enterprise that provided a living for Samuel Hingley (the late Sir Benjamin's brother) and his family. This firm was to cause Sir George a great deal of continuous commercial concern. Coincident with this, the Lloyds British Testing Company became a major time consuming business activity with a programme for rebuilding or constructing new public test houses at Netherton, Tipton, Chester, Cradley Heath, and Newcastle. LBTC is given a fuller treatment in chapter nine.

The boom years 1905-1907, when the index rose from 94.7 to 106.1, caused Sir George to form groupings of friends and erstwhile enemies in order to cope with the sheer volume of work on the market. Following informal discussions on the Birmingham Exchange, Sir George sent out a circular letter in January 1905 inviting virtually the entirety of the large diameter side-welded cable manufacturing fraternity to meet as a body.[30] The meeting took place on 26 June 1905 and the various firms met as The Cable and Anchor Makers' Association in order to arrange matters to suit their mutual interests. This grouping of ten firms comprised Hingleys, Brown Lenox, H P Parkes, R Sykes, Jno Green, Jno Abbott, Henry Wood, George Hartshorne, Samuel Taylor, and The Earl of Dudley's Round Oak Steelworks. In addition, in February, Sir George entered into a separate arrangement with Henry Wood that provided for a price-fixing deal with an un-named third party covering the manufacture of anchors, whereunder that third party undertook to give a pay-off of 1/- per cwt, to be divided equally between Henry Wood and Hingleys.[31] The

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30 WHC : Sec. 8 ; GBHPLB, 1 : 17 January 1905, 803.

31 Ibid., 17 February 1905, 831.

quasi-cartel nature of these alliances is treated more fully in chapter eight.

However, despite Sir George's efforts to arrange the market, prices for wrought iron were still too low for comfort by the end of 1905. This had been brought about by the ridiculously low prices being tendered by the North Staffordshire ironmakers, but after reaching a general agreement with R Heath of Stoke in September, prices were raised by 5/- per ton in the following January.[32] This was a very bold move at a time when the domestic market was under considerable threat from imports of Belgian, and to a lesser extent German, commercial iron. The key to Hingley's move lay in his confidence in the total superiority of the top class wrought iron produced in South Staffordshire. The whole matter of Belgian and German imports, even to the extent of their re-export by British merchants as British iron will be considered in chapter six, dealing with iron. The Cable and Anchor Makers' Association was never a well disciplined body and Brown Lenox soon decided to go it alone. However, Lenox's policy of pricing all work at very keen rates led Sir George to take steps to get them back into the Association in the interests of the trade as a whole.[33]

The short period of upward industrial activity that began in 1905 ended two years later, by which time the Conservatives had given way to a Liberal administration following the election of January 1906. Sir George was very doubtful as to the respective merits of tariff reform and free trade and he expressed himself very forcefully at the time of the general election, stressing that he had taken no part in political affairs since 1895. He went on to say: 'If the working men by their

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[32] WHC : Sec. 8 ; GBHPLB, 2 : 8 January 1906, 196.

[33] Ibid., 20 March 1907, 590.

votes bring about a change in the system under which we have all flourished reasonably well in this country during the last half century, they must be prepared to take the inevitable consequences'.[34]

The 1900s was the era when the big ships were constructed that completely changed the character of ocean travel. At the end of 1906 Sir George was in collaboration with the John Brown shipyard on the Clyde over the specification and tender for a new Hamburg Amerika liner some 447 feet long.[35] This liner was over-shadowed six years later in 1912 by the SS Titanic which was 888 1/2 feet long. In this period Hingleys supplied the chain and anchor outfits for a whole fleet of similar vessels.

Sir George, as the representative of Hingleys was now active in The South Staffordshire Ironmakers' Association, The British Iron Trade Association, and The Midland Iron & Steel Wages Board. The first body was essentially an interest group made up of the leading cable makers. The second was a lobbying group based in London. The third was the means by which, and before the days of mass membership of trades unions, industrial peace was achieved in the Black Country.

The abject collapse of business activity in general, and shipbuilding in particular, has to be seen in the light of several converging influences. Among these were Asquith's budget of 1907 that pared the Defence Estimates, the confusion caused by the emergence of the Dreadnought as the state-of-the-art warship, and the general dislocation caused by the era of the big ships. These adverse influences were further exacerbated by the suddenness of the recession in the USA.

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[34] Ibid., 10 January 1906, 199.

[35] Ibid., 22 December 1906, 508.

The collapse in business activity in 1908 and 1909

During this period business activity collapsed. The line on the graph of industrial activity, as shown in Figure 3.1, collapsed from 106.1 in 1907 to 93.5 in 1908 in an almost vertical line. Early in 1908 the Hingley brothers had to mount a private, and clandestine, rescue of H P Parkes by taking debentures in lieu of debts owing to Harts Hill. By mid year, Brown Lenox was in trouble and Hingleys was offered their Pontypridd works. Sir George commissioned Alexander Smith (the same consulting engineers who had valued the Noah Hingley works in 1899) to value the Pontypridd establishment on a breaking-up basis.[36] The value put on the works was £20 000.[37] The acquisition moved at a slow pace because of a disagreement over the value of the plant, but eventually in November the decision was taken by Brown Lenox to sell.[38] The new shareholders were notified by Sir George to Pinsent & Co, (a leading firm of solicitors in Birmingham) as being G B Hingley, H M Hingley, G F Simms, and C E Lloyd.[39] Jno Abbott in Gateshead did not survive the slump and in October 1909 Sir George had to decline an offer to take over that firm as a going concern.[40] Soon afterwards, Jno Abbott went into liquidation, a fact noted with great sadness by Sir George when in correspondence with H L Pattinson the director of the Newcastle test house.[41]

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[36] Ibid., 25 July 1908, 979.

[37] Ibid., 31 July 1908, 987.

[38] WHC : Sec. 8 ; DLB, 4 : 3 November 1908, 14.

[39] WHC : Sec. 8 ; GBHPLB, 3 : 10 February 1909, 114.

[40] Ibid., 15 October 1909, 293.

[41] Ibid., 27 November 1909, 364.

Thus Sir George, within two years of presiding over an association of the country's leading cable makers and anchor smiths glutted with work as a result of the concurrent naval programmes and the large passenger liners, faced the debris of a ruined industry. One of his own two works was closed down temporarily in 1909. The test houses in Newcastle-upon-Tyne, and Sunderland, faced closure and were kept open only as a result of intense pressure from the Lloyds Register. Indeed, the situation became so bad that the Lloyd's Register agreed in February 1909 to reduce their charges by 50 per cent in order to help over the losses in the northern test houses.[42]

Reference to Table 4.1 on the following page will demonstrate the scale of the devastation in the shipbuilding industry that took place during the catastrophic slump of 1908 and 1909. The full reality of the business cycle, and its dramatic consequences for employment in the industry, are shown in the unemployment figures for the north east especially Tees and Hartlepool, Wear, and Tyne and Blyth. On Teeside unemployment in shipbuilding rose from 12 per cent in 1907 to 40.5 per cent in 1908. On the Wear the figures were 13 per cent in 1907, rising to 46.9 per cent in 1908. Among the casualties of this slump was Hingleys' foremost collaborator in the north east, Jno Abbott of Gateshead a leading chainmaker. In addition the test houses in the north east were brought close to closure. As mentioned above, only the action of Lloyd's Register in halving its fees saved the day. Table 4.1 is based on one drawn up by Humphrey Southall who in turn used material contained in the London Gazette, 1903-1914.[43] Particular note should be taken of the consequences for the north east in 1908 and 1909.

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[42] Ibid., 15 February 1909, 126.

[43] Humphrey R Southall 'The origins of the depressed areas : unemployment, growth, and regional economic structure in Britain before 1914', Economic History Review 41 (2 1988) : 247.

Hingleys, whose main work was for the yards on the Clyde, the Mersey, and in Belfast, was not so badly affected as some although half capacity working became necessary for a time. This table also confirms, or bears out, Hingleys' experiences in the slump of 1903-1904, the short boomlet of 1905-1907, and the abject collapse of business in 1908 in the areas where Hingleys' worked. These were mainly the Mersey, the Clyde, and Belfast.

Table 4.1 : Shipbuilding unemployment 1902-1914

Mean annual unemployment

DISTRICT	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Thames & Medway	6.8	8.0	10.0	11.6	9.7	9.4	12.2	10.6	6.7	5.1	7.8	6.1
South Coast	2.9	4.9	4.5	7.9	5.3	3.0	3.8	6.5	2.6	2.3	1.8	1.8
Bristol Channel	19.1	16.0	18.6	20.1	16.2	15.2	17.5	21.5	17.3	14.5	14.0	11.1
Mersey	13.2	10.3	13.3	19.3	12.5	8.4	16.5	18.2	14.9	5.6	4.5	3.9
Humber	10.6	9.2	16.9	10.5	8.9	6.0	19.5	20.3	13.0	5.1	4.7	4.4
Tees & Hartlepool	14.5	16.5	17.9	11.6	9.3	12.0	40.5	30.1	25.0	5.5	5.1	3.4
Wear	10.5	18.7	12.8	8.1	3.3	13.0	46.9	37.8	25.7	5.9	4.5	2.8
Tyne & Blyth	8.2	15.0	14.0	11.6	4.9	9.4	28.2	28.3	22.6	5.0	3.6	4.0
Dundee, Leith & Aberdeen	6.0	17.3	23.7	16.0	8.7	10.0	28.8	35.5	25.7	6.0	4.4	4.6
Clyde	5.3	11.4	16.0	11.4	7.5	9.0	24.1	22.1	14.7	1.8	2.1	1.0
Belfast	1.9	4.5	13.1	11.0	5.7	4.5	11.2	18.3	4.1	0.6	1.3	0.8
Other Districts	3.3	5.6	7.5	9.0	7.2	7.4	11.6	14.2	8.6	2.2	1.6	1.6

On the labour front, the workforce had become very restless. As Sir George advised G B Cobb, of the Contracts Department at the Admiralty, no orders for navy cables had been placed for eighteen months.[44] A few weeks prior to this Sir George in one of his last letters to Jno Abbott, before the latter's business failure, had confirmed that all the employers were in favour of a 10 per cent reduction in wages. The men's representatives had stated that they had no mandate to accept this and for the first time since becoming managing director, Hingley faced the

[44] WHC : Sec. 8 ; DLB, 4 : 19 November 1909, 109.

very real spectre of a massive strike.[45] It was within this context that Sir George and his co-directors thought that they had a solution to present and future labour problems with the advent of the rash of machine made cable capabilities that appeared mainly from Belgium. Hingleys' ill-fated venture into this field is covered in greater detail in chapter eight.

Barrows & Hall of the famous 'BBH' wrought iron had not survived the slump of 1903 - 1904. Now H P Parkes and Brown Lenox were in deep trouble. Jno Abbott had failed to survive and the LBTC had severe financial problems. Yet nothing in the commercial misfortunes of the day could have prepared Sir George for the personal tragedies that he was to sustain in 1909. In a note that Sir George sent to William Ellis, his long time business associate at John Brown & Co, in Sheffield, Sir George expressed his feelings on the loss of his only brother Henry Montagu Hingley who had died very suddenly on 30 September 1909 and on the death of George Hepburn the engineer and inventor who had played such a major role in the development of the highly successful Hall's patent anchors. He also commiserated on the death of J Thompson of Ellis' own firm.[46] Sir George's mother, Fanny Georgina Hingley, who as the widow of Hezekiah Hingley had brought the family down from Grassendale in Liverpool in 1865 when Sir George was fifteen years of age, was infirm and totally blind. She died on 6 January 1910. Fortunately for Sir George, Mrs Hingley's passing and all the other deaths were pushed into the background by yet another dramatic upturn in business activity. The difference now lay in the sustained character of this upturn that was maintained right through to the end of the period covered by this study.

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[45] WHC : Sec. 8 ; DLB, 4 : 1 September 1909, 99.

[46] WHC : Sec. 8 ; GBHPLB, 3 : 6 December 1909, 374.

Trading in Peace and War, 1910 - 1918

Generally

The first decade of the reign of King George V was marked by industrial strife on a scale never before experienced in Britain, agitation over votes for women, the introduction of social welfare legislation that effectively enshrined the intervention of the state in the affairs of the King's subjects, and the ever pressing problems of Ireland. In parallel with these domestic traumas, the political situation in Europe was of growing and perpetual concern.

The early part of the reign was a period of great significance for Hingleys. The firm had now long been associated with the supply of the cables and anchors for many of the major ships of the world. It was also at this time that Sir George gave up his autocratic style of management in favour of a more professionally based board structure. His efforts were such that a board of professional managers was created that was to serve the firm well, especially in the years after his death.

After the sudden collapse of the markets in 1908 and 1909, the upsurge that came early in 1910 was equally dramatic. Having shut down one of the works in 1909, Hingleys was suddenly faced with the prospects of enormous amounts of work. The White Star's twin ships, the S S Olympic and S S Titanic, came on to the order books in 1910, followed by Cunard's S S Aquitania in 1911. The Germans, who were anxious not to be left behind on the Atlantic, placed orders for ships for the Hamburg-Amerika line. From 1912 onwards the Kaiser began work in earnest on his new battle fleet, a move that caught the British

authorities off-guard. Russia, Italy, and Spain, all came into the market with demands for warships.

The commercial agreement with the German firm Borsig, aborted in February 1911, came to life again in the middle of 1912. This agreement covered both the German navy and mercantile work. In conjunction with the alliance forged with Krupp in May 1911, the Borsig work created an even closer commercial arrangement with the country that was to become a mortal enemy only two years later. The nature of these alliances from the 1870s onwards is given fuller treatment in chapter eight. In 1911 C E Lloyd became the de facto Managing Director of the enterprise. While taking care not to infringe on the preserves of G F Simms and C E Howell, who ran the anchor and ironmaking facilities, Lloyd involved himself in all aspects of the business. He took on the responsibility for all the overseas interests that had previously been shared between Sir George and H M Hingley. He became responsible for BMMC, HPAC, and for Sir George's personal problems at the Harts Hill Ironworks. Acting in support of Sir George, he took part in the resolution of the long drawn out dispute with B K Morton over the agency in Australia. He also, in 1913 and on his own initiative, began a marketing drive that was to continue right through the first year of the war. This drive was aimed at achieving a much wider agency representation. Whereas the Hingley brothers had always made their appointments on the basis of a personal knowledge of the agent, Lloyd's emphasis was on the use of any professionally competent person or firm. It was at this time he joined the newly formed British Engineers' Association, a body with eyes on the markets in the new Republic of China. He began a campaign to re-shape the firm's agencies in Liverpool and in London. He coupled this with new ideas for Japan and Italy. Purely by chance, and as a result of seeking assistance over the acquisition of a small holding of shares in HPAC by an American, Lloyd made the acquaintance of W Carlile Wallace.

Wallace was to become a serious operator for Hingleys after 1914 when the war opened up an American market that previously had been closed to outside competition by high tariffs.

In 1910 the bulk of Hingleys' overseas market share came from the German alliances that had been fostered by H M Hingley and from the Italian connection that had been carefully nurtured by 'Ben' Hingley. By 1911, however, work for the Italian government became the cause of much concern, a concern based on the chronic non-payment of bills that haunted 'Ben' Hingley for the rest of his life. In 1912 the Kingdom of Italy fought a short war against the Ottoman Empire, acquiring the North African territories of Cyrenaica and Tripolitania. Acquisition of colonial power status strained Italian finances while accentuating the need for a modern fleet. Italy therefore embarked on a cynical policy of buying but not paying. Hingleys was badly caught out by this policy, with which the Italian navy department persisted right through to the later years of the Great War. Sir George was adversely affected on two fronts: first, his commercial judgement was put in doubt; second, he had to face down his co-directors who eventually accused him of favouring the non-paying Italian government at the expense of good payers at the British Admiralty.

In the early months of 1914 Hingleys parted company with John Rogerson of Wolsingham, Durham, who for many years had been a major supplier of anchor head castings for the Hall's anchor. Rogerson's contract was assigned to Krupp, thus cementing Hingleys' ever closer relationships with German enterprise in shipbuilding. The outbreak of war in August of that year brought a sudden end to a whole range of German commercial collaborations that dated back to the time of Noah Hingley himself. It also ended the often clandestine arrangements that H M Hingley had negotiated for the firm with great success from 1897 onwards.

The era of big ships and of warships

The particular revival of business activity that commenced early in 1910 with the index moving from 94.7 in 1909 to 108.5 by 1913 was dramatic for the sheer volume of work that it created for Hingleys. In short order the outfits for White Star's S S Olympic and the S S Titanic were obtained. It was of interest to note that the principal references in the files to these major contracts lie in the correspondence with W Janke, the agent in Hamburg.[47] After a false start in 1910 and early 1911, the new commercial alliance with the German firm Borsig came into being in mid 1912 and this led to a period of mutually advantageous cooperation. The market in Germany divided into two distinct parts of particular interest to Hingleys. The first was the drive by the Hamburg Amerika line to put on vessels to challenge the British ships on the lucrative North Atlantic run. This especially so as total British hegemony on this run was now in prospect with the Cunard's S S Aquitania coming into service to join the White Star vessels. Hingleys' growing contacts with Borsig in Berlin led to additional work emerging through their agents Schulz & Borchers for the Vulcan shipbuilding company in Hamburg.[48] The big prize, however, was German navy work where Borsig was particularly strong. By 1912, therefore, Hingleys had a very useful spread of work: the highly prestigious grand liners for Britain; and the well paid German mercantile and Imperial navy work.

In 1910 Sir George's interest in the battleship business in Italy had been re-awakened, and early in 1911 he advised his agent Pietro Micheli that he would extend a holiday in the south of France to take in Genoa in pursuit of more navy work at Spezia.[49] This was rather a fateful

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47 WHC : Sec. 8 ; GBHPLB, 3 : 5 January 1910, 409.

48 WHC : Sec. 8 ; DLB, 5 : 20 September 1911, 78.

49 WHC : Sec. 8 ; GBHPLB, 3 : 16 January 1911, 828.

visit for Sir George and was extended to encompass Rome that was now the seat of decision taking for navy work. Unfortunately, Sir George found himself in the last days of the Pietro Micheli agency with its headquarters in Genoa. Admiral Micheli, the son of Pietro Micheli, wanted to move the agency to Rome from where all government contracts were placed. On the other hand the Genoa based office objected to this. In the event Sir George opted for Micheli in Rome as he advised Rocca in July.[50] This resulted in much first class naval work being obtained. To round out the abundance of work for Hingleys, J E Crookston, the representative in Odessa, was successful in early 1912 in procuring the outfits for four ships for the Russian Steam Navigation Company.[51] The interest of Sir George and C E Lloyd in Odessa was further stimulated by Vicker's highly imaginative joint venture in 1913 with certain Russian banks not only to build three new battleships for the Black Sea fleet, but also to lay out new yards and ordnance works.[52] Unfortunately, the outbreak of war in 1914 frustrated this and all Hingleys' endeavours in Russia.

Industrial strife in 1910 - 1914, as it affected Hingleys in particular

Contemporary industrial history shows that wage freezes and reductions in times of depression always bring a bitter retribution when times improve. The wage reductions of 1908 and 1909 resulted in massive discontent once the effects of the upturn in industrial activity, that came in 1910, began to work through.

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50 Ibid., 7 July 1911, 930.

51 WHC : Sec. 8 ; DLB, 5 : 23 May 1912, 405.

52 Scott, Vickers, 85.

By the end of 1911, the mood prevailing in the Midlands among employers was caught by Sir George in a letter to J E Darbyshire the engineer involved with the test houses and with the Hall's patent anchor work. Sir George was widely acknowledged in the Black Country as a benevolent paternalist. As with most paternalists, he had a hard edge as he demonstrated when describing to Darbyshire the outcome of a trade meeting held on 15 November 1911 to discuss the costs of iron, chains, and anchors. In reporting the feeling of the meeting he stated:

> 'There is a feeling in the district we may be face to face with labour troubles all round... far better to have them out and done with it. Everyone is saying "let us put our house in order and fight it out" and do not let the railway companies or anyone else give way now, because the time had gone by for conciliation, and the younger generation want a lesson'[53]

If Sir George's sentiments were in any way reflective or representative of the mood of the employers at large, it was little wonder that 1912 saw 50 000 troops on the streets at times to maintain law and order. Hingleys, with its own coal mines and heavy dependence on the railways for moving its iron goods, was at times quite badly affected. The introduction of a minimum wage for miners and the relaxation of the statutory limitation on rail freight costs that had been referred to earlier, did bring industrial peace of a kind. However, having felt the bit between its teeth instead of between its cheeks, labour was well poised for the unexpected opportunities to unionise that proliferated both then and following the outbreak of the Great War in 1914.

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[53] WHC : Sec. 8 ; GBHPLB, 4 : 14 November 1911, 67.

Judith Vichniac, in her study of the iron and steel trades, comments on the sheer multiplicity of unions that had emerged by the 1910s. In addition to the elite unions such as The British Steel Smelters' Union of 1886 and The National Association of Blastfurnacemen of 1889, there were The Associated Iron & Steelworkers of Great Britain, The Amalgamated Society of Steel and Iron Workers, The Tin and Sheet Millmen's Association, The National Steelworkers' Associated Engineering and Labour League, plus the tinplate and galvanising sections of The Dockers' Union.[54]

As to the consequences for Hingleys of the great unrest, in the early months of 1912 C E Lloyd remained remarkably relaxed. In March, in correspondence with an Edward Tailby, of Birmingham, he merely commented that a railway strike had stopped movements of the firms' goods.[55] In April, however, he was not quite so relaxed when discussing the problem with George Harradon of the Sefton Iron Works, in Liverpool. Hingleys had been fortunate in being able to keep the chainmakers in work despite the month-long rail strike.[56] However, by October a very much gloomier picture was painted by Sir George when endeavouring to salvage something from the disruption. Hingleys was badly affected by the industrial tumult and iron output for the year was down by 5 000 tons, or five months of normal production. At the end of 1912, C E Lloyd when attempting to excuse the late deliveries of iron to Harrison & Dixon Ltd, of London, cited the continuing difficulties stemming from the strike, especially the general congestion. The London North West Railway (LNWR) and the London Midland Scottish Railway (LMS) had a

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54 Judith Eisenberg Vichniac, The Management of Labour : The British and French Iron & Steel Trade Industries. 1860-1918 (Greenwich, Conn. : JAI Press Inc., 1990), 147.

55 WHC : Sec. 8 ; DLB, 5 : 12 March 1912, 346.

56 Ibid., 3 April 1912, 372.

working agreement that reduced competition, and The London North East Railway (LNER) was on strike.[57]

The S S Titanic

During this period one event took place that guaranteed Hingleys a permanent place in the economic and technological history of the Black Country. This was the manufacture in 1911 of the enormous 15½ ton anchor for the S S Titanic.

The manufacture of the famous anchor took place at a time of strained relations between Hingleys and HPAC and the event receives very little attention in the company's files. However, the day on which the anchor was transported from the Netherton works to the railway station at Dudley Port is writ large in the folklore of the Black Country. The anchor was drawn through the streets of Netherton on an enormous dray pulled by 20 shire horses. The town of Dudley turned out 'en fete' and the hauliers W A Roe, put on a spectacle, bringing in the press to cover what was undoubtedly a quite remarkable event. The White Star shipping line, owners of the S S Titanic and its anchor, was astonished and annoyed by the press treatment received. Hingleys' records include very few incoming letters, but uniquely there is one from W A Roe regretting the annoyance caused to White Star by the widespread press coverage given to the triumphant procession of the anchor from works to railway.[58] C E Lloyd when attempting to mollify his customer, Harland & Wolff, expressed his regret that the press did not identify the 151/2 ton anchor as being destined for the S S Titanic or mentioning the White Star line, and stating that the carrier had accepted the blame for

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[57] WHC : Sec. 8 ; DLB, 6 : 27 December 1912, 113.

[58] WHC : Sec. 8 ; DLB, 4 : 17 June 1911, 468.

instigating the press coverage.[59] A photograph of the procession follows this page.

The last months of peace

The last months before the onset of the Great War were spent by Hingleys in getting on with the work in hand. C E Lloyd failed in his attempts to persuade Herren Rottman and Krause to make the long promised visit to England to discuss the continuation of the provisional agreement with Borsig. He did, however, continue with his plans to plant agents anywhere and everywhere where wrought iron, cables, and anchors, could be sold. He was probably as unprepared as anyone else for the scale of the conflict that was to come.

Hingleys and the Great War

An overview

Sir George was stunned by the outbreak of war with Germany, but C E Lloyd was galvanised into action. By the end of its first week he had withdrawn all quotations and repeat orders thus protecting the firm's financial position. His steadiness was a great source of support to Sir George Hingley. Lloyd went on to direct the firm throughout the war of 1914 to 1918, the twenty years of peace, and during the Second World War of 1939 to 1945.

Sir George Hingley, by contrast, was totally unprepared for the advent of war in August 1914: he was sixty four years of age and had already handed over day to day control of the business to his protege, Lloyd.

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[59] WHC : Sec. 8 ; DLB, 4 : 19 June 1911, 469.


NGLEY NETHERTON

However, during the four years of the conflict he was required, as chairman, to deal with the new phenomenon of ill-disciplined labour and to try keep his works from being run into the ground by excessive production demands not balanced by adequate expenditure on maintenance and the renewal of plant. In addition, he personally shouldered the burden of keeping the Lloyds British testing system in place, a burden that contributed to his death in August 1918.

By 1914 Sir George was indeed contemplating semi-retirement. He lived at a modest middle class level with his three sisters. He had status as a former Sheriff of Worcester and he was well regarded by his work force. Then, in the four years that followed the outbreak of the war in 1914, Sir George saw swept away the social order, the political order, the industrial order, and the general fabric of life as he had known it. Many of his prize commercial contracts were with Germany and all these were lost. Of more fundamental impact was the way that the Noah Hingley concept of benign paternalistic management came to an end.

Leaving aside Sir George's purely personal considerations, the most dramatic consequence for Hingleys as the result of the outbreak of war was the introduction of a form of government by decree in Britain, supported by the bureaucracy of the new command economy. This concept was foreign to anything ever experienced before by the Hingleys and the country at large. Dressed up as the patriotic Defence of the Realm Act, 1914, that was passed in one short session, this legislation gave the government of the day arbitrary powers never before experienced under the post-restoration parliamentary system. In short order, Hingleys as a firm was to all intents and purposes nationalised without compensation under this act and under the Munitions of War Act, of October 1915, under which the firm was declared a controlled establishment. After an uneasy first year during which Sir George and C E Lloyd endeavoured to

maintain business activities in Italy, in Japan, and in Australia, all production during the last three years of the war was governed by and subject to government dictate and decree. Hingleys' contracts were decided for them, any overseas work was subjected to severe regulation, and the workforce was no longer answerable solely to the management. Hingleys' industrial plant and equipment was subjected to excessive use and depreciation, without the compensation of the firm being able to carry out replacements and repairs. Historically, Hingleys had always renewed equipment out of revenue, but wartime regulations involving an unsophisticated form of excess profits tax now worked against this. Then, and even more annoying, vital replacements of equipment out of capital were denied on the grounds that Hingleys was not a front line activity. The fact that Hingleys serviced half the British fleet as a sub-contractor was consistently ignored by Government. This was perhaps deliberate, or part of the strange vendetta to which the firm was subjected, possibly as a result of its former German associations or simply through a lack of awareness of its role and contribution. A major objective of this thesis is to give due recognition to the firm of Noah Hingley. King of sub-contractors it may well have been for a quarter of a century. Outside the trade it was hardly known as a name, it being one of many firms that contributed to the completion of a ship. However, Hingleys' claim for a place in history is enhanced by the fact that even the grandest liner or the biggest dreadnought was only as safe as the cables and anchors that secured it when at rest.

Mid-way through the war the new phenomenon of bureaucratic returns and reports came as an added burden, with the time required to fill in forms often threatening the maintenance of productive activity. That was until H J Peart was brought in in 1916 to handle this excessively demanding task. Despite all these lets and hindrances Hingleys never failed to meet the demands imposed upon the firm. Early in the war its

military reservists were encouraged to return to the colours without delay; it allowed its men to enlist if they felt the call to volunteer; it filled gaps in its workforce from among the Belgian refugees; it coped with the exodus of its men to the munition factories; it worked night shifts on non-traditional products; it paid in advance the workforce's contributions to National Savings; its support of the war effort was total.

In the final months of the war, both Sir George Hingley and William Blakey Rumford, his assistant and colleague for 34 years, worn out and exhausted, passed away. No member of the Hingley family was ever again to manage the company founded by Noah Hingley.

The War Years

The war was expected to be over by Christmas 1914. Instead, the four long years that followed placed demands for warlike 'materiel' that had never before been experienced by British industry. Trench warfare by its very nature used up enormous quantities of equipment and munitions of all kinds. Initially Sir George found it very difficult to come to terms with the new situations created by the war. As late as May 1914 he had chosen some 4" diameter cable under manufacture for German vessels as his set piece display when entertaining Captain Bartlett of the White Star line. The abrupt end of the German connection, drove him into a shell. He buried himself in domestic minutiae and the affairs of the Lloyds British Testing Company. By October 1915 the works, now a Controlled Establishment, was subject to a priority order in favour of Admiralty work and especially for anchors. After years of official boycott of his anchors this was a happy change for Sir George as he notified J B Richardson at the Pontypridd works.[60]

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[60] WHC : Sec. 8 ; GBHPLB, 4 : 14 October 1915, 868.

During the first year of the war a decision was taken by C E Lloyd that resulted in an extraordinary development some half century later. By 1914 the major supplier of anchor heads for HPAC was the German firm of Krupp. In order to secure a replacement source on the outbreak of war C E Lloyd obtained the services of F H Lloyd & Co Ltd., of nearby Wednesbury. After the Second World War the Hingley firm was acquired by F H Lloyd, who retained C E Lloyd as its honorary chairman. In 1914 C E Lloyd guaranteed the bank loan of £5 000 needed to adapt F H Lloyd's works for its new role.[61]

The first year of the war also saw the complete breakdown of the genial master and men relationship that had been enjoyed by three generations of Hingleys. By May of 1915 the directors found themselves treating with representatives from The Workers' Union or from The Midland Puddlers' Union. As reported to the Chief Industrial Commissioner, some men tried to choose when they would work and which of the Board of Trade's new arbitration procedures it would follow.[62] By June, Sir George declared the situation over labour as being hopeless. In a letter to his fellow director J S Trinham, who was recuperating in Buxton from an illness, he complained that there was a flood of money in the industry, extensive poaching of men was rife, and incentive bonuses were demanded whether or not full shifts had been worked.[63]

In parallel with all the other upheavals in the first year of the war, two subsidiary dramas took place off-stage. The first was the almost bizarre dealings with the naval authorities of neutral Italy. The

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61 WHC : Sec. 8 ; DLB, 7 : 21 October 1914, 217.

62 WHC : Sec. 8 ; GBHPLB, 4 : 6 May 1915, 812.

63 Ibid., 15 June 1915, 834.

second was the quite frenetic drive by C E Lloyd to extend the company's representation across the world.

The Italian drama had one main plot and two sub-plots. The main plot was an internal quarrel within the Micheli agency that could have wrecked Hingleys' representation in Italy. The sub-plots were the cavalier way in which the Italian naval authorities regarded their commercial debts; and the growing difficulty of continuing to service Italian requirements at all. The internal quarrel resulted in the Hingley board attempting to terminate the agency with Micheli. Sir George, however, over-ruled the board and insisted on the agency being continued on a day to day basis for the duration of the war.[64] The matter of the Italian government's commercial debts to Hingleys, that stood at £13 862 in April 1915, was the cause of real dissension between Sir George and his fellow directors as he complained to Micheli.[65] Shortly afterwards Sir George advised Micheli that the work force was proving very antagonistic towards working for a neutral country, as Italy was at that time.[66]

The second year of the war found Sir George in better spirits, but he was often unwell. C E Lloyd was in control of daily activities and Sir George devoted himself to the affairs of the LBTC and also to his new role of rallying the ironmasters to fight the new breed of bureaucrats created by wartime legislation. Fuller details of this work is given in chapter nine dealing with relations with governments. Likewise, C E Lloyd's efforts in developing new markets in Europe and in North America are dealt with in chapter seven, dealing with marketing. Meantime, coping with the demands of the various procurement departments remained a high priority.

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[64] WHC : Sec. 8 ; DLB, 8 : 13 July 1915, 170.

[65] Ibid., 15 April 1915, 22.

[66] Ibid., : 30 April 1915, 39.

The third and fourth years of the war found Hingleys battling on several fronts to meet the incessant demands of the Admiralty and the army procurement departments. Imposed production quotas had to be met notwithstanding the debilitating effects on morale of the food rationing resulting from the success of the German U Boat campaign, and of the dreadful losses suffered by men of the Midlands county regiments at the Dardanelles and on the Somme. Within the firm the directors reacted in very different ways. H J Peart got on with the job of coping with demands of the new bureaucracy. C E Lloyd concentrated on securing market positions in America and in Japan. Sir George on the other hand addressed his efforts to the problems of industrial anarchy, coupled with the very real prospect of a complete breakdown of the system of proper testing for cables, a discipline partly created by his illustrious grandfather Noah Hingley.

His first concern lay with the sheer volume of inferior material that was being dumped on the market. This placed intense moral pressure on the superintendents to pass urgently required war supplies. Not only was inferior material being submitted for testing but unfinished inferior material was also being dumped at the LBTC yards to secure irregular free storage. This problem had begun in the previous year as Sir George had notified Andrew Scott at the Lloyd's Register.[67] It was a problem that became more and more difficult to contain. Sir George's second concern lay with the supply of anchor heads. During the war the supply of anchor heads to the Hingley works depended on the efforts of F H Lloyd, on a reinstated J Rogerson, on E Jopling of Sunderland, and by August 1917 a new supplier R D Tennent of Coatbridge. Of the four, only Jopling met the targets for delivery demanded by the Admiralty.

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[67] WHC : Sec. 8 ; GBHPLB, 4 : 29 May 1916, 982.

The other three had woeful performance figures as Sir George advised John Rogers at the Directorate of War Materials.[68]

His third concern lay with the breakdown of discipline in the labour market. By October 1917, and as the cable and anchor department notified the Board in an urgent internal memo, such was the shortage of any kind of labour the government had abandoned the system of clearance certificates for anyone wishing to leave a controlled establishment.[69] As the firm complained to Col. Horne at the Ministry of Munitions, civil servants were taking it upon themselves to grant wage increases without reference to the employers.[70] In the same month The Chain Makers' and Strikers' Association filed a wage demand for an increase of 20 per cent.[71] In November Sir George capitulated to the men's demands in order to prevent a mass exodus from his works, as he stated in his petition for retrospective approval for his action from the Ministry of Munitions.[72]

The firm of N Hingley & Sons Limited traded out the last year of the war and the last months of Sir George's life as an exercise in balancing the demands of the military and the navy with the demands of the workforce. He now saw the future of LBTC, the result of pioneer work in the field of testing by Noah Hingley himself and his son Benjamin, as part of the apparatus of state and he endeavoured to effect its sale to the Lloyds Register. The mood of desperate determination over the course of the

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68 WHC : Sec. 8 ; GBHPLB, 5 : 21 August 1917, 139.

69 WHC : Sec. 8 ; DLB, 11 : 18 October 1917, 45.

70 Ibid., 18 October 1917, 41.

71 Ibid., 16 October 1917, 44.

72 Ibid., : 2 November 1917, 63.

war was well summed up in his new year message to Admiral Michieli when he said : 'We shall fight the war to the bitter end'.[73]

After the losses at Passchendaele in the summer of 1917, and in the Kaiser's Battle of March 1918, Noah Hingleys' firm played a full part in supplying material for the counter offensive that ended the war in November 1918. In late 1917 the firm acquired the business of John Bagnall & Sons of Wednesbury solely in order to create a new forge capability.[74] The continuing desperate shortage of labour was coped with despite further calls from the army for the final offensive. Wage demands in February 1918 for increases of 12.5 per cent were probably the last negotiations handled by Sir George.

Sir George finally gave up active work in June 1918 and he died early in August. His faithful aide, W B Rumford, died in December. C E Lloyd took over as Chairman and served in that capacity until 1966 when the firm was merged with that of F H Lloyd & Co Limited. C E Lloyd's most significant act in the last months of the war was to accept that wrought iron would have to give way to steel. He turned to his agent in America, W Carlile Wallace, to carry out a technical appraisal of cast steel as a reliable replacement for wrought iron.[75] He thus prepared the firm for the era of steel. Sir George Hingley had, however, fulfilled his prophetic words to B K Morton in 1901 that wrought iron would see out his working lifetime.[76]

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73 Ibid., : 16 January 1918, 197.

74 Ibid., : 5 January 1918, 190.

75 Ibid., : 8 August 1918, 479.

76 WHC : Sec. 8 ; DLB, 3 : 10 January 1901, 70.

A Summary

The principal feature of the period from 1890 to 1914 was the sheer volatility of business activity general and the shipyard construction programmes in particular. To the inherent problems brought about by the violent swings in demand for new ships, were added the enormous structural changes in the size of both freighters and passenger boats. On top of this the endless vacillations by the British government over its massive warship replacement programme led to increased frustrations and eventually the emergence of a triumvirate of military-industrial constructors. The mini-booms were as ferocious as the mini-slumps of the period and containment of both varieties of economic situation was effected by Hingleys' masterly use of trade combinations, especially in times of boom.

An even more significant factor was Hingleys' great good fortune in having the goodwill of the massive John Brown enterprise. This, in addition to similar good fortune stemming from associations with Vickers and Armstrong-Whitworth, ensured a significant niche for its products in naval work. The John Brown connection, however, provided the way in for the work on the leviathans of the seas for which the Hingley firm was justly renowned.

'Ben' Hingley's quarrel with the Admiralty in 1904 over the repair costs for three navy anchors was the major blight on an otherwise successful twenty four years spent in maximising the firm's market share in good times as well as in bad. During the whole of the twenty eight years under review 'Ben' Hingley was at the centre from which the various arms of the firm's endeavours radiated. However, over the years he changed from being an egotistical person dedicated to centralising all control

in himself, to being a chairman convinced of the virtues of broad professional management. By his introduction of management by men possessing skills other than iron founding, who could direct the affairs of the firm far better than one person on his own, he ensured the future of the enterprise for a further half century.

PART THREE : MANAGING THE FIRM

CHAPTER FIVE : OWNERSHIP, CONTROL, AND SENIOR MANAGEMENT

The rationale behind the incorporation of the family business in 1890

During the nineteenth century parliamentary legislation severed the link between ownership and control. The legislation of 1844 established an office for the registration of joint stock companies, those having twenty five or more members or with large numbers of transferable shares. The principle of general limited liability was established by the Limited Liability Act of 1855. This enabled individual investors to limit their commitment to a company to the nominal value of their shares, thus safeguarding their personal fortunes. The establishment of companies in the modern form was greatly extended by the Companies Act of 1862. The Act of 1890 was essentially a tidying-up measure, the broad principles covering the establishment and conduct of companies having been established in the measures of 1855 and 1862.[1] The aim of the legislation was to make it easier for funds to be raised publicly for undertakings, such as railways, that required very large capital sums, and to enable this to be done without eating into scarce parliamentary time.

However, and as P L Payne has demonstrated, as late as 1885 the majority of manufacturing firms continued to be run as family businesses without acquiring the apparent benefits stemming from incorporation. On the other hand, an unexpected result of the 1862 legislation had been a large number of private, closely held, companies taking the cloak of incorporation, even though the private company, as such, was not recognised in law until 1907. Payne is firmly of the view that the

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1 A H Manchester, Modern Legal History (London : Butterworths, 1980), 355-358.

underlying motive for the incorporation of private companies was to obtain limited liability while retaining the original management and privacy of the past. Thus, the legislation had been put in place to meet one perceived need, but had produced a vastly different result.[2]

Now this legislation of 1862 had preceded Noah Hingley's death in 1877 by 15 years and 1890 was 28 years after its enactment. Thus the firm had had ample time to incorporate had it so wished. The reason, therefore, for non-incorporation before 1890 would appear to lie elsewhere. In 1890, and of much greater significance for Hingleys was the passing of the Partnership Act of 1890. This Act has been described as the milestone Act in partnership law in that era.[3] The reasons for this will be given later. The key element was the confirmation of total joint and several personal liability of all partners for the activities of the partnership.

The Memorandum of Association in respect of the company incorporated as N Hingley & Sons Limited is included in this study as appendix one. Reference to clause 3(b) shows that, following the death of Noah Hingley, Benjamin Hingley had personally carried on the business and traded as N Hingley and Sons. However, in this enterprise he was assisted by his two nephews, George Benjamin Hingley and Henry Montagu Hingley.

When the shares were allotted in the new company in January 1891, the equitable interests of the two brothers were capitalised by the allotment of 1000 shares between them, while Benjamin Hingley's interest was capitalised by the allotment of 1300 shares. The inference has been drawn, therefore, that under the Noah Hingley Family Settlement referred

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2 Payne, The Emergence of the Large Scale Company, 520.

3 Conversations in January 1993 with Dr Harry Smith, sometime university lecturer in law.

to earlier, the bulk of the equity in the famous ironworks had been settled on his fourth and youngest son Benjamin and on the two sons of his second son, Hezekiah; and that N Hingley and Sons had been a de facto partnership, rather than a sole proprietorship, a form of trading that had become subject to stringent regulations under the Partnership Act of 1890.

The significance of these family settlements has been pointed up by Lloyd Bonfield. Under a settlement the operation of primogeniture could be circumvented and the settlor could determine for himself the priority of succession to the patrimony and the distribution of the wealth it produced.[4] Therefore, and referring to the family tree on page 1/12 it can be seen that Noah Hingley's eldest son, Joseph, was effectively excluded from a participation in the affairs of the ironworks. Noah's second son, Hezekiah had died in 1865. His third son, Samuel, was unsuited through marital tragedies and physical breakdowns for the arduous task of being an iron master of substance. Noah's mantle, therefore, fell on his fourth and youngest son Benjamin and on his grandsons George Benjamin and Henry Montagu.

The Partnership Act of 1890 aimed in part to eliminate the abuses that had arisen from partners, active or sleeping, endeavouring to distance themselves from the consequences of the acts of their fellow partners. Section 9 of the Act enshrined the principle of joint responsibility among partners, and joint and several responsibility in Scotland, thus making trading as a partnership the most onerous way of conducting a business if there were no overriding reasons in favour of a partnership as against a company. The Act itself, in its fifty sections, codified the law in respect of this form of business association. A copy of the Arrangement of Sections of the Act is attached as appendix two.

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[4] Bonfield, 'Family Settlements', 341-354.

For Benjamin Hingley, now 60 years of age and active as a Member of Parliament, the partnership format must have been a less attractive way of conducting the business than of opting for incorporation. His nephews, George Benjamin and Henry Montagu were 40 and 35 respectively, and were gradually taking over the running of the business. They quite clearly had an equitable interest in the business virtually equal to his own, and there was little or no merit in assuming all the new responsibilities of partnership at an age when he could expect to be taking a less active role. He therefore opted to sell the family firm of N Hingley and Sons to the newly formed company of N Hingley & Sons Limited.

In doing so, he exempted himself and his nephews from the rigours of the new Partnership Act. At the same time he confirmed the provisions of the Noah Hingley Family Settlement.

The independent commercial valuation of N Hingley and Sons as at 30 June 1890

In preparation for the sale of the firm in 1890, the professional civil engineer Alexander Smith, M Inst. C E, of Colmore Chambers, 3 Newhall Street, Birmingham, carried out a detailed appraisal and calculation of the business.[5]

Smith found a business in an extremely sound condition as at 1890, the start of the period covered by this dissertation, and he valued the firm as a going concern worth £173 825.3.0. His full Inventory and Valuation is reproduced hereafter in the text.[6] Accompanying the Valuation there is a manuscript statement from Alfred Hilton Legge, the company accountant, confirming profits for the twenty years to 31 December 1889 as being £223 650.10.3. As a simple average this amounted to £11 182.10.3 per year, although in the final year they were actually £14 199.15.8.[7]

The Inventory and Valuation provided a complete insight into the nature and structure of the Hingley enterprise. Essentially the firm had three classes of production : the first was the manufacture of its own pig iron on which the quality of the firm's wrought iron depended; the second was the manufacture of wrought iron, from which chains and anchors were produced; and the third was the manufacture of chains and anchors on which its world wide fame in the thirty years under review was based. The firm's activities were balanced between these three classes of production, with each class able to contribute independently

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5 The address was of particular interest to the author as he began his own professional career in civil engineering in Colmore Chambers in 1949.

6 WHC : Sec. 3, Inventory & Valuation 1890.

7 Ibid.

to the sales activities of the firm. In addition the firm had its own collieries and support activities, making it largely self sufficient.

Of particular interest in the Valuation was the fact that the firm had 20 per cent of its equity in stocks and shares. Thus, the firm had its products spread across three lines of sales potential, it controlled its own support resources, and it had one fifth of its assets outside of the business. It was thus well placed to cope with the financial crises of the 1890s.

Inventory and Valuation of the Netherton Iron Works, and Chain & Anchor Works, The Old Hill Iron Works, & Blast Furnaces, The Old Hill Estate, & Collieries.

The Property of

Messrs N Hingley & Sons

30th June 1890

by

Alexander Smith, M Inst. C E

Colmore Chambers, 3 Newhall Street, Birmingham

Consulting Engineer & Valuer

Valued at £173 825.3.0

VALUATION SCHEDULE	FIXED PLANT AND MACHINERY	BUILDING AND LAND	LOOSE PLANT AND TOOLS	CONVERTIBLE STOCKS AND SHARES
Netherton Iron and Chain and Anchor Works	£ 29 102.17.0	£16 601.7.0	£4 822.18.9	£19 358.1.0
Old Hill Iron Works	£ 15 947.15.0	£ 7 129.0.0	£ 548.17.3	£ 5 659.2.0
Old Hill Furnaces	£ 12 114.2.6	£ 4 372.10.0	£ 443.6.0	£ 3 622.7.6
Collieries, House Property, Agricultural & Building Land, Farms & Stores	£ 2 147.4.0	£20 117.9.10	£5 117.4.6	£ 4 720.17.4
	£ 59 311.18.6	£48 220.9.10	£10 932.6.6	£33 360.8.2
Goodwill	£151 825.3.0 £ 22 000.0.0			
	£173 825.3.0			

'I am able to certify that:

The iron works are well arranged and substantially constructed; the Chain and Anchor Works are for the most part newly erected, and are I believe superior to any others in the Kingdom; the Blast Furnaces are of the most approved and modern construction, suited to the materials of the district; and the collieries producing about 100 000 tons per annum are a valuable adjunct to the works.

The whole of the departments are replete with every convenience, such as Railway and Canal accommodation, Fittings, Shops and Foundries, Stables and Loose stock and Tools, for carrying on the several important manufactures in which you are engaged. The fact of your raising your own mine, and producing a proportion of the pig iron is of considerable advantage, and renders the property very complete and of exceptional value.

I understand the Works have been mainly constructed out of Revenue, or the profits shown by the books would have been much larger, and my valuation does not represent the outlay, but is considerably below the cost.'

The structure of the company at its formation

The transition to company status was effected under an Agreement dated 8 September 1890 made between Benjamin Hingley on the one part and Alfred Hilton Legge, the company accountant, on the other part. Under the agreement the new company was to purchase as a going concern the business carried on by Benjamin Hingley under the style of N Hingley and Sons since the death of Noah Hingley in 1877.

As is usual, the Memorandum of Association was widely drawn and allowed the company to operate in any and all the areas covered by iron manufacturing and coal mining, as well as in non-ferrous metals, chemicals, etc. The authorised share capital was £250 000 in 5 000 shares of £50 each.

The composition of the original group of seven subscribers to the new company identified the members of the family with an interest, however small, in the family business. The allotment is shown in Table 5.1. Included in the scheme of allotment were: the three sons of Noah namely Joseph, Samuel, and Benjamin; Fanny Georgina, the widow of Noah's son Hezekiah; Leah, the daughter of Noah; and George Benjamin and Henry Montagu, the sons of Hezekiah and grandsons of Noah.[8]

[8] WHC : Sec. 2, Memorandum and Articles of Association 1890.

Table 5.1 : Shares on the Incorporation of N Hingley & Sons Limited

		Author's Annotation
Benjamin Hingley of Hatherton Lodge, Cradley, Worcestershire, Iron & Coal Master	10 Shares	Son of Noah Hingley
George Benjamin Hingley of Haywood, Halesowen in the County of Worcester, Iron & Coal Master	10 Shares	Grandson of Noah Hingley. Son of Hezekiah Hingley
Henry Montagu Hingley of Haywood, Halesowen, in the County of Worcester, Iron and Coal Master	10 Shares	Grandson of Noah Hingley. Son of Hezekiah Hingley
Joseph Hingley of Linton House, Cradley, Worcestershire, Gentleman	10 Shares	Son of Noah Hingley
Samuel Hingley of Fair View, Cradley, Worcestershire, Ironmaster	10 Shares	Son of Noah Hingley
Leah Hingley of Hatherton Lodge, Cradley, Worcestershire, Spinster	10 Shares	Daughter of Noah Hingley
Fanny Georgina Hingley of Haywood, Halesowen, Worcestershire, Widow	10 Shares	Widow of Hezekiah Hingley

A more significant allotment of shares took place on the 7 January 1891 and firmly put the subsequent ownership of the new company (and thus the family business) in the hands of Benjamin Hingley with 1300 shares, his nephew George Benjamin Hingley with 600 shares, and his other nephew Henry Montagu Hingley with 400 shares.[9] The full extent of the allotments is shown in Table 5.2.

Table 5.2 : Overall allotment of shares following incorporation

16 September 1890	George Benjamin Hingley Henry Montagu Hingley Joseph Hingley Samuel Hingley Leah Hingley Fanny Georgina Hingley	1-10 11-20 21-30 31-40 41-50 51-60	10 10 10 10 10 10
18 December 1890	Benjamin Hingley	61-70	10
7 January 1891	Benjamin Hingley George Benjamin Hingley Henry Montagu Hingley Benjamin Hingley	71-1270 1271-1870 1871-2270 2271-2370	1200 600 400 100

[9] WHC : Sec. 2, Allotment Book 1890-1920.

None of these shares was allotted for cash and they are thus seen as representing the agreed equitable interest that each of the seven individuals had in the firm of N Hingley & Sons as taken over by the new company in 1890.

The consolidation of family holdings following the death of Sir Benjamin Hingley in 1905

Although Benjamin Hingley remained an active Chairman until his death in 1905, the operating of the business devolved more and more on his two nephews with George Benjamin Hingley assuming the leading role. This troika of uncle and nephews controlled and managed the business until 1905. On the death of Sir Benjamin Hingley, both ownership and management narrowed still further into the hands of the two nephews.[10] After his death, Sir Benjamin Hingley's shares, were re-allocated within the family with the principal recipients being his nephews, George Benjamin Hingley and Henry Montagu Hingley. Minor recipients were the three daughters of his brother Hezekiah : Alice Linton Hingley, Lucy Miller Hingley, and Emily Georgina Hingley. After the death of Sir George Benjamin Hingley in 1918, these three spinsters became the principal shareholders of the company, dying in 1924, 1942, and 1948 respectively.

On 1 August 1906 the first allotment of shares since 1891 took place, bringing the total number of shares issued up to 4 000, out of the authorised number of 5 000.[11] This allotment is shown in Table 5.3.

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[10] Ibid.

[11] Ibid.

Table 5.3 : Allotment of shares on 1 August 1906

Sir George Benjamin Hingley, Bt	2371-3257	887
Henry Montagu Hingley	3258-4000	743

Then on 3 December 1906 a Special Resolution, under the Companies Acts 1862 to 1900, was passed requiring any sale of shares to be in the first instance in equal shares to George Benjamin Hingley and to Henry Montagu Hingley, or the survivor. Also, if either of these two wished to sell, they had first to offer the shares to the other. By the end of 1907, Joseph Hingley, Samuel Hingley, Leah Hingley, and Fanny Georgina Hingley, had disappeared from the List of Shareholders; the first three by death, and Fanny Georgina by a disposition within the family. Following the recognition of private limited liability companies in 1907, Hingleys' first official return of 20 November 1907 showed the shareholders as given in Table 5.4.[12]

Table 5.4 : Shareholders at 20 November 1907

	Shares	Value	Author's Annotation
Sir George Benjamin Hingley, Bt.	1974	£98 750	Son of Hezekiah Hingley
Henry Montagu Hingley	1650	£82 500	Son of Hezekiah Hingley
Harry Bertram Hingley	15	£ 750	Son of Samuel Hingley
Alice Linton Hingley	120	£ 6 000	Daughter of Hezekiah Hingley
Emily Georgina Hingley	120	£ 6 000	Daughter of Hezekiah Hingley
Lucy Miller Hingley	120	£ 6 000	Daughter of Hezekiah Hingley
William Shakespeare	1	£ 50	Solicitor
	4 000		

12 WHC : Sec. 2, Transfer Deeds 1905-1948.

Thus in 1907, almost exactly seventeen years after the formation of the Company, the two sons and three daughters of Hezekiah Hingley (the Liverpool connection) were effectively the owners of the enterprise. Additionally, the two brothers at the ages of 57 years and 52 years respectively were essentially the sole operators of the business assisted only by the aged Alfred Hilton Legge and George Blakey Rumford. This was an extremely dangerous position in which to be, especially as Henry Montagu Hingley was in indifferent health and was to die in 1910.

The first loosening of total family ownership

At the end of 1907, George Frederick Simms was brought into the business. As a shareholder, and as a director, he was to take an increasing role in the management of the enterprise. In the first significant allotment of shares outside of the family, G F Simms received 400 shares on 31 December 1907.[13]

G F Simms was a fellow chainmaker owning the neighbouring firm of George Hartshorne & Co, Netherton. By merging his firm with Hingleys he consolidated a long association that developed still further, especially in the practical side of the foundry activities and in the making of anchors. The bringing in of G F Simms as a shareholder and director was followed on 30 January 1908 by that of Cyril Edward Lloyd as a shareholder and director by the sale of 100 shares.[14] These two appointments had particular significance as they complemented the skills and areas of influence of the two brothers. The directors' letter books show quite clearly that George Benjamin Hingley was the principal salesman in the firm, while his brother Henry Montagu Hingley was the technical expert. By 1908 Henry Montagu Hingley was in indifferent

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[13] WHC : Sec. 2, Allotment Book 1890-1920.

[14] WHC : Sec. 2, Transfer Deeds 1905-1948, transfers 34-37.

health and George Frederick Simms came in as a very skilled ironfounder. Cyril Edward Lloyd , initially a civil engineer by training, came in to assist the younger brother in Europe, in the general sales activities of the business, and very soon he became the overall general manager.

At this same time, Sir George rewarded the faithful old retainer Alfred Hilton Legge with 5 shares at a nominal price of 10/- each.[15] He also sold 60 shares to Edward Henry Smith, one of his senior managers who was to become a director in 1911.[16]

The shareholdings following the death of Henry Montagu Hingley in 1910

H M Hingley died at the relatively early age of 55 years. Sir George Hingley, at 60 years of age, then became the owner of 2498 out of the 4400 shares issued and was virtually the sole proprietor. He did, however, make three modest dispositions of shares on 29 September 1911, followed by a further three on 2 October 1911. He transferred twenty shares to George Cyril Edwards on his appointment as company secretary.[17] Five were transferred to Washington Van Wart Kell on his appointment as Sir George's executor.[18] Forty to A F Moore, a fellow ironmaker.[19] And two hundred to Colonel James Samuel Trinham.[20] Trinham was a fellow ironmaster, who became a director with particular responsibilities for personnel and administration. He was still alive as a director during the Second World War and with Edwards he was in the

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15 Ibid : transfer 31.

16 Ibid : transfers 32-33.

17 Ibid : transfer 54.

18 Ibid : transfer 55.

19 Ibid : transfer 56.

20 Ibid : transfer 50.

first echelon of outside management expertise to be brought into the firm. Sir George also transferred a further forty shares to C E Lloyd.[21] Twenty were transferred to E H Smith.[22] And sixty to Charles Edward Howell.[23] Like E H Smith, Howell was a senior manager in the ironworks.

The pattern of shareholdings between 1908 and 1920

The Companies (Consolidation) Act of 1908 called for a full list of all shareholders and their holdings, together with a full listing of all directors. Table 5.5 shows the ever increasing number of shareholders between 1908 and 1920, distinguished by the total dominance of Sir George with his 2267 shares in 1918. After his death and by 1919 minority holdings totalling 1797 shares constituted the significant feature of the overall shares pattern.[24]

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[21] Ibid : transfer 51.

[22] Ibid : transfer 52.

[23] Ibid : transfer 53.

[24] WHC : Sec. 2, Annual List of Shareholders.

Table 5.5 : Shareholders and holdings per Form E of the annual Company Returns

HOLDINGS

NAME	1908-9	1910	1911-14	1915	1916	1917	1918	1919	1920
Sir George Hingley	1859	2498	2052	2447	2427	2407	2267	-	-
Henry Montagu Hingley	1530	-	-	-	-	-	-	-	-
Alice Linton Hingley	120	417	417	417	417	417	397	397	846
Emily Georgina Hingley	120	417	417	417	417	417	397	397	846
Lucy Miller Hingley	120	417	417	417	417	417	397	397	864
Harry Bertram Hingley	20	20	20	131	131	131	131	200	200
George Frederick Simms	400	400	400	420	420	420	420	520	520
Cyril Edward Lloyd	100	100	240	240	240	240	240	720	720
James Samuel Trinham			200	200	200	200	200	200	200
Edward Henry Smith			80	80	80	100	100	-	-
Charles Edward Howell			80	80	80	80	80	-	-
Harry Johnson Peart					120	120	120	220	220
J C Forrest							60	160	160
E J Taylor								510	510
W F Taylor								295	295
G H Taylor								290	290
Richard Lowndes								30	30
Estate of Sir George								1347	-
Minorities	131	131	77	238	238	238	378	1797	1797
	4400	4400	4400	5087	5187	5187	5187	7480	7480

In addition to C F Lloyd, J S Trinham, and G C Edwards, Harry Johnson Peart was brought in during 1916 as a shareholder and director. As G C Edwards was away at the War, Peart's major role was that of coping with the mass of paperwork, reports, and returns, demanded by the Ministry of Munitions of War that controlled the Hingley firm in all its activities. After the death of Sir George in August 1918, his executors appointed JC Forrest, another well known Black Country industrialist and mining engineer, as their representative on the Board.

During 1915 the authorised share capital in the company was increased to £300 000 from its original 1890 figure of £250 000. The share capital was further increased to £500 000 in 1919. At the same time E J Taylor, W F Taylor, and G H Taylor, all with fellow iron manufacturers, E Baylie & Co. Ltd., and Jno. Bradley Ltd., were brought in.[25] The authorised share capital remained at £500 000 until 1955 when it was increased dramatically to £2 000 000.[26]

The changing pattern of directorships between 1907 and 1920

In 1907 the company had only two directors, Sir George Benjamin Hingley and his brother Henry Montagu Hingley. In 1908 George Frederick Simms became a director following the merger of George Hartshorne Ltd., with Hingleys. In the same year Cyril Edward Lloyd was appointed a director with the role of professional manager. In 1911 Edward Henry Smith and Charles Edward Howell, both senior works managers in the firm, were appointed as directors. In the same year Colonel James Samuel Trinham was appointed a director with responsibilities for personnel. Then, in 1916, Harry Johnson Peart was appointed a director with the remit of coping with the consequences of the new national bureaucracy created by the war. In 1918 Jno. Charles Forrest, a man of great local standing, was appointed a director to represent the executors of the late Sir George Hingley. The three Taylors were appointed directors in 1919 following the increase in the capitalisation of the company. They together with Forrest completed a slow process, that had begun in 1908 with G F Simms, of drawing on a range of talent outside of the firm to assist in its management. By common consent, Cyril Edward Lloyd was appointed Chairman of the company following Sir George's death.[27] He

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[25] Ibid.

[26] WHC : Sec. 2, Mem. & Arts. 1890, revised Mem. & Arts. 1955.

[27] WHC : Sec. 2, Annual Lists of Shareholders.

was to retain this position permanently, albeit in an honorary style towards the end of his life. To him fell the distinction of leading the company for longer than Sir Benjamin and Sir George combined. He did this with considerable distinction, helped in no small measure by the fact that Sir George's massive holdings of shares had been so widely distributed following his death, so that the next half century belonged to the professional managers. A list of the directors in this period is given in Table 5.6.[28]

Table 5.6 : Directors of the Company 1908 - 1918 per Form E of the annual Company Returns

1908-09	1910	1911-14	1915-17	1918
Sir George Hingley	Sir George Hingley	Sir George Hingley	Sir George Hingley	C E Lloyd
H M Hingley	G F Simms	G F Simms	G F Simms	J S Trinham
G F Simms	C E Lloyd	C E Lloyd	C E Lloyd	G F Simms
C E Lloyd				
		E H Smith	E H Smith	E H Smith
		C E Howell	C E Howell	H J Peart
		J S Trinham	J S Trinham	
			H J Peart	Harry Bertram Hingley
				J C Forrest

Note: Harry Bertram Hingley, the nominal manager of the Harts Hill Ironworks under Sir George and C E Lloyd, was presumably appointed to the Board as a gesture of family goodwill. J C Forrest was appointed by the executors of Sir George's estate, with the full approval of the Board.

Form E for 1919 is of added interest as it includes, under the new requirement, all the other directorships held by the members of the Board. Harry Bertram Hingley is shown as a director of The Harts Hill Iron Works, and of Cradley Heath Gas Co. C E Lloyd and G F Simms are shown as directors of Lloyds British Testing Company. J S Trinham is shown as a director of The Harts Hill Iron Works, and of British Iron

[28] Ibid.

Manufacturers. E H Smith is shown as a director of the Coombes Wood Colliery. H J Peart is shown as a director of Jno. Bagnall & Sons Ltd, a wholly owned subsidiary. J C Forrest is shown as a director of Jno. Bagnall & Sons Ltd, and also of the Coombes Wood Colliery. Richard Lowndes and Edward John Taylor are shown as directors of E Baylie & Co Ltd, and of Jno. Bradley Ltd.

As far as the family was concerned, Harry Benjamin Hingley had made his career with the Harts Iron Works and was well into middle age as were his cousins Alice Linton Hingley, Emily Georgina Hingley, and Lucy Miller Hingley. The new era, then, belonged to Cyril Edward Lloyd who became Chairman of the Company and who became a well known public figure serving as Member of Parliament for the area for many years.

The other, non-trading, Hingley company

On 21 October 1901 The Netherton Iron, Chain, Cable, and Anchor Company was incorporated with an authorised share capital of £10 000 in 1000 shares of £10 each. At incorporation there were seven shareholders : Sir Benjamin Hingley, Bt.; George Benjamin Hingley; Henry Montagu Hingley; Harry Bertram Hingley; Alice Linton Hingley; Lucy Miller Hingley; and Emily Georgina Hingley. All are described as living at High Park, Droitwich, and each was allotted one share.[29] The Company never traded, being formed solely to protect certain trade marks. Alexander Smith in his valuation of 1890 refers to the Netherton Iron Works,... as being the property of Messrs N Hingley & Sons. Netherton Iron was a trade description fiercely defended by Hingleys, as will be shown in later parts of the study. Unfortunately, Netherton was a name that had achieved the same currency that Vaseline and Hoover have

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[29] WHC : Sec. 2, Mem. & Arts 1890, Mem. & Arts 1901 for NICCA filed here.

achieved in recent years, and many firms tried to pass off similar wrought iron as being Netherton.

The management style of the Hingleys, with its gradual evolution from autocracy to general management

The management style of N Hingley and Sons Limited at or about the time of incorporation followed the usual pattern of the time, the 'gaffer' and his close aides, his works managers, and his foremen. Benjamin Hingley, the 'gaffer' and first chairman of the incorporated company, had as his aides his nephews 'Ben' Hingley and H M Hingley. The day to day operations in the collieries, at the furnaces, and in the workshops was supervised by works managers and foremen. The Hingley firm had an additional key feature, the continued presence of A H Legge from 1862 to 1910, and of W B Rumford from 1884 to 1918.

Legge, whose office title was that of company secretary, was also the internal accountant and even more importantly he was the managing clerk. There was no facet or feature of the business with which he was not totally familiar. His key management tool was the weekly report of production from every colliery, every furnace, and every chain shop. Only fragments of his working papers survive, but these provide ample evidence of the firm control that he exercised over the working operation of the firm. This absence of business records has also been noted by Le-Guillou who was doubtful if anything more than rudimentary accounts existed in South Staffordshire before 1900. Often, account books were simply records of whatever nature the secretary thought worthwhile. Often the facts and figures were kept on any scraps of paper that were available.[30] When 'Ben' Hingley formally took over as managing director in 1895, following the serious illness of his uncle,

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[30] Le-Guillou, Competition, South Staffordshire Iron & Steel, 222.

he was able to depend on the excellence of Legge's production control and costings. In parallel with Legge, Rumford acted nominally as assistant company secretary, but it is evident from the letter books that he was in reality the personal clerk to 'Ben' Hingley. He shadowed Legge in his work and the two of them provided that vital ingredient often missing in the management of sizeable operations : a reliable knowledge of actual production achievements together with reliable costings.

In the 1900s, benefiting from the relative excellence of the education being received by the 'respectable' working classes, works managers emerged as members of the white collar stratum of management. It is possible that E H Smith and C E Howell both belonged to this stratum as they emerged from the works and went on to represent the firm on technical visits to Australia and to Canada. The conclusion that these two men, who became directors only in 1911 after many years in employment with the firm, came from the higher supervisory levels is drawn in part from the fact that they never wrote letters at director level. They did, however, perform the vital task of guaranteeing the production of iron. George Frederick Simms, the owner of George Hartshorne & Co, was an ironmaster in his own right. His firm was merged with Hingleys in 1907 so that he could bring his skills to support H M Hingley the production director who was in very indifferent health.

Hingleys' first move into professional management came in 1908 when Sir George Hingley appointed the 32 year old C E Lloyd as his personal shadow and assistant. After the death of H M Hingley in 1909 Lloyd soon emerged as the de facto general manager of the enterprise. As a civil engineer by training, he automatically drew on the technical iron making skills of Simms, Smith, and Howell, in the running of the business.

C E Lloyd had no background in trade. He was a member of the famous banking family. He had attended a public school but was always interested in being an industrialist. Indeed, after school he spent a short time in the highly skilled artisan craft of pattern making. Lloyd was joined by C E Edwards as company secretary in 1910 on the retirement of A H Legge. Thus the Black Country iron works found itself moving in the short space of three years from 1908 to 1911 to management by a troika of three middle class professionals. The third member of this middle class layer of professional management was James Samuel Trinham who was brought in as a shareholder director in 1911 with specific responsibilities for personnel and for interface with the new government agencies arising from the National Insurance Act and the like. Trinham was to work with Lloyd at the centre of the management team right up to middle of the Second World War. The professional middle class grip on the management of the firm was consolidated in 1916 by the appointment of Harry Johnson Peart. Peart covered for Edwards who was an officer away in the army for the whole of the war.

Some regretable consequences of autocratic management, 1895-1908

'Ben' Hingley was, if nothing else, a human being with a deep sense of responsibility for his widowed mother, his three spinster sisters, and his brother, all of whom looked to him for the provision of a home. In a working life of more than fifty years he scaled the heights as a Black Country ironmaster. However, the archives reveal three major commercial blunders during his period of stewardship that were to cause him long lasting concern. The first of these was his unwise personal involvement in the conduct of the firm's agency in Australia and New Zealand. The second was his quite unnecessary quarrel with the Admiralty in 1904 that resulted in the firm's anchors being blacklisted for ten years. The third was his attempt in 1908 to introduce the manufacture of machine-made cables without consultation with his workforce.

The business in Australia had been carefully nurtured by 'Ben' Hingley during his four visits to the colonies there before 1890. He had established a network of merchants in the principal towns. These merchants, either independently or through their head offices in London, were the means by which a major part of Hingleys' exports of iron were channelled. In or about 1893 the firm appointed a B K Morton, whose family was in the iron trade in Sheffield, as its agent in Melbourne. Morton's territory covered all the areas previously identified by 'Ben' Hingley namely Melbourne, Sydney, and Brisbane in Australia; Auckland, Wellington, Nelson, Christchurch, and Dunedin in New Zealand; India, Burma, the Malay States, China, and Japan. His duties were to supplement the activities of the firm's preferred merchants in these locations by identifying import opportunities and obtaining orders.

In the normal order of things the work of Morton could have been quite adequately supervised by A H Legge who was a master of the art of

progress chasing. However, because of his deep personal involvement in Australia, 'Ben' Hingley allowed Morton to achieve one of those classic servant master relationships where the servant dominated the master. Indeed, no other topic is recorded in more detail in the files than Morton's demands on Hingley. 'Ben' Hingley missed numerous opportunities to end the association with Morton even to the extent of tolerating frequent absences in Canada. The result was that Hingleys' affairs were often left in the hands of the office staff who did their best, but were unequal in the task of fighting-off competition from other British firms such as R Heath, Pearson & Knowles, and Shelton & Co., in a field where Hingleys had once held fifty per cent of the market share.

The commercial blunder made by 'Ben' Hingley was in failing to end the firm's association with Morton when he was contractually and ethically entitled to do so. The Australian economy was in recession after the financial crisis of 1893 and by 1900 Morton had his sights firmly set on Canada. By 1902 Morton advised Hingley of his wish to quit the Australian agency, but Hingley more or less compelled him to stay.[31] Then following an unauthorised absence of more than a year in 1902/3 in the Orient - an area now covered by A K Rhoden as a new agency - Hingley again exerted great moral pressure on Morton to return to Australia.[32] As a result of his seeming indispensibility Morton felt able to flout 'Ben' Hingley's wishes at every turn. He absented himself in Canada whenever he wished and he wrote a constant tirade of letters on any and every subject where his own finances were concerned for years to come. For 'Ben' Hingley this was a drain on his nervous energy at a time when he was running the enterprise with minimal help. Then, inexplicably, but no doubt under far more demanding pressures, the now Sir George

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[31] WHC : Sec. 8 ; GBHPLB, 1 : 4 September 1902, 1.

[32] Ibid., 16 April 1903, 226.

Hingley extended Morton's agency that had lapsed on 30 January 1908.[33] Eventually it fell to C E Lloyd in 1912 to bring Morton to order contractually and financially. In that year the Australian agency of B K Morton (Pty) Ltd., was formed on the basis of commercial realities and not on the interaction of individual persons living continents apart. Under a new local management the agency did extremely well. For Sir George it was the end of twelve years of constant aggravation from B K Morton.

The second commercial blunder was 'Ben' Hingley's quite unnecessary quarrel with the Admiralty in 1904. Hingley was in his early 50s, an age when men in business often assume a grandeur that can cloud judgement. Sir Benjamin Hingley, his mentor and friend, was in the last years of his life when 'Ben' Hingley reacted violently to the discovery that all the anchor head castings for current admiralty orders had been rejected as being probably unsound. For many years the manufacture and sale of the Hall's patent anchor had been a personal burden that 'Ben' Hingley found increasingly hard to bear. He was in an invidious position as he needed the basic excellence of the Hall's design to build a hegemonic position in the cable and anchor trade. As he advised George Hepburn, the chairman of Halls Patent Anchor Company, he had been placed in an intolerable position as a result of all current castings being under sanction and with the castings' sub-contractor, Charles Cammell of Sheffield, pressing for a complete re-appraisal of the design for the anchor head.[34]

By the middle of 1904 repair work had proved necessary on four warships that had been in service for some years, and extensive repair work was in prospect for a further two warships. In addition, and as Hingley

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[33] WHC : Sec. 8 ; GBHPLB, 2 : 27 July 1908, 961.

[34] WHC : Sec. 8 ; GBHPLB, 1 : 25 January 1904, 450.

advised Hepburn, the navy was contemplating dismantling and drop testing all its Hall's anchors.[35] At the same time Hepburn was chastised by Hingley who had discovered that both HPAC and Cammell had been aware of a partial hollowness in the anchor head castings for several years. Hingley was of the opinion that a crisis of confidence could ensue with foreign navies and shipping companies taking fright if the Admiralty excluded the Hall's anchors from its approved lists.[36]

As it happened, the Admiralty at this stage did not appear to have had punitive action in mind as far as the faulty anchors were concerned. Indeed a rare personal intervention by Sir Benjamin Hingley, in writing to the Director of Naval Contracts about the whole affair, undoubtedly had his desired effect.[37] The Director agreed to accept that hollow spots in some but not all castings could not be explained or avoided. He also suggested that Hingleys should meet the modest costs of £241.6.2 for the repair work so that the item could be eliminated from navy costs. Inexplicably, however, 'Ben' Hingley declined to accept this very modest charge and in a rather pompous letter to the Secretary of the Admiralty he stated that Hingleys could not be held responsible for defects in anchors that had given good service for many years.[38] Here 'Ben' Hingley had completely overplayed his hand and his firm was excluded from Admiralty anchor work until 1913 when the pressure of the re-armament programme compelled its inclusion.

Fortunately, the economic climate of 1905 to 1907 enabled 'Ben' Hingley to bounce back by re-designing the Hall's anchor in his own works in

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35 Ibid., : 15 June 1904, 599.

36 Ibid., : 18 June 1904, 611.

37 WHC : Sec. 8 ; DLB, 3 : 29 July 1904, 361.

38 Ibid., : 10 November 1904, 362.

time to dominate the market created by the new era of large ocean liners of 45 000 tons or more.

The third commercial blunder was Sir George Hingley's quite lamentable failure in the area of labour relations, where he appeared to ignore his workforce when setting-up the British Machine Made Cable Company in 1908. With nothing more than rumours to fuel his funk, Sir George embarked on a joint venture with John Brown & Co Ltd., of Sheffield to form BMMC as a means of maintaining his hegemonic position in the manufacture of ships' cables in the face of new technology. The extent of Sir George's concern is clearly illustrated in his letter to J B Richardson at the Brown Lenox works in Pontypridd in May 1905. In this letter he stated that the future looked bleak for all engaged in the manufacture of hand made cables ; that nothing could stop the onward progress of the machine made cable and that all the N Hingley plant would become scrap, especially now that machine made cables were passing the proving house tests without any problems.[39] A short time later Sir George complained to W H Ellis at John Brown that the latter's taking of orders for Brazilian warships, on the basis of supplying machine made cables, had destroyed Hingleys' personal connection of thirty years standing with that country.[40] In forming BMMC, however, he completely alienated a workforce that had been 'Hingleys' men through and through for more than seventy years. The company never did make a cable by machine in the period under review and Hingley never did regain the full trust of his men. Paradoxically, the orders for the cables for the SS Titanic were obtained through John Brown in 1910 and the specification was for machine made cables. In the event, Hingleys made them by hand as the machines were not technically capable of doing the work.

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[39] WHC : Sec. 8 ; GBHPLB, 2 : 30 May 1908, 934.

[40] Ibid., 4 June 1908, 937.

A summary

The transition from family firm to private limited liability company in 1890 was effected with no discernable dissent within the family. The centralisation of the share holdings into the hands of Benjamin Hingley, and his nephew George Benjamin Hingley and Henry Montagu Hingley, would seem therefore to have reflected the wishes of Noah Hingley under his family settlement.

The concentration of ownership and authority in three of the Hingleys continued until 1905. Thereafter, and following the death of Sir Benjamin Hingley in 1905 and that of H M Hingley in 1909, 'Ben' Hingley, while retaining the majority shareholding, relaxed his tight grip on the instruments of power. This began with the bringing in of George Hartshorne, a neighbour and competitor, as a shareholder director in 1908. It was followed by the recruitment of G C Edwards as a professional company secretary, then C E Lloyd as a professional manager, and finally J S Trinham as a professional personnel manager. Thus within three years the autocratic style of management was changed to one of collective management by a board of directors. The promotion of E H Smith and C E Howell, both being works managers, to the board of directors further strengthened its technical base. This sharing of responsibility ensured that no one man was put under the personal strains endured by 'Ben' Hingley or had the personal responsibility that allowed 'Ben' Hingley to err over for example, the B K Morton affair, the quarrel with the Admiralty, and the costly fiasco of the British Machine Made Cable Company.

PART THREE : MANAGING THE FIRM

CHAPTER SIX : WROUGHT IRON, CABLES, AND ANCHORS, AND TESTING

Generally

This chapter looks at the products on which Hingleys' fame and reputation rested. These were wrought iron of the best kind manufactured anywhere in the world; large diameter ships' cables, again of the most superior class; and ships' anchors manufactured to the design of the Halls Patent Anchor Company.

Noah Hingley and his fellow ironmakers had the great good fortune of literally sitting on the basic raw materials needed for the production of iron. Coal was readily available in the famous Ten Yard Seam or Thick Coal that covered the area. Ironstone lay under the coal seams, and limestone outcropped in the immediate vicinity.

Until the 1870s iron making was carried on without due regard to the market. The result was that at any one time only a proportion of all blast furnaces were actually working. In the Black Country, in 1840, there were some 135 blast furnaces out of which only 116 were working. In 1860 only 108 out of 181 furnaces were in blast. By 1879 only 44 out of 140 furnaces were working. A similar situation obtained with the puddling furnaces that produced wrought iron. In 1865 there were 2 702 puddling furnaces at work in the West Midlands. By 1913 this number had been reduced to 661. The time from 1877, when Benjamin Hingley took

over from his father, was the era of merchant furnace working with the iron being produced to order only.[1]

D B Evans has shown that by 1870 South Staffordshire and North Worcestershire had been outstripped in the production of pig iron by Scotland, South Wales, Lancashire, and the North East of England. The region remained, however, the biggest producer of bar and manufactured iron.[2] The emphasis placed by the Black Country manufacturers on bar and manufactured iron enabled them to maintain a dominant position in this section of the trade throughout the period under review. M Le-Guillou has highlighted the inroads made by the Belgians from the late 1880s and the Germans from 1895 onwards into the wrought iron markets traditionally supplied by the region.[3] He also cites the spirited stand made by five well known Black Country firms in manufacturing the finest quality of marked bar wrought iron that enabled them to dominate the market. These five firms are listed in Table 6.1[4].

Table 6.1 : Black Country marked bar houses circa 1900

NAME	BRAND
N Hingley, Netherton	Lion
Earl of Dudley's Round Oak Works	L Crown WRO
Bloomfield Ironworks, Tipton	Crown BBH
J B Bagnall, Wednesbury	Crown J B Bagnall
J Bradley, Stourbridge	Crown S C

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1 The Victoria History of the Counties of England : Staffordshire Volume, s.v. 'Iron & Steel'.

2 Evans, South Staffordshire Iron & Steel, 89.

3 Le-Gillou, Competition : South Staffordshire Iron & Steel, 248-257.

4 Ibid., 24.

The identification of Hingleys with the 'Lion' brand is interesting as the Hingley files clearly indicate that its preferred style for ships' cables was the 'Netherton Crown Special Best Best'. The 'Lion' brand was acquired following the acquisition in the 1890s of the bankrupt, and erstwhile famous New British Iron Company that dated back to 1833.[5] Hingleys found the 'Lion' brand particularly useful in its domestic marketing.

Iron versus steel

Iron in its various forms was the predominant ferrous metal until the 1880s. Then in 1886, world production of steel exceeded that of wrought iron for the first time. The drawing ahead of steel is shown in Table 6.2[6].

Table 6.2 Specimen Production totals for wrought iron and steel in the period 1885 to 1930

YEAR	Wrought Iron (000 tons)				Steel (000 tons)			
	Britain	US	Germany	World Total	Britain	US	Germany	World Total
1885	1910	1645	1420	7110	1890	1710	1200	6190
1890	1930	2590	1480	8560	3580	4280	2100	12280
1895	1150	2220	930	6480	3260	6110	3830	16650
1900	1160	2225	950	6760	4900	10190	6360	27830
1905	940	2095	830	5710	5810	20020	9510	44220
1910	1120	1780	350	4710	6370	26090	12890	59330
1913	1210	1720	210	4150	7660	31300	17320	75230
1920	590	1420	85	2310	9070	42130	8400	71120
1925	225	775	90	1210	7390	45390	12000	89080
1930	113	-	20	-	7330	40700	11360	93330

[5] Evans, South Staffordshire Iron & Steel, 85.

[6] Burnham & Hoskins, Iron & Steel in Britain, 1870-1930, 26-27.

The table shows the onward march of steel from 1870 to 1930, by which date wrought iron no longer ranked as a world metal. The inability of Britain to remain as a ranking producer of steel was matched however by its continued domination of the wrought iron industry, notwithstanding the international decline of that industry.

The year 1890 can be regarded as a watershed for steel in that the USA had now become the leading producer of steel with 34.9 per cent of the total world production. Britain on the other hand produced 29.2 per cent of total world production in 1890. Fast developing Germany produced 17.1 per cent of total world production in 1890.[7] Between 1903 and 1913 the world production of steel trebled from 27 830 000 tons to 75 230 000 tons. Of the 1913 tonnage the US share was 41.6 per cent, Germany's share was 23 per cent, while Britain's share was 10.2 per cent. In 1920 out the world production of steel of 71 120 000 tons the US produced 59.2 per cent, Germany produced 11.8 per cent having lost the Saar, while Britain's share was 12.75 per cent. After 1925 even France had outpaced Britain as a producer of steel and by 1930 out of a world production of 93 330 000 tons Britain's share was 7.9 per cent. Although Britain quite clearly lost out to the United States and Germany after 1895, the fact remains that Britain's production of steel remained remarkably consistent. This would seem to be in line with the sentiments expressed in chapter two that British industry consistently worked to the best level achievable.

Throughout the period under review Britain maintained its steady position within the declining wrought iron industry. In 1890, Britain produced 22.5 per cent of world production of wrought iron. In 1910

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[7] Ibid., 26-28.

Britain still produced 24 per cent, and in 1920 some 25.5 per cent of world production. Thus, during the whole period from 1880 to 1930 Britain steadfastly maintained a 20 to 25 per cent market share of all wrought iron produced. This market share remained remarkably stable bearing in mind the rise and fall of world production of wrought iron from 7 670 000 tons in 1880, to 8 560 000 tons in 1890, then down to 1 210 000 tons in 1925, and less than 500 000 tons by 1930. Hingleys, from its niche in the market for large diameter chains was producing 50 000 tons of wrought iron in 1910, a volume sufficient to maintain its commanding role in this field.

The dramatic rise of steel production rested on two major developments in the method of producing steel, one in Britain the other in the United States. In Britain the basic Bessemer process of 1856, as developed by the Thomas or Thomas-Gilchrist refinements of 1878, enabled phosphorous, and part of the sulphur, silicon, manganese, and carbon, to be removed. This was a great improvement on the original Bessemer process of 1856 that did not eliminate phosphorous, whereas the later process did. The essence of the Thomas-Gilchrist method was that air was blown through molten pig iron in a suitable vessel called the converter. The significance of this technological breakthrough rested on the fact that phosphoric ores were in greater supply world wide than non-phosphoric or pure ores.[8]

Over in America the manufacture of steel was still in its infancy in 1850 with an annual production of some 6 079 tons. Pittsburgh, with its vast resources of natural gas, was destined to become the major producer of steel in the USA. Dependent at first on Sheffield, both for steel

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[8] Ibid., 24-24.

imports and expertise in developing its oven industry, Pittsburgh rapidly became the centre of the crucible steel industry in the USA.[9] The actual breakthrough in America had been achieved through the Open Hearth Process of 1867 in which oxidation and the removal of impurities was achieved by heating with gas a bath of iron lying on the hearth of a regenerative furnace known as the Siemen's furnace.[10] Both these methods allowed the large scale production of high quality steel for the first time.

Fortunately for Hingleys, its major products depended on high grade wrought iron and not on steel. Throughout the nineteenth century and the early years of the twentieth century the quality of both iron and steel depended largely on the eyes, ears, and instincts of the men in the foundries. Eventually, and with the growth of steel technology in the twentieth century, the inherent tensile strength of wrought iron was matched by that of steel. In the period under review, however, top grade wrought iron was the only metal appropriate for large scale ships' cables and anchors.

The essential reasons why the Black Country opted for the continued production of wrought iron in preference to steel

The essential reasons were partly cultural and partly pragmatic. In the 1860s, when there were 2 702 puddling furnaces at work in the Black Country, the puddlers were the aristocrats of labour. The puddling process is described on page 6/15 and was a two hour cycle during which the titans of the labour force wielded their eight feet long paddles

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9 Tweedale, Sheffield Steel and America, 15.

10 Burnham & Hoskins, Iron & Steel in Britain 1870-1930, 24.

until that critical moment when the ore 'came to nature' and the balls weighing 1 cwt. were removed physically for the process of hammering. These men did not want to lose either their jobs or their positions of status. Their loyalties were to wrought iron, especially as there was little in the way of alternative employment. This opposition was maintained until the end of the century. Added to this was the influence of Joseph Hall, the head of Barrows & Hall of Tipton, an opinion former and leader. Before his death in 1862 he had hardened opinion against the steel making process developed by Bessemer at Woolwich in 1855.[11] As Le-Guillou has pointed out, only two significant enterprises were created in the last quarter of the 19th century for the manufacture of steel in the Black Country. The first was Alfred Hickman's Staffordshire Steel and Ingot Company formed in 1883 at the northern, Wolverhampton, end of the Black Country, which survived right through to nationalisation after the Second World War. This company used Bessemer converters of 5 tons capacity at its inception, and it introduced the open hearth steel process to the Black Country in 1887.[12] The second was the Earl of Dudley's Round Oak Steelworks Company Ltd., that was formed in 1892, failed in 1894, and was re-launched in 1897.[13] All the other some two dozen iron producers remained faithful to the product they knew best : the finest wrought iron on the market.

The pragmatic reason for the Black Country's preference for the manufacture of wrought iron instead of steel lay in the quality of ores readily available. The Bessemer and Siemens Martin processes for producing steel depended on an ore with a low phosphoric content. This

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11 Le-Guillou, Competition : South Staffordshire Iron & Steel, 28.

12 Ibid., 91-92.

13 Medley, The Geography of Decline, 268.

was not available locally. The issue of freight costs was also of enormous significance in the 1880s and, as Medley has pointed out, the Royal Commission on Depression in Trade and Industry highlighted the capricious, excessive, and preferential nature of railway freight rates at this time that mitigated against the importation from Spain to Sweden of ore suitable for steelmaking.[14] The nature of these have been identified by Le-Guillou as being 116 per cent higher for iron ore, 60 per cent higher for pig iron, 109 per cent higher for other iron, 98 per cent higher for steel rails, than the rates obtaining in 1881 in the United States or Germany.[15]

Thus, the Black Country stayed with wrought iron and the leading producers achieved a hegemonic position in that industry that survived into the 1920s.

The Black Country ironmaker in perspective

Le-Guillou has quoted P Temin's extremely accurate assessment of the region's ironmasters in the late 19th century and the early 20th century. Temin divided them into three categories, the first being the pre-classical one, comprising men of outstanding technical ability, but with limited organisational skills. This category included most of the Black Country ironmasters. The second category was the classical one comprising the capitalist entrepreneurs who combined technical ability (as against inventiveness) with organisational skills and an understanding of business. This was the category into which Hingleys

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[14] Medley, The Geography of Decline, 137, quoting from the First Report of the Royal Commission on Depression in Trade and Industry, 1886, 112.

[15] Le Guillou, Competition : South Staffordshire Iron & Steel, 155.

fitted. The third category was known as the Carnegie generation, being men who were captains of business rather than captains of industry. These men left the technical work to the hired technicians and concerned themselves with industrial rationalisation and improved transportation of the products[16]. C E Lloyd, on becoming Chairman of Hingleys in 1918, was very much in this mould.

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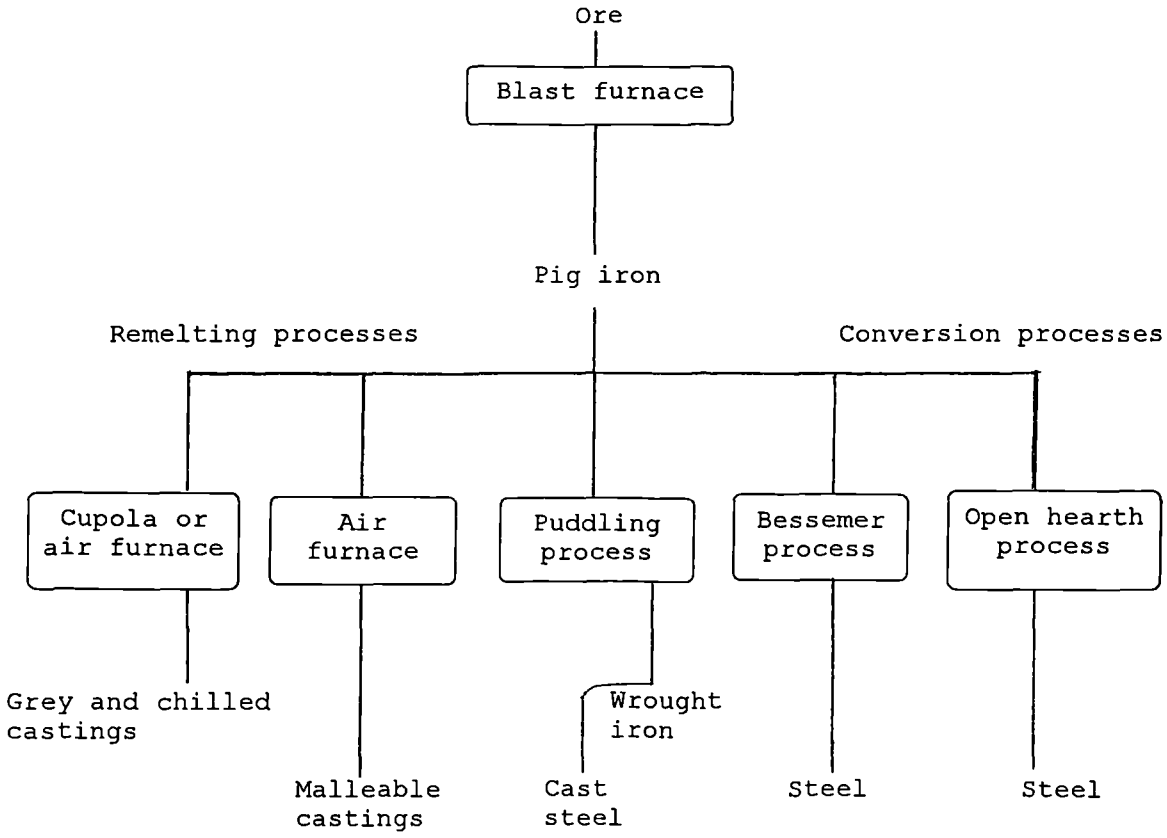
[16] Ibid., 37-38, quoting P Temin, The Relative Decline in the British Steel Industry 1880-1913, in Industry in Two Systems : Essays in honour of Alex Gerschenkron, H Rosovsky, ed., 1966.

The essential historical differences between pig iron, cast iron, wrought iron, and steel

The general scheme of iron and steel manufacture is shown in Figure 6.1. Hingleys was only concerned with the manufacture of wrought iron.

Figure 6.1 : Iron and steel manufacture



Pig iron was the basic iron produced by melting iron ore, limestone, and coke, in a furnace. Furnaces in Britain were blast furnaces and in very general terms a blast furnace had a shaft some 80 feet high and 20 feet wide at its base. The furnace was filled from top to bottom through a hopper with a continuous mix of the three basic constituents of ore,

limestone, and coke. The mechanics of the operation involved the introduction of very hot air (the blast) at the bottom of the shaft. This blast of hot air ignited the coke and the resulting heat oxidised the iron ore into pig iron. The limestone acted as a flux that combined with the other materials in the ore, and with the ash from the coke, to form slag. The whole process depended on the self generated heat that arose from the upwards rush of hot gas resulting from atmospheric nitrogen originating from the blast, coupled with carbonic oxide from the combustion of the coke.

It was a process that took up to fifteen hours and at the end there resulted a layer of molten iron in the hearth at the bottom of the shaft, with a completely separate layer (like water over oil) of slag overlaying the iron. The molten iron and the slag were drawn off through draw-off points in the collecting area. The iron so produced was saturated with carbon (up to four percent) from its contact with the coke, and was known as pig iron.

The pig iron was of little use in its raw state and further processing was required. In very general terms there were two options open to the ironmaker. The first was to produce cast iron by a remelting process. The second was to produce wrought iron, or steel, by a conversion process.

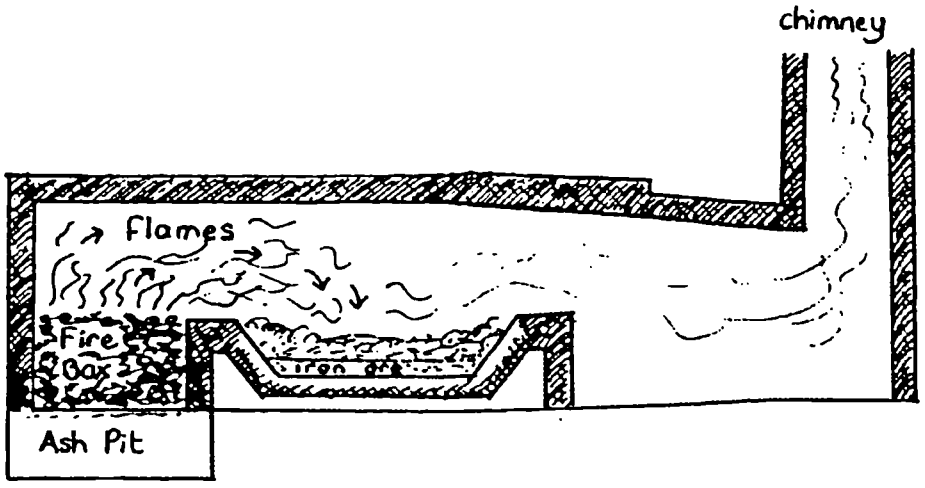
There were two main classes of cast iron : the first was grey or chilled cast iron; the second was malleable cast iron. Chilled cast iron was produced by remelting the pig iron and then hastening the cooling by pouring it into cold moulds. This produced a hard albeit brittle product. Malleable cast iron was produced by reheating the pig iron for about a week, maintaining the temperature for several days, and then

cooling gradually. This resulted in a more malleable iron because the resulting minuteness of its graphite particles did not break up the continuity of the mass as happened with chilled iron.

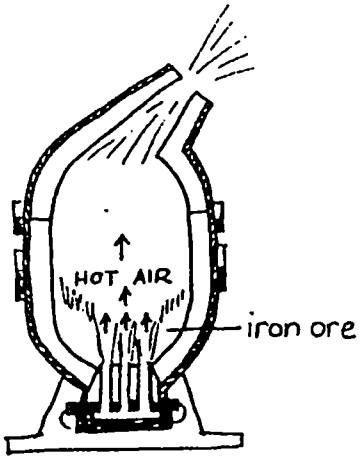
Wrought iron and ordinary steel were produced by a conversion process in which carbon, phosphorus, and other impurities were removed from the pig iron while it was in a remelted state. In Hingleys' day there were three methods of conversion in general use. First there was the oxidisation of iron ore as in the puddling, or wrought iron process. Second there was the oxidisation process effected by atmospheric air as in the Bessemer process. Third there was the open hearth method using a combination of heat and scrap steel. Reference to Figure 6.2 will show the essential features of the three systems.

Figure 6.2 : The Puddling, Bessemer, and Open Hearth systems

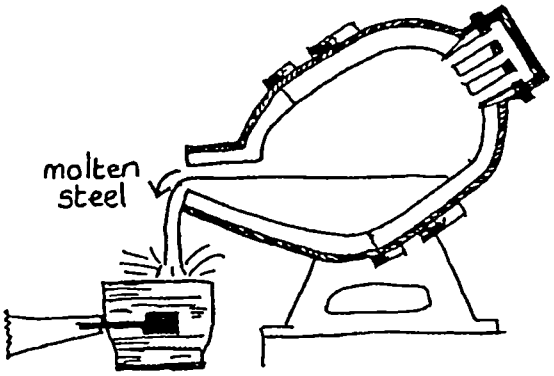
The Puddling Process



The Bessemer Process

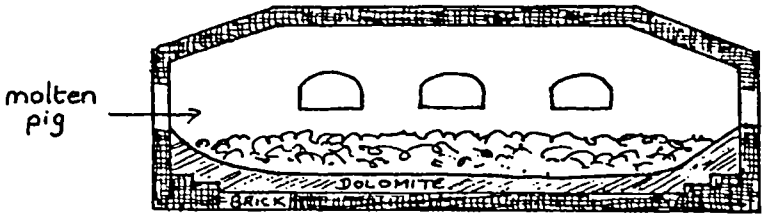


Blowing:
Converter in vertical position



Tapping:
Converter in horizontal position

The Open Hearth Process



In the puddling or wrought iron process molten pig iron was converted into wrought iron in the hearth or flat basin of a reverberatory furnace. The furnace was lined with iron ore and iron oxide was stirred into the molten mass by the puddlers, resulting in the oxidising out of the carbon, silicon, and phosphorous impurities. The process is further described a little later in the text.

In the Bessemer process molten pig iron was converted into steel by having its carbon, silicon, manganese, phosphorous, and sulphur removed by oxidisation. The process was carried out in a high retort capable of holding up to 20 tons of pig iron. It was effected by forcing hot air in very fine streams through the molten pig iron. The oxidisation of the impurities created the heat that drove the process. The steel was then poured off by tilting the retort that was mounted on trunnions. The distinctive feature of the Bessemer process was that it was effected by hot air alone.

In the open hearth method the pig iron was remelted in the hearth by flames from an adjacent reverbatory furnace so that no further carburation occurred. The oxidisation was effected by a combination of two techniques. In the first the flames oxidised the carbon, silicon, phosphorous, etc. In the second the introduction of scrap steel into the hearth had the effect of diluting these excess minerals.

We now come to wrought iron, the material on which Hingleys' international fame rested, under the appellation of Netherton Iron. As a firm Hingleys remained faithful to the Cort process, a method introduced by Henry Cort as early as 1784. The system was elegantly simple in that in reworking the pig iron it removed the iron from direct contact with the burning coal, thus eliminating recarburisation. The

method required a reverbatory puddling furnace that had a working chamber in which the pig iron was placed. Immediately adjacent was a fire box from which flames played through apertures onto the pig iron. While the mechanics of the exercise were simple, the actual puddling process called for a high degree of skill coupled with extreme physical attributes on the part of the workmen. Essentially, the molten pig iron was converted into low carbon bearing iron, or wrought iron, by oxidising out its carbon, silicon, phosphorous, and other impurities. This was achieved by stirring iron oxide into the molten mass of pig iron as it lay in a shallow layer in the hearth of the furnace. This extremely laborious process resulted in the removal of carbon as a gas, while the silicon and phosphorous became cinder or slag. The progressive decarburisation resulted in the molten metal solidifying in pasty grains through a process known in the trade as 'coming to nature'. The puddler then welded these grains together with his rabble hook into balls of about 80 pounds or more in weight. These iron balls were like sponges with the pores filled with molten cinder. This cinder was removed, first by hammering, then by rolling. The whole process was extremely arduous and only fit men up to the age of about 40 years were capable of coping with the physical demands of the job. The men involved were the elite of the foundry force.[17]

The process of rolling was the key to the final quality of the wrought iron. Hingleys reheated and re-rolled up to three times to produce its top quality Netherton Crown Special Best Best iron.

Cast steel was produced by a variation of the puddling process in which the reheated pig iron was treated in small crucibles in order to remove the cinder and slag.

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[17] Encyclopedia Britannica, 13th ed., s.v. 'Iron and Steel'.

The great merit of genuine wrought iron was its extreme durability and resistance to rust as compared with steel. In addition, its enormous tensile strength, stemming from the grain achieved in its manufacture, made it ideal for the size of ships' cables manufactured by Hingleys in a range from 2" to 6" in diameter.

Hingleys and its Netherton Iron

In a conscious policy decision 'Ben' Hingley continued the traditions established by his grandfather and uncle in deciding that the future of the firm lay in its adherence to wrought iron as its basic material. By the 1890s the wrought iron produced in Netherton by the firm of N Hingley & Sons Limited had become widely known, both at home and overseas. However, the name Netherton came to be used by merchants to describe any wrought iron that came from the Black Country and its environs. Indeed, the widespread misuse of a name that was covered by trademark registration caused quite serious problems for the Hingley firm. In South Africa there was a particular problem in the gold fields of the Witwatersrand over the sale of inferior unbranded iron as Netherton Crown. This caused Henry Montagu Hingley to write to H F E Pistorius of his Johannesburg merchants, E W Tarry & Co., supporting Tarry's proposed newspaper advertisement exposing the sham, and promising legal action.[18] This letter contains a short discourse by Hingley on the essential characteristics of wrought iron, emphasising by its exposure of the negative qualities of cheap iron the superior nature of the genuine Netherton article, and states: 'Cheaper iron works more easily than dearer, because the former is more porous and fuses due to the presence of cinder... Dearer iron requires and will stand a good

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[18] WHC : Sec, 8; DLB, 2 : 15 October 1897, 180.

heating and does not deteriorate in working. Cheap, hard iron loses its ductility. Netherton iron is not a difficult iron to work compared with most of its class. One of its main benefits is that the finished article is more reliable than those of cheaper iron. The purer the iron the more regular the quality - nowhere in the United Kingdom is greater attention paid to quality than at Hingleys'.

By the turn of the century, and under growing competition from the United States, H M Hingley had to defend the unique nature of Netherton wrought iron in a letter to Smellie & Co., one of his principal merchants in London.[19] This letter not only demonstrated Hingley's command of the subject, it also provided an insight into the working practices used in the Netherton works to produce its world famous product. The essential features cited were: 'English pig iron is defended against the US claims of superiority for its products... US pig iron is irregular and difficult to work... In the UK the pig iron is shingled or hammered to extract the dross, whereas in the US the balls from the puddling furnaces are passed through squeezers that carry forward a material that is porous and soft... Puddling produces what is known as grain, each grain being a small molecule covered by oxide of iron or cinder, and this is the flux that caused iron to weld... In the UK, works sorted scrap iron is used to create a bottom over the furnace plates. This produces clean iron and prevents adhesion to the furnace plates... US iron is really soft steel or ingot iron - borne out by difficulty of welding it... Steel making is a manipulation of cast material throughout and not a conversion of cast or pig iron to wrought iron and the creation of fibres... Iron resists corrosion longer than steel'

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[19] WHC : Sec, 8; DLB, 3 : 11 September 1900, 15.

The extent of Hingleys' use of wrought iron

In August 1914, C E Lloyd in a letter to Leo A Gadd of New Jersey, USA, and of Mexico City, provided the only definitive list in the files of the sheer scope of Hingleys' activities outside of cable making and anchor construction. In this letter Lloyd explained that Hingleys had two main products: chains, cables, and anchors; and bar iron. It was the bar iron trade that Lloyd was keen on extending to Mexico, as true wrought iron was not made in the USA, and he went to some lengths to extol the virtues of the British product. He stressed its superior suitability for welding and for all forms of repair and smithy work, the unique feature of wrought iron being its fibrous nature (whereas mild steel is crystalline) giving it greater resistance to shocks and less likely to snap. Further, wrought iron did not corrode as fast as steel and tended to last three times as long.

Lloyd explained to Gadd the uses to which wrought iron could be put. For railway work Hingleys supplied iron to the British companies GWR and LNWR; and overseas to the railways of India, South America, South Africa, and Australia. Ordinary quality iron was used for smithy work and for construction. The higher qualities were used for locomotives, couplings, drawbars, boiler stays, etc. The wrought iron underframes for wagons and coaches were more expensive but vastly more durable than steel. For mining work, Hingleys' wrought iron was used in well sinking equipment and for trams, tubs, cages, and the like, in collieries and mines in Britain, on the Rand in South Africa, in Mysore in India, and in Broken Hill, Australia. For agricultural machinery, wrought iron was the most used material in the world.[20]

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[20] WHC : Sec. 8 ; DLB, 7 : 8 December 1914, 302.

Lloyd went on to explain that Netherton Crown at £8.5.0 per ton free on board the ship was the standard wrought iron for wagon building, smithy work, and agricultural machinery. Netherton Crown Best at £9.5.0 per ton was usual for engineering and shoeing. Netherton Crown Best Best at £10.5.0 per ton was the best for heavy section requirements in railway work and engineering, while Netherton Crown Best Best Best at £11.5.0 per ton was the iron for draw gear, boiler stays, and higher class work.

Levels of production and production costs

When correcting the proof of his brother's obituary in 1909, Sir George made the observation that the works under H M Hingley was producing 1 000 tons of wrought iron per week.[21] After allowing for holidays and downtime this would seem to indicate general production levels well in excess of 45 000 tons per year. This figure is borne out by a note from H J Peart to R S Lowndes, of The South Staffordshire Ironmasters' Association in 1917, giving Hingleys' output of finished iron for the five years to 30 June 1914 as:[22]

30.6.10	:	41 384 tons
30.6.11	:	43 863 tons
30.6.12	:	44 031 tons
30.6.13	:	47 908 tons
30.6.14	:	43 352 tons

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21 WHC : Sec. 8 ; GBHPLB, 3 : 25 October 1909, 40.

22 WHC : Sec. 8 ; DLB, 11 : 19 November 1917, 95.

Tonnages of this nature, priced out at £10 per ton, would indicate an enterprise generating £440 000 per year from iron alone. Add to that the value of anchors and the sale of coal and pig iron and an undertaking turning over £600 000 per annum in the years immediately before the war would appear likely. Hingleys had a wages bill of £6 000 per week or £300 000 for the working year according to a note from C E Lloyd to Lloyds Bank in 1917.[23] According to the analysis given below in table 6.3 this would seem to give a turnover of some £1 500 000 in 1918.[24] This estimate is based on wages of £300 000 being approximately one fifth of the overall costs.

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[23] WHC : Sec. 8 ; DLB, 10 : 16 February 1917, 131.

[24] Ibid., : 27 June 1918, 466.

Table 6.3 : The cost of producing 'Netherton Crown' iron at June 1918

			%
Cost of pig iron	:	£ 8. 3. 6	56.00
Wages	:	£ 3. 3. 3	21.60
Salaries	:	£ 2. 4	.80
		£11. 9. 1	78.40
Other costs	:	£ 2.19.10	98.90
		£14. 8.11	90.90
Profit margin	:	£ 3. 3	1.10
Sale price per ton	:	£14.12. 2	100.00

Part of Hingleys' production was sold to the trade and part was reserved for its production of cables. The firm specialised in the manufacture of large cables, those in the range of over 3" in diameter. This required the works to be organised in departments producing small chain of diameters less than 2", medium chain of diameters less than 3", and the large chain of between 3" and 6" in diameter.[25]

The anchors manufactured by Hingleys and its principal competitors[26]

After 1900, the leviathans of the seas appeared. These enormous liners of over 45 000 tons, all needed larger and more reliable anchors. Ten

[25] WHC : Sec. 8 ; DLB, 1 : 9 November 1895, 151.

[26] Reference to appendix three containing the specifications attached to the patents of the anchors described in the following text, will explain the various parts of the anchors referred to in the narrative.

of these large liners are listed in the plate that follows page 3/3; and the size of these liners can be gauged from the photograph of the 'Olympic' (twin ship to the 'Titanic') that follows this page. Commercial demand was supplemented by the growth of the battle fleets of Europe, Japan, and South America. Here again, with strategic thinking being based on battleships and battle cruisers, the demand for large anchors became the new phenomenon for the industry. Examples of the weights involved were given to a Commander E P Statham of Arundel early in 1907. There were the 8 1/2 ton models supplied in the mid 1900s by Hingleys for White Star's S S Adriatic, and the 10 ton anchors supplied for Cunard's S S Lusitania and S S Mauretania. The largest battleship anchor at this time was 6 1/2 tons. The cables for Cunard's ships were 3 1/4" in diameter, whereas the largest navy cable was 2 11/16" in diameter.[27]

The ability to offer a complete outfit of large chains, cables, and anchors was restricted to a handful of firms. Hingleys was one of these, and full advantage was taken of the excellence of its cables and anchors to obtain a significant market share. During the period under review three anchors dominated the trade in Britain. The first was the Hall's Patent Anchor, originally patented in 1886 and then improved and re-patented in 1888, 1889, 1904, 1906, 1914, and 1917. The second was the William Wasteneys Smith anchor, developed and patented in 1899 and re-patented in 1904. The third was the William Lumsden Byers' anchor, first patented in 1900 and re-patented in 1903.

Of the three anchor designers cited, only W L Byers was an actual manufacturer of anchors and this enabled him to secure a large market share, especially in the north east, from his base in Sunderland. W W

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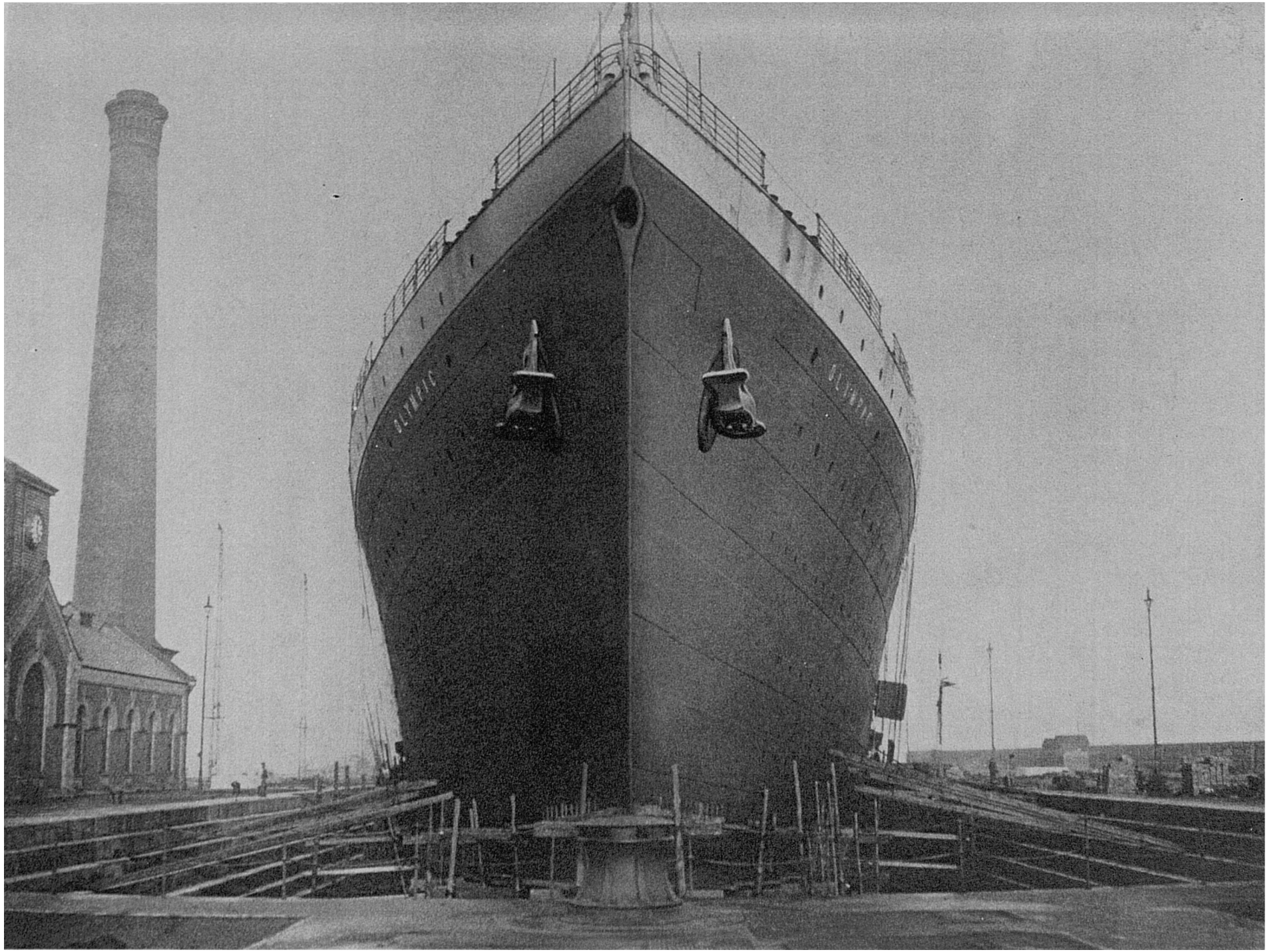
[27] WHC : Sec. 8 ; GBHPLB, 2 : 8 January 1907, 520.


OLYMPIC

Smith was a civil and consulting engineer and, following the problems that beset the Hall's anchor in 1904 his became the preferred design for the Admiralty for many years. The original Hall's anchor was a joint effort on the part of John Francis Hall, the manager of a steel works in Sheffield, and of John Verity a professional engineer from Leeds.

Referring to the seven patents taken out for the Hall's patent anchor in the period from 1886 to 1918, those of 1886, 1888, and 1889, were all held jointly by Messrs Hall and Verity. The patent of 1904 was held jointly, by the Halls Patent Anchor Company Limited of Sheffield and George Hepburn, a consulting engineer in Liverpool. The patent of 1906, the one taken out to rectify a fundamental flaw in the 1904 design, was held jointly by Joseph Ernst Fletcher who was Hingley's own consulting engineer and George Hepburn. Hepburn's name was only included in the patent as a courtesy as the new patent was Hingleys' determined response to the failures of certain castings in 1904 that caused so much anguish for the firm. The patents of 1915 and 1917 were held jointly by N. Hingley and Sons Limited and Joseph Ernst Fletcher.

Halls Patent Anchor Company Limited did not manufacture anchors as such. Its sole purpose was to hold the patents and then to collect the royalties stemming from the manufacture of the anchors. The association with Hingleys began in 1891 with that firm entering into an agreement with the patentees to manufacture their anchor on a sole manufacturing basis. In 1892 Hall and Verity transferred the patents and their rights to the Halls Patent Anchor Company Limited. Unfortunately, competitor firms had no scruples about manufacturing the design that pre-dated Hingleys' sole manufacturing agreement and constant efforts had to be maintained both at home and abroad to prevent pirating, as Sir George

pointed out to his solicitor, W Shakespeare, when giving a retrospect of the firm's association with the Hall's anchor.[28]

The Hall's Latest Improved Patent Anchor of 1906 was the best of its class, but it did not prevent owners and shipbuilders from specifying the less expensive 1889 and 1904 models. Even a manufacturer as sophisticated as Krupp had to be enlightened by C E Lloyd as late as 1911 as to the limitations of the 1889 design when dropped onto hard ground.[29] The commercial arrangement between HPAC and Hingleys continued until 1912. By then Hall, Verity, and Hepburn, were long since deceased and the firm was administered by accountants and solicitors who had no knowledge of the commercial realities of the day. C E Lloyd, having determined that his firm could no longer carry the cost of the royalties in its selling prices, bought out HPAC at valuation.

The early Hall's patents.[30]

Both John Francis Hall and John Verity were professional inventors. The concept they patented in 1886 was very simple. With the growth in the size of ships there came a growing tendency for the mooring cables to twist and break because of the enormous strains imposed upon them. The cause of this was the fact that anchors were rigid and could not compensate for the rolling action caused by the movement of the ship

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[28] WHC : Sec. 8 ; DLB, 4 : 2 May 1910, 125.

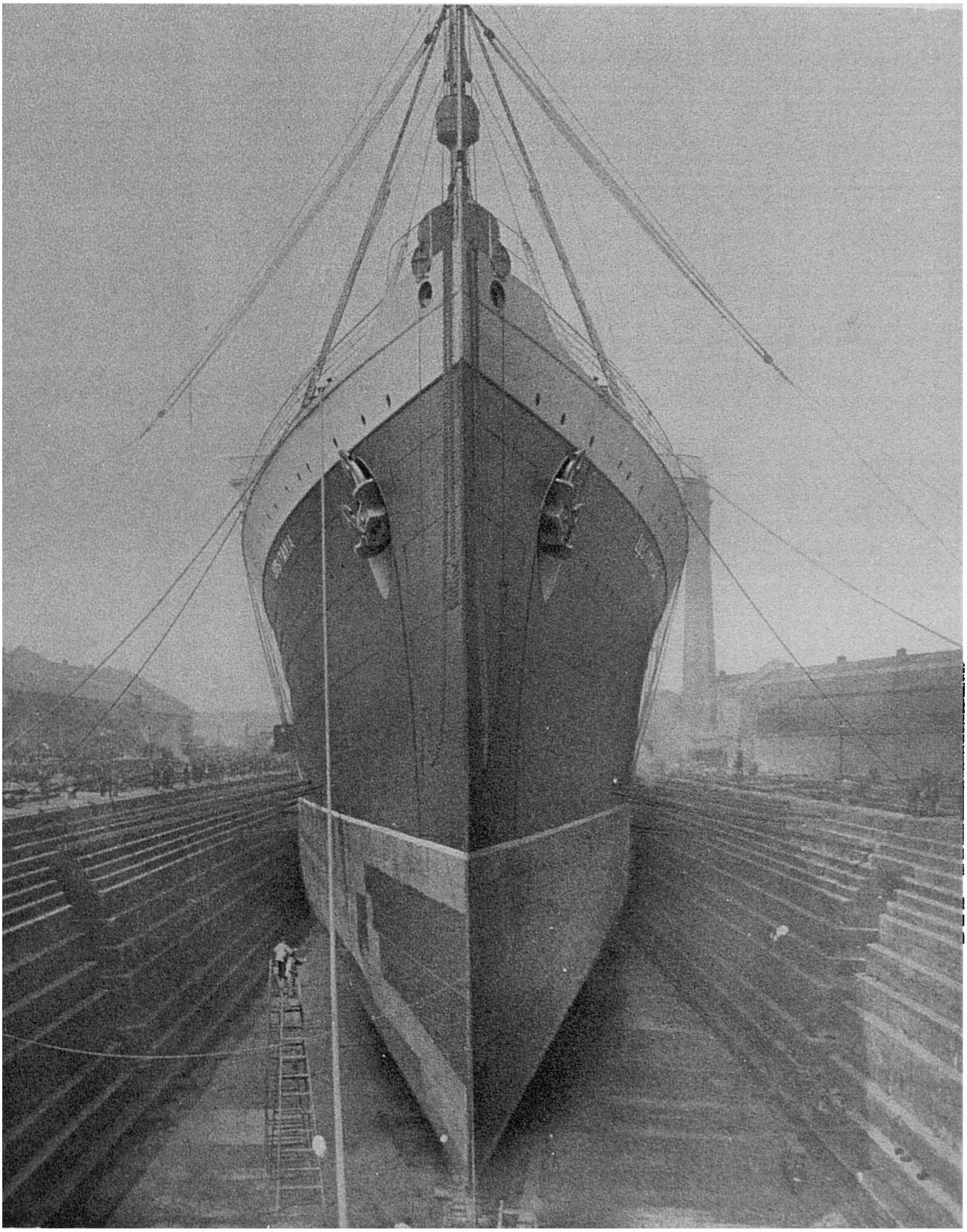
[29] WHC : Sec. 8; DLB. 5 : 29 August 1911, 42.

[30] All the patents under reference are held in bound format in the Birmingham Central Library, Chamberlain Square, Birmingham B3 3HQ. Photocopies of the relevant parts of the patent applications are appended at the end of the dissertation. As the patents are bound and may only be copied by Library staff the quality of copy is variable.

above. Hall and Verity's Patent No. 3461 dated 11 March 1886 set out to simplify the construction of anchors by making them less liable to roll. This was achieved by making the two arms (or flukes) of the head in one piece, preferably from cast steel, with a trough formed in the inner side of the crown. This trough received the two trunnions at the upper end of the shank, the shank being retained in position by a bolt through the head and trunnions. This arrangement allowed a radial movement of the arms to any required angle without twisting the shank and cable. A further refinement was the provision of projecting pieces on the outer side of the head to give a tripping action that had the effect of throwing over the arms of the anchor and instantly taking hold of the ground as the anchor was dragged over it.

Under Patent No. 6918 dated 9 May 1888 two simple improvements were made that reduced the tendency of an anchor to drag or roll. The first improvement was that the trunnions were no longer made in one piece with the shank. In order to achieve greater strength they were made from a tube that was passed through the head of the shank and then sweated into position. The second improvement was to extend the projecting pieces or trippers for the full width of the arms in order to enhance the throwing-over effect.

Patent No. 1353 dated 25 January 1889 aimed at a structural refinement and provided for the trunnions to be held in position by transverse pins as against a simple bolt.



The later Hall's patents

Patent No. 8068 of 8 April 1904 was a development by HPAC and George Hepburn. This patent addressed a growing problem arising from the increased size of all classes of ships. Essentially, when the anchor was dropped from these much higher ships it landed on its head on the seabed with considerable force. This height can be seen from the photograph of the S S Lusitania that follows this page. In so doing it created a punching action through the shank onto the trunnions that secured the shank to the head. This punching action could bend or even shear the bolts that held the trunnions in the anchor head, thus leading to total failure of the anchor. Hepburn's modification was to hold the trunnions in position with iron or steel blocks. These in turn were held in position with bolts. The effect of this was to eliminate bending strain on the old style trunnion bolts, thus making the anchor less liable to failure from this cause.

With this development Hingleys appeared well placed to compete with the best that the other manufacturers had to offer. However, in the same year, disaster struck when anchors that had been in service with the British Admiralty began to fail. Although the actual numbers of anchors involved was quite small, the resulting consequences were devastating for Hingleys' relations with the Admiralty. The nub of the problem was that certain anchor heads on being broken had been seen to be partially hollow inside. Hingleys were baffled by this manufacturing phenomenon, and 'Ben' Hingley was remarkably restrained when writing to George Hepburn in June of that year. Indeed, he confined himself to observing that he was disturbed to learn that both HPAC and Charles Cammell of Sheffield, the manufacturers of the castings, had always been aware of

the problem but had never advised Hingleys.[31] It should be noted that the anchor head was the only part of the complete anchor that was made from steel. The steel used was of the best quality and only manufacturers of the calibre of Charles Cammell, James Rogerson, or Krupp, were used for this important component.

In the wake of the debacle over what they had regarded as the state of the art anchor, Hingleys took over the redesign of the Hall's patent anchor. Fletcher, Hingleys' own engineer and formerly with Charles Cammell, took on the task, knowing that no method of casting could guarantee the elimination of voids within the body of the anchor head. His solution was to re-think the mechanical construction of the anchor so that a void in the casting was no longer critical. Fletcher's Patent No. 29063 dated 20 December 1906 enshrined a radical departure from the purely mechanical designs of earlier anchors. There were two key features in Fletcher's solution. The first was the intentional creation of voids in the anchor head where the shank was fixed to the trunnions. The mathematics of voids in solid planes is now common knowledge, but its application in 1906 was well ahead of its time. The second was the placing of the fixing bolts (holding the trunnion blocks) in the plane of the head itself. These ingenious innovations took Fletcher some eighteen months to devise. Unfortunately, the British Admiralty remained unforgiving and Hingleys served a biblical penance of seven years before being involved in the re-armament programmes of 1912 onwards.

Patent No. 15025 of 23 June 1914 and Patent No. 111960 of 14 March 1917 do not have a direct impact on the period under review, and are

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[31] WHC : Sec. 8 ; GBHPLB, 1 : 18 June 1904, 611.

mentioned here merely to take note of Fletcher's continuing work on anchor design.

The Wasteneys Smith patents

William Wasteneys Smith, a civil and consulting engineer from Newcastle-upon-Tyne, had patented designs for stockless anchors under Patent No. 552 of 1871, Patent No. 4281 of 1874, and Patent No. 3476 of 1885. The design covered by Patent No. 5938 of 18 March 1899 had as its principal objective an increase in the stability of the anchor when in the ground so as to ensure that it did not roll over. This was achieved by arranging the trippers on the arms so that they were on the outer edges. The result was that the trippers rested on the solid ground at a wider distance apart than the arms. It was a simple, ingenious, and very effective modification.

Patent No. 29413 of 31 December 1904 provided for a simple modification of the earlier patent and was aimed at facilitating the stowing of the anchor. This was achieved by curving inwards the outer portions of the arms of the anchor, and by rounding off the corners of the trippers.

Smith's anchors found particular favour with the British Admiralty and after Hingleys' problems of 1904, the Smith's anchors remained the Admiralty's preferred choice until 1912.

The W L Byers patents

William Lumsden Byers was an anchor manufacturer in Sunderland. His Patent No. 6541 of 7 April 1900 introduced an ingenious solution to the problem of ensuring the proper tripping of the heads of the anchors on bottoming on the sea or river bed. Whereas the Hall and the Smith anchor had the trippers in the same plane as the outer surface of the head, Byers placed his trippers at an angle of 20 degrees to the outer surface. This had the effect of throwing the anchor in a positive direction, thus achieving a firm grip.

Three years later Byers took out Patent No. 18595 on 28 August 1903. This patent addressed the problem of achieving better stowing of the anchor in the hawse pipe. New forms of ship design had resulted in the bows being in an almost vertical plane as can be seen from the photograph of the S S Lusitania that follows page 6/26. The innovation was aimed at assisting in bringing up the anchor and its arms parallel to the sides of the ship. This was effected by removing the ends of the anchor head. Additionally the fixing bolt through the head and shank was prolonged to form projections outside the sides of the head. These projections, together with the various areas and curved surfaces achieved in the rounding process, had the effect of causing the whole anchor to roll over smartly and to come up parallel with the ship's plating.

A summary of the anchor making capabilities of the three market leaders

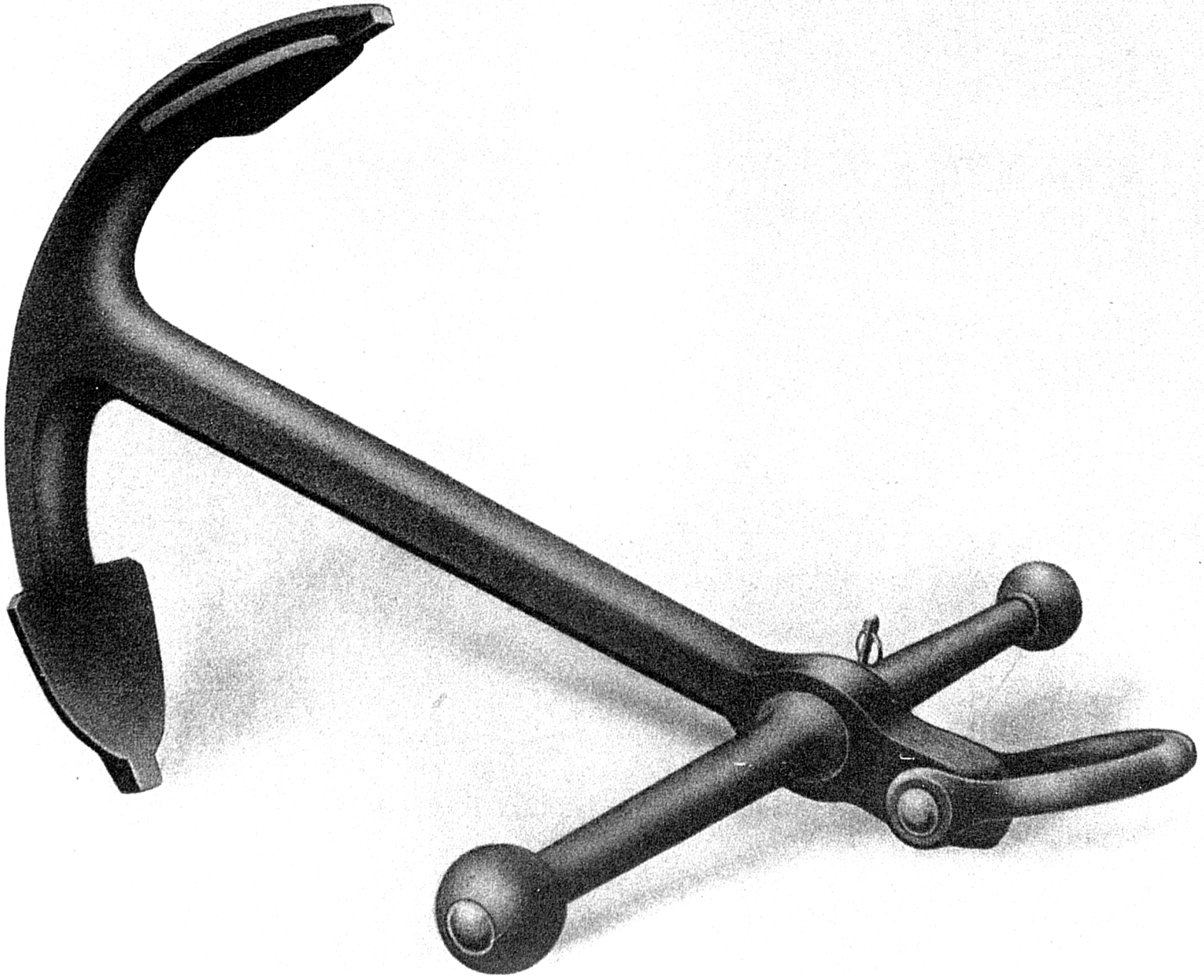
Hingleys' main strengths lay in the market for large anchors for the huge liners in the fleets run by Cunard, White Star, and Hamburg Amerika for the north Atlantic crossings. Wasteneys Smith developed a near monopoly of Admiralty work, while W L Byers held a commanding position in the commercial work of the north east and of west Scotland. The additional advantage that Hingleys had over its two main rivals, was its commanding position in navy work for Italy and for Japan, and recently for Germany.

The photographs that follow show:

- the conventional ship's anchor used by small boats
- the more sophisticated Hall's anchors [2]
- the enormous anchors used on the leviathans of the seas

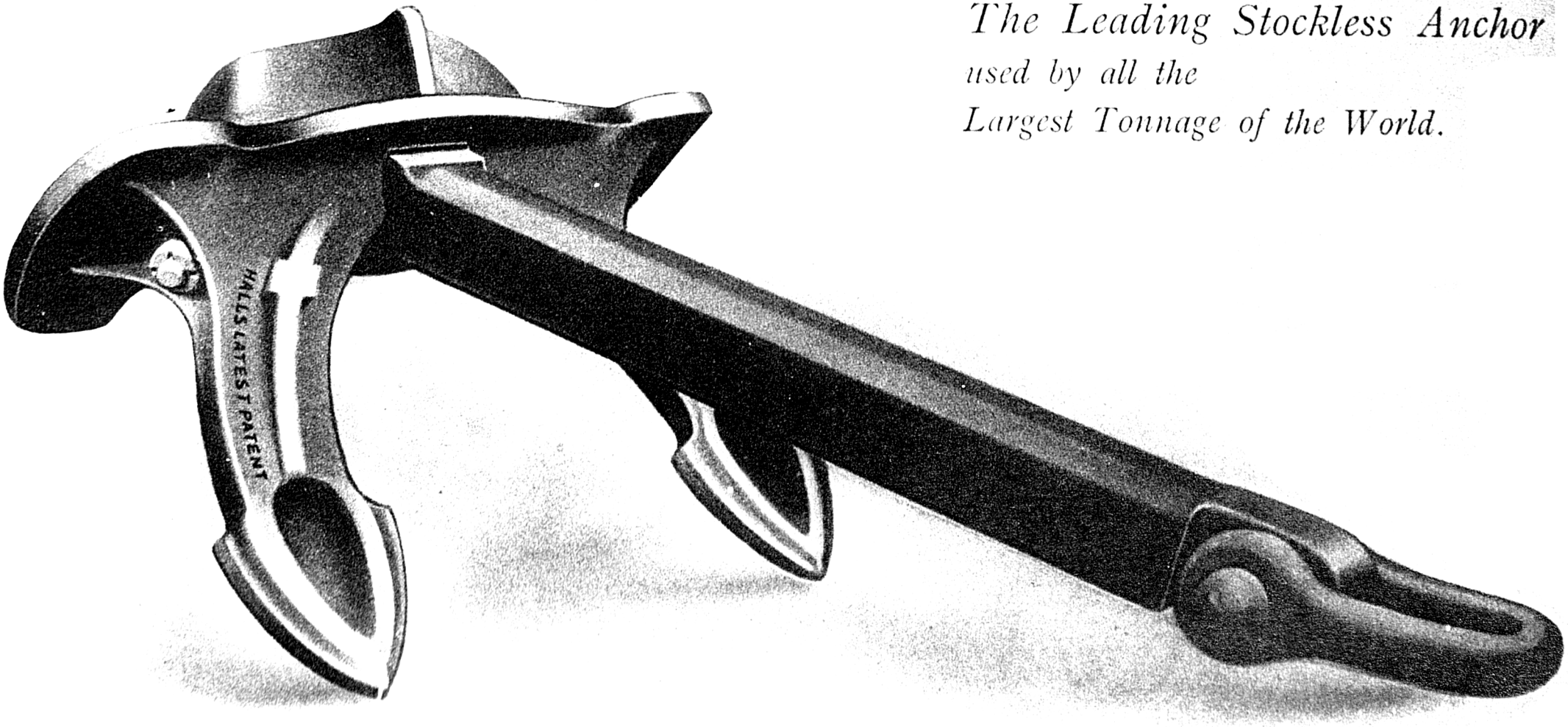
Ordinary Anchor.

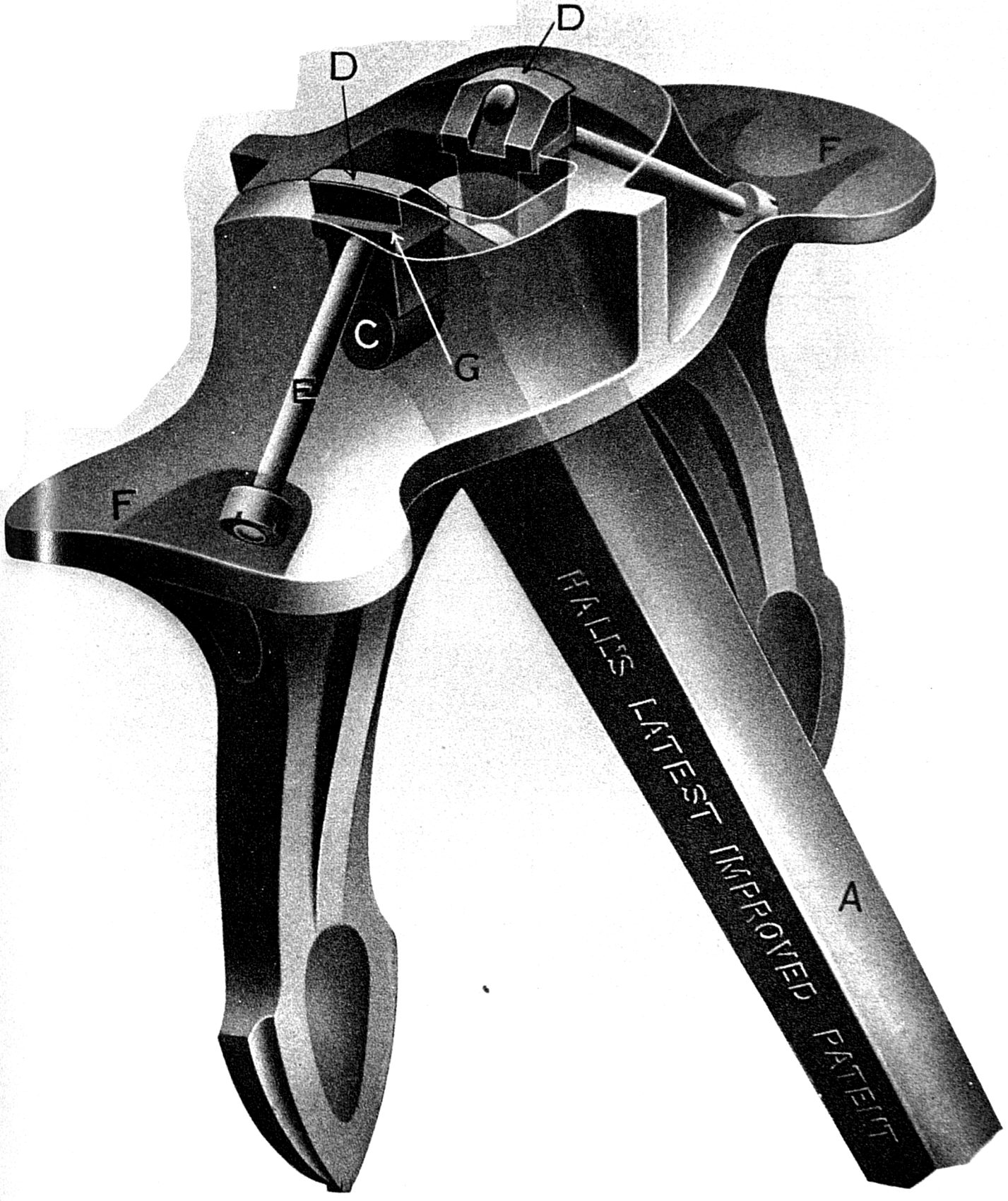
MADE WITH STRAIGHT OR BENT STOCK.



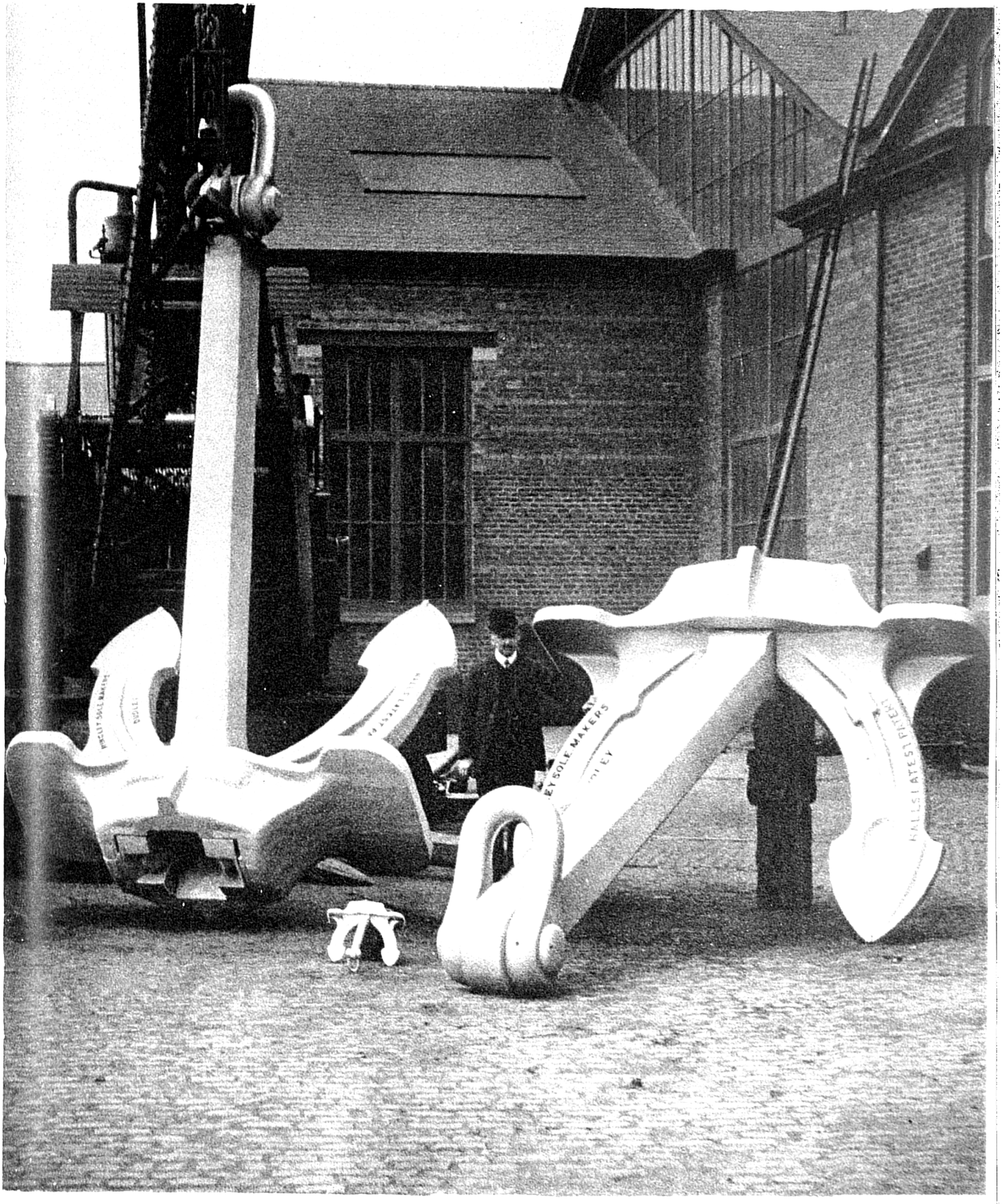
THE ONLY STOCKLESS ANCHOR MADE
THROUGHOUT OF MACHINED PARTS.

The Leading Stockless Anchor
used by all the
Largest Tonnage of the World.





HALL'S LATEST IMPROVED PATENT ANCHOR.



The testing of anchors by The Staffordshire Public Chain & Anchor Testing Company set up in 1868 and later subsumed into the Lloyds British Testing Company in 1900

Generally

There were two principal reasons why the firm of N Hingley was able to maintain a leading international position in the supply of ships' chains and cables. The first was the excellence of its wrought iron. The second was its long time dedication to proper and dependable testing.

The origins of testing

Notwithstanding the later pre-eminence of the Black Country in cable making, the earliest accepted proving house seems to have been set up in Millwall, London, by the Brown Lenox company. Samuel Brown, a lieutenant in the Royal Navy, had formed a partnership with his cousin, Samuel Lenox, in 1806, to make iron cables as a substitute for the traditional hemp ropes of the day. After successful sea tests in the Caribbean they set up a works in Millwall in 1812 to manufacture iron cables. In the same year Brown was persuaded by Lloyds of London to set up a proving house for wrought iron cables. This move was destined to establish Britain's reputation for providing high quality cables for the next hundred years.[32]

So as not to incur the wrath of other regional historians, it is as well to mention that the first recorded iron cables were made in North Shields in 1808. Noah Hingley made his first cable for a Liverpool

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[32] Ron Moss, 'William Bannister & Co, Chainmakers', Black Countryman 26 (Winter 1993) : 18-24.

merchant in 1820. Then in the aftermath of the Napoleonic Wars, because of the ruinous price of imported hemp, iron cable soon superseded the hempen article. Credit for the first proving house in the Black Country belongs to either William Bannister & Co or to Noah Hingley acting with Henry Pershouse Parkes.

William Bannister had set up an iron works in the Newtown area of Cradley Heath in 1830, some two years after Noah Hingley had established his chain works close to the corner of Providence Street and Newtown Lane. The location of the two enterprises are shown on the Newtown area map of 1884 included earlier in the text.

During demolition works in 1991 Ron Moss, a local historian, was allowed access to the site of the old Bannister works (for many years occupied by Stevens Bros Galvanising Works) where he detected the remains of a testing house, including the concreted over channel used to lay out 15 fathoms (90 feet) of cable for testing together with remains of hearths and other constructional details typical of a proving house such as strengthened piers for the roof trusses used for lifting purposes.

As to the first accepted proving house in the Black Country to which all ironworkers could sent their products, this honour belongs to The Staffordshire Public Chain & Anchor Testing Company set up in 1864. The test houses grew out of the Act of 1864 providing for the establishment of public testing houses. Further Acts were passed in 1871 and 1874. The prime movers in establishing the Black Country test houses were Noah Hingley of Netherton, and Henry Pershouse Parkes of Tipton. The first public proving house was opened in 1864 at Bloomfield in Tipton. The

second one followed in Cradley Heath, Netherton, at the top of Primrose Hill.[33]

However, the watershed in the public testing of all ships cables and anchors for British ships came with the Anchors and Chain Cables Act of 1899 and resulted in the formation in 1900 of the Lloyds British Testing Company Limited under the chairmanship of Sir Benjamin Hingley. This Act provided for the testing of anchors and cables to the entire satisfaction of the Lloyd's Register of British and Foreign Shipping.A more detailed account of the work of LBTC as a quasi agent of the Board of Trade is given in chapter nine dealing with relations with Governments. A brief note is made here of the fact that the ethic of public testing was a major part of the Hingley way of doing business. As a result, the customers could always depend on a standard for the iron, the cables, or the anchors that were supplied.

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[33] Ibid.

PART FOUR : MANAGING THE ENVIRONMENT

CHAPTER SEVEN : MARKETING

Generally

During the period under review, the principal exporting nations Britain, the United States, and Germany, each developed a distinctive method of selling. Burnham and Hoskins have described the British method as being based on the merchants at home and abroad. Germany developed the cartel as its preferred method of controlling both production and sales, while the United States developed vertical integration as its preferred mode.[1] Each country's method was largely a result of the individual business cultures of the time. In Britain, production and sales tended, at this time, to be separate operations carried out independently of each other. For the Germans, there was the compelling logic of the cartel especially once the market, production, and sales had been concentrated in restricted sources of control. The American method of vertical integration stemmed from its isolationist policies. At the time it was unique as the two-way process generated its own dynamics.

The British method of marketing can be seen as a natural development of established trade routes. The colonies, as well as many other countries in south east Asia and central and south America, had traditionally produced raw materials that were shipped back to Britain. In return Britain shipped out finished goods using the merchants based on the major British and overseas ports. Later, in line with the growing sophistication of the colonial markets, or prompted by discoveries of

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[1] Burnham and Hoskins, Iron & Steel... 1870-1930, 40.

gold or railway construction, dedicated agents were appointed by manufacturing firms to identify and corner specialised areas of the market for their principals back in Britain. Germany, not having a colonial empire of major economic consequence and being relatively newly unified into one state, developed the cartel as the principal force in marketing. The cartel foreshadowed the developments of the 20th century wherein the market became the servant of the producer and not the consumer. For the Americans, with their preferred policy of isolation and tariff protection, vertical integration became the major force in marketing. This method, with its emphasis on integrating the line of production from basic materials right through to sales, had the effect of creating added value along the chain and of identifying selling opportunities along the way.

In its early days, Hingleys depended almost entirely on general merchants as the principal route for the marketing of its products. Wrought iron was produced in the Black Country on a scale that could not be absorbed by the local market. Merchants who traded overseas tended to take the high quality or 'marked bar' products thus ensuring a continuous market for the Hingley grades of wrought iron, cables, and anchors. However, with the growth of the Empire and foreign trade, Hingleys developed a style of marketing strategy that was based on a mix of merchants and specialised agents, the latter being specifically selected to identify selected markets.

For the industry and the times, the activities of the Hingley firm in terms of marketing its products world wide were quite exceptional. As Medley has pointed out in his study, Black Country ironmakers were generally indifferent and apathetic towards overseas marketing. Indeed, in spite of the trade associations that existed at home, there was

little or no effort to extend cooperation to marketing the products overseas. There was far too much dependence on agents who did not necessarily supply key market intelligence to assist the development of an appropriate range of products. Rather, there was an over-emphasis on the lines that sold well and maximised commissions for the agents. These lines tended to be the basic items such as sheet, plates, and bar iron. This was in marked contrast to the Belgian and German firms who underpinned their business by marketing strategies that identified a consumer's total needs and matched the products to suit[2]. Le-Guillou has pointed out that whereas the Belgians and Germans had set up agencies in the Black Country from the 1890s onwards, it was 1900 before firms of the calibre of Stewarts & Lloyds had set up agencies in Australasia, South Africa, and Canada.[3]

The Hingley method of marketing was in sharp contrast to the high sophistication and ruthlessness shown by Joseph Chamberlain when he was developing the screw empire of his family firm, Nettlefold and Chamberlain. As early as the 1860s Chamberlain had mastered the psychology of packaging and the art of discounting. For the French, Chamberlain wrapped his screws in blue paper; for the Scots, in green paper, and so on.[4] As Chamberlain was aiming solely at the wholesale market, the simple ploy of colours produced dramatic results. Equally successful was his mastery of discounting that had domestic and foreign agents, together with middlemen of every ilk, streaming to his office in Birmingham to place orders. His system of discounting was based on the

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2 Medley, The Geography of Decline, 170-172.

3 Le-Guillou, Competition : South Staffordshire Iron and Steel, 225-226.

4 Peter T Marsh, Joseph Chamberlain, Entrepreneur in Politics (London : Yale University Press, 1994), 21.

use of a pair of percentage discounts that dominated screw making for a hundred years. The first was a wholesale discount of a percentage off the full list price. This discount was rarely less than an astonishing 50 per cent. The second discount was for regular cash settlement of accounts and was rarely less than 10 per cent.[5] This enabled him to sell hundreds of thousands of screws at prices about one tenth of those ruling in the early 1800s.[6] All this was achieved without detriment to a workforce that enjoyed near perfect conditions for the day.[7] For the Hingleys, apart from the distinctive trade marks, there was nothing so sophisticated. In its place stood hard persistent endeavour in the task of selling wrought iron, chain cables, and anchors, at a consistent level year in year out. This endeavour was matched only by the need to sell at a sensible price. This, in a market swamped with domestic and foreign wrought iron, could only be achieved by producing the highest quality of wrought iron that could be sold at the minimum prices set by the South Staffordshire Marked Bar Association. Membership of, and a leading role played in this Association was just one of the many facets of the paradox that was the Hingley operation. The Association was in effect a quasi-cartel in that it controlled the market. This was the market in the very top quality of wrought iron. As a quasi-cartel the market was the servant of the producer, but its key characteristic was that the prices set were fair.

Much of the credit for the Hingley network of overseas selling outlets must be given to 'Ben' Hingley himself. Although not referred to in any great detail in the Hingley archives from 1890 onwards, the obituary notices of August 1918 make it clear that before settling down in 1895

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5 Ibid., 21.

6 Ibid., 20.

7 Ibid., 22.

as the resident managing director of the firm, 'Ben' Hingley made no less than four long journeys by sea to India, the Far East, and the Australian colonies. As a result of these visits, he established personal relationships with merchants in Calcutta, Rangoon in Burma, and in the Malay Straits Settlements, and with commercial undertakings in Japan. His chief interest, however, lay in Australia and New Zealand, both of which eventually took up far more of his time than the exceedingly volatile trade warranted.

Peter Richardson and Jean-Jaques Van Helten have identified the key locations of gold mining in the Empire after the phenomenal strikes in Australia and New Zealand between 1851 and 1893. These were: Southern Australia from 1851 to 1871, the famous twenty year boom; New Zealand in the 1860s; Queensland in the 1870s; and Kalgoolie in 1893. Thereafter, interest in gold mining focused on the famous deep levels of the Witwatersrand in South Africa.[8] During its heyday gold mining presented a major outlet for wrought iron of all grades, and chains and cables of all sizes. The market opportunities created much competition among British firms. 'Ben' Hingley himself controlled the marketing efforts in Australia and New Zealand, carrying on long after the commercial returns justified the efforts. South Africa became the province of H M Hingley, especially following the pre-dominance of deep level mining after the 1890s. Due note is taken here of the extent of 'Ben' Hingley's research into the market opportunities in India, the Far East, and Australasia, before committing the firm to servicing a market in which competition was very fierce.

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[8] Peter Richardson and Jean-Jacques Van Helten 'The Development of the South African Gold Mining Industry, 1895-1918', Economic History Review, 2nd Ser., 37 (3 1984) : 319-340.

Stephen Nicholas has pointed out that in many cases the British principals' knowledge of the Australian market was probably limited as compared to that of the agent.[9] This was not the case with 'Ben' Hingley, notwithstanding the outstanding knowledge of B K Morton, the son of a Sheffield ironmaster, who was Hingleys' long term agent in Melbourne. As a result of his four visits to the Australian colonies, 'Ben' Hingley knew the market well. It was a market that depended on gold mining and the railways. For forty years these activities provided a useful outlet for the Hingley products. However, after the long decline from the 1890s onwards, coupled with B K Morton's growing disenchantment with Australia generally as the colonies progressed to Dominion status on the back of near continuous depression for the iron trade, 'Ben' Hingley gradually lost his personal grip on the Australian market.

Meanwhile, and probably because of Hingley's personal knowledge of the market, his relations with Morton were often strained especially when Morton tended to upset Hingleys' traditional network of London/Australia merchants with forays into unwise discounting. Virtually throughout Hingleys' agency with B K Morton, the remuneration for Morton was based on a commission on sales. As Nicholas has pointed out, this was both a control and an incentive. As a control the commission system enabled the principal to monitor the agent's performance as a seller of the products. As an incentive, the commission system discouraged opportunism.[10] Nicholas has also made the point that agents were required to focus on the selling of the goods and on collecting payment.

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[9] Stephen Nicholas 'Agency Contracts, Institutional Modes, and the Transition to Foreign Direct Investment by British Manufacturing Multinationals before 1939', Journal of Economic History, 43 (3 1983) : 677.

[10] Ibid., 678.

It was the agents' role to 'push the sales' and not to sit back and wait for orders.[11] Waiting for orders was the role of the merchants. This concept became a bone of contention between Hingleys and B K Morton, with the latter's frequent absences in the Far East and Canada becoming a growing source of tension between the parties.

Although Hingleys had to depend on merchants and agents to market its wrought iron, ships' cables, and anchors, the firm must have been aware of the effectiveness of the cartel system through its growing associations with John Brown and Cammell, and Vickers. These firms belonged to a cartel set up in 1894 by Hayward Harvey of New Jersey under which the patents held by four Harvey companies were exploited by a syndicate formed to control prices and to divide up international orders by drawing lots. The syndicate, consisted of the principal manufacturers of armour plate for warships in Britain, France, Germany, and the United States. Its members were Bethlehem Steel and Carnegie from the United States, Dillinger Heutten and Krupp from Germany, Acières de la Marne and Schneider & Chatillon from France, plus John Brown with Cammell and Vickers from Britain. In 1901 Armstrongs joined this cartel that functioned until 1911 when the Harvey patents expired, and notwithstanding the withdrawal of the US firms in 1908.[12] In 1901 and 1902 Vickers entered into a licensing and patent sharing agreement with two German firms. The first was with Deutsche Waffen und Munitionsfabriken for the manufacture of guns. The second was with Krupp for the manufacture of time and percussion fuses.[13]

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11 Ibid., 680.

12 Scott, Vickers, 86-87.

13 Ibid., 87.

Thus, there was an identity of interest and possibly an element of cross fertilisation between John Brown and Vickers which firms were major sources of work for Hingleys; and with Cammell who was a major supplier of anchor heads to Hingleys; and from the parallel activities of all the parties in Germany. In chapter eight particular attention is given to Hingleys' commercial arrangements from 1895 to 1914 with Hochfelder Walzwerk, Borsig, and Krupp. Whereas the major constructors referred to were interested in ships, armour plate and weaponry, Hingleys was interested in ships' cables and anchors. Again, and in yet another facet of the Hingley style the marketing policy and strategy in Germany were based on the cartel concept of eliminating the opposition by controlling the key product - in Hingleys' case their unbeatable cables and their superior anchors.

The Hingley method and style

N Hingley & Sons Limited traded in a highly competitive market economy. With a workforce of some 3000 men and women, and collieries and ironworks that needed to be kept working in order to maintain their life expectancy and efficiency, the enterprise was essentially production driven with a need to maintain turnover year by year. To achieve this Hingley had agents based in strategic places all over the world and in the United Kingdom, and it was on the efforts of these agents that the well-being of the firm depended.

The original Hingley method of marketing was to build up a system of autonomous agents each personally selected by one of the Hingleys and each reporting directly to the Head Office. There were three major areas of interest. The first was the home market in the United Kingdom. The second was the long standing colonial market in Australia and South Africa, with its derived activities in the Far East. The third was the European markets that were targeted on the expanding navies of the developing European states.

The products of the Hingley company were coal, pig iron, wrought iron, chains, cables, and anchors. In the United Kingdom coal, pig iron, wrought iron, and chains were sold by the usual combination of direct sales and the use of merchants. The sale of cables and anchors was a specialised operation that depended on the Hingleys themselves and their strategically placed retired naval representatives. In the colonies, where the principal market was in wrought iron and chains, sales were effected by a combination of London merchants and key representatives in the various countries. Among the developing European states,

principally Italy and Germany, the main market was in cables and anchors. Sales were effected by the use of retired naval officers, by the personal efforts of the Hingleys themselves, and by the appointment of local representatives of high standing in the community.

The overall marketing strategy, as developed by the Hingleys, is here demonstrated in a series of tables:

Table 7.1	: The London merchants who handled much of Hingleys' products
Table 7.2	: The principal agents in Britain
Table 7.3	: The agents responsible for promoting the Hall's patent anchor
Table 7.4	: The agents in the colonies and the Far East
Table 7.5	: The agents in other foreign countries

Until 1908, this remarkable network was managed almost entirely by 'Ben' Hingley and his brother. Even after the recruitment of C E Lloyd as general manager, the overall structure remained intact until the outbreak of war in 1914. Fuller details of the appointments shown in these tables are given in the following text.[14]

[14] The names listed in the various tables that follow have been abstracted from the various letter books.

Table 7.1 : The London merchants who bought and sold on Hingleys' products

NAME	DATE OF APPOINTMENT
F A Edelston & Co	All before 1890
G P Harris Scarfe & Co	
W Sandover & Co	
Smellie & Co	
E W Tarry & Co	
Wood & Parker	

Table 7.2 : The principal agents in Britain

NAME	LOCATION	DATE OF APPOINTMENT
Capt. T G Hardie	Glasgow and the shipyards on the Clyde	1895
B J Ackerley	Liverpool and the shipyards on the Mersey and in Belfast	1897
A M Carlisle	Harland & Wolff, Belfast	1897
Jno H Austin & Co	London	1890s
William J Firth & Co	London	1913

Table 7.3 : The agents responsible for promoting the Hall's Patent Anchor

NAME	LOCATION	DATE OF APPOINTMENT
Capt. Robert Lynn Smart	London	1898
J E Darbishire	London	1905
Admiral Thomas McGill	London	1911
Captain F C A Lyon	London	1911
Capt. A W Symes	London	1913

Table 7.4 : The agents in the colonies and the Far East

NAME	LOCATION	DATE OF APPOINTMENT
B K Morton	Australia and Far East	Before 1895
A K Rhoden	India and Far East, especially Japan	1897
William Milne	Durban, Natal	Before 1895
Murray Walker	Cape Town	1903
Scott S Piercy	Johannesburg	1903

Table 7.5 : The agents in other foreign countries

NAME	LOCATION	DATE OF APPOINTMENT
Major Domenica Rocca	Spezia, Italy	1888
Pietro Micheli	Genoa and Rome	1900s
Admiral Alfredo Micheli	Rome & Genoa	1912
Franz Tecklenborg	Bremen	Before 1890
Ruhe & Trelle	Bremen	Before 1890
Arnold Von Bippen and W Janke	Hamburg	1895
Schulz & Borchers	Berlin	Before 1900
Kem Brothers	Rotterdam	Before 1910
George Barrett	Madrid	1891
Ramon Aguirre	Madrid	1896
Colonel Fernandez	Madrid	1896
Juan Meniere	Madrid	1912
Felix de Urtiago	Bilbao	1911
Langstaff Ehrenberg and Pollok	Paris	Before 1895
George Baker	Vienna	1908
S Bauer	Vienna	1913
Hertogs & Wuyts	Antwerp	1903
Astrup & Son	Christiana, Norway	1900s
Sjoholm & Svalander	Gothenburg, Sweden	1900s
Capt. J M James	Tokyo	Before 1895
Capt. Takayama	Tokyo	1903
Dr T Matsuo	Yokohama	1900s
J G Crookston	Odessa	1900s
A N Bronstein	Odessa	1906
Rose Innes Cox & Co	Valparaiso, Chile	Before 1900
Hamson & Co	Valparaiso	1913

Marketing in the United Kingdom

The marketing of coal, pig iron, wrought iron, and chains was effected through the conventional means of direct sales and repeat orders either with company buyers or merchants. In the case of ships' cables and high profile anchors, a much more determined marketing strategy was called for. Although Hingleys was the world leader in this field, the firm faced intense competition from other cable makers and anchor makers. The various strategies adopted, either to cooperate with or to shut out these competitors, is given a fuller treatment in chapter eight.

The broad base, through which a regular portion of Hingleys' output was put on the world market, was provided by the six London merchants referred to in Table 7.1. As Hingleys preferred to ship through London and not through Liverpool and Bristol, the direct involvement with the London merchants on a day to day basis by the Hingley brothers had a direct financial consequence for the London office. Indeed, matters reached the proportions of an outright quarrel early in 1905 when Hingleys had to remind and reiterate to Jno. Austin, the London agent, that no commissions would come his way on goods handled by these six merchants as they were regarded as being within the personal oversight of the Hingley family.[15] The six firms were the ones through which Hingleys conducted its colonial and far eastern trade. The connections were long standing and the accounts were only nominally attached to the London office in order to give it an air of substance.

The London office itself comprised a modest arrangement of two rooms at 62 Gracechurch Street in the City of London. It was a 'good address' for 'Ben' Hingley to have in London; and Jno H Austin & Co serviced the

[15] WHC : Sec. 8 ; DLB, 3 : 31 January 1905, 386.

offices in return for costs up to £1 000 per annum, plus any commissions that could be earned outside of the trade with the six designated London merchants. Austin was never entirely happy with the arrangement and earned his principal living elsewhere, hence the quarrel referred to that took place early in 1905 when business was very slack. For all practical purposes the work of the London office was carried out by Messrs Sergeant and Leader, who were employees of Jno Austin. On their passing through death or retirement, the London agency was transferred in 1913 to William J Firth. His appointment was the subject of a very formal appointment drawn up by G C Edwards, the company secretary.[16] Mindful of continual wrangles over the years with Jno Austin over commissions, the formal contract with Firth was particularly specific on the basis on which commissions would be paid.

In the shipbuilding areas in which Hingleys concentrated its marketing efforts through the agents referred to in Table 7.2. B J Ackerley was the agent based in Liverpool with the task of representing Hingleys' interests on the Mersey and in Belfast. The shipyards on the Clyde and in the north east of England were serviced by Capt. T G Hardie who was based in Glasgow. The third and most unusual agent was the Rt. Hon. A M Carlisle, who was actually a director of the Harland & Wolff shipbuilding firm.

B J Ackerley was formally appointed in 1897 on the retirement of a Mr Gilbertson. His brief was to identify work opportunities and to lobby for the inclusion of Hingleys on the appropriate tender lists. His letter of appointment confirmed his remuneration as being based on a commission of 1 per cent on iron, chains, and anchors; and 2 per cent on

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[16] WHC : Sec. 8 ; SLB, 4 : 27 December 1913, 209.

Special Best Best quality chain or cable.[17] Capt. T G Hardie was formally appointed in 1895, his duties being very similar to those of Gilbertson who was succeeded by Ackerley in Liverpool. As with Ackerley, Hardie was required to work in very close association with either 'Ben' Hingley or H M Hingley. His agency called for specific efforts to 'push' the Hall's patent anchor, with a commission of 2.5 per cent on sales.[18] Details of the appointment of A M Carlisle have not survived, but a quarterly commission statement in 1897 shows him to have been receiving commissions of 2.5 per cent on the value of all outfits (the complete package of cables and anchors) supplied to Harland & Wolff.[19] This level of commission was the top rate paid anywhere by Hingleys. Obviously it was a legitimate commercial practice of the day to have an agent in the shipbuilder's office to represent the interests of a supplier.

Marketing the Hall's patent anchor : see Table 7.3

In the early days of Hingleys' association with the Halls Patent Anchor Co Ltd, the entire burden of marketing the product fell on 'Ben' Hingley, as recounted at some length in the next chapter. HPAC consistently declined to assist in the marketing of the anchor, regarding its sole role as that of collecting royalties arising from the sales of its invention. Accordingly, 'Ben' Hingley recruited a Lieutenant (later Captain) Robert Lynn Smart in 1898 to act as a 'pusher' for the anchor, especially with the procurement department of the British Admiralty, and as advised to HPAC.[20] In 1905 'Ben' Hingley

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17 WHC : Sec. 8 ; DLB, 2 : 2 April 1897, 98.

18 WHC : Sec. 8 ; DLB, 1 : 18 December 1895, 170.

19 WHC : Sec. 8 ; DLB, 2 : 16 April 1897, 105.

20 WHC : Sec. 8 ; DLB, 2 : 21 October 1898, 306.

recruited J E Darbishire, a consulting engineer based in Westminster, to provide a technical input into what had become a very competitive business.[21] Lynn Smart was the first dedicated agent for the Hall's anchor trade, and with Darbishire he was associated with the sale of the product right through to the end of this study.

Following the formal acquisition of the HPAC by Hingleys in 1911, Sir George Hingley appointed Admiral Thomas McGill to serve as chairman of the board, following the removal of the company's registered office to London. As discussed between G C Edwards, the company secretary, and Capt. T G Hardie, McGill's first task was to get the Hall's anchor back on the approved list for Admiralty tenders after an exclusion of some seven years.[22] To assist Admiral McGill, Capt. F C A Lyon of Kensington was appointed in 1911. His unexpected death in 1913 led to the appointment of Capt. A W Symes in his place. In his letter of appointment from G C Edwards, Symes' brief was defined as acting as a naval adviser in the London district in keeping the Netherton products before potential customers.[23] An intriguing feature of the retention of these retired officers as 'pushers' for the Hall's patent anchor, was the modesty of the annual fee they were happy to accept for their services. In no case did this exceed £50 per annum.

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[21] WHC : Sec. 8 ; GBHPLB, 1 : 29 March 1905, 888.

[22] WHC : Sec. 8 ; SLB, 1 : 23 December 1910, 301.

[23] WHC : Sec. 8 ; SLB, 3 : 18 June 1913, 473.

Marketing in the Colonies : see Table 7.4

The colonies in this context refer to those in Australia and to those in South Africa including the Boer Republics of the Transvaal and the Orange Free State. Those in Australia were of particular interest to George Benjamin Hingley who had visited there on four separate occasions, while South Africa tended to be looked after by Henry Montagu Hingley who had also visited there. Anecdotal evidence from Colonel Weston suggests that John, one of Noah Hingley's sons by his first marriage had emigrated to Australia, but the correspondence files do not point to any business links in that direction.[24]

Both in Australia and in South Africa marketing activities were directed at the mines and at the railways. The trade was essentially that of wrought iron and the smaller diameter chains associated with mechanical work. In promoting this trade no assistance was given by the British Government. Indeed, as Sir Hubert Llewellyn Smith recounts in his history of the Board of Trade:

'During the last few years of the nineteenth century British traders who were feeling the increasing pressure of foreign competition in British Empire markets, complained strongly of the handicaps to which they were subject through the absence of any official machinery for obtaining from those markets commercial information comparable with that supplied to their German and Belgian competitors... there was then a feeling voiced by the Colonial Office, which subsequent experience has shown to be unfounded, that the British Dominions (to use their modern title) would resent the appointment by the Mother Country of permanent officers stationed in their midst to promote the interest of United Kingdom trade. Nothing therefore was done until the Colonial Conference of 1907 except to survey the principal Dominion markets by a series of temporary commercial missions (South Africa 1903; Australia and New Zealand 1905; and Canada, 1906). In 1907 all reason for timidity was swept away by the adoption at the Colonial Conference of a resolution proposed by the Prime Minister of New Zealand in favour of the representation of British trade in the Dominions by permanent British Officers'.[25]

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[24] Colonel G P L Weston to five close relatives, 1 April 1952, personal papers of Mr C P Harris.

[25] Sir Hubert Llewellyn Smith, GCB, The Board of Trade (London : G P Putnam's Sons Ltd., 1928) p.76.

Against this background of no assistance from the British Government the Hingley firm marketed its products through the system it knew best : direct promotion of sales on the ground, supplemented by a dependable group of merchants operating out of London.

The group of London merchants referred to earlier in Table 7.1 was serviced by the two brothers independently of the efforts of the London office. The efforts of these merchants were further supplemented in the field by three principal agents: B K Morton in Melbourne, Victoria; Scott S Piercy in Johannesburg in the Transvaal; and A K Rhoden who operated the Yokohoma and Far East Agency. Rhoden is included in this group as he was recruited by George Benjamin Hingley in Sheffield in 1897 to assist B K Morton especially in respect of opportunities in China and Japan. Of the three, B K Morton was the senior in terms of service, having been in post well before the letter files began in 1895. A K Rhoden was the next to join, being appointed in 1897. Scott S Piercy was recruited in 1903. All three were to survive the Hingley brothers; and all were still in post in 1918. All were in some way or other connected with Sheffield, a town with which the Hingleys had many ties, especially in the manufacture of anchors.

B K Morton was connected with the family firm of B K Morton Limited of Sheffield, but he spent much of his working life in Australasia, the Far East, and in Canada. He was the Hingley agent for Australia and New Zealand and he also covered the Far East visiting to India, the Malay States, and Japan. The serious banking crisis of 1893 in Australia led to Hingleys experiencing very hard times in that region as 'Ben' Hingley discussed with Morton later in that year.[26] Indeed, so serious was the

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[26] WHC : Sec. 8 ; DLB, 1 : 11 July 1895, 86.

fall off in trade that Hingley decided to turn his attention to China, Japan, the Straits Settlement, and British Columbia. To give effect to this decision Hingley recruited A K Rhoden in 1897 to act as assistant to B K Morton. Despite the poor state of trade, but perhaps due to Hingleys' long standing connection with Australia going back to at least 1879, Hingleys offered Morton a very attractive financial incentive to cover such a wide area. The terms were to be £120 per annum for up to £3 000 of business, rising by £20 for every further £500 of business up to a ceiling of £500.[27] These were very generous terms for the state of the trade (being 4 per cent on sales) and provided little or no profit margin for Hingleys.[28]

A K Rhoden, who had been appointed in 1897, quarrelled with Morton in 1902 over the question of money and felt that he had to look elsewhere for his livelihood. This resulted in a rather cross exchange between 'Ben' Hingley and Morton, as a result of which Hingley appointed Rhoden as an agent in his own right for the Far East.[29] Hingley softened his strictures somewhat by praising Morton's efforts in Australia, while stressing that Morton did not really have the time to cover the Far East.[30] In the same letter Hingley expressed his personal credo on agents:

> 'This business... is largely a personal one and we make a practice of never appointing any agents unless we have seen them personally, for I am a firm believer in the question of personal sympathy and touch with customers.'

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27 WHC : Sec. 8 ; DLB, 2 : 21 September 1897, 171.

28 Ibid.

29 WHC : Sec. 8 ; GBHPLB, 1 : 24 December 1902, 97.

30 WHC : Sec. 8 ; GBHPLB, 1 : 16 April 1903, 226.

South Africa was of particular interest to H M Hingley and he made a visit there lasting several months in 1895. He followed this with a marketing drive by letter, covering the rising market in Johannesburg and the requirements of the Cape Government Railways. He made a determined sales pitch at the Cape Government Railways, first with an approach to Mr J D Tilney in East London, and then to Mr J M Thornton in Port Elizabeth. When writing to Tilney he stressed the volume of iron being transported to the Rand via East London; and also mentioning Mr William Milne who represented Hingleys in Durban.[31] This was probably a ploy to repeat Hingleys' accord with the Great Western Railway in England, where the GWR got all Hingleys' freight in return for buying loco iron. A similar letter went to Thornton.[32]

The decision to appoint an agent in the Transvaal was taken by H M Hingley during his visit in 1895 and he was counselled by his brother to prepare the merchants for such an appointment as agents were not held in high regard by the merchant classes in the Cape Colony, Natal, or in the Transvaal.[33] The actual implementation of the policy did not take place until 1903, after the Boer War, when Scott S Piercy was appointed the Hingley representative in Johannesburg. Piercy also seems to have had connections with Sheffield as all his commission was paid into a bank there. His office was in Commissioner Street, right in the mining headquarters of the city. His appointment became effective on 1 July 1903, being covered by a formal agreement prepared in the preceding May.[34] Under the agreement Piercy was to cover the Transvaal, the Orange River colony, Natal (except for government work), and Rhodesia.

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31 WHC : Sec. 8 ; DLB, 1 : 15 May 1896, 201.

32 Ibid., 15 May 1896, 203.

33 WHC : Sec. 8 ; DLB, 1 : 12 April 1895, 36.

34 WHC : Sec. 8 ; DLB, 3 : 21 May 1903, 274.

His brief was to keep the Netherton brand of iron before the notice of the mining engineers, and to work with the merchants in directing consumer choice towards Netherton iron. For this work he was to receive £200 per annum in respect of rent and travel, together with commission of 1 per cent on sales of iron, rising to 2 per cent on the sale of Netherton Crown Special Best Best iron and on Netherton Special Best Best chains.

Marketing in Europe : generally : see Table 7.5

Europe, after the United Kingdom, was the area in which N Hingley & Sons Limited maintained a very high profile in the sale of anchors and cables. In general 'Ben' Hingley tended to look after Italy and Russia, while Henry Montagu Hingley was responsible for Germany, Spain and the Scandinavian countries. The whole focus of the marketing drive was on the use of agents who could promote the company in a vigorous manner while maintaining the diplomatic niceties. This vigorous manner was defined succinctly in 1912 by G C Edwards, the company secretary, when remonstrating with Kem Bros., their agents in Rotterdam. Kem were seeking a revision of terms and Edwards advised them in a very pointed letter that merely reporting on the success or otherwise of tenders was not enough. With a pungency redolent of Sir George Hingley, Edwards went on to state:

> 'My firm desires an active Agent who will use his utmost efforts and influence, not only to secure orders by arranging to quote the lowest price, but also by endeavouring to influence Owners and Builders to regard favourably the quality of the material offered'.[35]

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[35] WHC : Sec. 8 : SLB, 2 : 8 November 1912, 262.

This statement summed up the marketing ethos of the Hingleys: sales in a highly competitive market were to be pushed as close to the margin as was commercially prudent and consistent with high quality. This insistence on the integrity of the product was the hallmark of the Hingley enterprise.

A table given in Collins New Academic Atlas of about 1900 is reproduced here as Table 7.6.[36] While in no way an official table, the countries shown were all of particular significance to Hingleys, even the United States after 1915.

Table 7.6 : Naval ships of the world, c 1900

NAME	No of VESSELS	ARMOUR PLATED OVER 4000 TONS
United Kingdom	573	78
France	444	49
Italy	288	19
Russia	254	25
Austria-Hungary	123	10
Turkey-in-Europe	103	7
Spain	95	8
Germany	87	15
United States	71	19
Japan	58	5
Argentine Republic	55	4
Chile	23	4
Brazil	18	3

With the exception of the United States, that had a closed market, Hingleys sold cables and anchors to all the thirteen countries listed in the table. Of particular importance was Italy, where because of the appalling heat in which large diameter cable was produced, there was little or no wrought iron manufacturing capacity of real importance. Next came Germany, where the Kaiser was developing a large German Navy.

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[36] William Collins, Sons, and Co., Ltd., Collins' New Academic Atlas (London and Glasgow, c.1900) p.96.

In a review of Thomas A Kohut's recent book, 'Wilhelm II and the Germans', Richard J Evans speculates that:

> 'Even the creation of the German Navy, his most cherished project, and a direct challenge to British naval hegemony, seems to have rested on a genuine conviction on his part that it would secure British approval and partnership rather than anxiety and hostility. It was conceived by him as an attempt to make Germany more like England...'[37]

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[37] Richard J Evans, "Rendering unto the Kaiser", Times Literary Supplement, 10 July 1992, p.7.

Marketing in Europe : Italy : see Table 7.5

The doyen of all agents in Europe in the period under review was Major Domenica Rocca whose remit was to cover the naval base of Spezia some 70 miles east of Genoa on the Riviera di Levante. According to Sir George Hingley's letter of appreciation to Rocca on his retirement in 1909, Rocca had acted for the firm since 1888.[38] At that time he was a serving officer with a delightfully informal manner. Indeed the first reference to him in the files is when 'Ben' Hingley acknowledged receipt of a postcard on which Rocca had confirmed the submission of Hingleys' tender for the Vittor Pisane and passing on an Admiral Morive's thoughts on the Hall's patent anchors and with a mention of a Commander Bigliale's views on current orders.[39] Rocca's essential role was to be aware of government orders and to lobby for the inclusion in the tender specifications of a requirement that ships' cables were to be of Hingleys' Netherton quality iron, and the anchors equal to those of the Hall's design. It was this persistent lobbying for a minimum level of quality that was the key to Rocca's role and to Hingleys' success in Italy. After his retirement, Rocca was granted a pension equal to his annual retainer by Sir George, and he was still in post acting as a consultant at the time of Sir George's death in 1918.

Rocca was succeeded first by Pietro Micheli who died in 1912, and then by Admiral Alfredo Micheli who was based in Rome with an office in Genoa. C E Lloyd who was monitoring the Italian connection by 1912, referred to the admiral in a letter to T & W Smith Ltd of Newcastle, as a gentleman who lived in some style and who was an excellent agent for

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[38] WHC : Sec. 8; GBHPLB, 3 : 11 November 1909, 341.

[39] WHC : Sec. 8 ; DLB, 1 : 22 March 1895, 25.

government work.[40] Lobbying in Italy developed from an insistence on minimum levels of quality, through to pressure to restrict the tender list to the two or three firms capable of doing first class work. This required the frustrating of the spurious propaganda put about by less scrupulous firms in search of a share of the Italian market. By 1913 the Italian government was subject to so much lobbying that it forbade army or navy officers, active or retired, from acting as agents. However, as G C Edwards, the company secretary, noted with satisfaction to Admiral Micheli, the latter had circumvented this rule by appointing his manager, Mr Panzano, as the nominal Hingley agent.[41] This ploy satisfied all parties.

Marketing in Europe : Germany : see Table 7.5

Hingleys had traded with German firms since the days of Noah Hingley himself, and representation was concentrated on Bremen, Hamburg, and Berlin.

During the period under review, Bremen was served by two principal agents. The first was Franz Tecklenborg who retired in 1897 and was thanked by H M Hingley in a warm letter of appreciation for his long association with the firm.[42] Tecklenborg was succeeded by the firm of Ruhe and Trelle in an association that continued right up to the outbreak of war in 1914.

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40 WHC : Sec. 8 ; SLB, 2 : 14 May 1912, 454.

41 WHC : Sec. 8 ; SLB, 4 : 5 December 1913, 178.

42 WHC : Sec. 8 ; DLB, 2 : 14 May 1897, 127.

The agent in Hamburg was Arnold Von Bippen, whose appointment was confirmed by A H Legge in 1895.[43] He was assisted by W Janke who was based in Bremen and whose appointment was confirmed by W B Rumford, the assistant company secretary, in 1910.[44] There was a tremendous rapport between Janke and members of the Hingley firm, with Janke endeavouring to maintain written contacts as late as 1915.

In Berlin the firm was represented by Schulz & Borchers with whom 'Ben' Hingley shared many written dialogues over wage rates for government work, as for example in 1901.[45]

The roles played by these three agents in Germany followed two clear paths. The first was to feed back to Hingleys the economic intelligence of what was in prospect for the growing Imperial Germany Navy and the major commercial fleets. The second was to monitor the workings of the collaborative agreements between Hingleys and the German firms of Hochfelder Walzwerk, Borsig, and Krupp. All these agreements depended on a strict adherence to the sharing of the market based on tonnage, a topic covered in more detail in the next chapter.

Marketing in the rest of Europe : see Table 7.5

Although Italy and Germany provided Hingleys with the bulk of its market share in Europe, there were well established agencies in Spain, France, Austria - Hungary, Holland, Belgium, Norway, and Sweden.

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[43] WHC : Sec. 8 ; DLB, 1 : 21 November 1895, 158.

[44] WHC : Sec. 8 ; SLB, 1 : 20 June 1910, 112.

[45] WHC : Sec. 8 ; DLB, 3 : 16 October 1901, 142.

The principal agent in Spain was based in Madrid with an eye on work for the Spanish Government. George Barrett was appointed as agent in August 1891 according to a letter written to Ramon Aguirre who took over the agency in 1896 on the death of Mr Barrett.[46] At the same time, H M Hingley had an overview arrangement of some kind with Colonel Fernandez in Madrid to work in tandem with both Barrett and Aguirre. Spanish government work must have been very attractive to Hingleys, as the firm paid commissions of 5 per cent on cables ordered, and 2.5 per cent on Halls' anchors, as confirmed to Fernandez.[47] These commissions were double those being paid anywhere else in the world, and would appear to indicate a very profitable line of business in Spain.

In later years the firm was represented by Felix de Urtiago, who was in post in 1911 when G C Edwards was corresponding on commercial matters.[48] In 1914 Edwards referred in correspondence to commission levels of 1 per cent on basic wrought iron, and 2.5 per cent on higher quality iron, commissions more in line with the norm for the trade.[49] Meantime, in Madrid, Juan Meniere had succeeded Aguirre only to die in office in 1912. The death of Meniere was referred to by Edwards when writing to the executors in 1913.[50] No further representation in Madrid appears to have been made before the outbreak of the war of 1914. The role of all the agents had been to obtain or influence orders for ships building anywhere for Spain in the shipyards of Europe.

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[46] WHC : Sec. 8 ; DLB, 1 : 1 September 1896, 240.

[47] Ibid., 1 September 1896, 241.

[48] WHC : Sec. 8 ; SLB, 2 : 20 July 1911, 106.

[49] WHC : Sec. 8 ; SLB, 4 : 18 February 1914, 351.

[50] WHC : Sec. 8 ; SLB, 3 : 20 February 1913, 334.

In France, government policy and its control of many manufacturers effectively prevented any market penetration by Hingleys until the north east of France was overrun by the Germans after 1914. Hingleys, however, had a long term representation in Paris through the firm of Longstaff Ehrenberg & Pollak, going back to the days of sailing ships. Longstaffs' role for Hingleys was to assist in obtaining contracts for foreign work being brokered through France. For example, in 1897, Brazil had warships under construction at Newcastle-upon-Tyne, in France, and in Germany. Hingleys was bidding for all this work through Longstaffs in Paris.[51]

Reference to Table 7.5 on page 7/13 will show the other agents in post in Europe in the period from 1900 onwards. In Holland the agents were Kem Brothers, whose date of appointment is not given in the files, but probably paralleled the German connection with Von Bippen. In Belgium the firm of Hertogs & Wuyts of Antwerp was appointed in 1903.[52] Astrup & Son in Christiana, Norway, had a long association with Hingleys according to G C Edwards.[53] In Sweden the agents were Sjoholm & Svalander of Gothenburg, whose date of appointment is unclear. Representation in Austria-Hungary was initially focused on Trieste, then part of Austria, with a Worcestershire man George Baker acting for Hingleys from before 1908.[54] Then, and only eight months before the outbreak of war in 1914, S Bauer was formally appointed by G C Edwards to procure contracts for the Austrian Navy in the Adriatic Sea.[55]

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51 WHC : Sec. 8 ; DLB, 2 : 23 April 1897, 109.

52 WHC : Sec. 8 ; DLB, 3 : 1 January 1903, 263.

53 WHC : Sec. 8 ; SLB, 3 : 14 May 1913, 423.

54 WHC : Sec. 8 ; DLB, 3 : 9 March 1908, 458.

55 WHC : Sec. 8 ; SLB, 4 : 5 December 1913, 180.

By reference to Table 7.5, it can be seen that Hingleys had an agent in post in every significant maritime nation in Europe.

Marketing in the rest of the world : see Table 7.5

Notwithstanding the concentration of business with Europe and the Colonies, Hingleys maintained long standing connections with Brazil, Chile, Russia, and Japan. Brazil tended to handle its naval requirements through a representative office in Paris, enabling Longstaffs to play a major role in the bidding. During the last quarter of the 19th century Hingleys was represented in Chile by the firm of Rose Innes Cox & Co of Valparaiso. In correspondence with this firm 'Ben' Hingley mentioned Hingleys' involvement of thirty years with Chilean requirements.[56] By 1913 the firm of Hamson & Co, also of Valparaiso, had taken over the agency and were monitored by G C Edwards.[57]

Of all the countries in the world, the one whose market 'Ben' Hingley found most hard to penetrate, apart from the United States, was that of Russia. Some success had been achieved by 1914, but the outbreak of war frustrated what promised to be a useful prospect in St Petersburg. In earlier years Hingley had concentrated his activities, as he had to, on Odessa. This city in the Crimea was the official entrepot for Russia and was founded by imperial fiat in 1798 with the specific role of being the accepted point of trade with the outside world, especially for the grain trade.[58] In Odessa, 'Ben' Hingley's marketing ploy was to use a

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[56] WHC : Sec. 8 ; GBHPLB, 1 : 25 May 1905, 907.

[57] WHC : Sec. 8 ; SLB, 3 : 28 March 1913, 363.

[58] Patricia Herlihy, Odessa : a history 1794-1914, Ukrainian Research Institute Monograph Series (Cambridge, Mass. : Harvard University Press, 1986), xvii & 411.

merchant and an agent in tandem in order to push sales. The merchant was J G Crookston who was required to cover business opportunities as far away as St. Petersburg. In particular, Hingley used Crookston to promote the sale of the Hall's patent anchor, even to the extent of having Crookston arrange for the manufacture of the anchor in St. Petersburg by a local steel works. The market for these anchors was seen as lying with the Russian Imperial and merchant navies, with royalties of 15 per cent to be shared between Hingleys, Halls, and Crookston.[59] The extent of this commercial arrangement is unclear from the files, but the letter of September 1903 clearly indicates that Crookston had a steel works lined up for the work and that a market existed. No doubt the domestic political situation in Russia at the time militated against a meaningful result, but the arrangement was significant for the fact that Hingleys was prepared to sell the design as against the product, which was its normal way of doing business. The agent was A N Bronstein who was in post from at least 1906, according to a letter from G C Edwards in 1913 enquiring about commissions paid between September 1906 and September 1913.[60] In the year 1913 Odessa was still the place in which Hingleys could make real impact due to the large number of ships using the Black Sea. Indeed, when discussing tenders with Bronstein for the outfits for eight new steamers, Edwards aired the possibility of a joint venture facility for cable making in the Crimea.[61]

Last comes Japan, a country visited by 'Ben' Hingley during his world travels before settling down as the resident managing director in

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[59] WHC : Sec. 8 ; DLB, 3 : 9 September 1903, 293.

[60] WHC : Sec. 8 ; SLB, 4 : 24 November 1913, 165.

[61] Ibid., 3 January 1914, 225.

England in or about 1895. The steady growth of the Japanese Imperial Navy in the 1890s attracted his attention and he appointed Captain J M James as his representative in Tokyo. Captain James was probably appointed in 1896 on the evidence of a letter written in January 1897 in which Hingley countered James's thoughts on a commission rate of 5 per cent by suggesting 1 per cent on cables and anchors as being the norm, and 2.5 per cent as generous.[62] Hingley's attention at the time was focused on the prospect of orders for the outfits for several large battleships.

Captain James was succeeded in 1903 by Captain Takayama who was appointed on a five year contract to represent both Hingleys and the Halls Patent Anchor Company.[63] Takayama was succeeded by Dr T Matsuo, who became a long time business associate of Hingleys and whose commission payments from before 1914 and right through the Great War are recorded in the Secretary's Letter Books.

The key to Hingley's successful participation in the Japanese market undoubtedly lay in the appointment of A K Rhoden in 1902 as the resident English agent in Japan, based in Yokohama. Rhoden was a steel man from Sheffield who was appointed as assistant to B K Morton in 1897. In 1902 he split from Morton in a disagreement over money, but because of the high regard in which he was held by 'Ben' Hingley he was made an agent in his own right for the Far East. His initial independent four year appointment was renewed in 1906 for a further three years at a fee of £400 to £500 per annum.[64] Rhoden's role in Japan was to provide the technical appraisals and evaluations that enabled the Japanese agents to

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[62] WHC : Sec. 8 ; DLB, 2 : 6 January 1897, 46.

[63] WHC : Sec. 8 ; GBHPLB, 1 : 16 December 1903, 413.

[64] WHC : Sec. 8 ; GBHPLB, 2 : 24 March 1906, 287.

procure work on Hingley specifications. He remained in Japan until the end of the Great War in 1918.

C E Lloyd's drive for greater agency representation in the period from August 1914 to October 1915

With the advent of war in August 1914 marketing became the province of C E Lloyd. His extraordinary efforts to extend the firm's world wide agency system were in marked contrast to the measured and carefully considered way in which the Hingley brothers had formerly appointed agents. Anticipating a short, sharp war followed by a trade war Lloyd began a world wide drive in search of new markets. His subsequent endeavours during the remainder of 1914 would seem to indicate that he saw distinct trading possibilities in China following the overthrow of the Ching dynasty by Sun Yat Sen in 1911. As will be shown later, he saw the opening of the Panama Canal in 1915 as a marvellous opportunity to trade with the west coast of North America generally. He also saw the overthrow of the old order in Mexico in the 1910s as the opportunity to break the stranglehold of the United States on trade in that region.

In short order, and even before the end of 1914, Lloyd had set in motion a drive to increase or initiate sales representation in South America, Canada, Mexico, Russia, France, and Australia. This was in parallel with moves to strengthen the B J Ackerly agency in Liverpool, to add strength to the Board of the Halls Patent Anchor Company, to enhance the sales efficiency of Harts Hill Ironworks, Sir George's private company, and to effect better representation in South Wales. South America was Lloyd's first target and he had in mind the recovery of certain of Hingleys' former markets with a drive focused on railway work, and

especially the under-frames for wagons and couplings. In this connection he opened discussions with T L Chubb for him to work out of Hingleys' London office in Queen Victoria Street as an adviser to W J Firth its manager. The contract envisaged an initial appointment of one year at a fee of £100 per annum, plus commissions of 0.5 per cent on all iron sold for £9 per ton or less in South America, rising to 1.5 per cent on all iron sold at better than £9.[65] Unfortunately, this scheme foundered in October of the following year when Hingleys was taken over by the government. Lloyd, therefore, had to cancel the arrangement with Chubb.[66]

C E Lloyd's efforts to include Mexico as a market were concentrated on Leo A Gadd of New Jersey, USA, and Mexico City. In August 1914 Lloyd approached Gadd with a view to the latter taking an agency in Mexico. The offer made to Gadd provided for a commission arrangement of 1 per cent on ordinary iron, and 2 per cent to 2.5 per cent on higher grade iron.[67] Regrettably, the idea of extending to Mexico foundered on the extreme political volatility of that country at that time, as Lloyd had to advise Gadd in the following December.[68]

So far two of Lloyd's overseas enthusiasms had proved incapable of realisation, but he persevered with China and Russia. In respect of China he joined The British Engineers' Association and steadily pursued this connection throughout the war. The Russian agency of J G Crookston in Odessa was by now moribund and fresh approaches were made, this time

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65 WHC : Sec. 8 ; DLB, 7 : 22 August 1914, 156.

66 WHC : Sec. 8 ; DLB, 8 : 4 October 1915, 300.

67 WHC : Sec. 8 ; DLB, 7 : 26 August 1914, 168.

68 Ibid., 8 December 1914, 302.

to the Russo-British Chamber of Commerce in Petrograd. Lloyd corresponded there with His Excellency M Basile de Timiriazeff. This exotically named person was the president of the Chamber and Lloyd set out to impress him with the scope of Hingleys' activities in cables, anchors, and wrought iron.[69] Again, this connection was maintained until the course of the war led to the downfall of the old order in Russia.

Australia, perhaps the oldest of Hingleys major export markets, was of particular concern to Lloyd. He was aware of American incursions into that market, but he was particularly concerned about the possibility of German penetration once the war was over. With this in mind he lobbied the Director of the Commercial Intelligence branch in the Board of Trade with a view to obtaining preferential treatment in Australia after the war. This preference was sought for British exporters who had maintained exports to Australia during the war.[70]

In November 1914 Lloyd approached Langstaff, Ehrenberg & Pollak, Hingleys' long time agents in Paris, with a view to extending their traditional activities among sailing ships into a countrywide sales drive.[71] Within days of making the enquiry, Lloyd found it necessary to instruct the London office to enquire of the London Chamber of Commerce as to whether a firm with such German sounding names would remain acceptable in France because of the xenophobia that had gripped Britain over anything German.[72] As the war progressed these reservations were overtaken by events and other agents were appointed.

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[69] Ibid., 3 November 1914, 230.

[70] Ibid., 23 December 1914, 331.

[71] Ibid., 26 November 1914, 271.

[72] Ibid., 8 December 1914, 298.

After the opening of the Panama Canal, C E Lloyd became very interested in the Canadian market. He therefore dispatched William Benjamin Rubery, formerly of H P Parkes, to Canada and the USA in September 1914. This North American visit was a resounding success resulting in the established agents, Drummond McCall of Montreal, being given a wider brief, the appointment of F R Whipple to cover New Brunswick, the appointment of Hugh Calderwood to cover Ontario, and most significant of all the recruitment of W Carlile Wallace of New York as the agent for the eastern United States. This latter appointment was a most fruitful act of recruitment and Wallace developed into a very effective agent right through the war.

Drummond McCall had a long established business in Montreal and Lloyd now encouraged them to look wider to the Great Lakes and the opportunities arising there as the new power house of American industry.[73] F R Whipple of Whipple St, West St John, New Brunswick, was appointed as agent of New Brunswick and Prince Edward Island.[74] Hugh Calderwood of Barrie, Ontario was appointed in early February 1915 with a brief to push cables and anchors for a commission of 5 per cent with the strict proviso that he did not encroach on the preserves of Drummond McCall.[75] W Carlile Wallace's appointment was in gestation somewhat longer than the others. As Wallace was a foreigner, Lloyd decided to check his references with J Howden & Co Ltd, of Glasgow.[76] He was also unhappy about Wallace representing Hingleys from the front parlour of his home. Wallace duly took a small office in respect of which Lloyd

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[73] Ibid., 4 February 1915, 413

[74] Ibid., 21 December 1915, 328.

[75] Ibid., 4 February 1915, 422.

[76] Ibid., 4 February 1915, 348.

granted an allowance of £25 per annum with effect from 1 April 1915.[77] The actual offer to Wallace was made in February 1915, and was conditional on his taking a proper office. He was required to effect representation in the US navy yards at Boston and Newport, and on Lake Erie. Commission rates were to be 2.5 per cent on ordinary cable and anchors; 5 per cent on high class chains, and cables and anchors where he obtained the naming of Hingleys in the specifications; and 1 per cent in the general, highly competitive market.[78] The association with Carlisle turned out to be highly successful as American navy cables were of very indifferent quality. The success of Hingleys' cables in America, as a result of the war, owed much to the great accord achieved between Lloyd and Wallace.

Lloyd's first new domestic appointment of the war was that of John C Penn of Penn & Co, Cardiff, with an agency to cover Cardiff and Newport for cables and anchors.[79] In October 1914 he grasped the nettle of the lightweight representation in Liverpool by B J Ackerley by appointing the Marine Engine Auto Control Co Ltd, of Liverpool, as assistant agents to work in tandem with Ackerley.[80] Once this arrangement had settled down, with Robert A Sydney in post, Lloyd formally advised Ackerley that under the new scheme of things he wanted him to be styled manager and not agent.[81]

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77 WHC : Sec. 8 ; DLB, 8 : 28 June 1915, 146.

78 WHC : Sec. 8 ; DLB, 7 : 5 February 1915, 424.

79 Ibid., 22 August 1914, 154.

80 Ibid., 30 October 1914, 225.

81 Ibid., 15 January 1915, 385.

At the Halls Patent Anchor Company, Lloyd added to its profile with the appointment of Captain P D Murray of Liverpool in September 1914.[82] In November, when commiserating with Murray over the loss of three contracts to Byers, Lloyd mentioned the heavy orders received from the Admiralty, and from the Italian government.[83] December had barely dawned before Lloyd was discussing with Murray the extraordinary rush in the shipbuilding market. The firm was deluged with work and by the sheer volume and pressure of Admiralty work that had taken it completely unawares.[84]

Such was this surge of work that Sir George felt sufficiently confident to encourage H Bertram Hingley, his cousin at Harts Hill Ironworks, to appoint a representative in London. Sir George was confident that £9 000 of business could be done per annum, justifying a man at £300 plus 3 per cent commission.[85]

The extraordinary drive by C E Lloyd to achieve greater agency representation during this period is summmed-up and illustrated in Table 7.7.

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82 Ibid., 7 September 1914, 182.

83 Ibid., 24 November 1914, 265.

84 Ibid., 2 December 1914, 282.

85 Ibid., 12 December 1914, 314.

Table 7.7 : C E Lloyd's extraordinary drive between August 1914 and October 1915 to achieve greater market penetration especially in the Americas

NAME	LOCATION	MARKET	DATE OF APPOINTMENT
T L Chubb	S America generally	Railway work	August 1914
L A Gadd	Mexico	Wrought iron and Railway work	August 1914
Russo-British Chamber of Commerce	Petrograd	Cables, anchors, and wrought iron	November 1914
Drummond McCall	Montreal	Wrought iron and railway work	Before 1914
F R Whipple	New Brunswick	Wrought iron and cables	December 1914
H Calderwood	Ontario	Wrought iron and cables	February 1915
W Carlile Wallace	New York	Cables, anchors, and wrought iron	April 1915
Penn & Co	Cardiff	Cables and anchors	August 1914
The Marine Engine Auto Control Co Ltd	Liverpool	Cables and anchors	October 1914
Capt. P D Murray	Liverpool	Cables and anchors	September 1914

A comparison of the commissions earned by B K Morton in Australia, T Matsuo in Tokyo, Scott Piercy in J'Burg, and W Carlile Wallace in New York, goes some way towards demonstrating the successful penetration by C E Lloyd of the US market during the Great War. Those commissions are shown in Table 7.8

Table 7.8 : Commissions paid in sterling pounds to certain overseas agents, 1914-1918

AGENT	1914	1915	1916	1917	1918
B K Morton	319	249	542	98	193
Scott Piercy	125	93	156	212	193
T Matsuo	-	-	285	174	360
W Carlile Wallace	-	-	-	176	870

Source of information : the Secretary's Letter Books 4 and 5 covering the quarterly payments to overseas agents.

C E Lloyd's incursion into the French market in 1917, coupled with other activities in 1917 and 1918 aimed at the post war world

After many pre-war years of being excluded from France by the policies of its government, Hingleys was now enjoying the new market that had been created there by the war. P Isnard's agency had been renewed in November 1916 and in early 1917 C E Lloyd approached The Welin Davit & Engineering Co Ltd, in London, with a view to its selling top specification work in France for vessels under construction there. A commission of 2.5 per cent would be payable on the top classes of iron, scaling down to 1.5 per cent or 1 per cent on ordinary qualities.[86] Lloyd advised Welins that the scope of work in mind was government vessels of some 7 500 tons requiring 23/16" cables and anchors to a value of £1 150 and mail boats with outfits to a value of £2 400.[87] The formal appointment followed in February and was for a period of one year

[86] WHC : Sec. 8 ; DLB, 10 : 9 January 1917, 60.

[87] Ibid., 18 January 1917, 71

from 1 January 1917 with a Mr Paul de Raine as the local representative. The agency was required to target all passenger boats and cargo boats over 5 000 tons. The commercial susceptibilities of Langstaffs of Paris, Marius Jullien of Marseilles, and Paul Isnard of Paris, were to be respected.[88]

Developments in the United States were also encouraging. During 1916 Sir George had renewed a connection going back some twenty years with Bradlee & Co, of Philadelphia; and W Carlile Wallace was building such a good portfolio of work that C E Lloyd suggested he employ sub-agents to meet competition from other British firms who had heard of Hingleys' successes.[89] A further development also took place over the long awaited possibilities on the west coast of North America. B J Ackerley had put forward the name of Balfour Williamson & Co, as agents for the west coast, only to be met by a guarded response from C E Lloyd on the grounds that they were merchants.[90] However, after three months of negotiation on the precise mechanics of representation, Lloyd appointed Balfours as agents on the basis of a merchant's commission or discount of 2.5 per cent.[91] This development of the United States market, after so many years of exclusion, was particularly pleasing for the whole firm. G F Simms, who was in charge of cable and anchor production, could not disguise his pleasure when discussing the American market with Thomas Hardie of the agents in Glasgow. He commented particularly on the fact that the United States was now looking to the United Kingdom for cables and anchors as it was unable to produce ships' cables of

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88 Ibid., 6 February 1917, 101.

89 Ibid., 13 April 1917, 237.

90 Ibid., 16 April 1917, 240.

91 Ibid., 26 July 1917, 447.

acceptable quality. Indeed, the scale of business was such that Britain was unable to progress through the test houses the quantity of cables demanded by the massive growth in US ship construction.[92]

Regrettably, and notwithstanding the euphoria over developments in the French and American markets, the Italian position remained a very sore point in the firm. Sir George, when exchanging new year greetings with Admiral Micheli, confided that his colleagues were of the opinion that Sir George was more interested in his work for the Italian government than in his work for the British Admiralty. This was a particularly aggravating point as the Italian government would not settle its debts.[93] H J Peart was particularly aggressive on this matter a month later when reminding Micheli that debts of £4 312.4.7 went back to June 1916.[94]

In the Orient, a new agreement was made with Dr Matsuo in May 1917 to be retroactive from 1 January 1917 for work in the very buoyant market in Japan.[95] This buoyancy was not without its problems as the British authorities had temporarily prohibited exports to Japan notwithstanding its status as an ally. This created a most unusual problem for H J Peart over finance as he was forced to confide to the Hong Kong & Shanghai Banking Corporation. Hingley's clients in Japan, in order to take advantage of the currency markets, had deposited £8 000 in advance of receiving ordered material that could not now be delivered.[96] This

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92 Ibid., 14 July 1917, 406.

93 WHC : Sec. 8 ; GBHPLB, 5 : 12 January 1917, 46.

94 WHC : Sec. 8 ; DLB, 10 : 14 February 1917, 116.

95 Ibid., 18 May 1917, 305.

96 Ibid., 12 June 1917, 345.

put Hingleys in a situation that was, for them, unique! On the other side of the coin, the decision by A K Rhoden to leave Japan on 31 October 1917 took C E Lloyd by surprise coming so soon after the offer of a ten year contract. The move had an added piquancy as Rhoden had accepted an offer from Sanderson Brothers & Newbould to join them in their London office.[97] The piquancy arose from the fact that Lloyd was in negotiation with the very same firm over a new venture in South America. In the event Rhoden agreed to extend his stay in Japan and by agreement with Sandersons he saw out the war for Hingleys. Before the end of the year Lloyd admitted defeat over Russia, having to advise B Courtney & Co. Ltd., with whom he had been in negotiation that under the circumstances prevailing there he could not contemplate doing business.[98] The emphasis then switched to South America with C E Lloyd discussing with Hingleys' old Australian colleagues, T & W Smith of Newcastle, the merits of joining forces with Sanderson Brothers & Newbould, who were crucible steel makers in Sheffield, in a South American venture.[99]

In August 1917, and in a rare sombre mood, C E Lloyd speculated to R A Sydney at the Liverpool agency as to whether agencies were needed any more now that Industry was entirely in government hands.[100] At this stage of the war the very real burden of the government's insatiable demands for tax revenues, coupled with the dead weight of ever increasing ministerial bureaucracy, was having a damaging effect on the morale of the management team. A case in point arose from the demands

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97 Ibid., 18 May 1917, 303.

98 WHC : Sec. 8 ; DLB, 11 : 14 November 1917, 83.

99 Ibid., 15 November 1917, 89.

100 WHC : Sec. 8 ; DLB, 10 : 1 August 1917, 457.

placed on Hingleys, by the government, to sell forward for eighteen months or two years virtually unlimited quantities of cable. As H J Peart pointed out very forcefully to the Commissioner of Inland Revenue, also in August, this meant holding large stocks of finished cable at the works to meet the demands dictated by the successes of the German U-Boats and by the fears of the government.[101]

Notwithstanding the acute attack of self doubt that affected C E Lloyd in August of 1917, he recovered his equilibrium later in the year and he pressed on with every activity that offered a meaningful result for the firm. During 1917 he had become convinced that the British Engineering Association would be a key factor in post war marketing and he took every opportunity to take space in its directories. The original focus of the BEA on China had now broadened into a world wide sphere of interest.

In France he renewed the agency agreement with Paul Isnard with effect from 1 January 1918. Isnard's commissions were to be 3.75 per cent on the first FF100 000 of business, and 5 per cent thereafter. By way of assisting with monthly out goings, FF600 per month was to be paid on account.[102] The high level of incentive offered by Lloyd reflected his interest in the continuing French market arising from the war.

In Japan, C E Lloyd effected a renewal of the pre-war agreements with the Kobe Steel Works for the manufacture of Hall's anchors in Japan, thus eliminating possible local competition. He effected a similar renewal with the Osaka Chain Manufacturing Company in respect of ships

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101 Ibid., 10 August 1917, 473.

102 WHC : Sec. 8 ; DLB, 11 : 1 January 1918, 202.

cables. Lloyd confirmed these renewal arrangements to The Hong Kong Bank in Yokohama who were appointed to act for Hingleys in the collection and onward remittance of the cash proceeds arising from these two commercial alliances.[103]

In Spain, C F Simms began a dialogue in April 1918 with Felix de Urtiaga on the possibility of setting up a local facility for the making of small chain up to 1" diameter.[104] This possibility remained of sufficient interest to warrant a Board's expression of intent once the war was over. However as Simms had to caution, nothing could happen before the end of hostilities as the export of funds was forbidden.[105]

C E Lloyd thus saw out the war with his marketing strategy in place for the peace. He had agents in position in all the key markets of the world, including America. The only void in his plan concerned Germany, but in the peace that followed there was little scope for Germany to enter the arena of major shipbuilding as it had in the 1900s.

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[103] Ibid., 8 May 1918, 356.

[104] Ibid., 18 April 1918, 316.

[105] Ibid., 20 August 1918, 492.

A summary

The Hingley method of marketing was developed into a sophisticated operation during the period under review. This sophistication arose from the ability of the Hingley brothers to tailor their methods to suit the needs and demands of the individual markets being served. In the United Kingdom the system devised was one of direct selling of anchors and ships' cables to the ship constructors by agents placed in the key shipbuilding areas. These agents must have been assisted in carrying out their role by the intelligence gathered by the Hingley brothers through the Sheffield connection of John Brown, Cammell, and Vickers. This especially after these firms acquired major shipbuilding interests on the Clyde, on the Mersey, and in Belfast. General ironwork was handled through the conventional merchanting channels.

Marketing in the Empire, and in other countries in the Far East and in South America, was handled by a judicious mix of London agents, with overseas connections, supplemented by dedicated agents located adjacent to the markets. In most other countries marketing was effected through dedicated agents who were chosen to match the culture of the country concerned. Thus, in Spain, Italy, and Japan, the preferred agent was an officer of some independent means. In Russia the preference imposed by circumstances was the use of a merchant and agent acting in tandem. In northern Europe generally the marketing strategy was based on a collection of agents of reputation but limited initiative. The exception to this, of course, was Germany. Here, Hingleys enjoyed the services of several exceptional agents. Most notable were Von Bippen and his colleague Janke whose roles were to monitor the quasi-cartel

arrangements that Hingleys enjoyed with a succession of German firms over ships' anchors and cables.

Thus, by the end of the Edwardian era, Hingleys had in place a system of marketing that guaranteed that in all normal circumstances its entire production could be sold at a fair price. The outbreak of war in 1914 was the catalyst that placed all marketing under the control of C E Lloyd. It was he who constructed, in a few short months in 1914, the basis for the new market opportunities in North America. In addition, he rationalised all the marketing systems he had inherited to reflect the new commercial realities of the time, and he brought the firm out of the war with its marketing strategy in place for the peace.

For a firm of somewhat modest proportions its international eminence, and its grasp of marketing as the senior partner of production was remarkable for the times.

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For a firm of somewhat modest proportions its international eminence, and its grasp of marketing as the senior partner of production was remarkable for the times.

PART FOUR : MANAGING THE ENVIRONMENT

CHAPTER EIGHT : RELATIONS WITH OTHER FIRMS, COMBINATIONS AND QUASI-CARTELS

An overview

From 1890 to 1910 the Hingley firm developed strategies and tactics to cope with the volatility of industrial demand that was such a feature of the domestic market. Unlike certain of the major defence contractors who were compelled to enter into mergers or amalgamations by the vacillations of the procurement department of the Admiralty or by the fluctuations in demand for merchant shipping, Hingleys was able to maintain its independence. These mergers were needed in order to build a capital base large enough to withstand the fluctuations and pressures of the market. As mentioned in chapter two, the leading mergers in arms and shipbuilding were between Vickers and Maxim in 1905 to give a capitalisation of £7 440 000, between Armstrong & Whitworth in 1897 to achieve £5 316 000, and between Cammell and Laird in 1903 to give £2 623 000.[1] Hingleys, however, with its modest capitalisation of £250 000 in 1890, rising to £300 000 in 1915 was able to keep its independence and achieve a hegemonic position in the cable and anchor trade by a series of alliances that were altered and adapted to suit the times.

In essence the Hingley strategy was to enter into alliances or combinations with other cable makers or anchor smiths in order to cope with the mini-booms that were a feature of the period. At the tactical level these combinations were varied, even to the extent of combining

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[1] Payne, The Emergence of the Large Scale Company, 539.

with bitter rivals if circumstances warranted this action. Hingleys' alliance with John Brown, which firm had a capitalisation of £2 947 000 in 1905, was very different from those with fellow cable makers. Here the alliance, resulting in the joint venture company British Machine Made Cable, was a frustrated endeavour to stay in a market that by the late 1900s seemed to be on the verge of domination by machines.

Overseas, Hingleys had a long standing alliance with Henry Wood of Chester that enabled the firm to dominate the significant Italian market. Its classic overseas alliances were, however, with the German firms of Hochfelder Walzwerk, Borsig, and Krupp. These alliances, invariably clandestine in nature, were regarded by H M Hingley and Sir George Hingley as the most significant of all their overseas adventures. They resulted in Hingleys holding a dominant position in the cable and anchor trade with Germany from 1895 right through to the outbreak of war in August 1914.

The domestic alliances

The Chain Makers' Association, with its headquarters in Cradley Heath adjacent to Netherton, had a membership of some twenty seven firms in 1916. Of these only fourteen were ranked as true cable makers on the basis that they made cables of 1¼" in diameter and upwards. These fourteen firms are shown in table 8.1 on page 8/4, and were referred to in correspondence with the Lloyd's Register during the Great War.[2] In the 1890s and 1900s the first seven firms shown in the table, being five from the list of 1916 together with George Hartshorne who had merged with his next door neighbour Hingleys in 1908, and Jno Abbott whose firm

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[2] WHC : Sec. 8 ; DLB, 9 : 24 March 1916, 112.

had failed in 1909, were the ones from among whom Hingleys formed its principal combinations between 1890 and 1910.

From time to time Hingleys included the four firms in the second group in the table, but only when absolute need compelled this. H P Parkes and Brown Lenox were regarded as unscrupulous competitors in the Italian market, and R Heath was viewed with disfavour over its pricing and quality standards in Australia. The seven firms in the third group were never invited to join Hingleys in a formal trade alliance as far as can be judged from the files, with the exception of Richard Sykes.

The last name in the table, W L Byers, was to all intents and purposes one of Hingleys' major competitors in anchor making. However, after the astonishing preference shown by the Admiralty for the Wasteneys Smith anchor from 1905 onwards, Hingleys and Byers formed ad hoc alliances to dominate the domestic market.

Table 8.1 : Domestic chain makers and anchor smiths from among whom Hingleys formed its domestic alliances

Name	Location
N Hingley & Sons	Netherton
George Hartshorne	Netherton
Samuel Taylor & Sons	Brierley Hill
John Green	Old Hill
Earl of Dudley's Round Oak Steelworks	Brierley Hill
Jno Abbott	Gateshead
Henry Wood	Chester
H P Parkes	Tipton
Brown Lenox	Millwall & Pontypridd
R Heath & Sons	Stoke-on-Trent
Waverley Iron Company	Coatbridge
N Bloomer & Sons	Quarry Bank
Fellows Bros	Cradley Heath
William Griffin & Sons	Cradley Heath
Jones & Lloyd	Cradley
Richard Sykes & Son	Cradley Heath
Jos Wright	Tipton
Woodhouse Bros	Cradley Heath
W L Byers	Sunderland

The three alliances of 1895 to 1900, including the first grand alliance of 1897

During the dramatic rise in industrial activity from 1895 to 1900, Hingleys entered into no less than three alliances or combinations in which the acceptability of the other participants changed to suit the conditions of the trade. The first of these, as recorded in the files, was an alliance formed with Henry Wood in 1896 and was aimed at dominating the Italian market on the two principles of quality combined with a fair price. A specific aim of the alliance was the elimination of Brown Lenox and H P Parkes from the Italian market. 'Ben' Hingley nurtured a particular animosity towards H P Parkes because of the

latter's alleged reputation for attempting to dump chain that had been rejected by the British Admiralty on the Italian market. This specific accusation was made in June 1895 to Major Rocca, Hingleys' agent in Spezia, in connection with the tenders for the Carlos Alberto warship.[3] This animosity was exceptionally fierce, probably because Noah Hingley and Henry Purshouse Parkes had formed the Staffordshire Public Chain and Anchor Testing Company in 1868 to maintain the highest quality of chains and cables in the Black Country. Two generations later, Noah Hingley's firm still maintained the highest quality of product. The H P Parkes's directors did not appear to be as high principled according to 'Ben' Hingley.

The mechanics of the alliance between Hingleys and Henry Wood was very simple in that the two firms agreed to take turns over the structuring of their bids for Italian naval work. 'Ben' Hingley, when writing to Major Rocca in January 1897 on the subject of the tenders for the Puglia, outlined the Henry Wood method of tendering so as to beat Brown Lenox. This involved the preparation of three quotations: the first was the official one, the highest and the proper tender; the second was a tender with a 1% discount off the anchors; the third was a tender with 1/- per cwt off the anchors and a 'good' reduction off the cables.[4] The agent then had use options two and three if the official tender was not sufficiently competitive to get the order.

The importance of the Italian navy work was confirmed by 'Ben' Hingley to Major Rocca in December 1896 when expressing concern at the lack of success with recent tenders.[5] Early in 1897 Hingley wrote again to

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[3] WHC : Sec. 8 ; DLB, 1 : 12 June 1895, 67.

[4] WHC : Sec. 8 ; DLB, 2 : 13 January 1897, 51.

[5] Ibid., 29 December 1896, 37.

Rocca with the disturbing news that, whereas Henry Wood had put forward two tenders for the Puglia, Brown Lenox had secretly submitted three tenders.[6] At this stage Hingley then pressed Rocca to play his trump card: the Italian naval authorities were to be made fully aware that their specification called for good quality chain, but that second class chain was being put forward by Hingleys' competitors.[7] The second alliance, also with Henry Wood, was for the British domestic market and it worked in parallel with the arrangements covering Italy. Its creation resulted directly from the sudden upturn in shipbuilding activity that took place between 1895 and 1900.

The first of Hingleys' grand domestic alliances was formed in 1897 and it was created specifically to cope with the sheer volume of work on the market. No less than eight firms joined the combination as 'Ben' Hingley liked to call it. The mechanics of the exercise were quite simple in that the group aimed for the larger sizes of cables where manufacturing capability was limited to a few firms. Contracts were obtained by the submission of agreed bids and the work was shared out by balancing the weights of orders over a period of time. The members of the 1897 combination, as identified in a letter from 'Ben' Hingley to Jno. Abbott, were N Hingley, George Hartshorne, Samuel Taylor, Jno Green, and the Earl of Dudley's Round Oak Steelworks, all of the Black Country; and Henry Wood of Chester together with Jno Abbott of Gateshead. The eighth member, surprisingly from one point of view, was H P Parkes.[8]

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[6] Ibid., 15 January 1897, 53.

[7] Ibid., 20 January 1897, 58.

[8] Ibid., 3 January 1898, 198.

The second grand alliance of 1902

In 1902 the grand alliance of 1897 collapsed in the wake of a fall in business activity from a peak of 104.4 in 1899 to 95.2 in 1903. In its place Hingleys formed a more widely based alliance in which only three of the earlier members were represented. These were N Hingley and H P Parkes from the Black Country with Henry Wood from Chester. The new members were R Heath & Sons from Stoke-on-Trent, The Waverley Iron Company from Coatbridge, and Brown Lenox from Millwall and Pontypridd.[9] This new alliance during the depressed years from 1902 to 1905 was obviously created to cover most of the major manufacturing areas in Britain. Its members were listed by 'Ben' Hingley in a letter to Maclean Fyfe & Maclean, Scottish solicitors involved in problems over trademarking in Rangoon. Of particular historical significance is the fact that this combination included the three manufacturers of the most celebrated wrought irons ever produced by the British trade. These were Hingleys' wrought iron known as Netherton Crown Special Best Best, Henry Wood's Snedshill Extra Best Best, and H P Parkes's BBH Special Best Best through its recent acquisition of Bradley Barrow & Hall, also of Tipton[10]. Henry Wood was not happy with some of the company he was now keeping and quickly left the combination.[11] The alliance itself had broken up by 1903.

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9 WHC : Sec. 8 ; GBHPLB, 1 : 9 October 1902, 20.

10 Ibid., : 16 February 1903, 174.

11 Ibid., : 28 November 1902, 76.

The mini-alliances of 1903 and 1904

With the collapse of the grand alliance of 1902 the Hingley firm entered into three mini-alliances to cope with the aftermath of the depressed conditions of 1903 to 1904. Two of these alliances were aimed at the anchor trade and were the means by which Hingleys mitigated its loss of anchor work for the Admiralty. The third alliance was aimed at ending the traditional rivalry between the ironmakers of South and North Staffordshire.

The first of the anchor trade alliances began in 1904 and was formalised in February 1905. It was between N Hingley as the manufacturer of the Hall's patent anchor, Henry Wood of Chester, and a third party whose identity is not disclosed in the correspondence. This combination provided for arranged tenders with the selected successful bidder paying the other two firms a share of the profit.[12] The second alliance was with William Lumsden Byers the celebrated anchor designer from Sunderland. It was aimed at the anchor market in the shipyards of the north east of England and of Scotland. This alliance too was formed in 1904 with 'Ben' Hingley corresponding on a personal basis with W L Byers with regard to arranging contracts with Armstrong Whitworth at the Elswick yard in Newcastle.[13] The alliance was very successful and, as it was aimed at the general trade, 'Ben' Hingley was able to involve his near neighbour George Hartshorne to cope with the sheer volume of work obtained.[14] This volume of work effectively offset the loss of navy

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12 Ibid., : 17 February 1905, 831.

13 Ibid., : 15 June 1904, 595.

14 WHC : Sec. 8 ; GBHPLB, 2 : 28 August 1905, 10.

work that is discussed elsewhere. The operational mode of the alliance was for the markets to be targeted to be the Elswick yard in the north east and the Vickers yard at Barrow. The tendering strategy as agreed between Hingley and Byers was the simple one of using cover prices, with the firms taking the contracts on a turn and turn about basis.[15] Added to this was the agreement under which Hingleys undertook not to quote below a certain figure in the north east, with Byers reciprocating in Scotland and Ireland. The minimum prices agreed were 20/- per cwt for anchors delivered to shipbuilders in Scotland and Ireland ; and 15/- per cwt for anchors delivered to shipbuilders in the north east.[16] All in all it was a most satisfactory alliance for Hingleys, but W L Byers died in December 1906 and the alliance did not survive the catastrophic collapse of the market in 1908. The accord between N Hingley, in the Worcestershire enclave in South Staffordshire, and R Heath & Sons of Stoke in North Staffordshire, was reached in September 1905. The alliance was aimed at raising the price of iron by 5/- per ton and it resulted in the prices of the two areas coming into harmony.[17] Under the alliance, Hingleys and Heaths, who were strong rivals in Australia and the Orient, were able to raise the prices of the North Staffordshire iron and present a united front to the market.[18]

The third and final grand alliance of 1904

With the upturn in industrial activity 'Ben' Hingley formed his third and last grand alliance towards the end of 1904. This alliance was larger than either of the preceding ones of 1897 and 1902, involving

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15 WHC : Sec. 8 ; GBHPLB, 1 : 8 July 1904, 634.

16 Ibid., 12 January 1905, 797.

17 WHC : Sec. 8 ; GBHPLB, 2 : 25 September 1905, 41.

18 Ibid., 8 January 1906, 197.

some ten firms styling themselves The Cable and Anchor Makers' Association according to a circular letter from Sir George to prospective participants.[19] Seven of the firms came from the Black Country and were N Hingley, George Hartshorne, Samuel Taylor, John Green, the Earl of Dudley's Round Oak Steelworks, H P Parkes, and a newcomer R Sykes. The other three were Henry Wood of Chester, now back in the fold, Jno Abbott of Gateshead and Brown Lenox of Millwall and Pontypridd. This alliance did well during the short boom of 1906 and 1907 that ushered in the era of the really big ships. It disintegrated completely in the business collapse of 1908. Of its members George Hartshorne merged with N Hingley as a natural consequence of its joint activities. H P Parkes was saved from collapse by financial assistance from Hingleys, Jno Abbott collapsed into liquidation, and the Pontypridd works of Brown Lenox were acquired by Hingleys. No further national alliances were attempted by Hingleys, but greater reliance was placed on assistance from within firms in the Black Country many of which in later years were absorbed into the Hingley firm.

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[19] WHC : Sec. 8 ; GBHPLB, 1 : 17 January 1905, 803.

Hingleys' joint venture with John Brown, a major constructor, aimed at providing cables by machine

The joint venture between John Brown & Co Ltd., capitalised at £2 947 000, and N Hingley & Sons Limited, capitalised at £250 000, has to be seen as one of the most unusual alliances of the period. It was between a major constructor and a major supplier and it created a company known as the British Machine Made Cable Co Ltd. It was a company that in its short active life succeeded in raising more questions than could be answered as to the commercial judgement of its founders.

Interest in the possibility of producing cables by machine was shown by Hingleys during the depressed period of 1903 and 1904. The growing militancy of labour, coupled with increased labour costs, coincided with news of dramatic developments in Belgium where machines had been produced that could manufacture satisfactory ships' cables. The interest of 'Ben' Hingley and H M Hingley was conveyed to L'Société Générale du Laminage Annulaire in Brussells at Easter 1904.[20] As the name implies, Laminage Annulaire specialised in rolling machines that provided ring shaped products. Laminage was also in negotiation with W L Byers of Sunderland, from whom Hingley may well have heard of the process and Hingleys and Byers made a joint approach to Laminage with a view to taking a licence to use their Masion process. Byers was interested in cable up to 25/16" diameter, while Hingley was interested in 3", 4", and even 6" diameter cable. Within a month Hingleys realised that the process was not one that would justify a joint venture with Byers.[21] The basic flaw at this stage was that under the Belgian

[20] Ibid., 2 April 1904, 508.

[21] Ibid., 13 May 1904, 566.

process flat iron was reheated and converted in the machine to a round section. This reheating had an adverse effect on the elasticity of the cable. The traditional British method where the cable was made from rolled iron bar ensured completion in one process.

Still intrigued by the possibilities of the machine process, Hingleys then approached L'Homogène Société Anonyme Internationale, also of Brussells, for details of their machine.[22] L'Homogène was also known to John Brown from whom the point of contact may well have come. Hingleys interest was further enhanced by the collapse of industrial activity in 1908, one of the consequences being to question the capability of the industry to continue with the production of cables by hand. Thus, and before the end of 1908, C E Lloyd who had also taken an enthusiastic interest in the machine process wrote to L'Homogène confirming that a joint venture company with a capitalisation of £100 000 was in the process of formation with new works at Netherton. The new company, BMMC, would manufacture cables using the Girlot process of L'Homogène.[23]

The way in which two highly respected firms such as N Hingley and John Brown were able to put together a company that was fatally flawed from inception almost beggars belief. L'Homogène was obviously put out by the news that the joint venture with John Brown also planned to use the Masion process of Laminage in addition to L'Homogène's Girlot process. H M Hingley had to write a very conciliatory letter to L'Homogène in which he stated that the alliance with John Brown was not intended in any way to downgrade the Girlot process of L'Homogène. Rather, and as he had to point out, John Brown had been using Laminage's Masion process

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22 WHC : Sec. 8 ; DLB, 3 : 4 July 1907, 432.

23 WHC : Sec. 8 ; DLB, 4 : 13 November 1908, 18.

on a working basis for some time, whereas the Girlot process was still in the proving stage. Both processes were to be used by the new company, BMMC, but Hingley was of the opinion that the Girlot process of L'Homogène would provide the cheaper cable. He further thought that, as John Brown were not cable makers as such, both processes, Girlot and Masion, should be allowed to prove themselves in the market.[24] In actual fact, neither the Masion nor the Girlot processes had ever been proved under British working conditions; and John Brown's experience in its early use of the Masion machine had not been without problems. In the event, notwithstanding the outstanding skills of J E Fletcher, Hingleys' gifted designer, BMMC never did succeed in operating either the Girlot or the Masion process to the potential claimed by the inventors.

Quite what prompted the Hingley management to commit itself so whole-heartedly of making cables by machine is not easy to determine. Hingleys enjoyed the best of raw materials and the best of labour in a process in which it was pre-eminent in the world. Undoubtedly, the sheer trauma of the business collapse of 1908 must have distorted the judgement of the Hingley team. It was probably the desire to be less dependent on manual labour, coupled with the way in which rumour feeds on rumour that caused to Sir George to panic in 1908 and to embrace machine manufacture as the only way to continue in the cable making business. In March, as he said to B J Ackerley, his agent in Liverpool, he had been taken aback at not being asked to quote for three new vessels for Holts and he surmised that the new fangled machine made cables had something to do with this.[25] Then, in the same month, after

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[24] WHC : Sec. 8 ; DLB, 4 : 22 November 1908, 26.

[25] WHC : Sec. 8 ; GBHPLB, 2 : 11 March 1908, 863.

thirty years of supplying cables to the Brazilian government, Sir George confessed himself completely 'bowled out' by that government's decision to use an experimental method for cables when unburdening himself to George Carter at the Armstrong Whitworth yard at Elswick.[26] Before the month was out, Sir George was either in a state of complete funk or he was seeking to confuse his rival Brown Lenox, while engaged in negotiations to acquire its plant at Pontypridd, when he made the amazing statement that the future was so bleak for all engaged in the manufacture of hand made cables that nothing could stop machine made cables; and that the Hingley workshops would become scrap.[27] The ultimate irony lay in the fact that the very company that was frightening the wits out of Sir George was none other than John Brown. Notwithstanding Hingleys' close links with John Brown, that firm had decided to break Hingleys' near monopoly of Brazilian government work and was not even a recognised cable maker. As Sir George later told W H Ellis at John Brown, the loss of the Brazilian order after 30 years of supplying that government was a severe blow, notwithstanding the fact that Hingleys had kept the anchor order. Sir George identified patent machine made cables as the reason.[28] Hingleys' total commitment to the concept of machine made cables reached its peak when BMMC, through John Brown, obtained the order in 1910 to supply the cables required by the White Star line for the S S Titanic.

Hingleys and John Brown, having made peace and having set up a new works in Netherton equipped with both the Girlot machine of L'Homogène and the Masion machine of Laminage, found that in the event they could not

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[26] Ibid., 21 May 1908, 915.

[27] Ibid., 30 May 1908, 934.

[28] Ibid., 4 June 1908, 937.

produce acceptable cable in the sizes required. Very soon the whole enterprise fell into disarray, not helped by the poor trading conditions of the time. As Hingleys advised L'Homogène, the main work-force refused point blank to cooperate in the essential hand finishing that was called for; and the labour employed in the BMMC works was unable to cope with the running processes of the furnaces.[29] When the two Belgian firms discovered that they had very different Royalty agreements, with L'Homogène on a minimum royalty of £1 800 per annum and Laminage on £2 250, relations with BMMC became extremely fraught. As Hingleys stressed to John Brown, this state of affairs was exacerbated by the fact that BMMC could not achieve even the minimum figures projected in the original agreement.[30]

By the end of 1910 the short working life of BMMC was over. Contrary to persistent rumours, the Admiralty declined to order machine made cables. On this basis alone the Spanish government declined to accept such cables for its three warships under construction at the Vickers yard, as Hingleys advised John Brown.[31] The Brazilian government followed suit over its two ships under construction with Vickers and Armstrong Whitworth. Even John Brown's coup, in obtaining the order for the cables for the S S Titanic in 1910, came to naught. BMMC could not manufacture the 3 3/8" diameter cables required and C E Lloyd took the decision in January 1911 to effect the manufacture by conventional means.

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29 WHC : Sec. 8 ; DLB, 4 : 5 August 1909, 84.

30 WHC : Sec. 8 ; GBHPLB, 3 : 19 March 1909, 151.

31 WHC : Sec. 8 ; DLB, 4 : 16 June 1910, 158.

Thus, the joint venture came to an end. Hingleys, as the owner of the site on which the works had been erected, acquired John Brown's half share of the equity. Hingleys notified its solicitor, W Shakespeare, that C E Lloyd, G C Edwards, and W B Rumford, had become the new directors in October 1911.[32] The company then ceased trading. The enterprise had lasted a little over three years and did not trade again within the period covered by this study.

The alliances with the German firms of Hochfelder Walzwerk, Borsig, and finally with Krupp

The German alliances began in 1895 with a clandestine arrangement between Hingleys and Hochfelder Walzwerk. They were to continue in one form or another right up to the outbreak of war in 1914. Commercially the alliances were very significant in monetary terms for Hingleys. For the German firms, their significance lay in the fact that they were enabled to equip the rapidly expanding merchant marine and the Imperial German Navy with first class outfits of cables and anchors. Even at a time when Germany was overtaking Britain as an industrial nation, no German firm had first class skills in the basic trade of wrought iron manufacture and fabrication.

The German alliances are intriguing. During the period from 1890 to 1914 Hingleys was the pre-eminent manufacturer of world class ships' cables and anchors. From 1904 to 1911 it was effectively black balled by the British Admiralty, yet in spite of this it was able to maintain its leading position with all the other major navies of the world both merchant and fighting. This was especially so with the British merchant

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[32] WHC : Sec. 8 ; DLB, 5 : 4 October 1911, 92.

marine, with most of the famous liners of the 1900s and 1910s being equipped with Hingley cables and anchors.

The period from 1900 to 1914 was one of great strain between the European powers, with constant threat of war. Espionage was a major activity of all governments and in 1909 the British Government formed the secret organisation known as MI5 in order to counter known intelligence gathering by German agents in over sixty British ports. During the Great War it transpired that the personal mail of senior Hingley personnel was the subject of MI5 surveillance, and this posed the question of how long had the firm been of particular interest to Naval Intelligence and MI5, especially in view of the clandestine nature of Hingleys' alliances with German firms. A search through War Office and Admiralty files, at the Public Record Office, for the period 1900 to 1914 did not reveal any evidence that Hingleys was under any surveillance, but it did reveal the scale of naval intelligence penetration of the German merchant marine and the German Imperial Navy. Examples of intelligence studies carried out between 1897 and 1909 are given in Table 8.2 as hereunder:

Table 8.2 : War Office and Admiralty intelligence studies in the period 1897-1909

YEAR	DEPT. & CLASS	FILE	TOPIC
1897	WO 106/46	E2/3	Military operations against German East Africa
1902	WO 106/46	E2/4	The resources of Germany in the event of war with England
1904	WO 106/46	E2/5	A scheme for the capture of the German naval base of Kiaon-Chan in China ; of strategic use for deep draught vessels
1904	WO 106/46	E2/2	An appraisal of the capabilities of the German war machine to mount an invasion of England
1905	WO 106/46	E2/1	The threat of a naval war with Germany
1905	WO 106/46	E2/10	Plans for the sea invasion of Germany in alliance with France
1909	WO 106/47A		Preparations for war with Germany
1900	ADM 231/34	620	The threat of war with France
1907	ADM 231/46	797	World wide naval alert and instructions for defence
1906	ADM 231/46	804	Details of all foreign warships, especially those of the German Imperial Navy. These details included full specifications for hulls, armour, fittings, arcs of fire of gun turrets, etc., etc

The Admiralty report 804 of 1906 showed British espionage and intelligence gathering of quite awesome proportions. To assemble the information given would have required penetration of the naval architects' teams, of the suppliers, of the shipbuilders, of the weapons' manufacturers, etc, etc, on a quite extraordinary scale. As to where Hingleys fitted into all this will probably never be known. What is certain is that Hingleys had an extraordinary rapport with the major constructors for the German navy in the period from 1895 to 1914 that stood in marked contrast to their well publicised quarrel with the British Admiralty from 1904 to 1913. During the period when the firm was under sanction from the Admiralty, it enjoyed its greatest commercial and foreign triumphs with Germany. The question remains: was Hingleys a major gatherer of intelligence for the Admiralty under the guise of being the black sheep of the industry? Or, was Hingleys

compromised in Admiralty eyes by the nature of its German alliances during the politically sensitive 1900s?

The domestic alliances and combinations entered into by Hingleys all pale into relative insignificance when compared to the alliances entered into with the German firms of Hochfelder Walzwerk of Duisberg, A Borsig of Berlin, and F Krupp of Annen. These alliances ran from 1895 right through the outbreak of war in 1914. They were classic cases of essentially fair arrangements under which the customer received a good quality product at a price that left the manufacturer with an acceptable margin. Such arrangements could not happen today as the various regulatory bodies would clamp down on such price-fixing and market-sharing arrangements. These schemes not only enabled Hingleys to help develop German cable and anchor making capacity, they also provided Hingleys with a reliable source of anchor heads for its domestic market. At the outbreak of war in 1914 Hingleys was severely compromised by the fact that a significant part of its anchor head supplies actually came from Krupp. Both Cammell Laird, and Rogersons of Durham, Hingleys' traditional British suppliers, had been discarded for reasons of price and unreliable delivery.

The German alliances, commencing 1895

In 1895 Hingleys entered into an agreement with the German firm of Hochfelder Walzwerk of Duisberg for the supply of cables and anchors. This agreement was a major achievement on the part of Henry Montagu Hingley, with 'Ben' Hingley stating to his brother that the work with Hochfelder Walzwerk for Nord Deutsch Lloyd Flensberg, plus the British

Government work at the Elswick shipyards on the Tyne, would make Hingleys independent of all second class work[33].

The Hochfelder agreement was in two parts, the intention being to run in harness for an initial period of two years. The first part of the agreement covered the supply of anchors and was a three way agreement between N Hingley & Sons Limited, Halls Patent Anchor Company Limited, and Hochfelder Walzwerk. The essentials of the agreement were contained in the appendix to a letter written in August 1895 by 'Ben' Hingley to his brother H M Hingley who was in Germany.[34] The appendix covered the three essential features of the agreement: first that it was between the three firms for anchors supplied to and for use only in Germany; second that the intention was that there should be a division of the business between Hochfelder and Hingley; and third was that Halls Patent Anchor Company would supply Hingleys with the castings. That the agreement between Hingleys and Hochfelder was of a clandestine nature was confirmed by a very strict letter in September 1895 from H M Hingley to his German agent Arnold Von Bippen in which he stressed the absolute need to keep the agreement private.[35] In a further letter H M Hingley stressed to Von Bippen that the agreement was for the two firms to work together for two years and that prices had been 'arranged' for all anchors.[36] An indication of the problem that was to dog this arrangement, both in its initial two years and in the years afterwards, was given in Hingley's letter to Herr Kupper of Hochfelder in November 1895.[37] This letter stressed the need to reinstate the provision in the

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[33] WHC : Sec. 8 ; DLB, 1 : 30 August 1895, 109.

[34] Ibid., : 26 August 1895, 102.

[35] Ibid., : 10 September 1895, 120.

[36] Ibid., : 21 November 1895, 158.

[37] Ibid., : 25 November 1895, 163.

agreement expressly forbidding the re-export of the Hall's patent improved anchors. Anchors were supplied only for use by German shipowners and by the German Imperial Navy and were not to be re-exported in general trade.

Whether from good business practice, or from foresight expensively gained in foreign markets, N Hingley & Sons Limited put the arrangement with Hochfelders on to the basis of a formal Contract on 20 December 1895, retrospective to 1 August 1895.[38] The agreement was signed by George Benjamin Hingley as Managing Director, and witnessed by W B Rumford, and was effectively an arrangement for the price fixing of all the German work that the two firms could obtain. Clauses 1 and 2 of the agreement restricted the manufacture of anchors to the Hall's Improved Patent Anchor design. Clause 3 covered the commission and tendering arrangements. Clause 4 covered work for the German Imperial Navy with Hochfelders acting as the front. This clause was to create an intriguing embarrassment some years later when the Imperial Navy sought quotations direct from Hingleys, not being aware of the clandestine arrangement between Hingleys and Hochfelders.[39] Clause 6 of the agreement stated quite baldly that the Object of the Agreement was the division of profits on anchors delivered to Germany. This division was to be one half of the difference between cost price and sale price; the payment to be made by Hingley to Hochfelders every six months without deduction of agency commissions or expenses. An indication of an expected profit of 5/- per cwt was included.

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[38] Ibid., : 20 December 1895, 177.

[39] WHC : Sec. 8 ; DLB, 3 : 30 January 1902, 181.

A further agreement was made on 20 December 1895. This too was for two years and provided for the regular fixing from time to time of prices for stud link cable for delivery to ships built in Germany.[40] The agreement, notwithstanding its quite candid motives in fixing market prices, was remarkable for its blend of a high tone of business ethics with commercial realism. Clause 1 stated that its objective was not to force excessive prices from shipowners and shipbuilders, but in a proper and wise manner to reduce hitherto keen competition between the two firms. Clause 2 stated specifically that the agreement referred only to cables of the highest quality, namely Hingleys' Netherton Crown Special Best Best or the Hochfelder Walzwerk Best Best. Clause 3 provided for a division in equal parts whenever Netherton iron was ordered, but where Hochfelders took the contract. Clause 4 stated that it was essential that orders were taken alternately by the two firms, unless a disparity came about because of the weights involved in each order.

The clandestine agreement between Hingleys and Hochfelders was dogged throughout its life by two irritating factors. The first was Hochfelders' propensity for selling on the HPAC anchors especially to the Dutch markets. Hochfelders consistently ignored, by various means, Hingleys' insistence of November 1895 that the clause forbidding selling on should be reinstated in the agreement. The second was the problem over royalties and commissions. This was a problem not helped by a remarkable piece of duplicity on the part of HPAC who had conceded a royalty to Hochfelders on all outfits supplied to German ships constructed in Britain without informing Hingleys. This matter was only resolved many, many years later, in 1910, when C E Lloyd took over the management of the German combinations.

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[40] Ibid., : 20 December 1895, 181.

The rupture in relations with Hochfelder Walzwerk

The agreement of 1 August 1895 between Hingleys and Hochfelders was for a period of two years, but it was repeatedly renewed until the end of 1903 before running into acute problems. Along the way the problems over royalties had been eased in 1899 at a meeting between H M Hingley and Kupper of Hochfelders. Unfortunately, however, the matter of selling on was a problem that defied resolution. Here it is perhaps relevant to notice that both British and German manufacturers shared a common belief that when HPAC improved its anchor design of 1886, as it did in 1888 and 1889, then anyone else could make the original pattern without restriction or royalty. This without doubt was the root of the problem over selling on.

It is possible that 'Ben' Hingley weakened his firm's position by seeming to condone Hochfelder's breach of contract in asking for a commission on the goods that had been sold on.[41] He should have supported his brother's stand over no selling on, and by November 1903 the position was virtually lost. When A H Legge reported to HPAC on H M Hingley's meeting with Kupper of Hochfelders in that month he stressed the very serious implications for Hingleys and for Halls. It seemed that Hochfelders had taken the stance that it had a free rein to make the original anchor instead of the latest model; that it could supply the obsolete model to the German navy; and that it could supply the obsolete model to any market free from all royalties.[42] The paradox was that while this dispute over obsolete anchors was taking place, perfectly normal business relations existed on general commercial work.

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41 WHC : Sec. 8 ; DLB, 3 : 26 August 1901, 128.

42 WHC : Sec. 8 ; GBHPLB, 1 : 3 November 1903, 391.

Indeed, in the previous year H M Hingley had personally thanked Hochfelders for declining to tender in competition for work in Rotterdam and for their help over German work, commenting specifically on the friendship between the two firms.[43]

All three firms seemed to have contributed to the virtual disintegration in 1904 of the 1895 agreement. First, HPAC failed almost by wilful neglect to maintain its patents in Germany, thus enabling Hochfelders to take a stance probably correct in law, but flawed ethically. Second, Hingleys and Hochfelders fell out over the working of the equalisation of orders by weight for German work. Then, in complete disregard for the Anchor Agreement that debarred Hochfelders from making or supplying any anchor other than the improved anchor and from exporting this anchor to any other country whether or not patents apply in these other countries, Hingleys had positive proof that Hochfelders had supplied anchors to Holste Brothers in Amsterdam as Hingleys confirmed to Von Bippen.[44]

Thereafter, what had been an exceptionally good commercial agreement between firms sank quickly into unseemly bickering, and the firms of Hingleys and Hochfelders drifted apart with 'Ben', now Sir George Hingley, adopting a very bitter attitude towards the company with whom he had maintained one of the most fruitful commercial arrangements of the period.

Almost inevitably it fell to C E Lloyd to adopt a pragmatic stance when it proved necessary to rebuild the relationship in 1910. He began by

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[43] WHC : Sec. 8 ; DLB, 3 : 20 September 1902, 244.

[44] Ibid., : 14 March 1904, 335.

enlisting the support of W Janke who was Von Bippen's colleague in Hamburg. A quite candid admission was made to Janke that Hingleys needed to do a deal with Hochfelder in order to carry on trading in Germany. The original agreement of 1895 had been between three parties. Hingleys now considered that the agreement had lapsed. Hochfelder, however, considered that its agreement with HPAC was still in place, thus giving them the right to manufacture the latest improved anchor design of 1906. Hingleys were taken aback by this as the 1906 anchor design was essentially theirs. However, if the agreement had in fact lapsed then Hingleys' right to sell anchors in Germany was in doubt. This was relevant as, despite the fact that German navy work was now the province of Hochfelders, the Hamburg Amerika work definitely remained with Hingleys.[45] C E Lloyd with his customary adroitness effected a rapprochement with Hochfelders within three months. He did this by freely admitting to the differences of some years back and suggesting that while blame lay on both sides the past should be left behind.[46]

A new 'Letter of Agreement' prepared by C E Lloyd and adopted in July 1910 contained three provisions. The first was that Hingleys should take over all the rights and obligations of Hochfelder Walzwerk in respect of the manufacture and sale of the Hall's patent anchors. The second was that Hingleys should pay Hochfelders £1 500 by way of consideration. The third was that an undertaking would be given by Hochfelders to abstain from competing in the stockless anchor trade in Germany for ten years from 16 June 1910, except for small anchors for the Rhine trade.[47] Thus, an agreement that had began in 1895 was

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45 WHC : Sec. 8 ; DLB, 4 : 2 May 1910, 130.

46 Ibid., : 6 June 1910, 151.

47 Ibid., : 20 July 1910, 178.

renegotiated on a basis that was acceptable to both sides after several years of unpleasantness between 1905 and 1910.

Borsig

C E Lloyd, who had already established commercial relations with A Borsig of Berlin over the matter of machine made cables using the Masion process, subsequently turned his attentions to a formal agreement with Borsig. The preamble to the accord of 19 October 1910 did not attempt to emulate the high moral tone adopted in the 1895 agreement with Hochfelder. Rather, it stated quite bluntly that the object of the accord was the limitation of competition in high class cables for the German market. Under the general details of the accord, each firm was to be allotted a proportion of the work available in cable making. In respect of anchors Borsig was to enter into a combination with Hingleys to manufacture the 1906 Hall's patent anchor design in order to keep patents alive, and also to obtain German navy work[48].

The fleshing out of the memorandum of accord was carried out by C E Lloyd personally who had taken over the German interests in the wake of H M Hingley's sudden death. The document was styled: 'The proposed agreement between A Borsig and N Hingley in respect of high class anchors and cables in Germany'. The document contained five points of agreement. Of these, three were matters of specification; a fourth detailed the way in which the market share obtained was to be divided out; but the fifth, at a time when European re-armament was a major issue, was quite remarkable. This was a most specific requirement

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[48] Ibid., : 2 November 1910, 205.

that neither party was to divulge the existence of the agreement.[49] More than eighty years later one can only speculate just what MI5 may have thought of this clandestine agreement that had as its commercial objective a sharing of Germany's naval programme of expansion. Reverting to the three matters dealing with specification, these provided first for the cables to be manufactured using Netherton Crown Special Best Best with Borsig at all times matching this standard. Second, the cable sizes to be aimed for were 53mm (2 1/8") and 77mm (3 1/16") which incredibly and coincidentally were British navy sizes. Third, the anchor was to be the 1906 Hall's patent anchor model. On the division of market share, and in contemplation of a ten year agreement, in years one and two Borsig would receive 25 per cent of the work and Hingleys 75 per cent; in years three and four the proportions would be 35 per cent and 65 per cent; and in year five and after the proportions would be 40 per cent and 60 per cent.[50]

Unfortunately, the agreement foundered initially on the time scale involved and on the quality demanded for cables. Lloyd could not contemplate participating in the market for ordinary cable as this was a commercial jungle. Neither would the firm enter an accord for a period of only two years as Borsig could then walk away with all Hingleys' superior technology. Ten years was the minimum period needed for a proper partnership.[51] Although the tentative agreement reached with Borsig in 1910 had foundered over the period of time for which it was to run, changed circumstances brought it to life again. Hamburg-Amerika determined to compete with the White Star's S S Olympic and S S Titanic,

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[49] Ibid., : 18 November 1910, 226.

[50] Ibid., 18 November 1910, 226.

[51] Ibid., : 12 December 1910, 244.

and Cunard's S S Aquitania. The Kaiser had ordered a new battle fleet and it was all action in the shipyards again. Against this background C E Lloyd forged the agreement of 1912.

When outlining his thoughts on the agreement to W Janke, the agent in Hamburg, Lloyd expressed the view that there was enough German work for both firms and that unnecessary competition would be mutually damaging. Hingleys could always beat Borsig on price, but Borsig was the local firm. Hingleys iron was superior, but in Germany Borsig's iron was seen as being quite adequate. Accordingly, the agreement was focused on the use of Netherton Special Best Best iron as against the Netherton Crown Special Best Best; and arranged tenders were to be the tendering ploy.[52]

The Heads of Agreement provided for:

> On every order taken by either side 3/- per 100 kilogram was to be paid into a common pool for dividing up at the end of each year
>
> Orders would be arranged so as to give a 50 : 50 division
>
> The agreement was to commence with the two orders for outfits from Blohm & Voss for Hamburg Amerika vessels, and one outfit from Tecklenborg for the Kosmos line
>
> Only the HPAC 1906 anchors were to be offered

Hingleys was now in the delightful position of negotiating from strength, and Sir George was rather anxious that Lloyd should not give too much away in his enthusiasm before the agreement was all signed and sealed. He therefore counselled Janke to be careful not to give away market share by being too open with Borsig. Hingleys had already

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[52] WHC : Sec. 8 ; DLB, 6 : 5 September 1912, 10.

achieved a remarkable penetration of the German market, especially with Bremer Vulcan of Hamburg with whom they had orders for four outfits, and with a further two in prospect. In order to jog memories Sir George listed for Janke the current German orders for which Hingleys was bidding:[53]

Bremer Vulcan	79mm (3 1/8") at 28/- per cwt
A G Weser	79mm (3 1/8") at 28/- per cwt
Blohm & Voss	81mm (3 3/16") at 28/9 per cwt
Reiherstag	79mm (3 1/8") at 28/- per cwt
A G Weser	54mm (2 1/8") at 20/- per cwt
Schichau	95mm (3 3/4") at 35/- per cwt

By January 1913, Lloyd was able to confirm to A Krause of Borsig that the agreement was working well; and that he had no objection to Borsig monopolising lines that had no attraction for Hingleys.[54]
Thus, an agreement that began its life with only one year in prospect before confirmation on 30 September 1913, ran on by mutual agreement until the outbreak of war in August 1914.

The alliance with Krupp

Because of the problems in 1910/1911 with the Borsig negotiations C E Lloyd found it necessary to form a German alliance of some form without delay. The answer was found with the German firm of Krupp.

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53 WHC : Sec. 8 ; DLB, 6 : 23 September 1912, 25.

54 Ibid., : 23 January 1913, 167.

Thus in May 1911 Lloyd reached an accord with Krupp of Annen, under which that firm was to manufacture the 1906 design of the Hall's patent anchor in Germany with a view to being awarded 20 per cent of all German orders. The draft Memorandum of Agreement was communicated to Janke in May 1911.[55] The signed Memorandum was in place by June 1911 and a formal association began that carried on right up to the outbreak of war in August 1914. By then Krupp had become the major supplier of anchor heads for Hingleys' trade in Britain.

With commendable speed Krupp proceeded to give the agreement a forward impetus and before the month was out the firm was enquiring after details of the 15 1/2 ton anchor in fabrication for the S S Titanic. C E Lloyd was compelled to stall by stating that the design details were absolutely confidential and could not be divulged. Incredibly, however, he did pass on similar designs for 14 and 15 ton anchors.[56] These designs must have been of exceptional commercial value to Krupp.

The Great War, beginning in August 1914 brought to an end the mutually advantageous German alliances that had begun in 1895, first with Hockfelder Walzwerk, then with Borsig, and finally with Krupp.

A summary of Hingleys relations with other firms

During the entirety of the period under review from 1890 to 1918, Hingleys proved itself a master of the commercial technique of forming alliances and combinations to suit the economic circumstances of the day.

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55 WHC : Sec. 8 ; DLB, 4 : 27 May 1911, 427.

56 Ibid., : 27 June 1911, 477.

The 1896 alliance with Henry Wood & Co of Saltney, near Chester, was conspicuously successful in dominating the Italian market and led eventually to Hingleys' commanding presence there.

The major domestic alliances, such as the six firm combination in 1897, as succeeded by the six firm combination of 1902, and as re-grouped in the ten firm alliance of 1904, demonstrated Hingleys' ability to combine with its natural commercial friends as well as with its natural commercial enemies.

As with the highly successful Italian Combination of 1896 with Henry Wood, Hingleys' alliance with W L Byers lasting from 1904 until 1906 was highly effective in dominating the domestic markets on the Tyne and in North West Lancashire. It also enabled Hingleys to survive what could have been a difficult period after the firm was excluded from Admiralty work.

Less happy was Hingleys' formal commercial alliance with John Brown & Co in contrast to its normal role as a supplier. Here, and notwithstanding the goodwill of the shipowners and shipbuilders, BMMC was not able to make a commercial proposition of manufacturing ships' cables by machine. This is seen as part of the industry's inability at the time to cross the bridge from trades resting on artisan skill and ingenuity, to the excellence of automated machine made manufacture.

Of all the alliances formed in this period the most extraordinary ones have to be those between N Hingley & Sons Limited and the German firms of Hochfelder Walzwerk, Borsig & Co, and Krupp. These alliances, almost invariably of a clandestine nature, enabled Hingleys to dominate the north European market for many years. At the same time it enabled the

German firms to develop an industry in which it had only a minor role until the 1900s. After that, and with the growth of the Imperial German Navy and the German mercantile marine, much use was made of Hingleys' capabilities and products. Whether these alliances were the channels along which the extensive naval espionage of the time was conducted remains undetermined.

PART FOUR : MANAGING THE ENVIRONMENT

CHAPTER NINE : RELATIONS WITH GOVERNMENTS

Generally on procurement

Notwithstanding Hingley's standing as one of the leading cable makers and anchor makers in the world, the firm was, after all, merely one among many suppliers to ship owners, ship builders, and to government procurement departments.[1]

Contacts with foreign government departments tended to be at a subordinate level with relationships being handled by intermediaries who were selected to suit the culture of the countries concerned. Pertinent examples are seen as the relations with the government departments in Italy, Spain, Germany, and Japan. These relations are contrasted with the tactics employed in the USA after 1915 when the tariff barriers were breached by the demands of war.

In Italy, in Spain, and in Japan, relations with governments prior to 1914 were handled by using members of the officer class to deal with their contemporaries in government. These officers were not required to sell wares as the agents and merchants were required to do. Rather, their role was to inculcate, within the members of their own class in the procurement departments, an awareness of the excellence of Netherton iron in its various grades, coupled with the superior qualities of the Hall's patent anchor after the re-design of 1906. Thus the government departments responsible for procuring vessels for their respective

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[1] See chapter 3, after page 3, for a list of major liners supplied.

navies were rarely in direct contact at tender stage with Hingley personnel.

In Germany, direct relations with government departments were specifically avoided because of the nature of the commercial arrangements that Hingleys had with Hochfelder Walzwerk, Borsig, and Krupp from 1897 onwards. At all times, Von Bippen and Janke, were required to preserve the secret nature of the compacts entered into by Hingleys for German projects. This resulted inevitably in the farcical situation of 1902 (referred to in chapter eight) when the procurement department of the German Imperial Navy invited Hingleys to tender for the supply of cables and anchors, not being aware of the arrangements over tendering that Hingleys had with Hochfelders.

The situation in the USA was very different from that obtaining elsewhere in the world. Tariff barriers effectively kept Hingleys out until 1915. Thereafter, W Carlile Wallace was commissioned to take his bag and his Hingley catalogues and sell to the procurement offices in the navy yards that mushroomed on the east coast of America. Direct contact with government was accordingly at a minimum.

In Britain direct relations with government departments grew slowly until the 1900s. Before then Hingleys' relations with government would have been restricted to making application for inclusion in the Admiralty list of approved suppliers, and to bidding in response to Admiralty tenders. There was no possibility of replicating the position obtaining in Italy where the efforts of Major Rocca ensured that Hingleys was stated as the standard required in navy specifications. In Britain, the Admiralty set the standards for cables, for anchors, and for the men employed on its work both in respect of their skills and their rates of pay. However, in 1914 the exigencies of war required

Hingleys as a firm to develop a permanent relationship with the arms of government. Principally this arose from the designation of the Hingley firm as a Controlled Establishment in October 1915. Lesser causes stemmed from the new bureaucratic processes coupled with the incidence of new forms of wartime taxation. However, the first real change in Hingleys' arm's length relationship with government came as a result of the failure of anchors on certain naval ships in 1904. This brought the firm into direct face to face contact with the heads of department within the Admiralty. The matter of the ships' anchors that failed is treated in greater detail in earlier chapters. However, and whatever the merits or otherwise of 'Ben' Hingley's handling of this affair, the ensuing rift with the Admiralty lasted from 1904 to 1913. The exclusion of the Hingley firm from supplying anchors to the British Navy was matched almost paradoxically by its rise to that of being the principal supplier of extremely large anchors for most of the major Atlantic liners of the period. It was also matched by the part played by Hingleys in equipping the fleet of the German Imperial Navy, and of its mercantile marine.

Generally on Hingleys' role in the testing of cables after the legislation of 1899

The Anchors and Chain Cables Act of 1899 brought the long established practice of testing under the control of the Board of Trade. Hingleys' record on testing was of the highest order, The Staffordshire Public Chain & Anchor Testing Company having been established in 1864 with Noah Hingley as co-founder. Following the Act of 1899 this company was subsumed into the new Lloyds British Testing Company formed in 1900.

LBTC, while in all respects a privately owned company, was effectively an arm of the Board of Trade. For both Sir Benjamin Hingley and Sir

George Hingley, the chairmanship of the company became an extremely onerous burden. For Sir George it eventually became the hardest cross he had to bear in his business life. Indeed, in his dying days in 1918 the conduct of the affairs of the LBTC eventually drove him to his grave.

The fall from favour with the British Admiralty

On Christmas Eve 1903 'Ben' Hingley wrote to Charles Cammell with the disturbing news that three castings for admiralty anchors had been condemned by the inspector. One was found to be hollow and took two quarts of water.[2] This relatively minor problem was blown up out of all proportion by the bizarre misunderstanding of the situation by 'Ben' Hingley. It resulted in Hingleys being out of favour with the Admiralty for more than ten years. As it was, the fault in the casting was eliminated by Fletcher's re-design of 1906, but in a few acts of unbelievable commercial stupidity Hingley prejudiced the firm's relations with the British government for more than a decade. Why did it get so out of hand? Hingley was a king among ironmasters. He was the heir apparent in the leading firm of iron, cable, and anchor makers in the world. He was also 53 years of age, a dangerous age for private businessmen of substance. By then Hingley would expect to be right, or to have got it right, in most things under his control. The firm was known to be the leading exponent of quality control in the whole cable making and anchor business and the realisation that his company appeared technically incompetent came as a rude shock to 'Ben' Hingley. The situation was not made any easier when he learned to his dismay that both Hall and Verity always knew that the Cammell castings were not

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[2] WHC : Sec. 8 ; GBHPLB, 1 : 24 December 1903, 425.

completely solid. He reminded George Hepburn of this at the time when relations with the Admiralty were going awry.[3]

Relations with the British Admiralty after the rift of 1904

By the middle of 1906, some eighteen months after Sir George Hingley assumed he had straightened everything out with the Admiralty, it had become obvious that the Hall's patent anchor had effectively been ruled out of service with the British navy. Essentially, the Admiralty had embarked on a policy of discrimination in favour of the excellent Wasteneys Smith anchor, and there seemed to be little that the other major manufacturers could do about it. If Hingleys actions in 1904 over their faulty anchors had been bizarre and insensitive, and if the Hingley files are to be believed, the Admiralty's actions in the years from 1905 verged on the extraordinary.

Reference to figure 3.1, will show that industrial activity was on the rise during the years 1905 and 1906 when the extent of the Admiralty's sanctions against Hingleys became very public. This rise in business activity softened the effects of the boycott on Hingleys' trade in anchors during these particular years. However, at the end of 1905 Sir George wrote to A W Sampson at The Fairfield Shipbuilding and Engineering Co Ltd, at Govan, seeking his assistance over the matter of the Admiralty's preference for the Wasteneys Smith anchor and the effective blocking out of the Hall's anchor.[4] Then, early in the new year when confirming quotations for cruisers being built at Govan, Hingley stated that his bid was conditional on the Hall's anchors being taken in preference to the Wasteneys Smith's anchors cited in the

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[3] Ibid., 22 June 1904, 619.

[4] WHC : Sec. 8 ; GBHPLB, 2 : 30 December 1905, 186.

specification, a matter about which he intended to see Sir Euan McGregor, the Director of Naval Contracts.[5]

Sir Euan seems to have been well disposed towards the Hingleys and even undertook to arrange a meeting with the Controller at the Admiralty to discuss the preference shown for the Wasteneys Smith anchor. Meantime, Hingleys agreed with W L Byers, the other principal manufacturer, not to tender for admiralty work where the Smith anchor was specified.[6] The meeting with the Controller on 14 February achieved nothing and Hingley obviously came away very disgruntled. When reporting to Byers on the meeting, Sir George raised the question of the monopoly being created in favour of Wasteneys Smith and suggesting a formal complaint to the Financial Secretary.[7] Sir George also raised the matter of monopoly when writing to John Brown at Clydebank.[8] At this time the yards of John Brown and Fairfields were constructing two cruisers for the British navy and Hingleys reluctantly agreed to supply the Smith's design of anchor at a loss on the contract. This led to a very sharp personal exchange between Hingley and Wasteneys Smith, with Hingley challenging Smith to supply the anchors at Hingleys' bid price or face exposure over their much higher charges.[9] This matter of price eventually became a very emotive issue with Hingleys formally notifying Edmund Robertson, at the Admiralty, that the Controller's policy was standardisation gone mad, with all natural competition having been abolished, and with the government paying 20 per cent over and above the market rate for ships' anchors.[10] In July, after a spectacular outburst directed to the

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5 Ibid., 11 January 1906, 202.

6 Ibid., 25 January 1906, 223.

7 Ibid., 15 February 1906, 251.

8 Ibid., 21 February 1906, 257.

9 Ibid., 24 March 1906, 289.

10 WHC : Sec. 8 ; DLB, 3 : 7 August 1906, 422.

Secretary of the Admiralty, Hingley specifically requested George Hepburn of HPAC to join him in a visit to the Admiralty to protest against the monopoly prevailing in favour of the Wasteneys Smith anchors, and in lobbying MPs, and in particular Edmund Robertson at the Admiralty.[11] This outburst was contained in a four page letter to the Secretary in which Sir George recited Hingleys' proud record in supplying the navy for many years. He then focused on the two cruisers being built at Govan and Clydebank in 1905, where accepted tenders were set aside so that the Smith's anchor could prevail. Hingley was particularly incensed that the Hall's close stowing anchor was no longer acceptable. He expressed distaste over the way that the Hall's anchors had been displaced on the new Royal Yacht, notwithstanding the preference of the constructors. He expressed the view that the unfortunate episode of the failed anchor castings, thought to have been sorted out between the late Sir Benjamin Hingley and Sir Euan McGregor, was still an issue in the light of the continuing proscription on the Hall's anchors that had resulted in his firm being asked repeatedly to supply other firms' anchors in tenders for ships' outfits. He then threw discretion to the wind by accusing the admiralty of sending all its orders in one direction at prices substantially higher than Hingleys' prices, of ruling the Hall's anchor out of service, of insisting that only the Smith's anchor had admiralty approval, and of demeaning Hingleys' status with foreign governments who used the Admiralty's approved lists as points of reference in making up tender lists.[12]

The Secretary at the Admiralty seems to have been completely unmoved by Sir George's outburst and early in 1907 the Admiralty issued tender documents in which Crown privilege was specifically invoked in requiring

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[11] WHC : Sec. 8 ; GBHPLB, 2 : 12 July 1906, 388.

[12] WHC : Sec. 8 ; DLB, 3 : 10 July 1906, 416.

tenderers to offer the Wasteneys Smith anchor in breach of normal patent requirements. This action particularly annoyed Sir George as it was common knowledge that Smith did not actually manufacture anchors. He designed them, but the manufacturing was carried out by Spencer & Sons of Newcastle-upon-Tyne. Notwithstanding his irritation, Sir George wrote personally to Wasteneys Smith pointing out the breach of patent by the Crown and enquiring if Hingleys should tender. Sir George at this time was desperate to obtain some navy work and he offered Smith an 'arrangement' with commissions based on agreed prices.[13] Smith rejected the overtures from Sir George, who then charitably wished Smith well in the hurly burly of bidding his own anchors against his competitors who would be offering anchors that were legally pirated under government edict.[14]

Sir George's endeavours in 1911 to break down the Admiralty bar on his anchors

In December 1910 Sir George approached a retired naval officer, Admiral McGill, with a view to him taking an appointment to push the Hall's anchor at the Admiralty.[15] In C E Lloyd's subsequent briefing of McGill specific reference was made to the preference of the Admiralty for the Wasteneys Smith anchor, but stating that of late orders had been given for the Byers' design of anchor. McGill was asked if he was prepared to approach Sir Philip Watts at the Admiralty to 'test the water' over the Hall's anchor.[16] McGill recommended a very gentle approach, but early in 1911 contacts were made with the Admiralty that Lloyd found particularly encouraging. McGill was able to visit the Admiralty in

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13 WHC : Sec. 8 ; GBHPLB, 2 : 16 April 1907, 601.

14 Ibid., 24 April 1907, 605.

15 WHC : Sec. 8 ; GBHPLB, 3 : 3 December 1910, 789.

16 WHC : Sec. 8 ; DLB, 4 : 9 January 1911, 258.

January and this visit was referred to by Lloyd when enquiring if the time was now ripe to follow up the possibility of Halls being allowed to tender in six months' time.[17] It so happened that mid-way through this six months the Director of Navy Contracts had requested sizes of the Hall's anchors for inclusion in the Admiralty tables. Lloyd wondered if this was sheer coincidence or the new influence of Admiral McGill.[18]

The watershed in the long estrangement between Hingleys and the Admiralty was finally reached in June 1911. McGill had visited Sir Philip Watts at the Admiralty, and C E Lloyd when discussing McGill's visit expressed his surprise at Sir Philip's comment that HPAC had refused to take part in navy tests. As Hingleys had been endeavouring to get a navy trial since November 1909 this came as a shock. But, the news from McGill that left Lloyd completely perplexed was Sir Philip's specific reference to the universal popularity of the Hall's anchors with the mercantile marine as being one reason for its non-use by the navy.[19] As the excellent Wasteneys Smith anchor more than met Admiralty requirements, Sir Philip obviously considered that Hingleys' major share of mercantile work more than compensated for the firm's exclusion from government contracts.

This revelation from Sir Philip concerning the universal popularity of the Hall's anchors among the owners of the merchant fleets seems to have relaxed the long standing frustration at Hingleys. Indeed, when discussing with McGill the merits or otherwise of an autumn campaign at the Admiralty, C E Lloyd went as far as to wonder if they should accept Sir Philip Watt's view that they were doing well enough commercially

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17 WHC : Sec. 8 ; DLB, 4 : 8 May 1911, 392.

18 Ibid., 22 March 1911, 336.

19 Ibid., 17 June 1911, 436.

without navy work.[20] However, the great arms race was getting under way and the navies of the world were busy ordering warships. Hingleys entered into this work with zest notwithstanding the troubled industrial climate prevailing at the time. Among the projects out to tender were battleships at Barrow for the Turkish navy, work for the India Office, warships for Chile at Newcastle, work for the German navy, a cruiser for Australia, and Argentinean destroyers at Krupp, together with general work for the British navy. Hingleys had a middling success rate with this array of work, but sufficient orders were obtained to keep the works busy.

During 1912 C E Lloyd became painfully aware of a most disagreeable feature of government procurement procedures. The India office, which at the time was one of the great offices of state, introduced a tactic of accepting a tender for cables and anchors and then requiring a discount from the successful tenderer before signing the contract. Lloyd was so taken aback by what he called 'this undignified request', that he dispatched both McGill and Darbishire to the new purchasing office at the Admiralty in search of verification.[21] This rather doubtful tactic obviously became part of civil service thinking, the writer having experienced the same treatment in the 1980s when verbally accepted professional fee quotations were expected to be discounted by a sum set by the ministry before written acceptance was given.

Although events in March 1911, when the Admiralty asked for sizes of Hall's anchors for inclusion in its lists, had led Hingleys to believe that the long embargo on its anchors was over, the firm still had great difficulties in obtaining contracts. C E Lloyd was particularly dismayed in June 1912 by his inability to obtain confirmation of orders

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[20] WHC : Sec. 8 ; DLB, 5 : 18 September 1911, 70.

[21] Ibid., 3 April 1912, 373.

for two destroyers under construction by J S White & Co, of Cowes. He asked Admiral McGill to visit Sir W E Smith at the Admiralty to discuss the problem.[22] In the course of this discussion McGill discovered that the Admiralty actually had an approved list of suppliers for each class of vessel in service, and that access to these lists was very difficult to obtain. The origin of this restriction possibly lay in the desire for greater security. At a practical level for anchor makers, it made approval before tendering, and approval before awarding of contracts, a tedious process.

However, and by the middle of the summer of 1913, the Admiralty bias in favour of the Wasteneys Smith anchor underwent a major change. Virtually overnight, and as C E Lloyd advised Admiral McGill, all six leading manufacturers were invited to take part in tests at Portsmouth.[23] The six firms were: HPAC, Wasteneys Smith, Byers, Brown Lenox, Martins, and Taylors. The trials and the evaluations of the results were expected to take months to progress to completion. The outbreak of war in 1914 made the trials somewhat irrelevant as all sources of manufacturing capacity were soon pressed into war service.

Lobbying activities with the French and Italian authorities

One of Lloyd's imaginative moves in 1912, as the now effective head of HPAC, was an attempt to overcome the French government's embargo on foreign cables and anchors on navy ships. This he did by offering to license French firms to manufacture the Hall's patent anchors. In discussing this with Marius Jullien, the firm's agent in Marseilles, he put forward two options. The first was to sell or lease patent rights to the French navy, with the navy arranging the manufacturing side for

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22 Ibid., 29 June 1912, 434.

23 WHC : Sec. 8 ; DLB, 6 : 21 August, 1913, 355.

its own requirements, while Hingleys concentrated on the mercantile trade. The second option was for a French firm to take a licence to manufacture anchors for both the navy and for the merchant fleets.[24] These efforts came to naught mainly because the French Admiralty had its own chain making factories. However, when these factories were lost to the Germans after 1914 Hingleys was able to secure part of the market that this loss created.

At the same time in 1912 when C E Lloyd was attempting to penetrate the French government market, Sir George became very concerned about his hold on the Italian market. For many years Hingleys' pre-eminence there had stemmed from Major Rocca's success in ensuring that Italian naval specifications stated that cables had to be fabricated from wrought iron equal to Netherton iron, and that anchors had to be equal to the Hall's patent anchor in design. It now appeared that a competitor firm had pressed for the removal of these names from the specifications. Sir George's response was to instruct Admiral Micheli to offer his government a ten year deal on the basis of an exclusive contract.[25] The outcome of this offer is not revealed in the files, but Hingleys went on to secure most of the bigger Italian navy contracts.

The command economy that developed during the Great War of 1914 - 1918

During the first year of the war Hingleys as a firm was able to continue as a privately managed company. However, after the battle of Loos in 1915 when the Western Front in northern France became a continuous line of fortified trenches, the demands of the government for 'materiel' culminated in the Munitions of War Act of October 1915. Under this Act the firm of N Hingley & Sons Limited was declared a Controlled

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[24] WHC : Sec. 8 ; DLB, 5 : 22 January 1912, 255.

[25] Ibid., 26 January 1912, 271.

Establishment. Under the powers of direction given by the Act, the entirety of Hingleys' production had to be in accordance with orders given it by the new Ministry for Munitions of War. At the same time, however, the firm had to run itself as a private concern insofar as plant, equipment, use of labour, use of capital, use of managerial skills, etc, were concerned. As a result, for the remainder of the war, Hingleys and fellow manufactures found themselves in continual conflict with the new bureaucrats who were endeavouring to impose a command economy upon private enterprises.

Within six months of the creation of the Ministry of Munitions of War and the take-over of the Hingley firm as a Controlled Establishment a state of open conflict existed between the ironmasters and the temporary civil servants at the new ministry. Early in January 1916 Sir George Hingley had presided over a large gathering of ironmasters at which a resolution had been passed demanding that the government set more realistic prices for the current controlled prices of all forms of iron. As Sir George pointed out to W R Lysaght at the Ministry of Munitions, even scrap iron was selling for £6.10.0 per ton and the vexed question of a revision of government fixed prices for iron had to be addressed with vigour.[26]

The officials at the ministry conceded the merits of an increase in the prices of all grades of iron, but only if the ironmasters accepted an inspection of their cost accounts for the last quarter of 1915 to establish the true cost of the pig iron from which all other irons were produced. Looking back from eighty years on, one has to wonder at the furore that this requirement provoked. Nowadays all kinds of government agencies have the statutory right to carry out audits of the books of private concerns. In 1916, however, it was adjudged to be quite

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[26] WHC : Sec. 8 ; GBHPLB, 4 : 11 January 1916, 924.

outrageous conduct even by the normally pragmatic C E Lloyd. Lloyd took an active part in the confrontation with the ministry officials and went so far as to accuse the Director General of having reneged on agreements that had been reached earlier with Sir George's deputation.[27] This dispute was one of the first of many that followed wherein, according to the manufacturers, temporary civil servants would negotiate positions in open consultations, only to have the conclusions altered by other (possibly Treasury) officials before promulgation. This practice gave rise to many of the bitter disputes over taxation, for example, that were a feature of later years.

The meeting with the Director General in February 1916 must have been explosive in nature. Sir George stated, as he reported to Clarence Smith at T & W Smith Ltd of Newcastle, that the ironmasters would not accept the dictates of civil servants, after which he led the deputation as a body out of the meeting.[28] Following this disastrous meeting of February 1916, relations with the Ministry deteriorated even further. By July 1916, Sir George was in open conflict with L Llewellyn at the Ministry on virtually every item on the agenda. He stated quite bluntly to Llewellyn that prices had to go up by 1 August to £14 per ton for ordinary bar iron and £15 per ton for marked bar iron. These figures were supported by rises of 5/- per ton in the cost of pig iron, resulting in rises of 10/- per ton for finished iron, plus the fact that wages had risen by 15 per cent.[29]

The early months of 1916 saw battle lines being drawn every bit as rigid as the trenches that spread across northern France. Notwithstanding the state of the war, with the drawn out Battle of the Somme in preparation

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[27] WHC : Sec. 8 ; DLB, 8 : 14 January 1916, 460.

[28] WHC : Sec. 8 ; GBHPLB, 4 : 24 February 1916, 944.

[29] WHC : Sec. 8 ; DLB, 9 : 26 July 1916, 328.

or in progress, the imposition of government dictates had outraged the manufacturers on whom the supply of munitions depended. Almost inevitably they decided to combine in order to present a united front to the various government procurement agencies. By July 1916 Hingleys was a member of The Birmingham & District Association for Controlled Establishments as H J Peart, the director now responsible for administration, advised The Midlands Employers' Federation.[30] The specific role of this Association was to handle confrontations with government departments. All disputes over prices paled into insignificance, however, when compared with the bitterness that arose between manufacturers and government over retrospective taxation, especially when coupled with a near total lack of appreciation by government agencies of the concept of depreciation. H J Peart, the director charged with the task of coping with the mass of reports, returns, tax computations, and the like that were required, led the assault on a very doubtful aspect of the Finance (No. 2) Bill, of April 1916. In this he endeavoured to enlist the support of Austen Chamberlain, the distinguished Birmingham MP, among others, when addressing the problem to the Rt Hon J W Wilson, MP. The nub of his complaint was that having accepted an excess profits tax under an earlier Act that was based on profits over and above the firm's average profits for the two years prior to 1914 plus a weighting of 20 per cent, the government was now proposing to tax the 20 per cent weighting as well.[31]

This was a particularly vicious move as it had the effect of savagely diminishing Hingleys' retained earnings. The firm, as was the custom of the times, financed repairs and replacements out of revenue. Indeed, Hingleys' capital base had remained virtually unchanged for years. A

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[30] Ibid., 13 July 1916, 314.

[31] Ibid., 9 June 1916, 271.

reduction in the level of retained earnings could only have a dramatic effect on the financing of these essential repairs and replacements. In the same month as the furore arose over retrospective taxation, matters came to a head over depreciation allowances

The origins of the dispute were innocuous enough. In addition to its normal requirements for chains, cables, and anchors, the Admiralty now asked Hingleys to supply square link mooring chain. Sir George agreed to do this pointing out that this would be wartime work with a limited life and that he would require a write-off of 60 per cent in the first year, and 15 per cent per annum thereafter, on the capital cost of the new forge that would have to be laid down.[32] However, O H Smith the official at the Ministry of Munitions later denied ever having agreed to the write-off proposals. It was left to C E Lloyd to attempt a deal based on a 50 per cent write-off in the first year, he having stressed again that the forge would be of no use to Hingleys after the war as excess capacity in the industry was widely expected.[33] In the event, the deal eventually struck by H J Peart was for the elimination of an annual depreciation factor in return from an ad hoc higher retention of any profits arising from the operation of the forge.[34] This was pragmatic stuff, but it was taxation policy being made on the hoof, without any regard to either the Finance Act or to normal commercial rules.

A further major irritant at this time between manufacturers and government was government obduracy over the working of plant virtually to the point of destruction. Hingleys' plant, that had been obsolete and due for renewal at the outbreak of war in 1914, was on the verge of

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[32] Ibid., 3 June 1916, 260.

[33] Ibid., 15 July 1916, 321.

[34] Ibid., 14 August, 1916, 350.

breakdown. However, the granting of any licences to purchase new equipment was fiercely resisted by the Board of Trade. In October 1916, with a crisis looming, C E Lloyd tackled the assistant secretary in the Marine Department of the Board of Trade over the fact that earlier applications to replace forges had been vetoed, but that his most recent one for a smaller forge had to be approved if the production of cables and anchors for the mercantile fleets was to continue. Absurdly, and because Hingleys was not the main supplier of anchors for the British Navy the Admiralty offered little in the way of support. However, what the civil servants in the Admiralty and the Board of Trade had overlooked was that Hingleys supplied more than half of the requirements of the entire British mercantile marine, as Lloyd pointed out to them very forcefully.[35] This argument had to be repeated again in full to the Ministry of Munitions a month later, when it was stressed that attempts to purchase a forge from Davy Brothers in Sheffield had been vetoed on the ludicrous grounds that Hingleys only had Category 'B' priority, it not being a major Admiralty supplier.[36] Common sense prevailed and licences were issued when it was eventually realised by the Ministry that more than half the fleet on charter to the Admiralty was serviced by Hingleys.

The crisis over pig iron that emerged in 1916

One of the happier examples of cooperation between industry and commerce arose due to the crisis over the supply of pig iron during the second year of the war. Strangely, there is no reference of any kind in the Hingley files to this crisis. This, notwithstanding the fact that the firm was totally dependent on supplies of iron ore for the manufacture of its own pig iron for its cables and anchors. Perhaps the reason for

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35 Ibid., 27 October 1916, 466.

36 WHC : Sec. 8 ; DLB, 10 : 24 November 1916, 6.

this lies in the contrasting treatments received from Hingleys from the various arms of government bureaucracy. Mention has been made of the difficulties encountered over licences for replacement of plant, and of punitive tax measures suffered. In contrast the measures taken to overcome the pig iron crisis involved the government in quite extraordinary acts of generosity with the tax payers' funds.

One of those involved in tackling the shortage of pig iron was Dr F H Hatch whose job it was to procure iron ore. After the cessation of hostilities he wrote-up his recollections of the endeavours of the industry. At the outbreak of the war in August 1914, there were enormous stocks of pig iron in Britain. These arose in part from the large importations of German and Belgian pig iron in the early months of 1914. In consequence, consumption of pig iron did not exceed its production until June 1916. By then an Iron Ore Supply Committee was set up within the Ministry of Munitions to handle the allocation of all hematite pig iron that was produced. In May 1917 this direction was extended to basic pig iron. The committee set a programme for constructing ten new blast furnaces and re-opening a further forty-one existing furnaces. Monthly production targets were set for 19 050 tons of hematite pig iron, giving an anticipated production of 1 900 000 tons of pig iron per annum. This programme was subsequently expanded from fifty-one blast furnaces to eighty-nine. This and target production of 3 500 000 tons of pig iron per annum never became achievable. The programme involved a massive mobilisation of the country's earthmoving equipment and the endeavours of the MacAlpine family in this respect are mentioned inter alia in the text. By the end of 1916 some 1 600 German prisoners of war were drafted into the quarries in order to excavate the vast quantities of ore that were required. Unfortunately, the supplies of hematite ore soon ran out and Britain was left dependent on the lean phosphoric ironstone, the main British ore. This circumstance called

for sweeping changes in plant and in the logistical arrangements necessary to move the ores all over Britain.[37]

So critical was the production of pig iron that by May 1917 it was necessary to recall men from the army to operate the newly opened or re-opened blast furnaces. The results achieved were quite spectacular and in February 1917 the production of basic pig iron had reached 47 920 tons per week. By May 1918 it had reached 65 530 tons per week, with the Midlands playing a notable part in the targets achieved. The final German offensive of April 1918 resulted in the recall of most of the furnacemen.

Of specific significance for the furnace owners was the declared government policy of 1916 in its negotiations with the owners. In order to guarantee full commitment, the government laid down two principal objectives that were to govern the programme. The first was that the owners would have modern plants at the end of the war, constructed at pre-war costs. The second was that extensions and new constructions would incorporate the very latest in design techniques so as to meet the needs of the war and of the peace. Thus, in addition to very generous financial provisions, the industry benefited from being able to produce pig iron at commercial prices from the traditional British phosphoric ores with their low iron content of 28 per cent, instead of relying on imported hematite ore that gave 50 per cent.[38]

The retrospect by Dr Hatch also throws an interesting light on the supposed superiority of US steel makers, as discussed in chapter two. The Ministry of Munitions sent a delegation to the United States in June 1916 to buy shell steel. Its task was made extremely difficult by the

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37 F H Hatch, ' Ministry of Munitions and its influence on the Iron and Steel Trade', The Iron and Coal Trades Review, (98 1919), 873.

38 Ibid., (99 1919), 1, 35.

realisation that the US works were built for large scale production of a definite class of steel. All too often this was ordinary commercial steel that was not suitable for shells. To produce the ferro-silicon steel needed for shells caused problems that were not capable of speedy resolution.[39]

In the field of social legislation the most worrying matter for Hingleys in 1916 was the possible extension of unemployment insurance to its large workforce of 2 300. Here, and in tune with the culture of the times, H J Peart, when writing to R Lowndes of the Ironmasters' Association on the matter, was genuinely mystified as to why Hingleys' workforce, that had never experienced unemployment, should be included.[40] This proposed incorporation of the Hingley workforce of some 2 300 people into the national unemployment scheme had to be seen as a very doubtful manoeuvre on the part of government. Not in its recorded history had the Hingley workforce ever been laid off. Short time working yes, but never unemployment. Forced incorporation at this stage of the early development of the welfare state was seen as a further taxation without directly related benefits.

Thus, early in 1917 H J Peart, the director now responsible for finance and administration, was in at the birth of the new order that has grown ever since in leaps and bounds. This is the system under which, in most firms of any size, there are many employees who work effectively only for the government as tax collectors, gatherers of statistics, etc. These employees make no contribution to the commercial life of the business as Peart felt compelled to protest in July 1917 to the Controller of Mines at the Board of Trade. He further stressed that he

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[39] Ibid., (99 1919), 69.

[40] WHC : Sec. 8 ; DLB, 9 : 5 July 1916, 307.

just did not have the staff to cope with the demands of preparing income tax returns, of producing rolling reports of production levels achieved, of calculating munitions levels, of producing excess profit calculations, etc, that left less and less time for administering the business.[41]

Thus, in the relatively short space of three years, relations with government underwent a dramatic change. Involvement of government in every facet of business life, through its social welfare and taxation policies, became an unwelcome albeit accepted fact of life. For firms such as Hingleys, that were determined to have a commercial future after the war, the experience stood the company in good stead. Its professional managers proved themselves in the most harrowing of conditions, and they were able to conduct the company's affairs to the satisfaction of its now numerous small shareholders, and to the wrought iron trade in which it was to be one of the last survivors.

Lloyds British Testing Company as a quasi agent of the Board of Trade

The Anchors and Chain Cables Act of 1899 may be seen as the watershed in the public testing of ships cables and anchors for British ships. The Act was sponsored by the Board of Trade and it provided for testing to the entire satisfaction of the Lloyd's Register of British and Foreign Shipping. The object of the Act was to establish complete independence of testing in Great Britain. The mechanics of the new testing provisions were described in detail by Hingleys in a letter in 1902 to Rudolph Rosentiel of Hamburg Amerika's technischer bureau. The test houses had to be provided by and owned by the manufacturers, but the general work force was paid by the Lloyd's Register which in turn charged LBTC for the monies expended. The test house supervisors were,

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[41] WHC : Sec. 8 ; DLB, 10 : 12 July 1917, 375.

however, appointed and paid by the Lloyd's Register, their salaries being paid out of the fees received for testing. These fees were 1/- per cwt for anchors; 1/6 to 3/6 per cwt for cables, the average being 2/6 per cwt. The Board of Trade had the absolute right to fix the charges.[42]

One of the reasons for the Act of 1899 was the intense dissatisfaction in the English trade at the action of the Lloyd's Register in licensing foreign testing machines for the testing of cables and anchors for foreign owned ships, while requiring British owners to use the more rigorous public testing. With the coming of the Act, five of the prominent public test houses in Britain decided to join together to form the Lloyds British Testing Company. Accordingly, the two test houses in the Black Country were joined by the test house companies in Chester, Glasgow, and Newcastle. Specifically excluded from the arrangement were the test house companies in Cardiff and in Sunderland, the operators of these companies being in ill favour with the principals of the other five test houses. The original subscribers of the LBTC as constituted in 1900 were: Benjamin Hingley, George Benjamin Hingley, H P Parkes, T P Jones, and Jno. Green, representing South Staffordshire; Thomas H Dixon and Sir Thomas Frost representing Chester; Andrew McLean and Charles Cammell representing Glasgow; and Hugh Lee Pattinson and Lawrence W Adamson representing Newcastle-upon-Tyne.[43] Benjamin Hingley was the chairman of LBTC from 1900 to 1905, and after his death he was succeeded by George Benjamin Hingley, his nephew, who served until he died in August 1918.

In the period between 1896 and 1899 when the sustained campaign of The Chain, Cable, and Anchor Manufacturers' Association came to fruition,

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[42] WHC : Sec. 8 ; DLB, 3 : 23 January 1902, 177.

[43] Companies House, Cardiff.

'Ben' Hingley became clearly identified as the activist who wanted to break the monopoly enjoyed by the Lloyd's Register. This monopoly allowed the Register to effectively control public testing in Britain, while at the same time allowing the licensing of foreign testing machines for the testing of cables and anchors for foreign owned ships. Under the Act of 1899, the Board of Trade became the regulator in chief to the satisfaction of the manufacturers, notwithstanding the fact that the Lloyd's Register still retained the right of endorsement of the test house certificates. A peculiar feature of this campaign for public control was that public testing had no place in the political and commercial culture of France and Germany. It was necessary therefore for 'Ben' Hingley to reach an accord with Bureau Veritas of France. An agreement between 'Ben' Hingley and John Gravell of the Bureau in 1897 provided an acceptance of the British view that cables and anchors for sea going ships should only be examined and tested at public proof houses having an official licence.[44] This agreement was further buttressed later in the year in a formal agreement concluded with P L Breslauer of the London office of Bureau Veritas and in which the Bureau undertook to accept only those test certificates issued by the public test houses.[45] With regard to Germany H M Hingley was faced with a somewhat more difficult situation. As Hingley stressed to Herr Lacisz of Germanischer Lloyd in 1896, it was rather anomalous for that body to accept private test house certificates for cables manufactured in Germany while insisting on Lloyd's certificates for the same product manufactured in Britain.[46] Hingley stressed the need for Germanischer Lloyd to have a system that matched that of the Lloyd's Register in Britain. In this contention he was probably heavily influenced by the clandestine commercial alliance he had with Hochfelder Walzwerk.

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[44] WHC : Sec. 8 ; DLB, 2 : 21 May 1897, 128.

[45] Ibid., 29 October 1897, 184.

[46] Ibid., 9 November 1896, 7.

When the Act of 1899 came into effect the Board of Trade became the issuer of licences for the public test houses and also set the scale of charges. The Lloyd's Register were to be the legal testers and was the body that appointed and paid the superintendents. The manufacturers had to provide the test houses.

Sir Benjamin Hingley, who was dedicated to testing and quality, became the first chairman of the Lloyds British Testing Company. Its original test houses were at Netherton, Tipton, Chester, Glasgow, and Newcastle-upon-Tyne. His nephew, 'Ben' Hingley, never quite shared his uncle's enthusiasm for the LBTC. As he said to a Messrs. Lamb, Beal & Son in 1901, he would have preferred the Board of Trade to have taken responsibility for the test houses required by the Act.[47] This indeed was an odd comment coming from a man who did not care for undue interference in the free market. Many years later, when he was dying in 1918, Sir George Hingley endeavoured to sell the LBTC to the Lloyd's Register. The public test houses had given magnificent service throughout the War of 1914 to 1918, and Sir George had remained steadfast in his earlier views of 1901 that this public service ought to be run by some sort of public body. He was never happy over the fact that the manufacturers had to carry the full burden of providing and maintaining the test houses to the entire satisfaction of both the Lloyd's Register and the Board of Trade.

With the establishment of the LBTC in 1900, and building on the rapport that had already been established by his brother with Bureau Veritas, H M Hingley took on the task of bringing the Germans into line over testing. He began by expressing the hope to Captain von Eickstadt of the Reiche Marine, Berlin, that his committee would recommend to Germanischer Lloyd that it should abandon testing on private machines in

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[47] WHC : Sec. 8 ; DLB, 3 : 3 May 1901, 113.

Britain in favour of using the public test houses licensed by the Board of Trade. Hingley stressed that this move was essential in the interests of quality and in achieving an equal footing when tendering.[48] By and large a mutually acceptable working agreement was reached between LBTC and Germanischer Lloyd, and this held for some three years. However the dramatic fall in industrial activity, that reached a low point in 1904, put strains on the alliance. Early in 1904, H M Hingley had to remonstrate with Germanischer Lloyd over its activities with the Bute Test House in Cardiff, a house not in LBTC. The gist of Hingley's complaint was that he had come across Bute test certificates that had been signed by the Germanischer Lloyd surveyor in Newcastle without having been present at the tests in Cardiff. If Germanischer Lloyd was prepared to extend this facility to Bute, that had no comprehensive agreement with them, Hingley argued that Germanischer Lloyd should include all the LBTC test houses within the facility.[49]

Coincident with the upturn in industrial activity in the short lived boom of 1906 and 1907 LBTC was required to embark on a programme of renewal and refurbishment for its five test houses. Sir Benjamin Hingley died in 1905 and his nephew, now Sir George Hingley, took over as chairman of LBTC. Sir George's endeavours to run a business to suit the statutory requirements of the Board of Trade and the Lloyd's Register, while returning an acceptable level of profit to those carrying the financial costs of the operations, namely the principal manufacturers, became the cross that was to be a burden for the rest of his life.

After the Navy driven boomlet of 1906 and 1907, the severity of the collapse in industrial activity that was a feature of 1908 and 1909 had

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[48] WHC : Sec. 8 ; DLB, 3 : 25 September 1900, 20.

[49] Ibid., 7 January 1904, 317.

consequential and dramatic consequences for LBTC with its seven test houses to feed. There was Sunderland on the river Wear, and the Low Walker test house at Newcastle-upon-Tyne. The Black Country had test houses in Cradley Heath, Netherton, and Tipton. Chester had the test house at Saltney; and Scottish one was in Glasgow. Things were so bad by May 1908 that Sir George was compelled to advise Peter Sampson at the Board of Trade that the working expenses of the test houses had to be reduced substantially.[50] A temporary easing of the pressure in favour of closing one of the north east test houses came with a gesture from the Lloyd's Register in reducing its charges by a massive 50 per cent. Sir George, when thanking Andrew Scott for this concession, hoped that the reduction over the time span of 1 July 1908 to 31 December 1909 would save the day.[51]

With the return of a steady increase in industrial activity that was to last from 1910 to 1920, LBTC settled down to a more or less settled routine notwithstanding a continuous level of commercial irritation created by others. However, after a compact lasting for more than a decade, private testing machines licensed by Bureau Veritas came back into use in 1910 in breach of the agreement with LBTC.[52] Then early in 1911 Sir George had to urge H L Pattinson, of the Newcastle test house, to resist the efforts of the Tyne Commissioners to extend municipal trading by building a test house at Howden to compete with Low Walker.[53] However, after the serious industrial troubles of 1911 and 1912 that are covered elsewhere, trading for LBTC improved to such an extent that at the end of 1912 Sir George proposed to Andrew Scott at Lloyd's Register

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50 WHC : Sec. 8 ; GBHPLB, 2 : 27 May 1908, 925.

51 WHC : Sec. 8 ; GBHPLB, 3 : 15 February 1909, 121.

52 Ibid., 696.

53 Ibid., 854.

that the superintendents be paid a special bonus. He suggested £25 for the senior men at Netherton and Tipton; £15 for Cradley Heath, Chester, Glasgow, and Newcastle/Sunderland; and an increase of 5/- per week for the assistant superintendents at Netherton and Tipton.[54]

Perhaps the unreal situation in which the last peacetime months were spent was captured by Sir George's continuing pre-occupation with test certificates. Late in 1913 he was much occupied in stressing to C F Redman, at the Lloyd's Register, of the desirability of British test certificates being clearly identified as such so as to distinguish them from test certificates issued abroad by foreign test houses recognised by Lloyd's.[55] It was a very real issue to him in that the integrity of the product depended as much on it being seen to be British as on the test itself.

With the advent of war in August 1914 Sir George Hingley entered on the last phase of his intensely personal involvement with the affairs of LBTC. The upsurge in navy work, that was a feature of the first year of the war, led to each of the testing houses becoming particularly busy. However, Sir George's main concern during the first year of the war was to prevent private test houses from breaking into a cable testing market that was governed by statutory public testing. Eventually, Sir George was compelled to urge J Rogers, the Inspecting Officer at the Admiralty, to issue direction orders so that cables had to be sent to the public test houses only.[56] This was a matter that was to cause even greater concern later in the war, when the losses at sea became so great that ships were commissioned for service without the cables being tested at all.

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[54] WHC : Sec. 8 ; GBHPLB, 4 : 17 December 1912, 407.

[55] WHC : Sec. 8 ; DLB, 5 : 26 November 1913, 427.

[56] WHC : Sec. 8 ; DLB, 8 : 22 September 1915, 274.

During the second and third years of the war Sir George's main problems in dealing with government lay in the conflicting demands of the various departments of state. Driven by the sheer volume of orders for ships' cables, every conceivable firm of chainmakers was taking government orders. More and more inferior cable was being dumped at the public test houses, with the inevitable result that the volume of successfully tested cable was affected. Entreaties by Sir George to Andrew Scott at the Lloyd's Register on the consequences of so much rubbish being submitted for testing were very pointed.[57] This was a problem thrown into very sharp prominence with the National Service Act of 1916 bringing as it did the possibility of call-up for the test house superintendents, the very men who were at the heart of the testing process. Thus the problem of reconciling the conflicting demands of the state fell increasingly on Sir George.

The fourth and last year of the war was one of growing frustration for Sir George, as far as the LBTC was concerned, in this particular relationship with a government department. The company had made quite attractive profits of £119 279 in the five years to 31 December 1917, as Sir George had mentioned to his auditors early in 1918.[58] For Sir George, however, the constant demands of the labour force that early in 1918 was insisting on increases in the order of 12.5 per cent, coupled with the Admiralty's pressure for more men to be taken on for the work of testing, coupled with the demands of the call-up, coupled with the relaxing of the statutory requirements for cable testing, finally caused him to decide that enough was enough.

Thus, in his last months Sir George set out to sell LBTC to the Lloyd's Register, the very body whose monopoly he had set out to break in the

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[57] WHC : Sec. 8 ; GBHPLB, 4 : 29 May 1916, 982.

[58] WHC : Sec. 8 ; GBHPLB, 5 : 22 January 1918, 203.

lobbying that led to the Act of 1899. By then he was a dying man. His negotiations with Andrew Scott at the Lloyd's Register showed a quite unnecessary obstinacy. For example he refused to provide Scott with copies of the LBTC accounts unless there was a serious commitment to purchase the company.[59] It is not entirely clear what he wanted to keep confidential as in the correspondence with his auditors already referred to he had confirmed quite attractive profits for the previous five years. Perhaps it had something to do with the fact that Sir George needed Scott's support to do away with the practice of discounts on fees, in order to offset the heavy wage increases in prospect.[60] The fears about wage increases were well founded and in March Sir George had to complain to W B Leech the Assistant Director of Shipyard Labour, that 'uncontrolled' firms could pay what they thought fit, whereas at LBTC he was faced with his men refusing to work unless a wages increase of 12.5 per cent was made retroactive to 15 October 1917 and not 1 January 1918.[61]

However, in the same month, March 1918, Sir George offered to sell LBTC to the Lloyd's Register for the sum of £270 000. In his offer to Andrew Scott he stressed that this was lower than his originally intended figure and that he had valued the business as a going concern including land, buildings, machinery, tools, and goodwill.[62] Scott obviously baulked at the figure, and Sir George sought to reassure him particularly over the properties and machinery by stressing that the Board of Trade's annual maintenance requirements guaranteed that those were in good order.[63] However, Scott being a member of a regulatory

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59 Ibid., 15 January 1918, 196.

60 Ibid., 1 February 1918, 217.

61 WHC : Sec. 8 ; DLB, 11 : 4 March 1918, 242.

62 WHC : Sec. 8 ; GBHPLB, 5 : 6 March 1918, 243.

63 Ibid., 2 May 1918, 268.

body and not a businessman had no concept of goodwill as part of the value of a going concern. Until the 1960s when acquisitions were increasingly made as a means of asset stripping, goodwill was always an item in the sale price of a profitable going concern. Most valuations invariably consisted, therefore, of the true value of the fixed and cash assets less debts, together with a valuation of goodwill. This could be two or three times the annual profits, depending on the strength of repeat business. Lloyd's Register obviously had difficulty over the goodwill factor in Sir George's valuation.

After this Sir George threw in his hand. He admitted to J A Black, the LBTC director in Glasgow, that he was not well and that he might accept £260 000 for the testing company. More significantly he stated: 'I do not think I am prepared to continue acting as Chairman under present conditions for much longer...'.[64]

His final letter to Andrew Scott in June 1918 was remarkably brusque. He informed Scott that the South Staffordshire committee of LBTC strongly disapproved of any further increases in pay to the Lloyd Register's superintendents who were already very well paid; that any alterations in charges from the Board of Trade would have to be dealt with later and then only by himself personally; and finally, he told Scott that if either of these matters came up, he should say that the chairman was away and was unwell and that he should delay any business matters until September.[65]

Sir George Hingley wrote no more letters. He did go away; and on 19 August 1918 he died.

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[64] Ibid., 3 May 1918, 271.

[65] WHC : Sec. 8 ; GBHPLB, 5 : 14 June 1918, 289.

A summary

The transition of the Hingley firm from supplicant supplier to major lobbyist and setter of international standards for ships' cables and anchors, is seen as one of its major achievements during this period. Without doubt, Hingleys' ability to persuade the governments of Italy, Germany, Japan, and other maritime nations including eventually the USA, through its agents, that cables made from the best Netherton iron and anchors made to the HPAC design of 1906 were the best in the world, was a crowning achievement of this period. It should be noted, however, that Hingleys' excellence in these products stemmed directly from its supplicant role with the British Admiralty. The admiralty specifications compelled manufacturers to produce the very best. It was thus on the back of this enforced excellence that Hingleys' hegemonic position in the supply of cables and anchors to foreign governments was mounted. Likewise the regulatory role of the Board of Trade in liaison with the Lloyd's Register also had the effect of raising the quality of Hingleys' domestic endeavours to the level that made the firm unbeatable in the foreign market.

Regarding relationships with foreign governments, the Hingley brothers proved to be particularly perceptive in identifying the officer class as the route to influencing specifications, especially in Japan and Italy. Evidence of any firm relationship with the German government has not come to hand. What is certain, however, is that the enormously successful and clandestine arrangements with major German firms, using highly placed agents as monitors, effected a more than satisfactory arm's length relationship with Germany.

As with all firms with a capability to manufacture the munitions of war, Hingleys had a major problem in adapting to the sheer scale of

government bureaucracy created after 1915. That it did cope, notwithstanding continual reductions in its clerical personnel, is yet another tribute to the professional management introduced by Sir George and consolidated by C E Lloyd.

Of all relationships with governments, the longest was that brought about by testing. Ever since the major role played by Noah Hingley in setting up The Staffordshire Public Chain and Anchor Testing Company in 1864, the firm through the standards that it created had an influence on the Board of Trade and the Lloyd's Register. The Anchors and Chain Cables Act of 1899 that resulted in the formation of the Lloyds British Testing Company as a quasi agent of the Board of Trade, ensured for Sir Benjamin and for Sir George Hingley an intimate relationship with government terminated only by their deaths.

CONCLUSION

In my introduction I stated that the main thrust of my dissertation would be to show that the firm of N Hingley & Sons Limited was an industrial anachronism harnessed to a paradox. Hingleys was able to maintain a hegemonic position in the shrinking market for high quality wrought iron because it made a product - large diameter ships' cables and large anchors - that could not be made as well in the steel that was available at the time.

This is not to suppose that the Hingley management buried its corporate head in the sand as far as technological development was concerned. In 1904 the brothers 'Ben' Hingley and H M Hingley made a serious approach to the Belgian firm of L'Société Genérale du Laminage Annulaire on the subject of the manufacture of ships' cables by machine. This was followed in 1907 with an equally serious approach to a second Belgian firm, L'Homogène Société Anonyme Internationale. These approaches eventually culminated in the formation in 1908 of the joint venture company known as British Machine Made Cables Co Ltd., in which Hingleys and John Brown invested jointly £100 000. The company was launched on the expectations that the Masion process of Laminage and the Girlot process of L'Homogène would enable it to take a commanding presence in the supply of large diameter ships' cables. The venture failed on two counts : the first was the inability of the machinery to produce the larger sizes of cable to a performance standard acceptable to the trade. The second was the total intransigence of the workforce that point blank refused to carry out the vital finishing work on the machine made cables. As was common for the time the machine made product could only be brought into service if the vital man made shackles and the like were to hand. Here a complete block on this work revealed an intriguing

facet of the relationship between masters and men in the Hingley works. There, the basis for all working practice was the agreements reached in the meetings of the Midland Iron & Steel Wages Board. These agreements were aimed at mutual well being, with profits for the masters and good pay for the men depending on the production by hand of wrought iron and its products. At the time it was too soon for the men to give away their privileged industrial way of life. Thus, and right through to the death of Sir George Hingley in August 1918, the only real concessions to mechanical progress in the works was the introduction of the famous Nasmyth steam hammer in 1850 by Noah Hingley himself, together with the efficient rolling machines that enabled the firm to produce such high quality wrought iron. Even to the end of the Hingley era in 1918, the firm's preferred process of producing wrought iron remained essentially the puddling process designed by Henry Cort in 1784.

The paradox lay in the fact that notwithstanding the steady decline of wrought iron as a world metal, and the great advances in metallurgy that took place during the period under review, Hingleys' wrought iron remained undisputedly the best material available for the manufacture of large diameter ships' cables. I found it significant that only after the outbreak of war in 1914 did the USA admit that its cables were vastly inferior in quality to those made from wrought iron in Britain. From 1915 onwards Hingleys, through its agent W Carlile Wallace, brought home to the Americans the superiority of the British product manufactured from wrought iron. This product was supplied in large quantities, on a par with that of the equipping of our own ships, for the duration of the Great War. The paradox here lay in the fact that the US, by now the leading producer of steel in the world, could not at that stage manufacture a satisfactory ship's cable. Significantly however, within days of Sir George's death in 1918, C E Lloyd instructed Wallace

to investigate the progress being made in America to produce a variety of steel to match the essential characteristics of wrought iron.

It is possible that Lloyd's interest in the possibility of using steel for the manufacture of ships' cables arose from reports on a method under development in the United States. This involved the casting of steel anchor chain in sand moulds, the interlinking being achieved in the construction of the moulds and the subsequent pourings.[1]

In harnessing the efforts of the firm to the international demand for its products, Hingleys always had several factors of major significance in its favour. These were focused on the sheer good fortune of having the works located in an area rich in coal, limestone, and the iron ore that were so vital in production of wrought iron. Noah Hingley built on this good fortune and he was able to leave to his son Benjamin, and his grandsons G B Hingley and H M Hingley, a family firm that was easily converted in 1890 into a soundly based corporate body. Thus the firm of N Hingley & Sons Limited was able, through its inherent stability, to act as the standard bearer for the trade throughout the period under review.

Notwithstanding the relative calm in which the firm carried on its business from Netherton, the country and industry at large was subjected to much rapid social and economic change during the period under review. After 1890 the organisation of unskilled labour effected changes in the relationships and attitudes between labour and capital that resulted in marked hostility for almost the next ninety years. Until the outbreak of the Great War in 1914, Hingleys was largely shielded from industrial

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[1] A E Crockett in the Proceedings of the Engineers' Society of Western Pennsylvania (35 1919) 1-25 referred to in Journal of the Iron and Steel Institute, (99 1919) 659.

strife due mainly to the workings of the Midland Iron & Steel Wages Board that resulted in amity over pay.

Ideologically the long time nostrum that destitution was more likely to be due to fecklessness or to the divine will was finally discarded as a worthless concept of a man's state. In its place there developed an ideological desire to improve the quality of the nation's basic asset of people. After a last rearguard action in the 1890s by the do-ers of good works, the early 1900s saw the state taking a greater role in the physical care and feeding of school children. After the landmark general election of 1906, the determination of central government to involve itself in the affairs and situation of its least advantaged citizens became part of the constitutional ethic. The culmination of these endeavours came with the National Insurance Act of 1911 that enshrined the concept that neither sickness nor unemployment should necessarily result in destitution. Hingleys had a good record in mutual welfare and, although paternalistic until the Great War, national insurance plus the workings of the Wages Board ensured the firm one of the happier places in the peace.

Economically the firm was as exposed as any other to market forces, but due to the hegemonic status that it held in the trade it was able to influence the fortunes of many out of all proportion to its own size and position. This was demonstrated with great effect in the trading combinations of 1897, 1902, and 1904, in which Hingleys brought together the leading firms in the cable making trade to cope with the sheer scale of demand created in the mini-booms of 1897 and 1904 and with the depressed conditions of 1902. Other trading alliances enabled the firm to corner the anchor market in Italy and in the northern areas of England, and for almost ten years from 1904 to offset the banishment by the Admiralty.

In parallel with the formidable trading alliances created in Britain, Hingleys ran the hugely successful trading partnerships with German firms from 1895 right through to the outbreak of war in 1914. These partnerships left a question that I have been unable to resolve : was Hingleys' firm a major agent of espionage for the British Government in Germany? Certainly, the amount of information on the Imperial Navy that was in British hands in the 1900s must have come from a reliable source. And again, was a dispute over less that £250 worth of repairs of sufficient magnitude to have Hingleys barred by the Admiralty at a time when the gathering of naval intelligence by a firm apparently out of favour with its own government may well have been yet another of its clandestine roles in Germany?

Hingleys enjoyed virtually continuous production in all its works, save for a bad few months in 1909, throughout the whole of the period under review. It followed, therefore, that its wares had to be sold, and the firm developed a system of marketing that was highly effective. The tables given in chapter seven demonstrate the spread of representation across the entirety of the world where wrought iron, cables, and anchors, could be used. Marketing strategy in Britain and the colonies was based on a tight group of London merchants, whose efforts were supplemented by their own branch operations in the colonies and by Hingleys' own personally selected agents who were expected to work in concert with the merchants. In Italy and Japan a different approach was needed and Hingleys tapped into the culture of an officer class that needed to supplement its basic income by commercial representation. In Germany, a small number of highly placed agents was recruited to help negotiate and then monitor the clandestine commercial alliances with Hochfelder Walzwerk, Borsig, and Krupp. By painstaking attention to detail, coupled with its ability to demonstrate the superiority of its

products, the firm ensured that its wrought iron, cables, and anchors, sold well in most of the developing colonies and in the maritime countries of the world.

As to the products themselves, Hingleys set a world standard for all the normal uses for wrought iron. Its bar iron, although not as easy to work as cheaper brands, was unequalled for durability and tensile strength. It had no difficulty in holding its market in mining, railway construction, rolling stock construction, and general use. Likewise with ships' cables, the firm was one of a very small number able to make both large diameter and fine diameter cables per the Admiralty specifications that called for accuracy to 1/16th of an inch. As such, and coupled with the remarkable quality of its cables, the firm was able to dominate market share whenever reliability was the key determinant. Regarding anchors, the Hingley firm had been anchor smiths since 1848, but with the coming of the big ships in the later part of the 19th century it pooled its resources with the superior design capability enjoyed by the Halls Patent Anchor Co. Ltd. The association between inventor and anchor smith began with the manufacture of the Hall's designs of 1888 and 1889, with the leap forward to major eminence with the design of 1904. This latter design was the one containing the critical fault that led to Hingleys taking over the design in 1906, a move that resulted in Hingleys becoming the producer of the finest large anchors anywhere in the world.

During the course of the dissertation I have endeavoured to demonstrate how, during the period under review, Hingleys' relationships with its own government in particular changed from a long arm's length arrangement to an involvement with the agencies of government in every facet of the firm's operations. In 1890 contact with government was limited in the main to a deferential course of action aimed at ensuring

the inclusion of the firm's cables and anchors on the navy list. This changed dramatically after 1904 and the debacle of the failed anchor. This resulted in Hingleys developing a determined lobbying approach that had very little success. However, after 1912 when Hingleys had acquired the Halls Patent Anchor Co Ltd., and had appointed a retired admiral as its chairman, things did improve partly because of personalities and very much due to the re-armament programme. It was, however, in the field of social welfare that involvement with government became most marked. Although Hingleys' workforce was largely excluded from the workings of the labour exchanges and the old age pensions introduced in 1906, the National Insurance Act of 1911 changed forever the relationship between employer and employee. With the State now taking the lead role in the provision of unemployment pay and in the provision of medical services, Hingleys as a paternalistic employer had its status reduced to that of one of the many that were no longer the sole providers for its workforce.

The Great War had the greatest effect, however, on relations with government. After 1915 when the firm was declared to be a Controlled Establishment, it was for all practical purposes merely a technical arm of government. That it was able to cope with the demands of a command economy, while having to operate as a capitalistic entity subject to the new order of regulations, production targets, and taxation of many and various kinds, was due in no small measure to the professional management introduced by Sir George Hingley after 1908. Of all his formidable achievements, the way in which he transformed his erstwhile regime of the gaffer and two aides into a highly effective professional board of directors must rank as one of his finest achievements, especially as the transition was effected within three years. It was the period during which G C Edwards was brought in as a professional company secretary, C E Lloyd was appointed as the new managing director,

and J S Trinham was brought in as a professional personnel director. Under Sir George's firm hand these newcomers soon gelled with the masters of the iron trade in the firm, namely G F Hartshorne who had taken over from H M Hingley, and E H Smith and C E Howell the trusty works managers.

The final paradox in the Hingley story has to concern Sir George Hingley's early determination to concentrate the ownership of the business in the hands of himself and his brother. After his death the ownership became so widely spread that N Hingley & Sons Limited was effectively a company wholly under the control of its professional managers. In this it was among the earliest of British companies to find itself in this position.

Finally, it is my hope that this story will guarantee a place in the recorded history of the Black Country for the firm founded in 1820s by Noah Hingley. A firm transformed by his son Benjamin into a private company in 1890, and taken on to international hegemony in the trade of ships' cables and anchors by his son Hezekiah's children, George Benjamin Hingley and Henry Montagu Hingley. This was the firm, situated on the side of a canal in Netherton that led the world in the production of ships' cables and anchors. It had a concentration of excellence that created a remarkable epitaph for the three generations of Hingleys who headed the firm. As for the area from which the firm traded in 1920, some 90 per cent of all chain manufactured in the British Isles came from the Black Country.[2] The ships' cables and anchors on the Mauritania, Lusitania, Bismarck, Imperator, Aquitania, Olympic, and Titanic, were just some among many in the era of the big ships of the 1900s that were the products of N Hingley & Sons Limited, Netherton Ironworks, Dudley, North Worcestershire, England.

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[2] Moss, Chainmakers, 18-29.

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THE WRIGHT HINGLEY COLLECTION

This dissertation has relied heavily on the contents of The Wright Hingley Collection held in the Local History Archives of the Dudley Libraries Archives and Local History Service. (The archivist's index to this collection is reproduced here in part in facsimile):

Section 2. Articles of Association and Shares etc

Memorandum and Articles of Association, 1890.

Numerical Register of Shares, circa 1890.

Allotment Book, 1890-1920.

Transfer Deeds, 1905-1948.

Annual Lists of Shareholders, 1908-1919.

Section 3. Inventory

Inventory and Valuation, 1890.

Section 8. Correspondence and Papers

Directors' Letter Books, 1894-1919.

Mr G B and Sir G B Hingley's Private Letter Books, 1902-1918

Secretary's Letter Books, 1909-1919.

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APPENDICES :

Appendix One: **Partnership Act, 1890**

Appendix Two : **Memorandum of Association for N Hingley & Sons Limited**

Appendix Three: **Patents for the anchors designed by:**

- **Halls Patent Anchor Company**
- **William Wasteneys Smith**
- **William Lumsden Byers**

APPENDIX ONE :

Partnership Act 1890

CHAPTER 39.

An Act to declare and amend the Law of Partnership. [14th August 1890.]

A.D. 1890.

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

Nature of Partnership.

Definition of partnership.

1.—(1) Partnership is the relation which subsists between persons carrying on a business in common with a view of profit.

(2) But the relation between members of any company or association which is—

(*a*) Registered as a company under the Companies Act, 1862, or any other Act of Parliament for the time being in force and relating to the registration of joint stock companies; or

25 & 26 Vict. c. 89.

(*b*) Formed or incorporated by or in pursuance of any other Act of Parliament or letters patent, or Royal Charter; or

(*c*) A company engaged in working mines within and subject to the jurisdiction of the Stannaries :

is not a partnership within the meaning of this Act.

Rules for determining existence of partnership.

2. In determining whether a partnership does or does not exist, regard shall be had to the following rules :

(1) Joint tenancy, tenancy in common, joint property, common property, or part ownership

Partnership Act, 1890.

[53 & 54 Vict. Ch. 39.]

ARRANGEMENT OF SECTIONS.

A.D. 1890.

Nature of Partnership.

Section.

1. Definition of partnership.
2. Rules for determining existence of partnership.
3. Postponement of rights of person lending or selling in consideration of share of profits in case of insolvency.
4. Meaning of firm.

Relations of Partners to persons dealing with them.

5. Power of partner to bind the firm.
6. Partners bound by acts on behalf of firm.
7. Partner using credit of firm for private purposes.
8. Effect of notice that firm will not be bound by acts of partner.
9. Liability of partners.
10. Liability of the firm for wrongs.
11. Misapplication of money or property received for or in custody of the firm.
12. Liability for wrongs joint and several.
13. Improper employment of trust-property for partnership purposes.
14. Persons liable by "holding out."
15. Admissions and representations of partners.
16. Notice to acting partner to be notice to the firm.
17. Liabilities of incoming and outgoing partners.
18. Revocation of continuing guaranty by change in firm.

Relations of Partners to one another.

19. Variation by consent of terms of partnership.
20. Partnership property.
21. Property bought with partnership money.
22. Conversion into personal estate of land held as partnership property.
23. Procedure against partnership property for a partner's separate judgment debt.

Section.

A.D. 1890.

APPENDIX TWO :

Memorandum of Association for N Hingley & Sons Limited

THE COMPANIES ACTS, 1862 TO 1890.

COMPANY LIMITED BY SHARES.

Memorandum of Association

OF

N. HINGLEY & SONS LIMITED.

1. The name of the Company is "N. HINGLEY AND SONS LIMITED."

2. The Registered Office of the Company will be situate in England.

3. The objects for which the Company is established are :—

(*a*) To adopt and carry into effect an agreement dated the eighth day of September, 1890, and made between Benjamin Hingley, of Hatherton Lodge, Cradley, in the Parish of Halesowen, in the County of Worcester, Iron and Coal Master, of the one part, and Alfred Hilton Legge, Accountant to the firm of N. Hingley and Sons, of the other part, for the purchase of the lands and buildings, ironworks, blast furnaces, collieries, mines, hereditaments, stock-in-trade, tools, implements, real and personal estate, goods, chattels, book debts, credits and effects, trade marks, existing contracts, and businesses of the firm of N. Hingley and Sons, as specified in the said agreement, and to carry out the terms of the said agreement either with or without modification.

(*b*) To continue the businesses hitherto carried on by the said Benjamin Hingley under the firm of N. Hingley and Sons, and to enjoy and undertake all the existing rights and liabilities relative thereto, and to make such additions and modifications to and in such businesses as may from time to time be deemed expedient.

(*c*) To carry on in any part of the world all or any of the following trades or businesses, namely : Ironmasters, Colliery Proprietors, Mine Owners, Miners, Manufacturers of Pig Iron and finished Iron of all kinds, Cables, Anchors, Chains, Sheets, Plates, Rails, and of Iron and Steel in all their branches, Iron, Steel, and General Merchants, Iron and Brass Founders, Smelters, Chemical Manufacturers, Contractors, Engineers,

Boiler Makers, Wheelwrights, Boatbuilders, the making and repairing of all kinds of Wagons, Trucks, Carriages, and Carts, Slag Dealers, Commission Agents, Manufacturers of Forgings, Bricks, Tiles, Pipes, Coke, Patent Fuel, Gas, Lime Burners, Farmers, Timber Merchants, and any other trade or business which may be thought for the benefit of the Company to carry on in connection with any of the trades above specified.

(*d*) To search for, get, raise, make merchantable, sell, purchase, and deal in Coal, Coke, Charcoal, Timber, Ironstone, Limestone, Iron, Steel, or any other minerals, metals, chemicals, articles, materials, preparations and things, and to effect any such purchases and sales on commission, or as Agents or otherwise.

(*e*) To apply for, purchase, or otherwise acquire any Patents, licenses and the like conferring an exclusive or non-exclusive or limited right to use any invention which may seem capable of being used for any of the purposes of the Company, or the acquisition of which may seem calculated directly or indirectly to benefit the Company, and to use, exercise, develop, grant licenses in respect of and otherwise turn the same to account.

(*f*) To purchase or otherwise acquire and undertake all or any part of the business, property, and liabilities of any person or company carrying on any business which this Company is authorised to carry on.

(*g*) To purchase, acquire, take on lease, construct, erect, equip, make, maintain, work, and use all or any of the following matters or things, namely:—Blast Furnaces, Ironworks, Chain, Cable and Anchor Works, Ironfoundries, Lime Works, Boiler Works, and all other kind of works, houses, offices, workshops, and other buildings, railways, tramways, canals, quays, slip-ways, wharves, staiths, docks, shipping places, gas works, water works, reservoirs, coke ovens, roads, telegraphs, telephones, and other works and appliances, steamships and other vessels and machinery, rolling stock, tools, and plant of all kinds necessary or convenient for the purposes of the Company, or any of them, or calculated, directly or indirectly, to advance the interests of the Company, and to contribute to the expense of or aid in the acquisition, construction, maintenance, improvement, development, or use of any such matters and things.

(*h*) To enter into partnership or into any arrangement for sharing profits, union of interests, or co-operation with any person or company carrying on or about to carry on any business

which this Company is authorised to carry on, or any business or transaction capable of being conducted so as, directly or indirectly, to benefit this Company, and to take or otherwise acquire and hold shares or stock in or securities of, and to subsidize or otherwise assist any such company, and to sell, hold, re-issue with or without guarantee, or otherwise deal with such shares, stock, or securities.

(*i*) Generally to purchase, take on lease or in exchange, hire or otherwise acquire any real or personal property, and any rights or privileges which the Company may think necessary or convenient with reference to any of its objects, and capable of being conveniently dealt with in connection with any of the Company's property or rights for the time being, and in particular any land, buildings, easements, licenses, patents, machinery, plant, tools, implements, and stock-in-trade, and to purchase, hire, construct, repair, and navigate boats for the purposes of the Company.

(*j*) To establish, provide, maintain and support, or aid in or contribute to the establishment, provision, maintenance and support of any schools, buildings, hospitals, institutions, associations, classes, or libraries for the benefit, either altogether or in part, of persons employed by or having had dealings with the Company, and of their families, servants, and others, and to grant or continue any pensions or allowances to any such persons and their families and relations, and to subscribe or guarantee money for charitable or benevolent objects, or for any exhibition, or for any public or useful objects, and to recompense or reward persons in the employ of the Company for services rendered by them either by the payment of money or by allotting Shares to such persons direct or to a Trustee or Trustees for their benefit upon such terms and conditions as may be deemed expedient.

(*k*) To apply for, promote, support and obtain any Bill in or Act of Parliament or Provisional Order or other authorization calculated to benefit the Company, or to advance any of its objects, and to oppose any Bill or Provisional Order or prolongation or extension of patent promoted or applied for by any other person or Company.

(*l*) To promote, make, provide, acquire, lease, use, and dispose of railways, canals, tramways, and other ways, for the more convenient access to any parts of or otherwise for the benefit of any property of the Company, and to connect the same with any railway, tramway, port, place, river, canal, or outlet for traffic, and to disburse for or contribute to the expenses

of promoting, making, providing, acquiring, working, or usi the same.

(*m*) To make and carry into effect arrangements with landowne railway companies, shipping companies, and owners, carrie and other companies and persons, for transport from or any parts or places of minerals, goods, or other articl manufactured or sold by the Company, or required for the operations.

(*n*) To promote any other Company for the purpose of acquiri all or any of the property and liabilities of this Company, for any other properties which may be thought to be for t benefit of this Company directly or indirectly.

(*o*) To lend money to such persons and on such terms as may see expedient, and in particular to customers and others havir dealings with the Company, to guarantee the performance contracts by any such persons, and to become sureties.

(*p*) To sell, improve, manage, develop, build upon, lease, mortgag dispose of, turn to account, or otherwise deal with all or an part of the real leasehold or personal properties of th Company.

(*q*) To borrow any amount of money upon mortgage or raise mone for all or any of the purposes of the Company in such manne as may be deemed expedient, and in particular by the issu of or upon debentures, bonds, bills, notes, or other obliga tions or securities of the Company, or by mortgage of a or any part of the Company's property or assets, real an personal, including its uncalled capital, or without any suc security.

(*r*) To draw, accept, make, indorse, execute, and issue bills c exchange, promissory notes, and other negotiable instrument

(*s*) To sell, lease, and dispose of the whole or any part of th undertaking of the Company, and the whole or any of th property of the Company, for such consideration as th Company may think fit, and in particular for Share debentures, or securities of any other Company, havin objects altogether or in part similar to those of this Company

(*t*) To issue as fully paid up or partly paid up, or at or subject t any premium or discount, any of the Shares of the Company and to issue Guaranteed or Preference Shares or Stock.

To employ any of the funds of the Company in the purchase o its own Shares, and to hold, sell, and dispose of any Share so purchased according as the Company think fit, but not s as to constitute a reduction of the Capital within the meanin of "The Companies Act, 1867."

(*u*) To establish and regulate in the United Kingdom or elsewhere manufactories, works, agencies, and depots for the purposes of the Company, and to enter into any contracts, agency, or other agreements relating to the businesses which the Company may for the time being carry on with any person or persons, company or companies, which the Company may consider conducive to the interest of or for the benefit of the Company.

(*v*) To allot any Shares of the Company credited as fully or partly paid up, as the whole or part of the purchase price for any property purchased by the Company, or in pursuance of any contract in connection with the Company's business.

(*w*) To pay all the expenses of and preliminary to and incidental to the promotion, formation, establishment, and registration of the Company, and all brokerage, discount, and other expenses which may be deemed expedient for placing all or any of the Company's Shares and Debentures or any other obligations.

(*x*) To invest and deal with the moneys of the Company not immediately required upon such securities and in such manner as may be from time to time determined.

(*y*) To do all or any of the above things in any part of the world, and either as principals, agents, or otherwise, and either alone or in conjunction with others, and either by or through agents, or otherwise, and to procure the Company, to be incorporated, registered, or recognised in any foreign country or place, or in any British Colony.

(*z*) And generally to do all such things as are incidental or conducive or auxiliary to the attainment of any of the above objects.

4. The liability of the members of the Company is limited.

5. The Capital of the Company is £250,000, divided into 5,000 Shares of £50 each, with power to decrease or increase, and Shares forming the Capital of the Company (original or increased) may be divided into different classes or consolidated into Stock, with such rights, preferences, priorities, and guarantees as between the respective holders thereof as may be prescribed by any regulations which may be made by the Company, and which shall for the time being be in force, and any Shares may be issued at a premium, at par, or at a discount. Any part of the Capital of the Company may be issued in Stock or in Shares, which shall be deemed and credited as partly or fully paid up, or in Share Warrants to bearer, and interest at a rate to be agreed upon between the Directors and the Shareholder may be paid to any Shareholder on all amounts paid in advance of calls, and on all amounts of uncalled capital paid in advance.

WE, the several persons whose names and addresses are subscribed are desirous of being formed into a Company in pursuance of this Memorandum of Association and we respectively agree to take the number of Shares in the Capital of the Company set opposite to our respective names.

NAME, ADDRESS, AND DESCRIPTION OF EACH SUBSCRIBER.	Number of Shares taken by each Subscriber.
BENJAMIN HINGLEY, of Hatherton Lodge, Cradley, Worcestershire, Iron and Coal Master.	Ten Shares
GEORGE BENJAMIN HINGLEY, of Haywood, Halesowen, in the County of Worcester, Iron and Coal Master.	Ten Shares
HENRY MONTAGU HINGLEY, of Haywood, Halesowen, in the County of Worcester, Iron and Coal Master.	Ten Shares
JOSEPH HINGLEY, of Linton House, Cradley, Worcestershire, Gentleman.	Ten Shares
SAMUEL HINGLEY, of Fair View, Cradley, Worcestershire, Ironmaster.	Ten Shares
LEAH HINGLEY, of Hatherton Lodge, Cradley, Worcestershire, Spinster.	Ten Shares
FANNY GEORGINA HINGLEY, of Haywood, Halesowen, Worcestershire, Widow.	Ten Shares

Dated the 8th day of September, 1890.

Witness to the signatures of BENJAMIN HINGLEY, GEORGE BENJAMIN HINGLEY, HENRY MONTAGU HINGLEY, and JOSEPH HINGLEY,

WILLIAM SHAKESPEARE, SOLICITOR,
83 Colmore Row, Birmingham.

Witness to the signatures of SAMUEL HINGLEY, LEAH HINGLEY, and FANNY GEORGINA HINGLEY,

RICHARD AUGUSTUS EATON,
CLERK TO WILLIAM SHAKESPEARE,
83 Colmore Row, Birmingham,
SOLICITOR.

APPENDIX THREE :

Patents for anchors manufactured by:

- **Halls Patent Anchor Company**

Date of Application, 11th Mar., 1886.
Complete Left, 11th Dec., 1886.
Complete Accepted, 11th Jan., 1887.

A.D. 1886, 11*th* MARCH. N° 3461.

PROVISIONAL SPECIFICATION.

Improvements in the Construction of Anchors.

We JOHN FRANCIS HALL of Norbury, Sheffield, in the County of York, Manager of Steel Works, and JOHN VERITY of Billing Bank, Bramley, near Leeds in the County of York, Engineer, do hereby declare the nature of this invention to be as follows :—

The objects of our invention are to simplify the construction of anchors and to render them more efficient and certain in their action, and less liable to roll over than heretofore ; a common fault with some anchors, causing the cable to twist and break.

According to our invention we make the arms or flukes in one piece, and at the crown or upper portion thereof a trough is provided for the reception of the trunnions, which are formed on the upper end of the shank and fit between two projecting parts within the trough. A bolt or pin being passed through the projecting pieces and trunnions, retains the shank in position between the arms or flukes, at the same time allowing a radial movement of the arm to any required angle.

The trunnions after being placed in position in the trough and secured there by means of the aforesaid bolt, are enclosed therein by a suitable cover.

In order to place the shank in position, a hole is provided at the bottom of the trough through which the shank is passed where it is held by the hereinbefore mentioned bolt.

In order to make the action of the anchor more certain we provide projecting or "tripping up" pieces on the crown or upper portion of the trough, these arms having the effect of throwing over the arms of the anchor into position for instantly taking hold of the ground as the anchor is dragged thereon.

The stock bar is formed in two parts these are hinged onto the shank in a suitable position, so that they can be turned down against the sides of the shank in order that such stock bar when closed against the aforesaid sides can be drawn up therewith into the hawse pipe, or compactly stowed on deck or at the side of the ship.

This arrangement of hinged stock bar is applicable to other anchors.

J. W. HARDING,
Agent.

[*Price 8d.*]

COMPLETE SPECIFICATION.

Improvements in the Construction of Anchors.

We JOHN FRANCIS HALL of Norbury Sheffield in the County of York, Manager of Steel Works and JOHN VERITY of Billing Bank Bramley near Leeds in the County of York, Engineer do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

The objects of our invention are to simplify the construction of anchors and to render them more efficient and certain in their action, and less liable to drag or roll over than heretofore.

DESCRIPTION OF DRAWINGS.

Fig. 1 is a front elevation. Fig. 2 a side elevation. Fig. 3 a plan looking at the top. Figs. 4. 5. 6. 7. 8. 9. 10 and 11 are various views shewing details of the same.

According to our invention we make the two arms or flukes A in one piece, preferably in cast steel, and at the crown or upper portion thereof is formed a trough B for the reception of the trunnions C which are formed on the upper end of the shank D and which fit between two projecting parts E formed across the bottom of the trough B.

A bolt F or pin being passed through the projecting parts E and trunnions C retain the shank D in position between the arms or flukes A, at the same time allowing of a radial movement of the arms or flukes A to any required angle.

In order to place the shank D in position a hole G is provided through the bottom of the trough B through which the shank D is passed and afterwards held in position as shewn in drawings by the hereinbefore mentioned bolt or pin F.

The outer edges of the walls H of the trough B perform the duties of "trippers" but in order to more completely perform this operation we form or provide on their edges the projecting pieces J; by this arrangement the flukes or arms A of the anchor are instantly thrown into position for taking hold of the ground immediately the anchor commences to drag thereon.

We apply what is known as a "fisher" at K for hooking up the anchor when required.

This anchor being without a crossbar can readily be drawn into the hawse pipe and easily stowed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1st. The arrangement of arms or flukes A constructed in one piece, substantially as herein set forth.

2nd. The arrangement and application of the walls H forming the trough B for the trunnions C of the shank D and the means employed for securing the same together, substantially as herein set forth.

3rd. The application of the walls H of the trough B, and the projecting pieces J for the purpose of "tripping" or throwing over the anchor into position, substantially as herein set forth.

4th. The combination of the various parts forming the anchor, substantially as and for purposes herein set forth.

J. W. HARDING,
For the Applicants.

LONDON: Printed by DARLING AND SON,
For Her Majesty's Stationery Office.
1887.

FIG. 2.

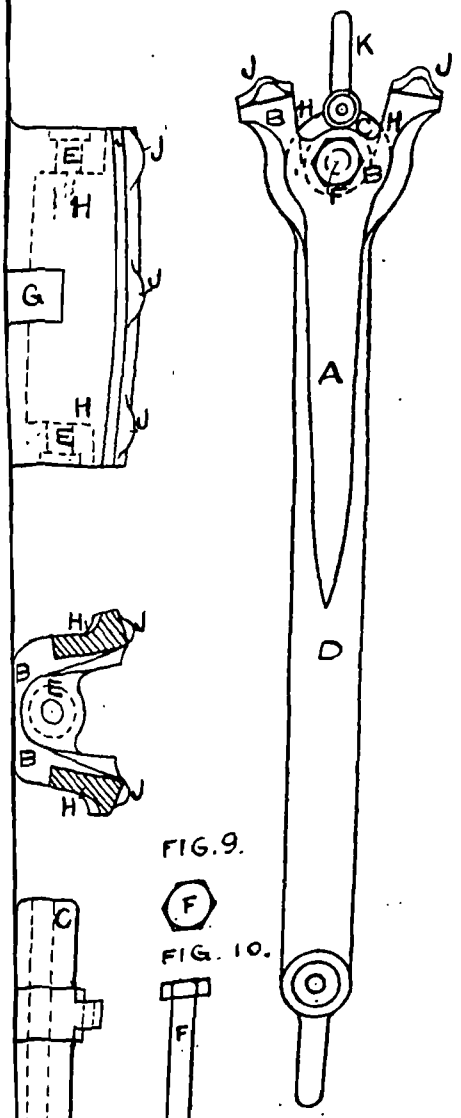


FIG. 9.

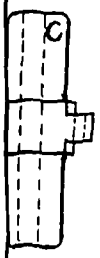


FIG. 10.

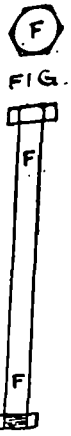


FIG. 11.

FIG. 1.

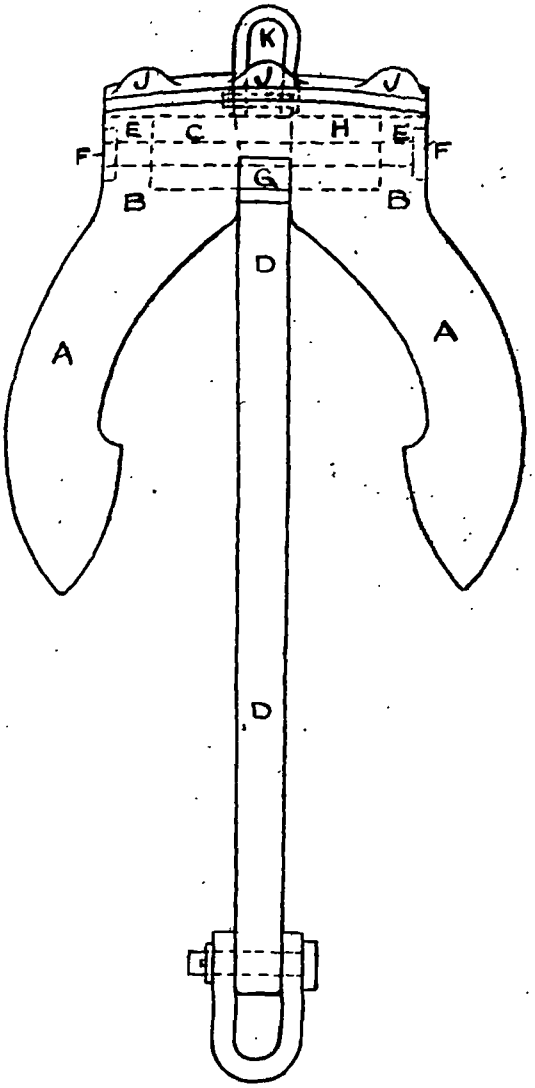
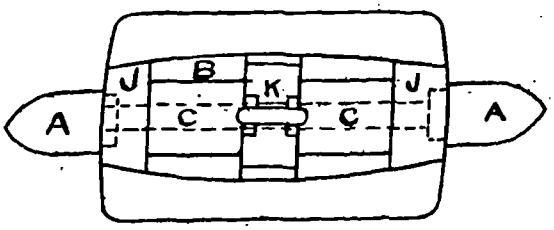


FIG. 3.



Printed by Darling and Son
Her Majesty's Stationery Office. 1887

FIG. 4.

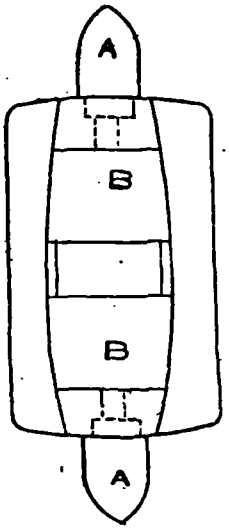


FIG. 5.

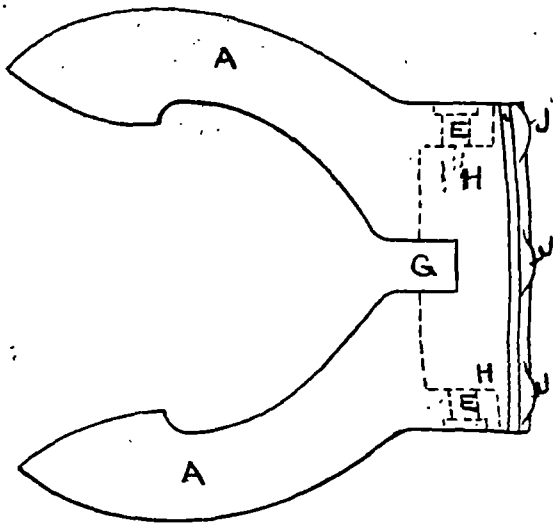


FIG. 6

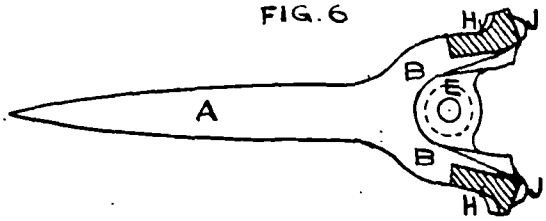


FIG. 9.

FIG. 7.

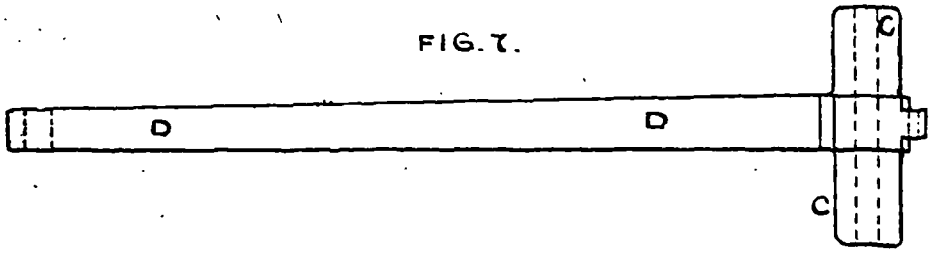


FIG. 10.

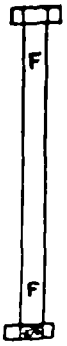


FIG. 8

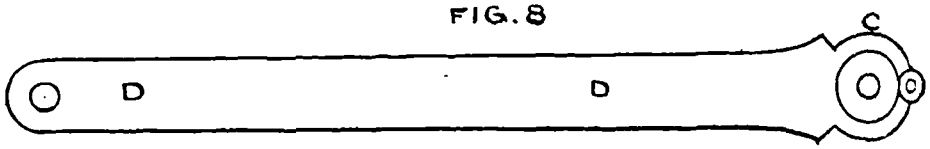


FIG. 11.

London: Printed by Darling and Son
for Her Majesty's Stationery Office 1887

Date of Application, 9th May, 1888
Complete Specification Left, 9th Feb., 1889
Complete Specification Accepted, 9th Mar., 1889

A.D. 1888, *9th MAY.* N° 6918.

PROVISIONAL SPECIFICATION.

Improvements in the Construction of Anchors.

We, JOHN FRANCIS HALL of Norbury Sheffield, Manager of Steel Works, and JOHN ...ERITY of Billing Bank, Bramley near Leeds, Engineer, both in the County of York, ...o hereby declare the nature of this invention, to be as follows:—

Our invention consists in certain improvements in anchors whereby they are ...endered more efficient and certain in their action and less liable to drag or roll over ...an hitherto, and has reference to a patent granted to us dated 11th day of March ...886, No. 3461.

According to our invention we make the arms or flukes and horns or trippers in ...ne piece, such horns or trippers being arranged in front of the centre of the axis of ...e crosshead.

The crosshead is hollowed out for the reception of trunnions of the shank; these ...unnions are not made in one piece with the shank but consist of a tube passed ...rough an eye or opening in the head of the shank when such head is in a heated ...ate, and when cold holds such trunnions firmly by shrinkage.

We extend or prolong the trippers the full width of the flukes, these thereby ...ving the purpose of a stock bar.

The crown of the crosshead is recessed to receive the trunnions of the shank, and ...rounded or arched at suitable points in its length, also the extremities of such ...wn are projected laterally therefrom, so that with these combined arrangements ...e anchor on being dropped overboard will fall into position immediately on reaching ...e ground.

A bolt or pin being passed through the arched or rounded pieces and trunnions ...ains the shank in position between the arms or flukes, at the same time allowing a ...dial movement of the shank and arms or flukes to any required extent.

Dated this 9th day of May 1888.

J. W. HARDING,
Agent for the Applicants.

[*Price 8d.*]

COMPLETE SPECIFICATION.

Improvements in the Construction of Anchors.

We, JOHN FRANCIS HALL of Norbury, Pitsmoor, Sheffield, Manager of Steel Works, and JOHN VERITY of Billing Bank, Bramley, near Leeds, Engineer, both in the County of York, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Our invention consists in certain improvements in anchors whereby they are rendered more efficient and certain in their action and less liable to drag or roll over than hitherto, and has reference to a Patent granted to us dated 11th day of March 1886 No. 3461.

In the accompanying drawings Fig. 1 is a front elevation. Fig. 2 a side elevation and Fig. 3 a plan looking at the top of anchor, shewing our improvements.

According to our invention we make the arms or flukes A and horns or trippers B in one piece, such horns or trippers B being arranged in front of the centre of the axis of the crosshead C.

The crosshead C is hollowed out for the reception of the trunnions D of the shank E, these trunnions D are not made in one piece with the shank E, but consist of a tube passed through an eye or opening in the head of the shank E when such head is in a heated state, and when cold holds such trunnions firmly by shrinkage.

We extend or prolong the trippers B the full width of the flukes A, these thereby serving the purpose of a stock bar.

The crown of the crosshead is recessed to receive the trunnions D of the shank and is rounded or arched at suitable points F in its length, also the extremities G of such crown are projected laterally therefrom, so that by these combined arrangemen the anchor on being dropped overboard will fall into position immediately on reachin the ground.

A bolt or pin H being passed through the arched or rounded pieces F trunnions D retains the shank in position between the arms or flukes A, at the sa time allowing a radial movement of the shank E and arms or flukes A to any requir extent.

Having now particularly described and ascertained the nature of our said inv tion and in what manner the same is to be performed, we declare that what claim is:—

1st. The arrangement, construction and combination of flukes A with horns trippers B, such horns or trippers B being arranged in front of the centre of the of the crosshead C, substantially as and for purposes herein set forth.

COMPLETE SPECIFICATION.

Improvements in the Construction of Anchors.

We, JOHN FRANCIS HALL of Norbury, Pitsmoor, Sheffield, Manager of Steel Works, and JOHN VERITY of Billing Bank, Bramley, near Leeds, Engineer, both in the County of York, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Our invention consists in certain improvements in anchors whereby they are rendered more efficient and certain in their action and less liable to drag or roll over than hitherto, and has reference to a Patent granted to us dated 11th day of March 1886 No. 3461.

In the accompanying drawings Fig. 1 is a front elevation. Fig. 2 a side elevation and Fig. 3 a plan looking at the top of anchor, shewing our improvements.

According to our invention we make the arms or flukes A and horns or trippers B in one piece, such horns or trippers B being arranged in front of the centre of the axis of the crosshead C.

The crosshead C is hollowed out for the reception of the trunnions D of the shank E, these trunnions D are not made in one piece with the shank E, but consist of a tube passed through an eye or opening in the head of the shank E when such head is in a heated state, and when cold holds such trunnions firmly by shrinkage.

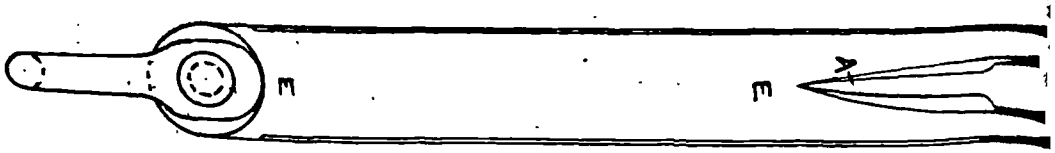
We extend or prolong the trippers B the full width of the flukes A, these thereby serving the purpose of a stock bar.

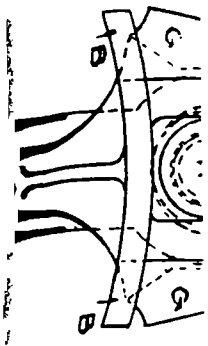
The crown of the crosshead is recessed to receive the trunnions D of the shank E, and is rounded or arched at suitable points F in its length, also the extremities G of such crown are projected laterally therefrom, so that by these combined arrangements the anchor on being dropped overboard will fall into position immediately on reaching the ground.

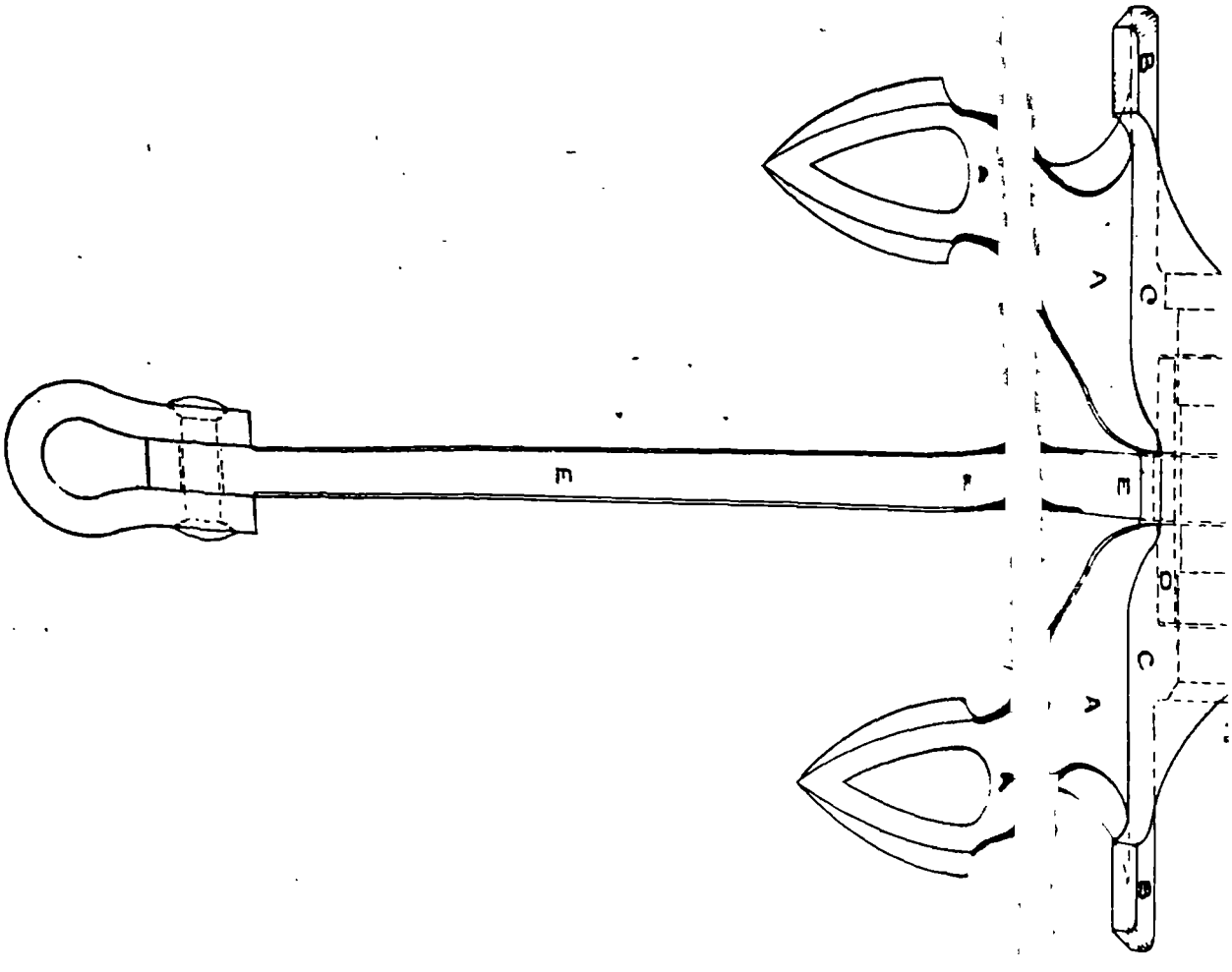
A bolt or pin H being passed through the arched or rounded pieces F and trunnions D retains the shank in position between the arms or flukes A, at the same time allowing a radial movement of the shank E and arms or flukes A to any required extent.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1st. The arrangement, construction and combination of flukes A with horns or trippers B, such horns or trippers B being arranged in front of the centre of the axis of the crosshead C, substantially as and for purposes herein set forth.


E
E


B
C
C
B


B
A
C
E
E
D
C
A
B

[This Drawing is a full size reproduction of the Original.]

(1 SHEET)

FIG. 3.

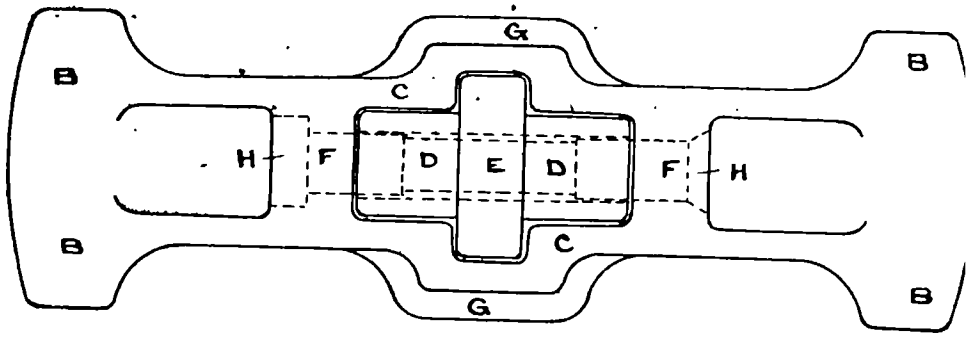


FIG. 2.

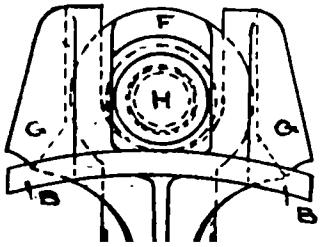
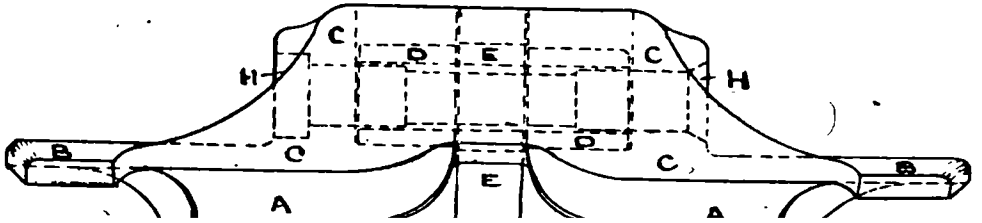


FIG. 1.



N° 1353 A.D. 1889

Date of Application, 25th Jan., 1889
Complete Specification Left, 25th Oct., 1889—Accepted, 23rd Nov., 1889

PROVISIONAL SPECIFICATION.

Improvements in the Construction of Anchors.

We, JOHN FRANCIS HALL of Norbury, Pitsmoor, Sheffield, Manager of Steel Works, and JOHN VERITY of Billing Bank, Bramley near Leeds, Engineer, both in the County of York, do hereby declare the nature of this invention to be as follows :—

Our invention consists in certain improvements in anchors whereby they are rendered more efficient and certain in their action, and less liable to drag or roll over than hitherto, and has reference to a patent granted to us dated 11th day of March 1886 No. 3461.

According to our invention we make the arms or flukes and horns or trippers in one piece, such horns or trippers being arranged in front of the centre of the axis of the crosshead.

The crosshead is hollowed out for the reception of the trunnions of the shank, such trunnions consisting of a spindle passed through an eye or opening in the head, when such head is in a heated state, so that when cold it holds the trunnions firmly by shrinkage.

The trunnions are held in position in the crosshead by transverse pins, at the same time allowing a radial movement of the shank and arms or flukes to any required extent. We extend or prolong the trippers the full width of the flukes they thereby serving the purpose of a stock bar. The crown of the crosshead is recessed to receive the trunnions of the shank.

By the above combined arrangement of crosshead and trippers, the anchor on being dropped overboard will fall into position immediately on reaching the ground. Other parts of the anchor may be of the same description as those described in our aforesaid patent.

Dated this 25th day of January 1889.

J. W. HARDING,
Agent for the Applicants.

COMPLETE SPECIFICATION.

Improvements in the Construction of Anchors.

We, JOHN FRANCIS HALL of Norbury Pitsmoor, Sheffield, Manager of Steel Works, and JOHN VERITY of Billing Bank, Bramley near Leeds, Engineer, both in the County of York, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

Our invention consists in certain improvements in anchors whereby they are rendered more efficient and certain in their action, and less liable to drag or roll over than hitherto.

Fig. 1 is a front elevation. Fig. 2 an end elevation, and Fig. 3 a plan looking on the top shewing anchor constructed in accordance with our invention.

According to our invention we make the curved arms or flukes A, horns or trippers B and crosshead C in one piece, such horns or trippers B being arranged in front of the centre of the axis of the crosshead C, instead of on the axis or behind it, and by so doing more weight is thrown into the flukes A, causing them more readily to point downwards and dig into the ground than when such horns are central with the axis or behind it, therefore by our arrangement the flukes are more certain in their action. The crosshead C is hollowed out at D for the reception of the trunnions E of the shank F, such trunnions E may be made in one piece with the shank F, or may

consist of a spindle passed through an eye or opening G in the head H when such head is in a heated state, so that when cold it holds the trunnions E firmly by shrinkage.

The trunnions E are held in position in the crosshead C by the transverse pins J, at the same time allowing a radial movement of the shank F and curved arms or flukes A to any required extent, by this arrangement whatever oxadization takes place, the trunnions E always work freely, and any accumulation of foreign substances does not prevent the perfect and certain working of the flukes A. We project the hereinbefore mentioned trippers B from the crosshead C the full width of the curved arms or flukes A, these serving the purpose of a stock bar, and by being projected the full width of the flukes A they are more effective in preventing the "heeling over" of the anchor, this being a great feature, for, on the trippers greatly depends the behaviour and success of the anchor.

By the above combined arrangements the anchor on being dropped overboard will fall into position immediately on reaching the ground.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1st. The combination of curved arms or flukes A with horns or trippers B and crosshead C, substantially as and for purposes herein set forth.

2nd. The arrangement and application of trippers B provided in front of the centre of the crosshead C, substantially as and for purposes herein set forth.

3rd. The combination of trunnions E with shank F, transverse pins J and crosshead C, substantially as and for purposes herein set forth.

4th. The arrangement construction and application of horns or trippers, projecting the full width of the curved arms or flukes A, substantially as and for purposes herein set forth.

5th. The combination with curved arms or flukes A, horns or trippers B, crosshead C, trunnions E, shank F, transverse pins J, all arranged substantially as and for purposes herein set forth.

Dated this 25th day of October 1889.

J. W. HARDING,
Agent for the Applicants.

London: Printed for Her Majesty's Stationery Office. by Darling & Son, Ltd.—1889.

FIG. 3.

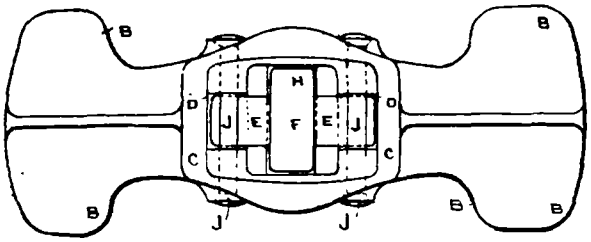


FIG. 2.

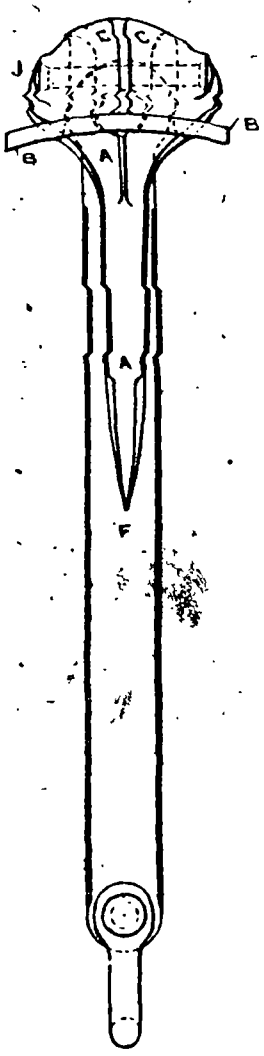
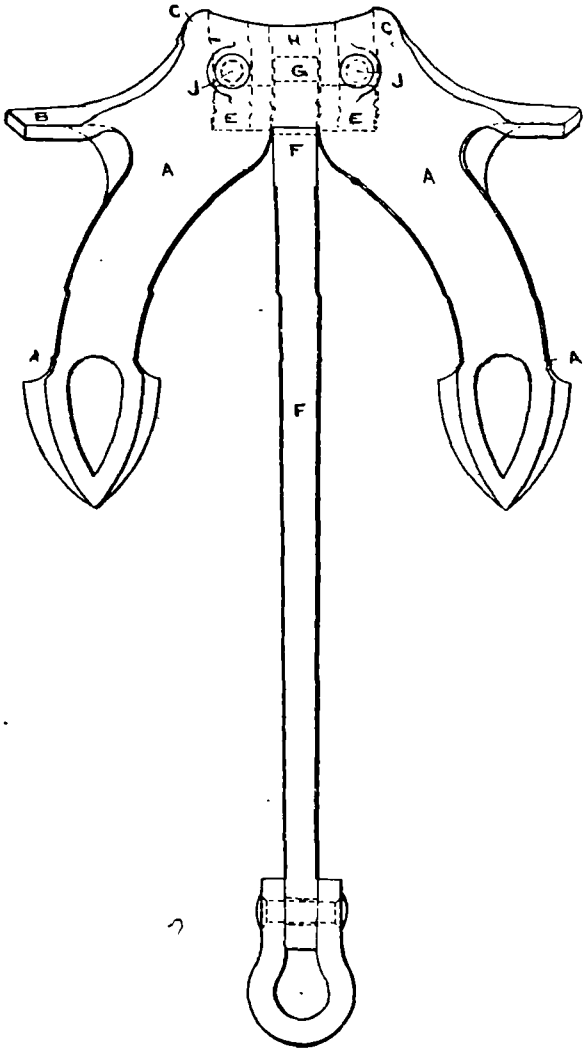


FIG. 1.



[This Drawing is a reproduction of the Original on a reduced scale.]

LONDON: Printed by DARLING and SON Ld.
for Her Majesty's Stationery Office. 1889.
Malby & Sons, Photo-Litho.

N° 8068 A.D. 1904

Date of Application, 8th Apr., 1904—Accepted, 2nd June, 1904

COMPLETE SPECIFICATION.

Improvements in or connected with Ships' Anchors.

We, HALL'S PATENT ANCHOR COMPANY, LIMITED, of 26 George Street, Sheffield, in the County of York, Engineers, and GEORGE HEPBURN, of Redcross Chambers, 11 Redcross Street, Liverpool, in the County of Lancaster, Consulting Engineer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to ships' anchors of the type called "Stockless Anchors", and it has primarily for its object to provide an improvement by which anchors of this type as at present used, are not so liable to become broken in use or deranged.

The invention is illustrated in the annexed drawings, in which Figure 1 is a side elevation of the anchor partly in section; Figure 2 is a cross section; and Figure 3 is a plan view of the anchor, viewed from below.

Figures 4 and 5 are sectional side elevation, and cross section, showing a slight modification.

Referring to the drawings, 1 is the head portion of the anchor: 2 are the flukes; and 3 is the stem. 4 are the trunnions on the stem which fit in the hollow chamber or recess 5 in the head 1 of the anchor, and carry the head.

With regard to these trunnions, they are usually held in place by cross bolts passing through the sides of the head, and close to the trunnions 4; and in practice it is found that, frequently, when the anchor is lowered and drops on to the bottom, especially when hard, these bolts bend or break by the jar and weight of the shank, and in consequence the anchor fails in its action.

Now according to the present invention, this is obviated by providing, and filling in the space 5 at each side where the trunnions 4 lie with, iron or steel blocks 6, the upper edges of which will come against and support and hold the trunnions 4; while these blocks themselves are held in position by the bolts 7. Hence there is no bending strain on the bolts, but only a shearing strain, when the anchor drops on the bottom, thereby strengthening the anchor by strengthening the shank trunnion supports, and preventing mishaps or accidents due to the anchor not acting when required.

In the modification shown in Figures 4 and 5, the blocks 6 are not held by the bolts 7 passing through them, but are in dove-tail shape, and fit in dove-tail recesses at each side of the chamber 4, so that when placed in position, they will take the thrust of the trunnions 4 when the anchor strikes the bottom: and the bolts 6 hold these blocks in place in their dove-tail recesses, so that they cannot come out.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

The herein described improvement in ships' anchors, namely, the employment within the recess of the hollow chamber 5, at each side of the head in which the trunnions 4 of the anchor stem lie, of blocks 6 fitting into such recesses, and

[*Price 8d.*]

supporting the lower side of the trunnions; and such blocks being held in place by the bolts 7 passing through the sides of the head 1 of the anchor, and blocks 6 themselves, or on the outside of such blocks; for the purposes specified.

Dated this 6th., day of April, 1904.

CHEESBROUGH & ROYSTON,
Applicants' Patent Agents,
15 Water Street, Liverpool.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1904.

A.D. 1904. APRIL 8. N° 8068.

HALL'S PATENT ANCHOR CO. [LTD.] & *another's* COMPLETE SPECIFICATION / 1 SHEET /

Fig.1.

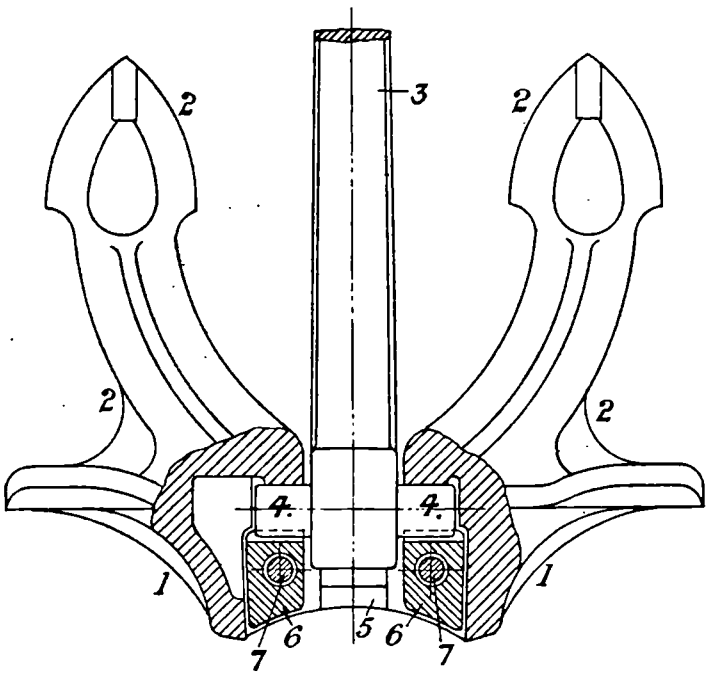


Fig.2.

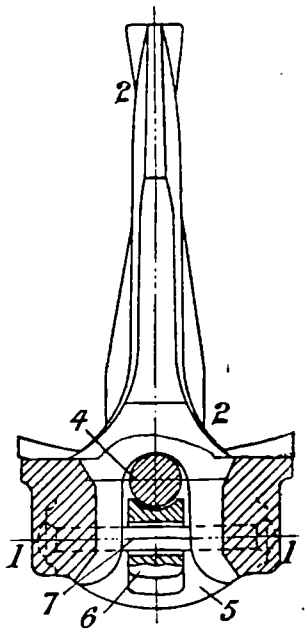


Fig.3.

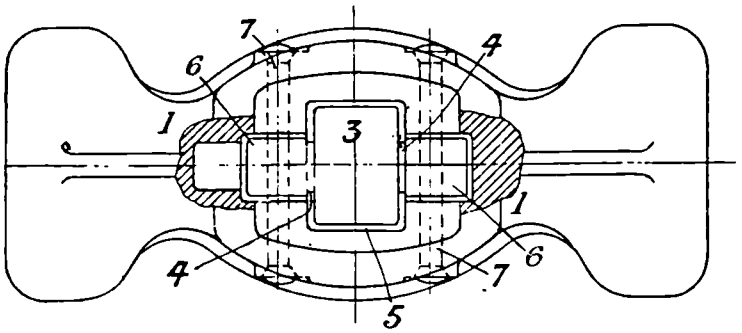


Fig.4.

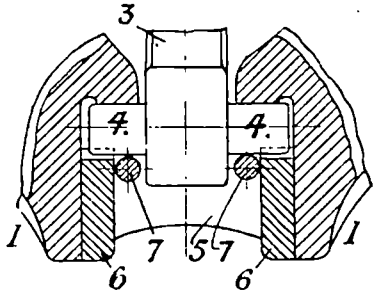
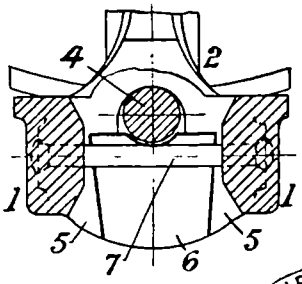


Fig.5.



[This Drawing is a reproduction of the Original on a reduced scale.]

Malby&Sons, Photo-Litho.

N° 29,063 A.D. 1906

Date of Application, 20th Dec., 1906—Accepted, 19th Dec., 1907

COMPLETE SPECIFICATION.

Improvements in or connected with Ships' Anchors.

We, GEORGE HEPBURN, of Redcross Street, Liverpool, in the County of Lancaster, Consulting Engineer, and JOSEPH ERNEST FLETCHER, of Netherton Iron Works, Dudley, in the County of Worcester, Engineer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to ships' anchors of the type called "stockless" or "patent" anchors; and it has primarily for its objects and effects to provide improvements as hereinafter described by which the weakening of the castings, due to the construction hitherto adopted, is obviated, and the strength generally of the whole casting of the head and flukes is rendered greater; and also

ERRATUM.

SPECIFICATION No. 29,063, A.D. 1906.

For the name of the second Applicant "Joseph Ernest Fletcher" as printed *read* "Joseph Ernst Fletcher"

PATENT OFFICE,
3rd April, 1908.

anchor head with flukes combined, and the shank head in place; Figure 2 is an end view of same, partly in section; Figure 3 is a cross section through the head or crown at the line A A in Figure 1; Figure 4 is a top plan view of the anchor.

Referring to the drawings, *a* is the crown of the head, *b* are the flukes, *c* is the shank, and *d* the trippers. *e* are the trunnions of the shank; *f* are the journals or sockets in which the trunnions rest, and *h* the blocks which hold the trunnions, and so the shank, in place.

According to this invention, bolts or rivets *i*, which hold the blocks *h* in place, lie in the plane of the anchor head, and extend obliquely through these blocks and the head, one end of said bolts or rivets coming in the angle between the undersides of the trippers *d*, and the outside face of the flukes *b*; and the other end on the outside of the blocks *h* within the cavity of the crown; the blocks being chamfered off at right angles to the axis of the bolt or rivet

[*Price* 8*d*.]

N° 29,063 A.D. 1906

Date of Application, 20th Dec., 1906—Accepted, 19th Dec., 1907

COMPLETE SPECIFICATION.

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We, GEORGE HEPBURN, of Redcross Street, Liverpool, in the County of Lancaster, Consulting Engineer, and JOSEPH ERNEST FLETCHER, of Netherton Iron Works, Dudley, in the County of Worcester, Engineer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to ships' anchors of the type called "stockless" or "patent" anchors; and it has primarily for its objects and effects to provide improvements as hereinafter described by which the weakening of the castings, due to the construction hitherto adopted, is obviated, and the strength generally of the whole casting of the head and flukes is rendered greater; and also sound castings are ensured, and so the wastage and expense due to unsound castings of the head and fluke portion, which are sometimes produced, are obviated.

The particular type of "stockless" or "patent" anchor to which this invention relates, is that in which the shank end which fits in the head of the anchor, is provided with trunnions which fit and work in correspondingly formed sockets provided in opposite sides of a cavity formed in the head, and in the bottom of said cavity, and are held in place in the head by blocks fitted into the cavity and lie over, and hold in place, the trunnions, and are held in place themselves by bolts or rivets.

Generally, anchors of this kind are provided with single webs extending down from the crown to the ends, or to near the ends of the tripping parts or wings, and from the outside faces of the flukes to the ends or near to the ends of the trippers underneath: and the invention, as hereafter explained, has also reference to these parts.

An anchor involving improvements according to this invention is illustrated in the accompanying drawings, and it—the invention—will be described with the aid of these drawings; the novel characteristics of it being set out or comprised in the claiming clauses concluding the specification.

In the drawings, Figure 1 is an elevation, partly in section, showing the anchor head with flukes combined, and the shank head in place; Figure 2 is an end view of same, partly in section; Figure 3 is a cross section through the head or crown at the line A A in Figure 1; Figure 4 is a top plan view of the anchor.

Referring to the drawings, *a* is the crown of the head, *b* are the flukes, *c* is the shank, and *d* the trippers. *e* are the trunnions of the shank; *f* are the journals or sockets in which the trunnions rest, and *h* the blocks which hold the trunnions, and so the shank, in place.

According to this invention, bolts or rivets *i*, which hold the blocks *h* in place, lie in the plane of the anchor head, and extend obliquely through these blocks and the head, one end of said bolts or rivets coming in the angle between the undersides of the trippers *d*, and the outside face of the flukes *b*; and the other end on the outside of the blocks *h* within the cavity of the crown; the blocks being chamfered off at right angles to the axis of the bolt or rivet

[Price 8d.]

hole in them at this part; and between the trippers *d* and the base of the flukes *b* (which are wide tapering parts, see Figure 2,) where they merge into the head, two webs *k* are provided, one on either side, which give extra strength to these portions of the anchor coupled with lightness; and the head or nut of the rivet or bolt *i* lies within the space or chamber formed by these webs *k* between the trippers and the outside edge or face of the fluke bases.

Between the end faces of the cavity in the crown, next which the blocks *h* lie, and the outer part of the crown through which the block holding bolt or rivet ends pass, a cored out cavity *l* is formed; and the metal of the crown *a* above this cavity, is carried down to the trippers *d* in a plain flush surface. On the inside edge Y or at the back of the crown near the parts A A, in casting the head, the metal may be run into the mould, and the "feeding heads" may be placed at these points; and this part being without webs, this can be effected here in a sound manner, that is, without liability of the casting being defective or weak, due to shrinkage or contraction; whereas in the casting of these anchor heads at the usual points, namely on the outside edge *x* of one of the flukes, where a single web is usually employed, defective castings not infrequently result, due to such shrinkage or contraction at these points of pouring or feeding. And this plain flush surface enables the "feeders" to be easily cut off.

The internal faces of the crown cavity against which the outer faces of the blocks *h* lie, are rabitted inwards or recessed, as shown, and the blocks are made of such a size or shape as to fit into, and lie in these rabitted parts or recesses when in place; and they are made, practically, in width, about equal to the diameter of the trunnions *e*; and at their sides fit in between two cheeks *m* formed on the inside of the crown cavity, which support them sideways, and at the bottoms of which the trunnion sockets or journals lie.

By arranging and disposing the block holding bolts *i* in the manner and position described, the casting of holes in the two outside walls of the crown *a* to receive holding or fastening bolts or rivets passed transversely through the crown, as is frequently done, is avoided; and thereby the weakening of the crown due thereto is obviated. And by constructing the anchor as described, whereby metal can be poured in casting the anchor and "fed" onto the back of the crown in lieu of the fluke base that is by making it—the crown—flat instead of being webbed the back section of the head is strengthened.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. An anchor of the kind herein referred to wherein the shank is held by bolts or rivets disposed in the plane of the anchor head, and extending obliquely between the cavity thereof, in which the shank head lies, to a point outside said head; substantially as described.

2. In an anchor of the kind herein referred to in which the bolts or rivets employed for holding the shank head fastening or holding blocks lie within the plane of the anchor head, arranging and disposing the outer end of said bolts or rivets in the angle between the underside of the trippers, and the outside or face of the fluke base; as set forth.

3. In an anchor of the kind herein referred to, a cavity *l* provided in the crown head at each end of the crown cavity, and at the closed lower end, a hole below the trippers through which the shank holding bolt or rivet lower ends pass; as set forth.

4. In an anchor of the kind herein referred to, the construction of the crown *a* with a flush plain surface extending from the upper part thereof to the trippers' upper surface; as and for the purpose set forth.

5. In an anchor of the kind herein referred to, the two webs *k* disposed along the outer edges of the tapering fluke base where said fluke merges into

the head, and extending up and joining at their upper parts the underside of the trippers; as described and shown for the purpose specified.

6. The anchor having its parts arranged, combined, and constructed as shown in and set forth with reference to the drawings.

Dated this 17th day of December, 1906.

CHEESBROUGH & ROYSTON,
Applicants' Patent Agents,
15, Water Street, Liverpool.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1908.

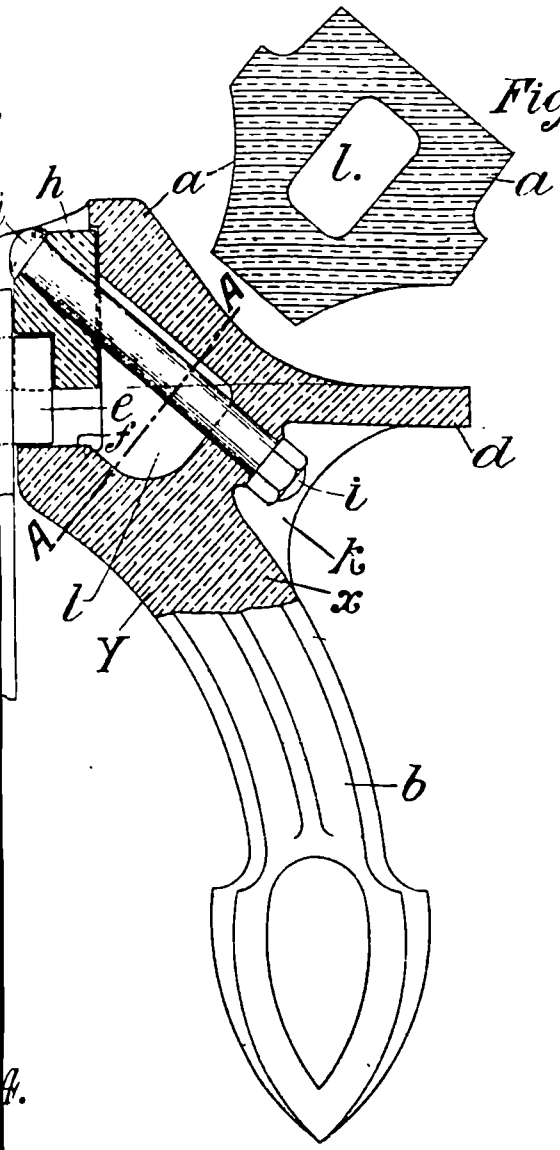


Fig. 3.

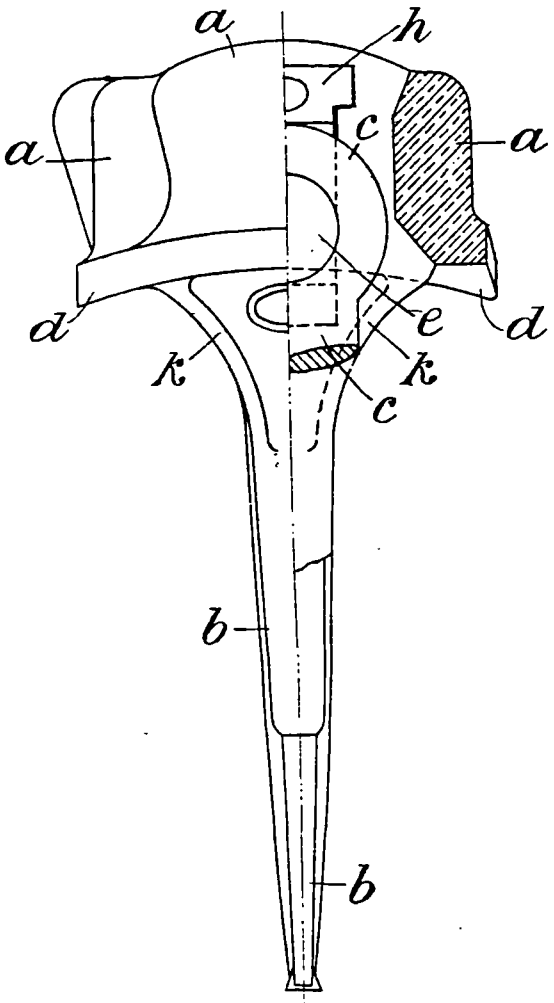
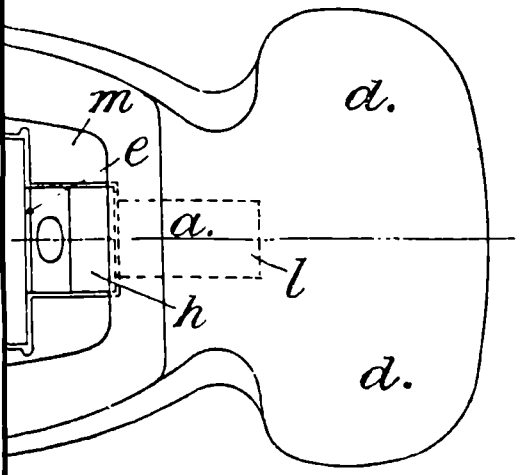


Fig. 2.



Malby&Sons, Photo

Fig.1.

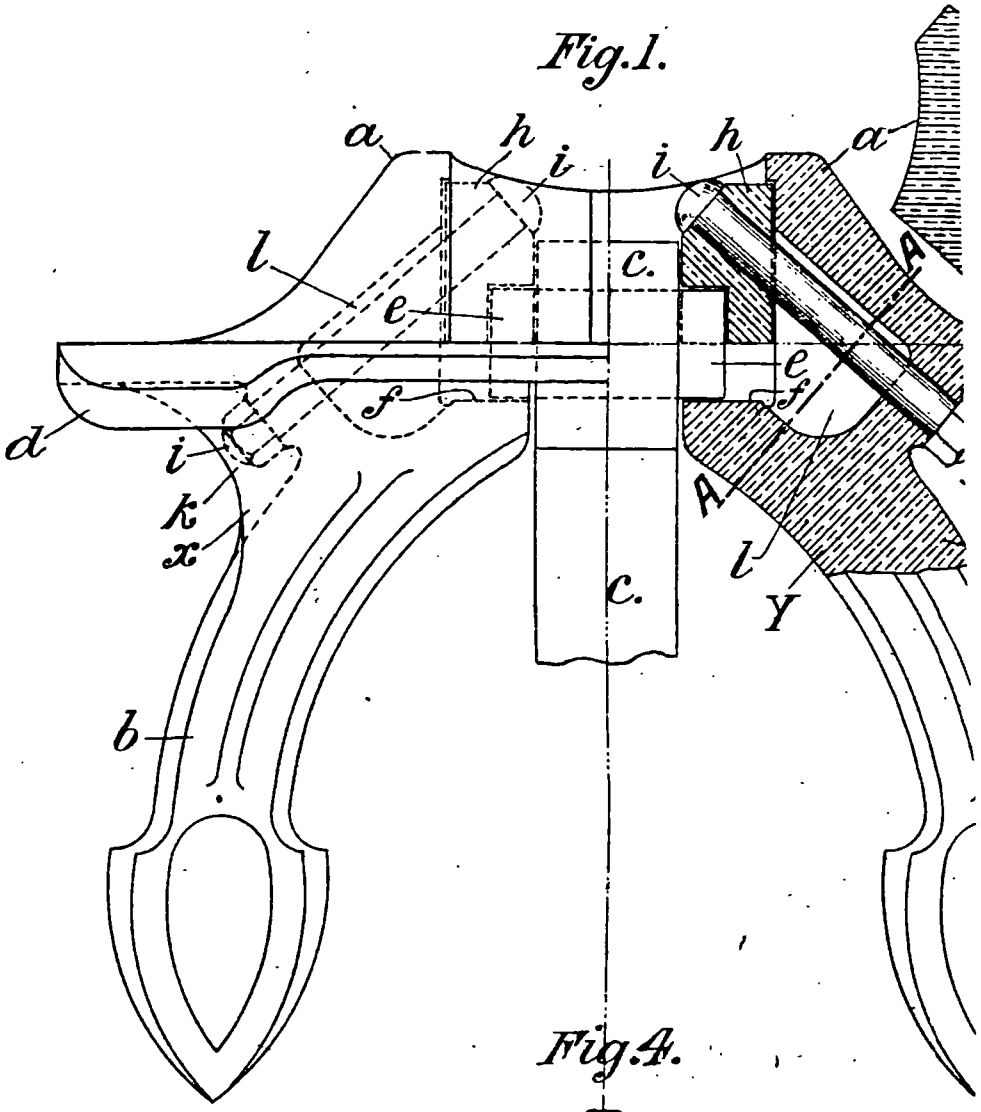
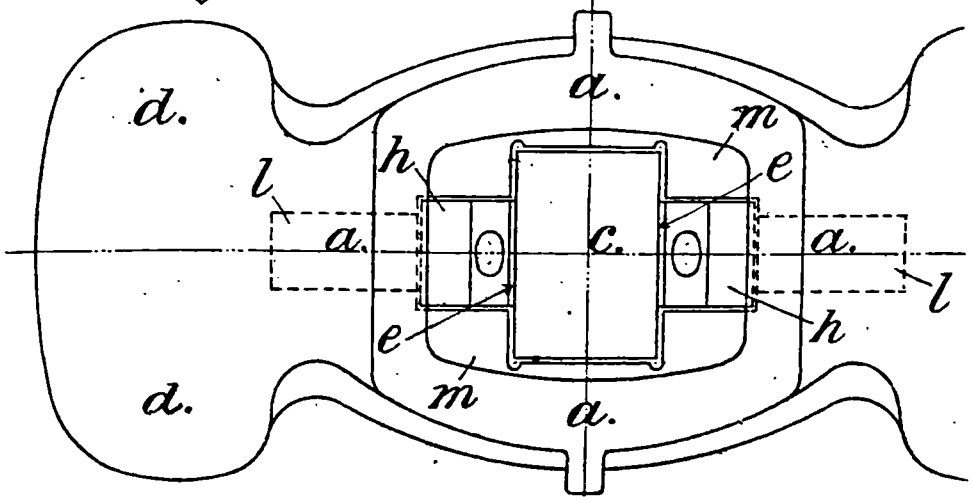


Fig.4.



N° 15,025 A.D. 1914

Date of Application, 23rd June, 1914

Complete Specification Left, 14th Nov., 1914—Accepted, 27th May, 1915

PROVISIONAL SPECIFICATION.

Improvements in Ships' Stockless Anchors.

We, JOSEPH ERNST FLETCHER, of "Raydon", Hinley Road, Dudley, in the County of Worcester, Engineer, and N. HINGLEY AND SONS LIMITED, of the Netherton Ironworks, Dudley, in the County of Worcester, Ironmasters, do hereby declare the nature of this invention to be as follows:—

This invention has reference to ships' anchors, and more particularly to that type which are called "Stockless" or "Patent" anchors; that is to say, a type wherein the flukes are connected to the shank by a hinge the axis of which is disposed at right angles to the shank, and the flukes move about this hinge, and take an oblique position in relation to same; and it relates furthermore, more particularly to cast anchors of this kind, which have a rib more or less centrally on the opposite sides of the flukes, and the flukes have at their ends, a species of enlarged tip or blade generally wider than the main portion of the flukes.

In practice, it is found that the tip portions or blades of the flukes of anchors of this kind frequently snap off somewhere about the centre between the actual extremity of the tip portion and its base; and the primary object of the invention is to obviate this defect simply, and without adding materially to the weight of the anchor; and also to provide improvements by which the anchor can be more easily secured or stowed and manipulated.

According to this invention, ribs on each side of the flukes are extended down same to the actual extremity of the tip or blade portions, and right down across same. These ribs are comparatively shallow, and at the lower end, taper down; and in some cases, project slightly beyond the extremity of the tips or blades proper. By this, not only are the tip portions or blades strengthened, and rendered proof against the weakness referred to, but the ribs also serve the purpose of causing the anchor to be pressed outwards away from the surface of the ship when being weighed in the ordinary manner, when the tips come against the edges of the plates of the vessel, and so prevent the tips of the anchor flukes getting under, and being caught by these projecting plate edges.

In some cases, the fluke tip or blade portions are recessed at each side at the centre; and thus, in such a case, the cross section of the fluke through the tip or blade portion, say near the centre, represents a relatively thin portion on each edge; then a shallow rib or projection at each side; then a groove at each side; and then at the centre, a projection consisting of the aforesaid ribs, which extend down on each side of the centre of the fluke to the extremity of the tip. And through the blade, and say the recessed portions on each side of the central projections or ribs referred to, a hole is provided, for the purpose of engaging it by a hook or sling, and slinging or securing the anchor to the deck, or as when hawsed on or in the ships' side; and these holes may be provided without materially weakening the flukes. Instead of forming two holes, one on each

side of the ribs through the recessed parts referred to, the ribs may be widened or bossed at this part concerned, and a single hole passed through this widened or bossed part.

Dated this 22nd day of June, 1914.

E. R. ROYSTON & Co.,
Applicants' Agents,
Tower Building, Water Street, Liverpool, and
Donington House, Norfolk Street, London, W.C.

COMPLETE SPECIFICATION.

Improvements in Ships' Stockless Anchors.

We, JOSEPH ERNST FLETCHER, of "Raydon", Himley Road, Dudley, in the County of Worcester, Engineer, and N. HINGLEY AND SONS LIMITED, of the Netherton Ironworks, Dudley, in the County of Worcester, Ironmasters, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to ships' anchors, and more particularly to that type which are called "Stockless" or "Patent" anchors; that is to say, a type wherein the flukes are connected to the shank by a hinge the axis of which is disposed at right angles to the shank, and the flukes move about this hinge, and take an oblique position in relation to same; and it relates furthermore, more particularly to cast anchors of this kind, which have a rib more or less centrally on the opposite sides of the flukes, and the flukes have at their ends, a species of enlarged tip or blade generally wider than the main portion of the flukes, down which the ribs extend to the end. In some cases these central ribs are projected beyond the tips of the flukes, in a species of angular horn on each side of the terminal or end of the tip; these projections, however, being separate and distinct from each other; and the object of this invention is to provide improvements in or modifications of anchors of these kinds by which the anchor can be more easily stowed or secured and manipulated.

Under this invention the rib on each side of the fluke, extends beyond it, and round it, so that the ribs join and are continuous and become one beyond the tip, and this is illustrated in the accompanying drawings, in connection with which the invention will be described; the features claimed as novel under it—the invention—being specified in the claiming clauses concluding the specification.

In the drawings, Figure 1 is an end elevation of the anchor; Figure 2 a side elevation; and Figure 3 a cross section at AA Figure 2.

Referring to the drawings, *a* is the head of the anchor; *b* are the flukes; *c* the tip or blade portions of it; and *d* is a rib extending down each side of the flukes *b* from the head portion *a* towards the tip portion *c*. These parts are all formed in one, and are generally made of cast steel.

e is the shank to which the fluke portion is secured by a hinge *f* shown in dotted lines.

The ribs *d* on each side of the flukes, are extended down to and across the tip or blade portions *c*, and to their actual extremities these rib portions are marked *i*.

As shown in the drawings, the lower portion of the ribs *i* taper down, and project slightly beyond the extremity of the tip or blade portions *c*, where they join and become one, so that the ribs surround, as it were, the extreme ends of

the blades. By this not only are the tip or blade portions *c* strengthened, but the ribs *i* serve the purpose of causing the anchor to be pressed outwards away from the surface of the ship when being weighed in the ordinary manner, when the anchor tips come against the edges of the plates of the vessel; and so prevents the tips of the anchor flukes getting under, and being caught by these projecting plate edges.

The tip or blade portions *c* shown in the drawing are recessed at *k*, at the centre, on each side of the ribs *i*; and thus by this construction, the cross section of the tip or blade portion *c*, say near the centre, transversely represents a relatively thin portion at each edge; then a shallow projecting portion *l* at each side; then a groove *k*; and then at the centre, a projection consisting of the rib *i*, which as stated extend down on each side of the blade or tip portion *c* to their extremity. And through the blade or tip portion, *viz.*:— through each of the recessed portions *k*, a hole *o* is provided, as shown at the left hand side in Figure 2; or, a hole may be provided through the ribs *i* as shown on the right hand side of the figure. The hole or holes are for the purpose of engaging it by a hook or sling, and slinging or securing the anchor to the deck, or as when hawsed on or in the ships' side; and these holes may be provided without materially weakening the flukes.

Where single holes *o* pass through the ribs *i*, these ribs are enlarged or bossed out on these parts, so that their strength shall not be diminished.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. In an anchor of the type herein referred to, the ribs *i* extending across the tip or blade portion *c* of the flukes, and to a point beyond the actual extremities of said tip portions where the two ribs join up, and are continuous and become one; substantially as herein described and shown.

2. An anchor of the type herein referred to, having ribs extending down the flukes of each side, and a hole or holes passed through the tip or blade portions; substantially as herein described.

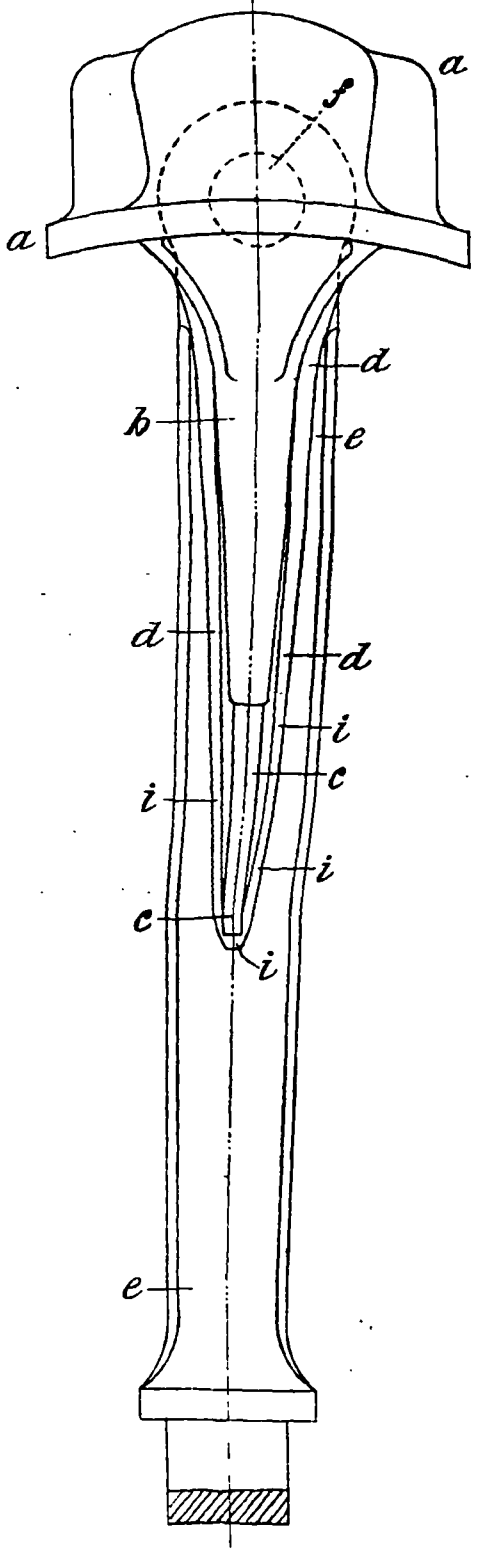
Dated this 29th day of July, 1915.

E. R. ROYSTON & Co.,
Applicants' Patent Agents,
Tower Building, Water Street, Liverpool, and
Donington House, Norfolk Street, London, W.C.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1915.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.



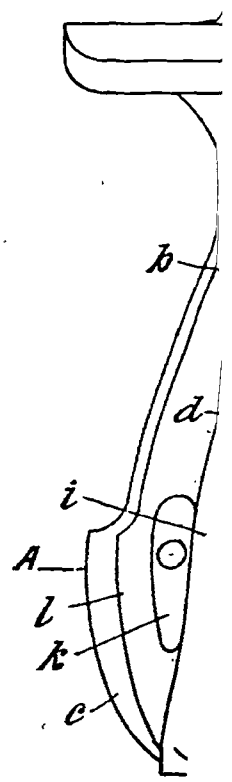


Fig.

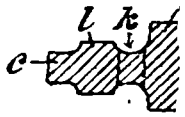


Fig.2

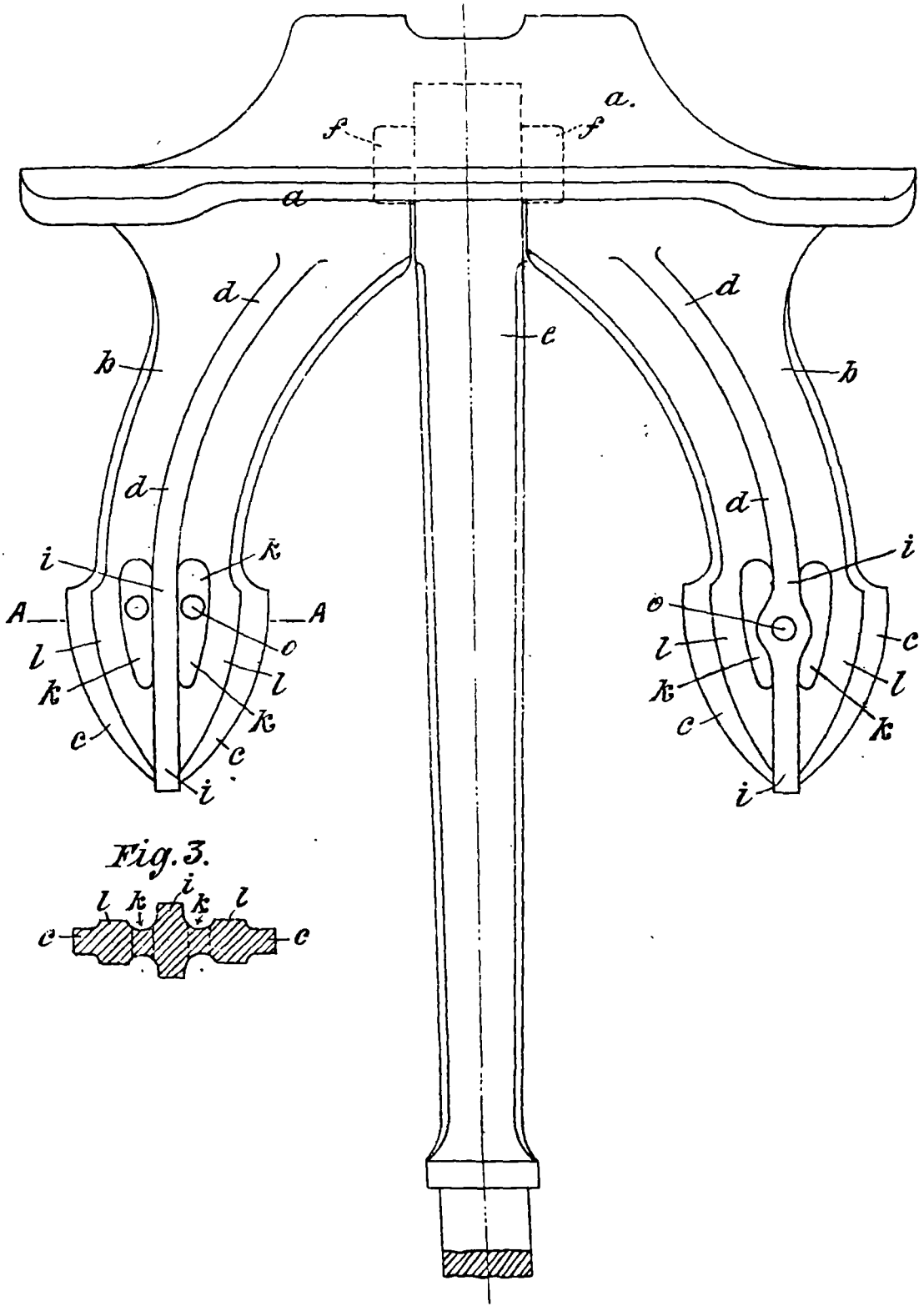


Fig.3.

Malby & Sons, Photo Litho

111,960

PATENT SPECIFICATION

Application Date, Mar. 14, 1917. No. 3679/17.
Complete Left, Sept. 14, 1917.
Complete Accepted, Dec. 20, 1917.

PROVISIONAL SPECIFICATION.

Improvements in Ships' Anchors.

We, N. HINGLEY & SONS, LIMITED, of Netherton Iron Works, Dudley, in the County of Worcester, Iron Masters, and JOSEPH ERNST FLETCHER, of "Raydon," Himley Road, Dudley, in the County of Worcester, Engineer, do hereby declare the nature of this invention to be as follows:—

This invention has reference to ships' anchors of the type more particularly called "stockless" or "patent" anchors, and it has for its object and effect to provide a special form or construction of anchor of this kind.

The anchor according to this invention consists of the combination of an anchor head with which the flukes are in one; a spherical headed shank, the head of which fits and works in a socket in a recess formed in the back or outer end of the head; removable shank head holding blocks in recesses at the sides of said recess, and extending say from a plane in line with the axis of the ball of the shank, to a point between this plane and the longitudinal plane of the shank, and secured in said recesses in the head (which may be narrower than that for the spherical head) and secured there by bolts, which are passed diagonally down through the head say at an angle of between 30° and 60° from the general longitudinal plane of the shank; and an elongated aperture in the inner part of the head through which the shank passes of substantially the same width as—or only slightly larger than—the diameter of the shank, which say is circular, and which thus serves to support the anchor head and keep it in position as regards one direction.

Regarding the aperture or slot through which the shank passes, the walls of its sides are so shaped and formed as to constitute supports and guides in or for the movement of the head and flukes in their oscillation about the axis of the shank head or ball; and the end of the aperture or slot will form the limit of angular movement of the head and flukes about the shank head or ball.

The head will have trippers at each end and side, such as are commonly used in anchors of this character.

Dated this 15th day of March, 1917.

E. R. ROYSTON & Co.,
Applicants' Patent Agents,
Tower Building, Water Street, Liverpool, and
Donington House, Norfolk Street, London.

[*Price 6d.*]

111,960

PATENT SPECIFICATION

Application Date, Mar. 14, 1917. No. 3679/17.
Complete Left, Sept. 14, 1917.
Complete Accepted, Dec. 20, 1917.

PROVISIONAL SPECIFICATION.

Improvements in Ships' Anchors.

We, N. HINGLEY & SONS, LIMITED, of Netherton Iron Works, Dudley, in the County of Worcester, Iron Masters, and JOSEPH ERNST FLETCHER, of "Raydon," Himley Road, Dudley, in the County of Worcester, Engineer, do hereby declare the nature of this invention to be as follows:—

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ERRATUM.

SPECIFICATION No. 111,960:

Page 1, line 29, *for* "15th" *read* "13th."

PATENT OFFICE,
May 23*rd*, 1918.

Improvements in Ships' Anchors.

We, N. Hingley & Sons Limited, of Netherton Iron Works, Dudley, in the County of Worcester, Iron Masters, and Joseph Ernst Fletcher, of "Raydon," Himley Road, Dudley, in the County of Worcester, Engineer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained, in and by the following statement:—

This invention has reference to ships' anchors of the type more particularly called "stockless" or "patent" anchors, in which the head and flukes are in one piece, and they and the anchor shank lie in the same plane when these two relatively movable parts are in the mid-position, and the head and flukes are adapted to oscillate about a joint between the outer end of the shank and the head.

In some of such anchors the joint between the shank and the head has consisted of a ball on the shank end fitting into a corresponding spherically formed socket in the head, the shank head being placed in position in the socket by passing it through the head from the back; and the two parts are held in position by blocks fitting in and fastened in the metal surrounding the socket aperture.

In other cases, the joint or connection of the shank end fluke head has been by cylindrical trunnions on the shank end, fitting into corresponding recesses or bearings in an aperture in the head, such trunnions being held in position in the bearings by blocks similar to those above referred to, fitting into recesses at each side of the aperture and outside the trunnions, and held in position by diagonal bolts extending through them to a point in the space under the ordinary stockless trippers of the anchor, and outside the flukes.

This invention consists of the following combination of parts, namely, an anchor head and flukes having a semi-spherical socket in the bottom of a recess formed in the head, a spherical headed shank, the head of which fits and works in the semi-spherical socket, and blocks fitting in rectangular recesses leading in opposite directions out of the said recess, and having spherically formed outer faces adapted to bear on the outer part of the spherical shank head, and held in position in such recesses by diagonal bolts extending through same and through the head to a point under the trippers.

The anchor is illustrated in the annexed drawings, and the invention will be described with the aid of these drawings, in which Figure 1 is an elevation half in section, Figure 2 a plan showing the end of the head, and Figure 3 is an end elevation of the anchor.

The body of the anchor comprises the head 1 and flukes 2, and tripping parts 3 which are in one as usual, and the shank 4 has a spherical head 5, which fits and works in a socket 6 formed in the bottom of the recess 10, formed in the back or outer end of the head as usual; and this shank head is held in its socket 6 by removable holding blocks 7 fitted in recesses at the ends of the recess 10, they being of smaller width than the centre portion of the recess itself, which, as seen in Figure 2, is of just sufficient size to receive the head 5; and the inner surfaces of the blocks are of spherical contour to correspond with the spherical head 5, and are secured in position by bolts 8 which pass diagonally down through the head at an angle of between 30 and 60 degrees from the general longitudinal plan of the shank, and the fastening nuts of which lie in the recess formed by the underside of the trippers 3, the outside surface of the flukes 2, and the webs 9, which protect them.

The upper surfaces of the blocks are inclined towards and lead on to the surface of the head 5, so that the interior of the recess or chamber 10 will always be washed through with water and be self cleansing.

The aperture 11 on the inner side of the head 1 is in width sufficient to freely take the shank 4 as seen in Figure 1; and is extended on each of the central positions for a certain distance to allow the body of the anchor to move about the axis of the head 5 angularly in relation to the general plane of the anchor.

The limits of movement in the case of the anchor shown are those represented by the radial lines 12, which represent the centre line of the head taken down the flukes, when the anchor body is in each extreme position.

The parallel walls of the sides of the aperture 11 are so shaped and formed as to constitute supports and guides in and for the movement of the head and flukes in its oscillation about the axis of the spherical shank head 5, and the ends of this aperture will form the limits of angular movement of the head and flukes about the shank head.

The end portions of the recesses 10 in which the blocks 7 fit, overhang at the upper part at 13, and the blocks are correspondingly formed so that these overhanging portions overhang the inner part of the blocks and serve to help to hold them in position.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

The "stockless" or "patent" anchor substantially as herein set forth.

Dated this 13th day of September, 1917.

E. R. ROYSTON & Co.,
Applicants' Patent Agents,
Tower Building, Water Street, Liverpool.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1918.

FIG. 2.

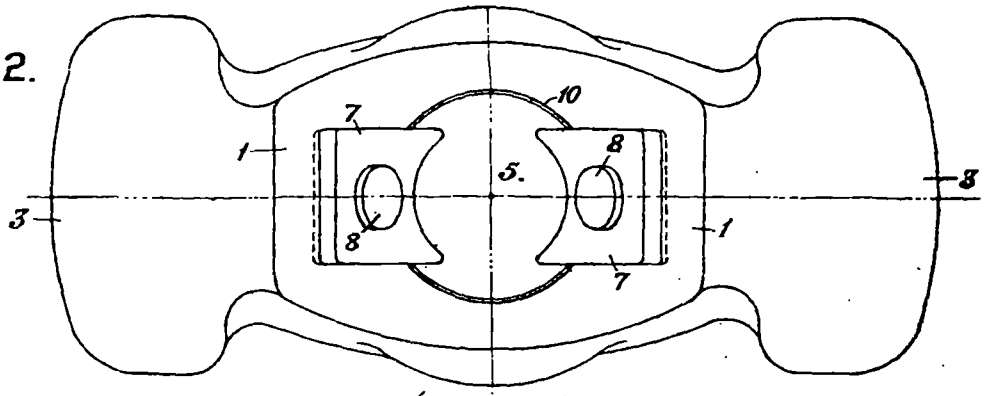
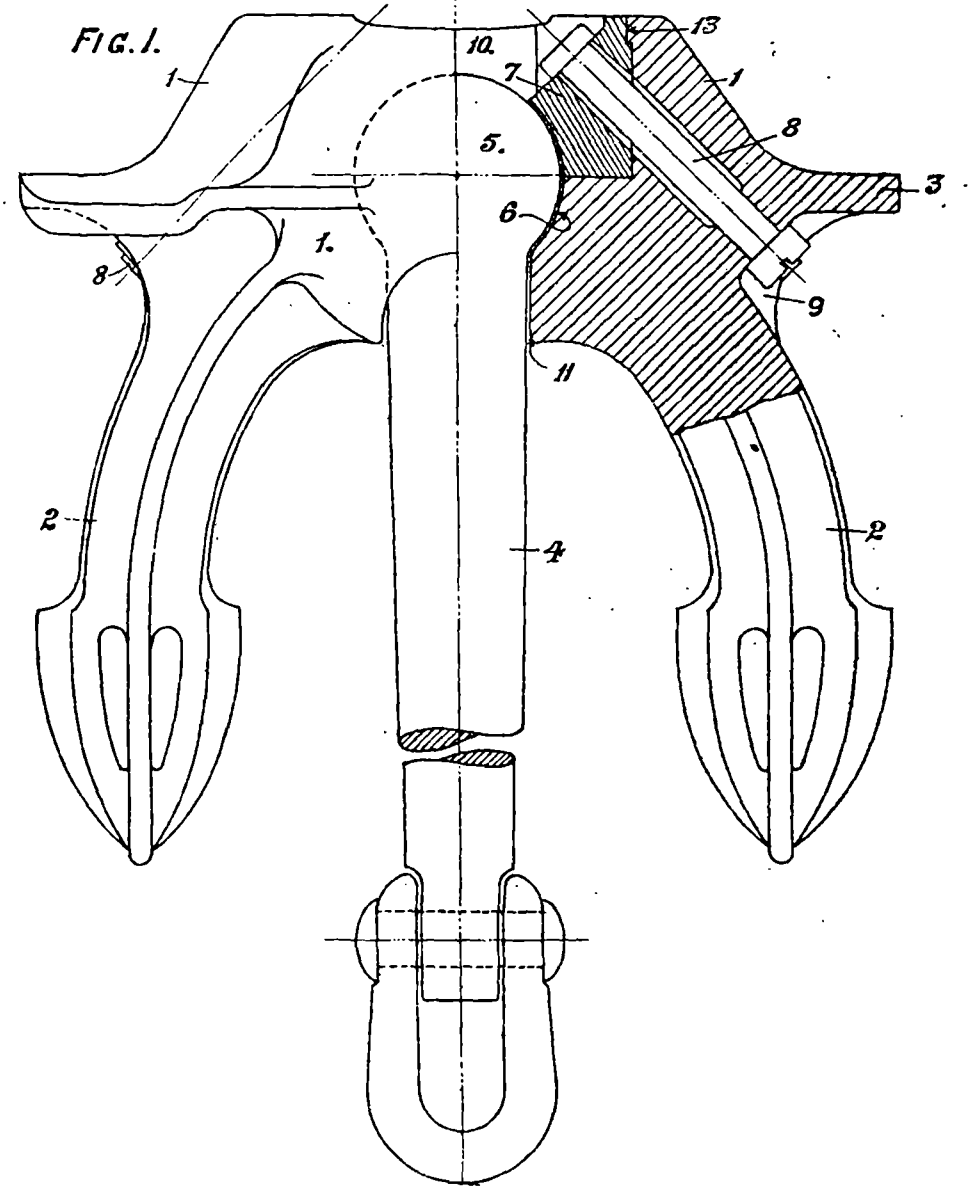


FIG. 1.



Malby & Sons, Photo-Litho

FIG. 2.

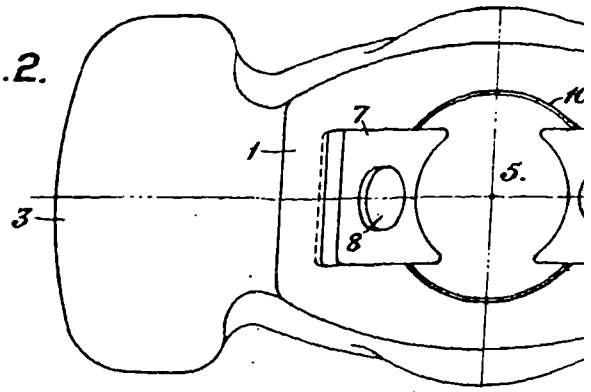


FIG. 3.

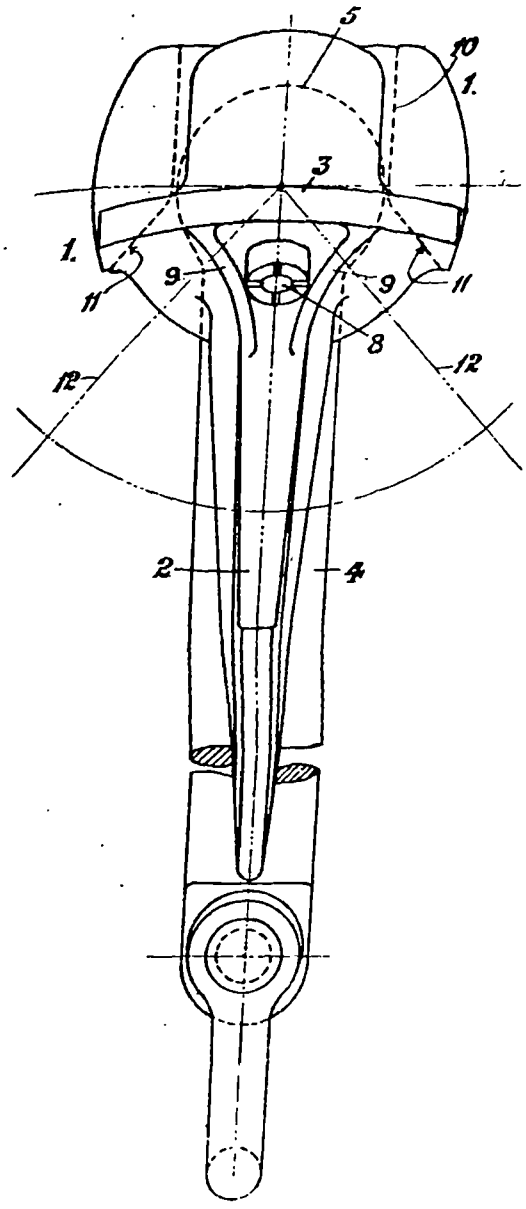
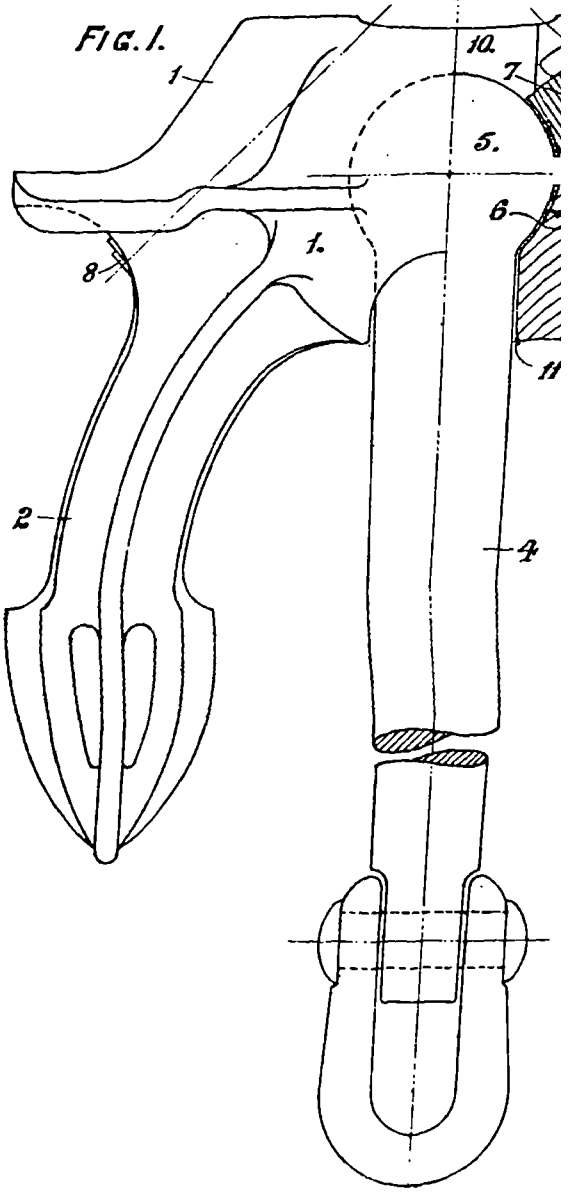


FIG. 1.



APPENDIX THREE :

Patents for anchors manufactured by:

- **William Wasteneys Smith**

N° 5938 A.D. 1899

Date of Application, 18th Mar., 1899
Complete Specification Left, 18th Dec., 1899—Accepted, 20th Jan., 1900

PROVISIONAL SPECIFICATION.

Improvements in Anchors.

I, WILLIAM WASTENEYS SMITH, of 57 to 60, Sandhill, in the City and County of Newcastle-on-Tyne, Civil and Consulting Engineer, do hereby declare the nature of this invention to be as follows:—

My invention relates to anchors of the kind generally known as stockless anchors for which Letters Patent have been granted to me No. 552 A.D. 1871 No. 4281 A.D. 1874 and No. 3476 A.D. 1885, and has for its principal object to increase the stability of such anchors when in the ground and insure their not rolling over. According to my invention I make, or arrange, the horns, or trippers, of such anchors, so that they will bear on the solid ground at a wider distance apart than the arms are apart; the said horns, or trippers, being disposed behind the centre of the axis upon which the arms, or the arms and crosshead, turn; that is on the side of the said axis opposite to that from which the shank of the anchor projects. The crosshead may be made in one with, or be attached to, the shank, or it may be made in one with, or be attached to, the arms, the stops for limiting the movement of the arms being on the crosshead and arms, or on the crosshead and shank. When the crosshead is made in one with the shank, or is affixed thereto, the arms, with the horns, or trippers, formed therewith, or secured thereto, as aforesaid, may be secured to an axis passing through, and projecting from, each end of the crosshead; and, when the crosshead is formed with, or secured to, the arms, the shank may be secured in the crosshead by a short pin, or axis, the horns, or trippers, in any case, being formed with, or secured to, the arms in such a position as to lie behind the centre, or axis, on which the arms turn as aforesaid.

Dated this 18th day of March 1899.

JOHNSONS & WILLCOX,
47, Lincoln's Inn Fields, London, W.C., Agents.

COMPLETE SPECIFICATION.

Improvements in Anchors.

I, WILLIAM WASTENEYS SMITH, of 57 to 60, Sandhill, in the City and County of Newcastle-on-Tyne, Civil and Consulting Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

My invention relates to anchors of the kind generally known as stockless anchors for which Letters Patent have been granted to me No. 552 A.D. 1871, No. 4281 A.D. 1874 and No. 3476 A.D. 1885, and has for its principal object to

[*Price* 8*d*.]

increase the stability of such anchors when in the ground and insure their not rolling over. I will describe my invention with reference to the accompanying drawings.

According to my said invention I make, or arrange the horns, or trippers, *d*, of such anchors so that they will bear on the solid ground outside of that disturbed by the arms and at a wider distance apart than the arms C are apart; the said horns or trippers, *d*, being disposed behind the centre of the axis upon which the arms C, or the arms C and crosshead B, turn; that is, at the rear or base of the arms and on the side of the said axis opposite to that from which the shank A of the anchor projects. The crosshead B, may be made in one with, or be attached to, the shank A, as shewn in plan in Figure 1, cross section in Figure 2, and side elevation in Figure 3; or it may be made in one with, or be attached to, the arms C as shewn in corresponding views in Figures 4, 5, 6 and 7, the stops *e*, for limiting the movement of the arms, being formed by the projections on arms C which come in contact with the crosshead B, in the former case, and by the terminations of the slot in the crosshead B, which come in contact with the shank A, in the latter case. When the crosshead B, is made in one with the shank A, as in Figures 1, 2, and 3, or is affixed thereto; the arms C with the horns or trippers, *d*, formed therewith or secured thereto, as aforesaid, may be secured by a pin or axis *f*, passing through, and projecting from each end of the crosshead B, and, when the crosshead B, is formed with, or secured to, the arms C as in Figures 4, 5 and 6, the shank A may be secured in the crosshead by a short pin or axis *f* inserted in the recess provided for it or by a longer pin passing entirely through both arms and crosshead as in Figure 7 the horns or trippers *d* in any case, being formed with, or secured to, the arms C in such a position as to lie behind the centre or axis, on which the arms C, turn as aforesaid.

Having now particularly described and ascertained the nature of my invention and the manner in which the same is to be performed I declare that what I claim is:—

1. The construction of anchors, of the kind referred to, so that the horns, or trippers, lie behind the centre, or axis, on which the arms turn, and so that the said horns or trippers, bear on the ground at a greater distance apart than the distance of the arms apart; substantially as hereinbefore described.

2. The construction of anchors as hereinbefore described and illustrated in Figures 1, 2 and 3 of the accompanying drawings.

3. The construction of anchors as hereinbefore described and illustrated in Figures 4, 5, 6 and 7 of the accompanying drawings.

Dated this 18th day of December 1899.

JOHNSONS & WILLCOX,
47, Lincoln's Inn Fields, London, W.C., Agents.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd.—1900.

N° 29,413 A.D. 1904

Date of Application, 31st Dec., 1904
Complete Specification Left, 30th Sept., 1905—Accepted, 2nd Nov., 1905

PROVISIONAL SPECIFICATION.

"Improvements in Anchors"

I, WILLIAM WASTENEYS SMITH, of 57 to 60, Sandhill, in the City and County of Newcastle-on-Tyne; Civil and Consulting Engineer, do hereby declare the nature of this invention to be as follows:—

My invention relates to anchors of the kind known as stockless anchors, and especially to such anchors as are described in the Specification of Letters Patent No. 5938 A.D. 1899 granted to me and it has for its object to improve the said anchors so as to facilitate the stowing thereof.

According to my present improvement I curve inwards the outer portions of the sides of the arms marked C in the drawings of the aforesaid specification, and I also round off the corners of the horns of the trippers marked *d* in the said drawings so that the anchor, as it comes up in contact with the side of the ship is, owing to these curved and rounded off portions, always caused to roll over on the flat and not come up edgewise or foul and the stowing of the anchor in the ship's hawse pipe is thereby much facilitated.

Dated this 31st. day of December 1904.

JOHNSONS & WILLCOX,
47, Lincolns Inn Fields, London, W.C.
Agents.

COMPLETE SPECIFICATION.

"Improvements in Anchors".

I, WILLIAM WASTENEYS SMITH, of 57 to 60, Sandhill, in the City and County of Newcastle-on-Tyne, Civil and Consulting Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to anchors of the kind known as stockless anchors, and especially to such anchors as are described in the Specification of Letters Patent No. 5938 A.D. 1899 granted to me, and it has for its object to improve the said anchors so as to facilitate the stowing thereof.

According to my present invention I curve inwards the outer side edges of the rear portions of the arms marked C in the drawings of the aforesaid specification, which side edges of the rear portions extend beyond the sides of the main, or fluke, portions of the said arms, and I also round off the corners of the horns on the said rear portions, and constituting the trippers marked *d*, in the drawings of the aforesaid specification, so that the anchor, as it comes up in contact with the side of the ship, is, owing to these curved and rounded off portions, caused to roll over on the flat should the anchor tend to come up

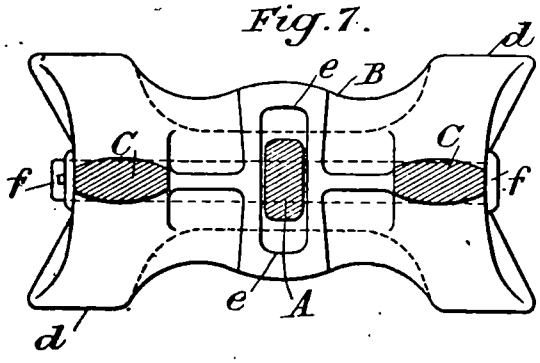
[*Price 8d.*]

18. N° 5938.

SPECIFICATION.

SHEET 1.

Fig. 7.



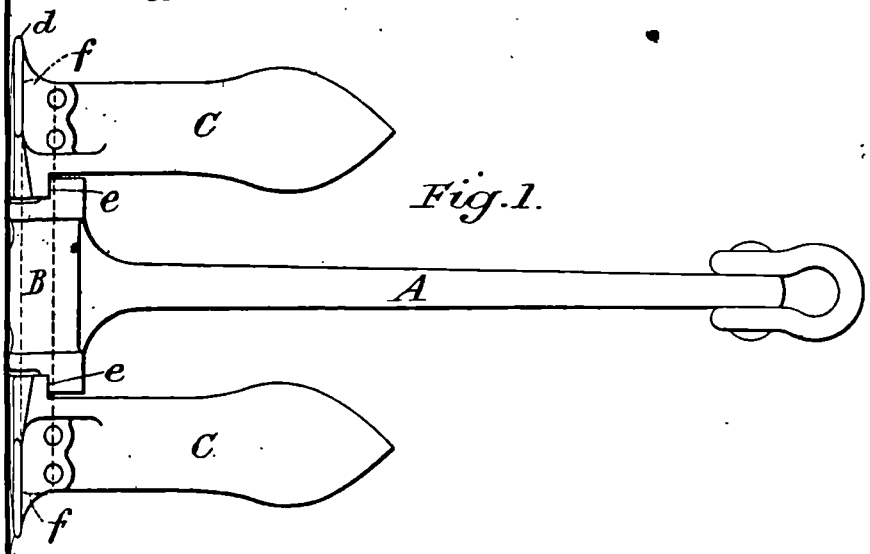


Fig. 1.

Fig. 2.

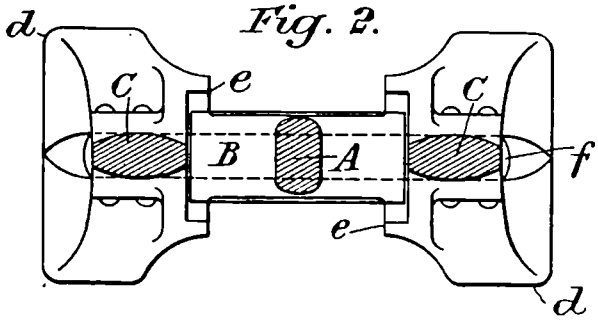
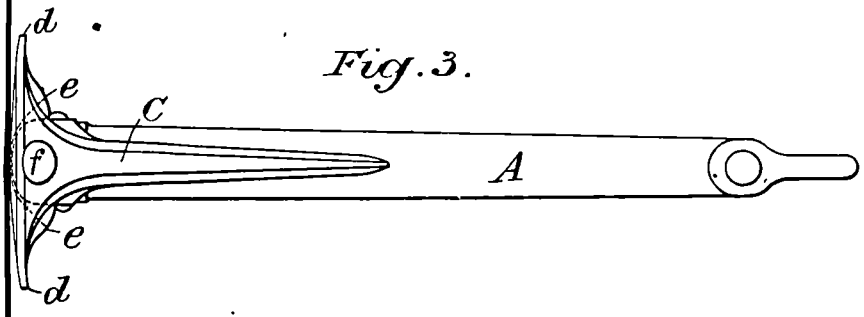
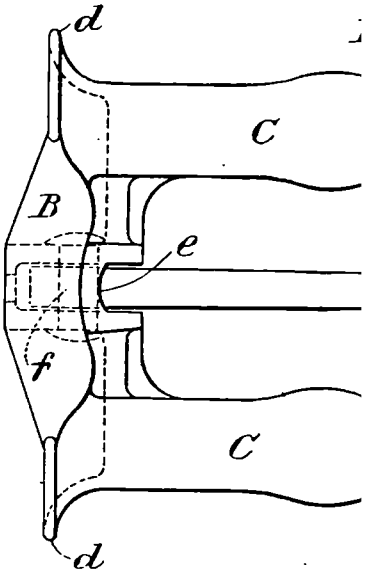
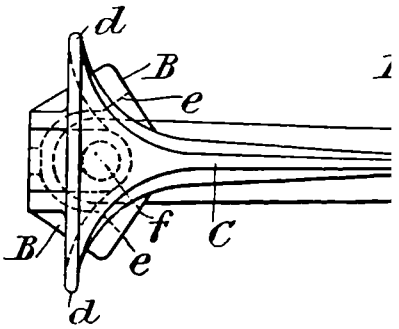


Fig. 3.







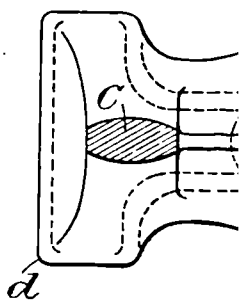


Fig. 4.

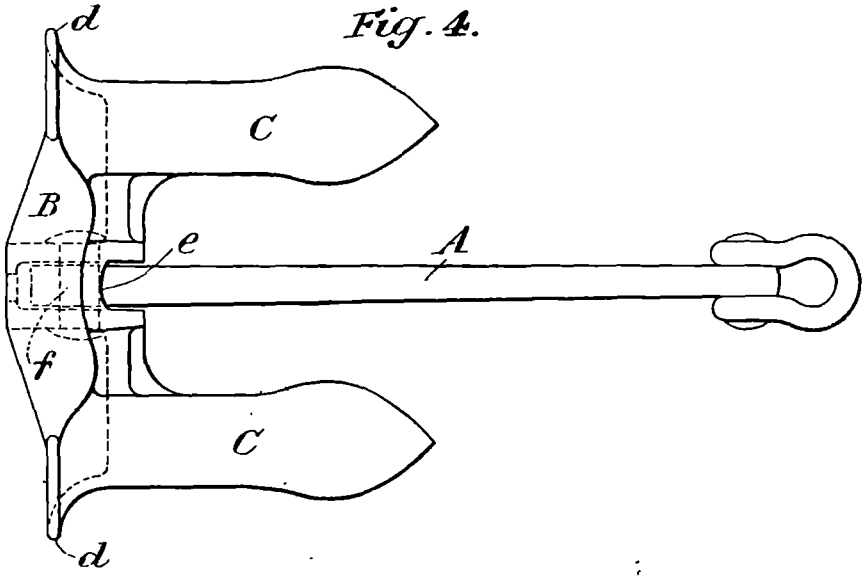


Fig. 6.

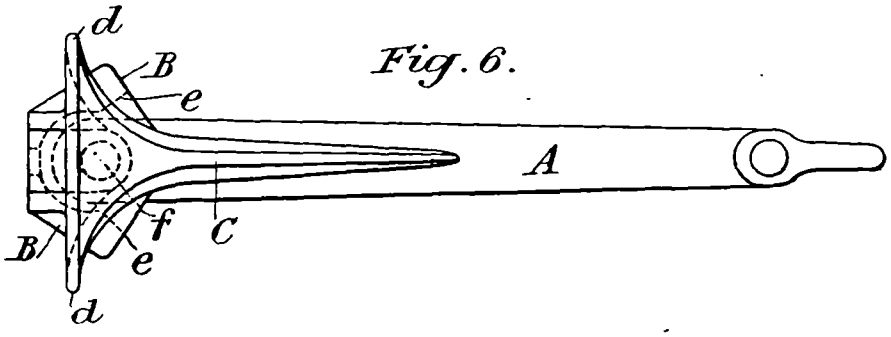
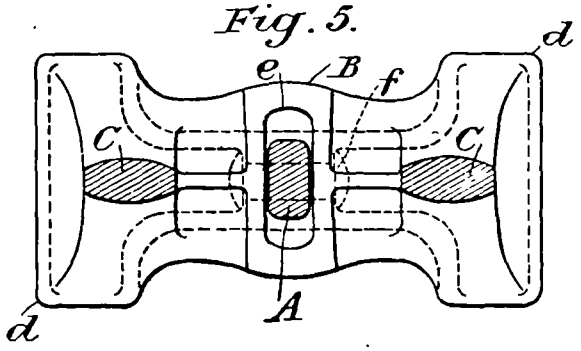


Fig. 5.



Malby & Sons Photo-Litho

edgewise and fouling will thus be prevented and the stowing of the anchor in the ship's hawse pipe be much facilitated.

In the accompanying drawing I have shewn in Figure 1 a cross-section corresponding to Figure 2 of the drawings of the aforesaid Specification of Letters Patent No. 5938 A.D. 1899, in which the arms are two separate parts each keyed on a shaft, or spindle, which passes through the cross-head, and in Figure 2 of the accompanying drawing I have shewn a cross-section corresponding to Figure 5 of the drawings of the aforesaid specification, in which both the arms and the cross-head are integral; the said Figures 1 and 2 of the accompanying drawings illustrating the modifications in accordance with my present invention, the aforesaid curvature of the side edges of the rear portions of the arms being indicated at *c*, and the aforesaid rounding off of the horns of the trippers *d*, as aforesaid, being indicated at d^2. When the anchor, in being raised, comes into contact with the side of the vessel, if it be not already in position on the flat, it will roll over into that position in consequence of the aforesaid curvature of the side edges of the aforesaid portions of the arms C, and the rounding off of the horns of the trippers and fouling will be prevented and stowage in the hawse pipe will be much facilitated.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

In anchors of the kind referred to; the modifications in the formation of the parts specified in the manner and for the purpose hereinbefore described and illustrated in the accompanying drawings.

Dated this 30th day of September 1905.

JOHNSONS & WILLCOX,
47, Lincolns Inn Fields, London, W.C.
Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1905.

[This Drawing is a full-size reproduction of the Original.]

Fig. 1.

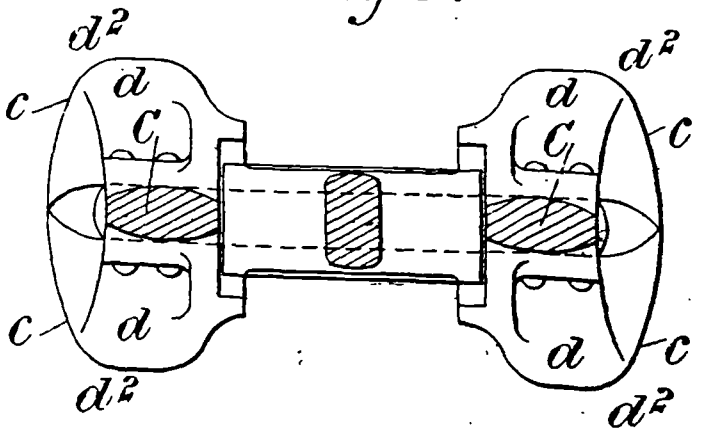
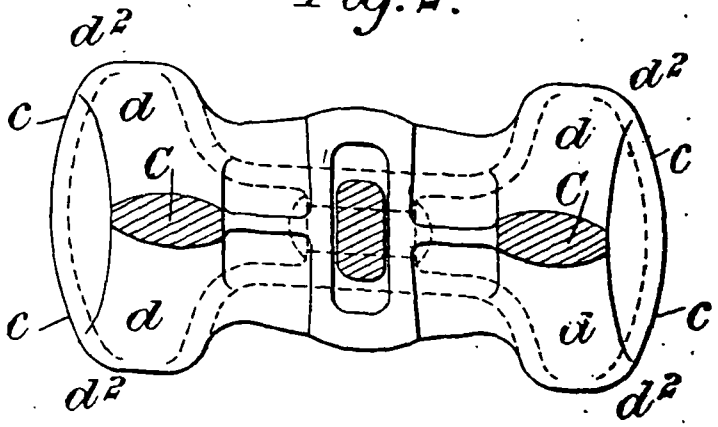


Fig. 2.



APPENDIX THREE :

Patents for anchors manufactured by:

- **William Lumsden Byers**

N° 6541 A.D. 1900

Date of Application, 7th Apr., 1900

Complete Specification Left, 7th Jan., 1901—Accepted, 6th Apr., 1901

PROVISIONAL SPECIFICATION.

"Improvements in Pivoted Anchors"

I, WILLIAM LUMSDON BYERS of 11 Norfolk Street, Sunderland, in the County of Durham (Anchor Manufacturer), do hereby declare the nature of this invention to be as follows:—

My invention has for its object improvements in the construction of pivoted anchors, and relates more particularly to the means employed to trip the anchor head and cause its flukes to "take" in the surface over which the anchor is let go, but embraces also modifications in the construction of the anchor head and method of pivoting the same to the shank.

With the object of ensuring the proper tripping of the heads of pivoted anchors, whatever the nature of the surface in which the flukes of the latter are to become embedded, I employ lateral projections or trips, as heretofore, but the outer end or edge of these I provide with inclined wings, lips, or flanges of considerable area, extending backwards or away from the anchor flukes. These lips or flanges constitute flat surfaces inclined to the length of the anchor flukes, preferably at an angle of about 20 degrees, or so that if the lines formed by the surfaces were produced, they would meet the flukes of the anchor at a point about one third of the entire length of the flukes from their points. When the lateral projections or trips are unable to secure the necessary resistance to effect a proper tripping, (especially in soft or muddy bottoms) these flat surfaces will support or retard the sinking of the anchor head sufficiently to enable or cause the flukes to assume their proper relative positions when the strain comes on the anchor.

When desired such inclined surfaces may be formed independently of the lateral projections or trips, or may be employed independently thereof, whilst they may be strengthened by suitable webs at the back.

Further, in constructing pivoted anchor heads, instead of providing lugs on the cross head to enable the shank to be hinged thereto, I form a suitable recess in the centre of the cross head to receive the end of the shank and secure the latter by a pin or bolt passing completely through the cross head from end to end. This pin is secured in position by upsetting the projecting ends thereof after a collar has been placed on each of them.

The opening through the cross head is preferably enlarged between points near the recess for the end of the shank and the outer ends of the cross head so that the bolt may be more easily placed in position.

Dated this 5th day of April 1900.

CASTLE SMITH
"Invention" Office, Mitre Court, Fleet Street London, E.C.
Agent for the Applicant.

[*Price 8d.*]

COMPLETE SPECIFICATION.

"Improvements in Pivoted Anchors"

I, WILLIAM LUMSDON BYERS, of 11 Norfolk Street, Sunderland, in the County of Durham (Anchor Manufacturer), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention has for its object improvements in the construction of pivoted anchors, and relates more particularly to the means employed to trip the anchor head and cause its flukes to "take" in the surface over which the anchor is let go, but embraces also modifications in the construction of the anchor head and method of pivoting the same to the shank.

With the object of ensuring the proper tripping of the heads of pivoted anchors, whatever the nature of the surface in which the flukes of the latter are to become embedded, I employ lateral projections or trips, as heretofore, but the outer end or edge of these I provide with inclined wings, lips, or flanges of considerable area, extending backwards or away from the anchor flukes.

Further, in constructing pivoted anchor heads, instead of providing lugs on the cross head to enable the shank to be hinged thereto, I form a suitable recess in the centre of the cross head to receive the end of the shank and secure the latter by a pin or bolt passing completely through the cross head from end to end. This pin is secured in position by upsetting the projecting ends thereof after a collar has been placed on each of them.

The opening through the cross head is preferably enlarged between points near the recess for the end of the shank and the outer ends of the cross head, so that the bolt may be more easily placed in position.

An anchor constructed according to my invention is shown in the accompanying drawings, of which Fig. 1 is a plan, Fig. 2 a front view, and Fig. 3 a side view, partly in section.

The anchor head *a* is formed with the lateral projections or trips *b*, the upper faces of which form with that of the head a concave surface, divided longitudinally by a strengthening web or ridge b^1, and transversely by webs or flanges b^2. The outer edges of these trips are provided with wings, lips, or flanges *c* of considerable area extending backwards or away from the flukes *d* at an angle to the latter, as shown by dotted lines.

The lips or flanges constitute flat surfaces inclined to the length of the anchor flukes, preferably at an angle of about 20 degrees, or so that if the lines formed by the surfaces were produced, they would meet the flukes of the anchor at a point about one third of the entire length of the flukes from their points. When the lateral projections or trips are unable to secure the necessary resistance to effect a proper tripping, these flat surfaces will support or retard the sinking of the anchor head (especially in soft or muddy bottoms) sufficiently to enable, or cause, the flukes to assume their proper relative position when the strain comes on the anchor.

When desired, such inclined surfaces may be formed independently of the lateral projections, or trips, or may be employed independently thereof, whilst they may be strengthened by suitable webs at the back.

The head *a* is provided with a central recess *e*, the sides of which are elongated by webs or flanges b^2, in which the end of the shank *f* is pivoted by a bolt *g*, passing entirely through the cross head *a*, the opening for the passage of this bolt being enlarged at intervals, as shown in the sectional part of Fig. 2 to facilitate the insertion, and said bolt being secured in position by a conically bored ring *h* being passed over its end, and the latter then upset.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

(1) A pivoted anchor provided with inclined lateral wings or lips such as *c* substantially as and for the purpose described.

(2) A pivoted anchor provided with inclined lateral wings or lips such as *c* in combination with lateral projections or trips having curved upper surfaces substantially as described.

(3) A pivoted anchor having the shank thereof pivoted in a recess in the cross head thereof by a bolt passing entirely through the latter substantially as described.

Dated this 7th day of Jany 1901.

CASTLE SMITH
Agent for the Applicant

Redhill: Printed for His Majesty's Stationery Office, by Malcomson & Co., Ltd.—1901.

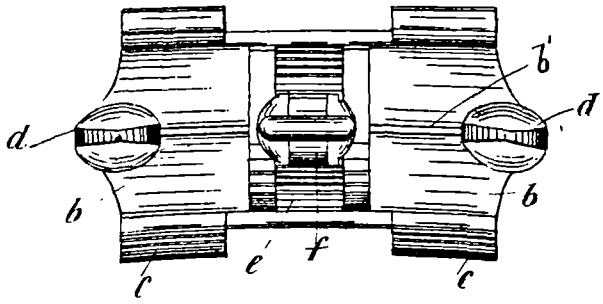


FIG 1

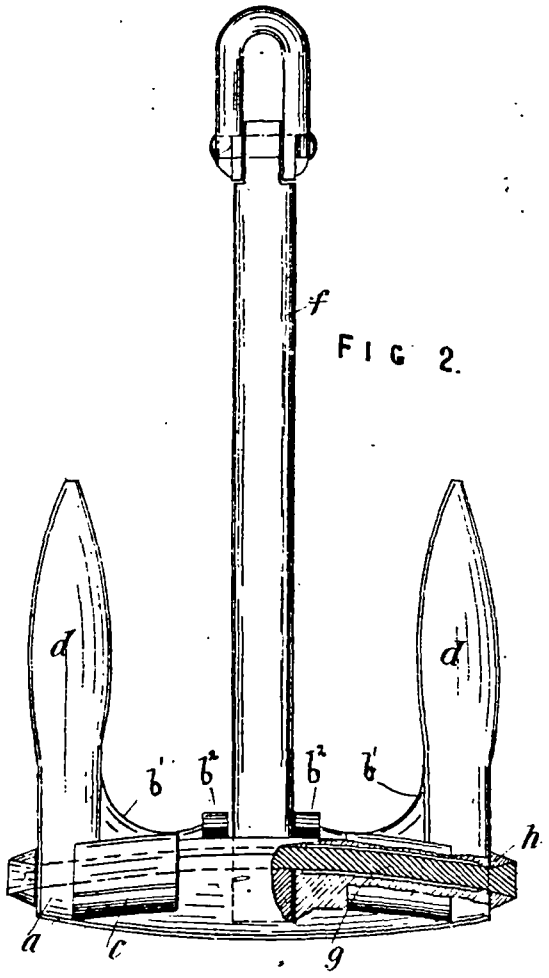


FIG 2.

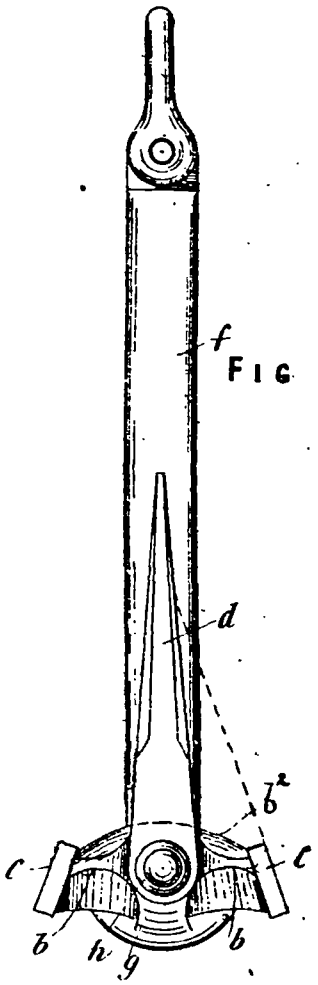


FIG 3

[This Drawing is a reproduction of the Original on a reduced scale.]

Malby & Sons, Photo-Litho.

N° 18,595 A.D. 1903

Date of Application, 28th Aug., 1903

Complete Specification Left, 20th May, 1904—Accepted, 23rd June, 1904

PROVISIONAL SPECIFICATION.

"Improvements in Anchors"

I, WILLIAM LUMSDON BYERS, Director of W. L. Byers and Company, Limited, of 11 Norfolk Street, Sunderland, in the County of Durham, Manufacturer, do hereby declare the nature of this invention to be as follows:—

My invention relates to certain improvements in the construction of anchors of the stockless type. It is designed to form an anchor of such configuration that it shall always come up in a proper position to the hawse pipe, that is to say, with the length of the anchor and both arms approximately parallel with the side of the ship, and this the more especially in respect of ships built on very fine lines, in which case the bows form an almost vertical plane, at a very acute angle to the central line of the ship.

To carry my invention into effect, and for the end specified, the corners of the ends of the anchor-head are made of the form of a portion of an arc of a circle. On each end of the head of the anchor is a projection, and through this projection the bolt is prolonged. The said projection forms the middle portion of an arc drawn from the two sides of the casting, and the above named corners of the end of the crosshead form parts of the same arc, the result being that there is a space between the corners and the projection which would not touch the ship's side. The projections cause the anchor to roll over smartly on to the rounded corners, and these corners allow the anchor to completely roll over, and come up with the length of the crosshead against, and parallel to the ship's plating.

To further facilitate the turning of the anchor in the hawse-pipe, I make the shank with a round section. Brackets may be provided between the projections and the outside edge of the flukes to prevent the projections from fouling the ship's keel.

Dated this 28th day of August 1903

CASTLE SMITH,
"Invention" Office, Mitre Court, Fleet Street, London, E.C.
Agent for the Applicant.

COMPLETE SPECIFICATION.

"Improvements in Anchors"

I, WILLIAM LUMSDON BYERS, Director of W. L. Byers and Company, Limited, of 11 Norfolk Street, Sunderland, in the County of Durham, Manufacturer, do hereby declare the nature of this invention and in what manner the same is

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to be performed, to be particularly described and ascertained in and by the following statement:

My invention relates to certain improvements in the construction of anchors of the stockless type. It is designed to form an anchor of such configuration that it shall always come up in a proper position to the hawse pipe, that is to say, with the length of the anchor and both arms approximately parallel with the side of the ship, and this the more especially in respect of ships built on very fine lines, in which case the bows form an almost vertical plane, at a very acute angle to the central perpendicular line of the ship.

In order that my invention may be the better understood I now proceed to describe the same, with reference to the accompanying sheet of drawings, regard being had to the figures and letters of reference marked thereupon, in which:—

Fig. 1 shows a front elevation.

Fig. 2 shows a side elevation.

Fig. 3 shows a broken half view of Fig. 2 as seen from below.

To carry my invention into effect, and for the end specified, the corners, A, of the ends of the anchor head are made of the form of a portion of arcs of a circle. On each end of the head of the anchor is a projection, B, and through this projection the bolt, C, is prolonged. The said projection, B, and the ends of the bolts each form the middle portion of an arc drawn from the two sides of the casting, and the above named corners, A, of the ends of the crosshead form parts of the same arcs. The projections, B, cause the anchor to roll over on to the rounded corners, A, A, and these corners, A, A, allow the anchor to completely roll over, and come up with the length of the crosshead, D, against, and parallel to, the ship's plating. To further facilitate the turning of the anchor in the hawse-pipe, I make the shank round in section, E. The shackle pin is at W.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

The construction of a stockless anchor in such a manner as to come up in proper position to the hawse-pipe substantially as specified.

Dated this 20th day of May, 1904

CASTLE SMITH,
"Invention" Office, Mitre Court, Fleet Street, London, E.C.
Agent for the Applicant.

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BYERS' Complete Specification. *(1 SHEET)*

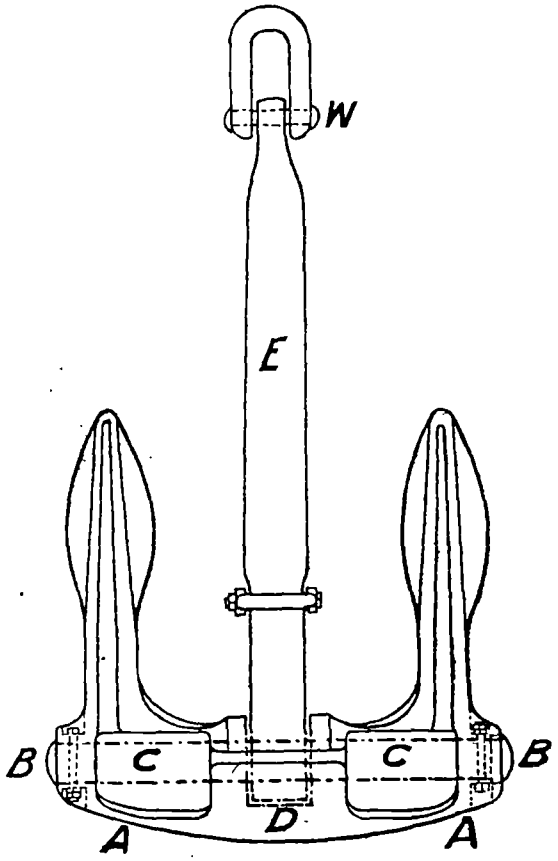

Fig. 1

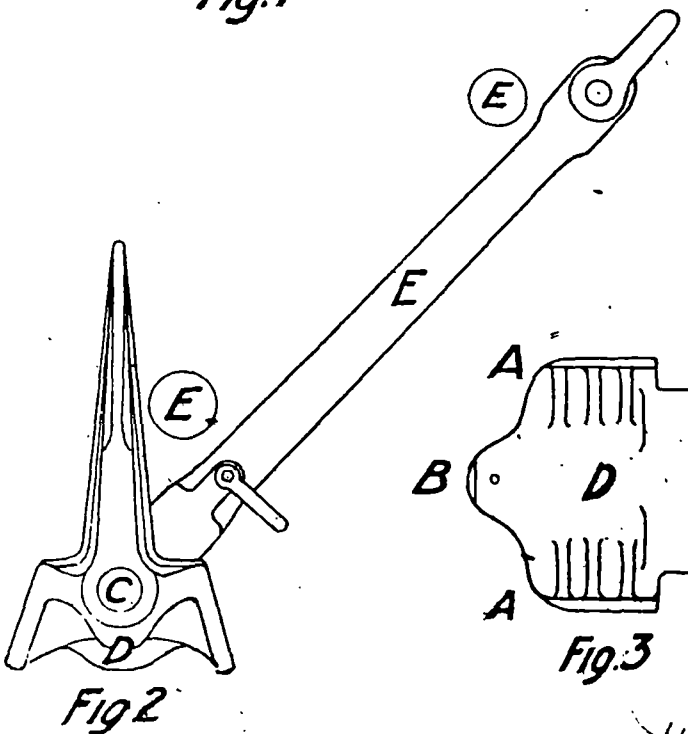

Fig 2

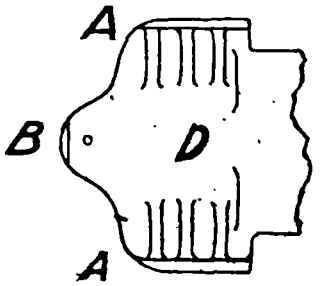

Fig. 3

[This Drawing is a reproduction of the Original on a reduced scale.]

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