

1920

Uniform cost accounting system

Robert E. Belt

Association of Manufacturers of Chilled Car Wheels

Follow this and additional works at: https://egrove.olemiss.edu/acct_inst

Recommended Citation

Belt, Robert E. and Association of Manufacturers of Chilled Car Wheels, "Uniform cost accounting system" (1920). *Publications of Accounting Associations, Societies, and Institutes*. 112.
https://egrove.olemiss.edu/acct_inst/112

This Article is brought to you for free and open access by the Accounting Archive at eGrove. It has been accepted for inclusion in Publications of Accounting Associations, Societies, and Institutes by an authorized administrator of eGrove. For more information, please contact egrove@olemiss.edu.

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS
1847 McCORMICK BUILDING
CHICAGO

Uniform Cost Accounting System

Adopted by the Association, October 19, 1920

GEORGE W. LYNDON, *President*

Prepared by

ROBERT E. BELT, C. P. A.,
AND THE COST COMMITTEE

W. C. DOERING, *Chairman* - - - - - Southern Wheel Co.
ANDREW MUIRHEAD - - - - - National Car Wheel Co.
R. K. WEBER - - - - - Mt. Vernon Car Mfg. Co.

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS
1847 McCORMICK BUILDING
CHICAGO

Uniform Cost Accounting System

Adopted by the Association, October 19, 1920

GEORGE W. LYNDON, *President*

Prepared by

ROBERT E. BELT, C. P. A.,
AND THE COST COMMITTEE

W. C. DOERING, *Chairman* - - - - - Southern Wheel Co.
ANDREW MUIRHEAD - - - - - National Car Wheel Co.
R. K. WEBER - - - - - Mt. Vernon Car Mfg. Co.

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS

1847 McCORMICK BUILDING
CHICAGO

Uniform Cost Accounting System

Adopted by the Association, October 19, 1920

GEORGE W. LYNDON, *President*

Prepared by

ROBERT E. BELT, C. P. A.,
AND THE COST COMMITTEE.

W. C. DOERING, *Chairman* - - - - - Southern Wheel Co.
ANDREW MUIRHEAD - - - - - National Car Wheel Co.
R. K. WEBER - - - - - Mt. Vernon Car Mfg. Co.

Association of Manufacturers OF Chilled Car Wheels

1847 MCCORMICK BUILDING

CHICAGO

PRESIDENT & TREASURER
GEO. W. LYNDON

VICE PRESIDENTS
E. F. CARRY
J. A. KILPATRICK

SECRETARY
FRANK C. TURNER

CONSULTING ENGINEER
F. K. VIAL

BOARD OF DIRECTORS:

J. M. BUICK, Vice-Pres. AMERICAN CAR & FOUNDRY CO.
J. A. KILPATRICK, President, ALBANY CAR WHEEL CO.
W. S. ATWOOD, Asst. to Pres., CANADIAN CAR & FOUNDRY CO.
CHAS. A. LINDSTROM, Asst. to Pres., CENTRAL CAR WHEEL CO.
F. K. VIAL, Chief Engineer, GRIFFIN WHEEL CO.
E. F. CARRY, President, HASKELL AND BARKER CAR CO.
A. G. WELLINGTON, President, MARYLAND CAR WHEEL WORKS
W. C. ARTHURS, President, MT. VERNON CAR MFG. CO.
J. D. RHODES, President, NATIONAL CAR WHEEL CO.
F. B. COOLEY, President, NEW YORK CAR WHEEL CO.
A. J. MILLER, Genl. Mgr., RAMAPO FOUNDRY & WHEEL WORKS
Wm. F. CUTLER, President, SOUTHERN WHEEL CO.

MEMBERS

Name	By Whom Represented	Address	Daily Capacity Wheels
Albany Car Wheel Co.....	J. A. Kilpatrick, Pres.....	Albany, N. Y.....	200
American Car & Fdy. Co.....	J. M. Buick, V.-P.....	St. Louis, Mo.....	4,500
Bass Fdy. & Machine Co.....	J. H. Bass, Pres.....	Ft. Wayne, Ind.....	800
Brown Car Wheel Works.....	H. G. Brown, Pres.....	Buffalo, N. Y.....	240
Buffalo Car Wheel Fdy. Co.....	A. B. Neill, V.-P.....	Buffalo, N. Y.....	250
Canadian Car & Fdy. Co., Ltd.....	W. S. Atwood, Asst. to Pres.....	Montreal, Que.....	400
Canada Iron Fdrs., Ltd.....	Chas. L. Jobb, Genl. Supt.....	Montreal, Que.....	400
Central Car Wheel Co.....	Chas. A. Lindstrom, Asst. to Pres.....	Pittsburgh, Pa.....	350
Dickson Car Wheel Co.....	Hy. H. Dickson, Pres.....	Houston, Texas.....	300
Dominion Wheel & Fdrs., Ltd.....	G. Kilpatrick.....	Toronto, Ont.....	200
Griffin Wheel Co.....	F. K. Vial, Ch. Engr.....	Chicago, Ill.....	6,000
Haskell & Barker Car Co.....	E. F. Carry, Pres.....	Chicago, Ill.....	400
Hannibal Car Wheel & Fdy. Co.....	John Morron, Pres.....	Hannibal, Mo.....	120
Lobdell Car Wheel Co.....	Geo. G. Lobdell, Jr., Pres.....	Wilmington, Del.....	600
Louisville Car Wheel & Ry. Sup. Co.....	N. E. Green, Pres.....	Louisville, Ky.....	160
Marshall Car Wheel & Fdy. Co.....	Chas. Cobb, Jr., Secy.....	Marshall, Texas.....	130
Maryland Car Wheel Works.....	A. G. Wellington, Pres.....	Baltimore, Md.....	700
Mt. Vernon Car Mfg. Co.....	W. C. Arthurs, Pres.....	Mt. Vernon, Ill.....	450
National Car Wheel Co.....	J. D. Rhodes, Pres.....	Pittsburgh, Pa.....	1,110
New York Car Wheel Co.....	F. B. Cooley, Pres.....	Buffalo, N. Y.....	300
Ramapo Fdy. & Wheel Works.....	A. J. Miller, Gen. Mgr.....	Ramapo, N. Y.....	215
Reading Car Wheel Co.....	H. H. Hewitt, Pres.....	Buffalo, N. Y.....	200
Standard Car Wheel Co.....	C. A. Brayton, Pres.....	Cleveland, Ohio.....	250
Southern Wheel Co.....	Wm. F. Cutler, Pres.....	St. Louis, Mo.....	1,400
Tredegar Iron Works.....	St. Geo. M. Anderson.....	Richmond, Va.....	120
Total.....			19,585

Uniform Cost Accounting System

Fundamental Principles for Ascertaining the Cost of Producing Chilled Iron Car Wheels.

AN examination of the cost accounting systems of the members of the Association shows that a variety of widely different methods of cost accounting are used to ascertain the cost of producing car wheels. This is especially true with respect to methods of handling old wheels received through exchange contracts; to methods of distributing general plant expense and administrative and general overhead expense where products in addition to car wheels are manufactured; to methods of handling depreciation; failed wheels; replacements of pattern and flask equipment; and to methods of classifying cost information.

The result is extremely wide difference in costs which are not true cost differences but differences, to a large extent, due to variations in methods of ascertaining costs. In the case of several companies it was found that their monthly production costs of wheels, due to an unreliable method of handling their old wheel exchange accounts, bore no relation to the sales value of the wheels shipped, with the result that the derived profit per ton was generally entirely misleading. On the other hand, while there is substantially no uniformity in methods, there are several of the members that have good cost accounting systems and determine their monthly costs and profits accurately. Even though the cost accounting methods of certain members are good and provide the individual companies with valuable comparative information, the broader com-

Uniform Cost Accounting System

mercial advantages of uniformity and of a knowledge of costs through the use of common methods and consistent treatment are lost.

As a basis for greater uniformity we have outlined herein a simple and practical cost accounting procedure based on fundamental principles which are applicable to all wheel foundries. The principles are not new and untried and it is believed they embody the good points of the many different systems at present used by wheel manufacturers.

As the process of manufacturing chilled car wheels is essentially the same at all plants and as there are few local conditions which are peculiar to individual concerns that affect cost methods, we are of the opinion that uniform fundamental principles outlined below can be satisfactorily followed by all of the members of the Association with the minimum amount of clerical labor consistent with accurate results. It is recommended, therefore, that the following principles for determining the cost of producing car wheels be adopted as standard and that each member adjust their accounting systems to conform thereto:—

1. Observe the following primary cost divisions or departments:—

Metal	Cleaning and Shipping
Melting	General Plant Expense
Molding	General Office Expense
Coremaking	

2. Charge to each primary cost division or department, under appropriate accounts, all costs of labor, material, supplies and expense incurred in or for those departments. A classification of labor, material and expense accounts is shown on page 13.

3. Prepare an accurate monthly cost statement showing for each item entering the statement the total cost per hundred pounds of good wheels, the grand total cost per hundred pounds of good wheels, and

Old Wheel Exchange Accounts

the differential cost per hundred pounds of good wheels. The differential cost is the conversion cost plus the difference between the cost of the mixture in the new wheels and the value of the old wheels used. An illustrated form of monthly cost statement is shown on page 30.

4. In the monthly cost statement, old wheels used in the mixture are to be entered at a base market price, taking up in the accounts, as explained below, the difference between the arbitrary exchange price for old wheels named in the sales contract and the base market price.

Old Wheel Exchange Accounts

Contracts for the sale of new wheels, particularly those to be used in the replacement of worn out ones, invariably specify that the Railroad furnish at a stipulated arbitrary exchange price a tonnage of old wheels equal to the tonnage of new wheels to be shipped under the contract. In effect, therefore, the Railroad agrees to furnish the metal required for the production of the new wheels covered by the sales contract. The obligation on the part of the Railroad to furnish old wheels, and on the part of the wheel company to pay for them at the stipulated price, is a definite and fixed one and one which the books should record.

In theory, the old wheels to be received under a sales contract at a fixed exchange price will be used in the manufacture of the new wheels, but in practice it is generally the case that the new wheels are shipped out usually from sixty to ninety days in advance of the receipt of the old wheels. This necessitates the use of metal in the manufacture of the new wheels which has not yet been furnished under the contract and which usually costs either more or less than the metal to be furnished under the particular contract.

If all exchange contracts with different roads entered into by the wheel manufacturer specified old wheels at a

Uniform Cost Accounting System

uniform price the substitution of metal would be no consequence as affecting cost and accounting methods, but where this is not the case it is very essential that the records reflect the difference in value of the metal actually used to manufacture new wheels under a given contract and the cost of the old wheels to be received under that particular contract. Otherwise, the wheel manufacturer may be in a position of substituting old wheels at a cost of say \$40.00 per ton for wheels at \$20.00 per ton provided for under the particular sales contract. This situation not only affects the true production cost but selling values as well, for in the above case the selling value is on the basis of old wheels at \$20.00 per ton instead of at \$40.00 per ton. Therefore, under sales contracts specifying the exchange of metal at varying prices, if the difference in metal is not taken into consideration, both production costs and selling values covering a particular period are inaccurately stated and comparisons are seriously distorted.

To facilitate the accounting procedure and to insure accurate and comparative costs and selling values the following sales policy and accounting practice is recommended covering the exchange value of metal:—

1. In sales contracts with different customers specify the purchase of old wheels at a uniform base price, the price to be the approximate market value of old wheels at the beginning of the period covered by the sales contract.

2. In cases where sales contracts provide for the purchase of old wheels at varying prices and where it is not possible to secure from all roads a uniform old wheel price, the following accounting practice is recommended in order to arrive at accurate and comparable production costs and selling values:

- (a) At the end of each month prepare an Old Wheel Exchange Summary covering all contracts having metal exchange clauses, showing weight of old wheels due

Old Wheel Exchange Accounts

at the beginning of the month and the value of the metal at exchange prices; weight of new wheels shipped during the month and the value of the metal therein at exchange prices; weight of old wheels received during the month and the value of the metal at exchange prices; and weight of old wheels due at the end of the month and the value of the metal at exchange prices. An illustrated form of an Old Wheel Exchange Summary is shown on page 11.

(b) Open a ledger asset account entitled "Old Wheels Due from Customers" and a ledger liability account entitled "Old Wheels Redeemable Under Contracts" to record the value at exchange prices of all old wheels due under contracts from customers and the liability of the wheel company for payment. At the end of each month the asset account will be charged and the liability account credited with a value at exchange prices equal to the weight of new wheels shipped during the month. The asset account will be credited and the liability account charged with the value at exchange prices of old wheels received from customers during the month. The asset account, at the close of each month, will then reflect the value of old wheels due from customers at exchange prices, and the liability account will show the obligation of the wheel company to redeem the old wheels. The two accounts will always correspond in amount. Illustrated journal entries are shown on page 12 based upon the Old Wheel Exchange Summary.

(c) New wheels shipped will be recorded at the invoice price, i.e., old wheel exchange price plus differential. If the base market value of the old wheels received or to be received in return for the new wheels shipped during the month is greater than the value of the old wheels at exchange prices, an account entitled "Contingent Metal Exchange" will be charged with the difference, and an account entitled "Sales Equalization" will be credited. If the base market value of the old wheels received or to be received in return for the

Uniform Cost Accounting System

new wheels shipped during the month is less than the value of the old wheels at exchange prices the account "Contingent Metal Exchange" will be credited with the difference and "Sales Equalization" account will be charged.

(d) Old wheels received will be vouchered at the stipulated exchange or invoice price. If the base market value of the old wheels received during the month is greater than the value of the metal at exchange prices, Old Wheels (stock account) will be charged with the difference and the Contingent Metal Exchange account will be credited. Any adjustment by customers in settlement of old wheels due at an exchange price below the base market price will also be credited to the Contingent Metal Exchange account. If the base market value of the old wheels received during the month is less than the value of the metal at exchange prices Old Wheels (stock account) will be credited and Contingent Metal Exchange account will be charged.

In preparing monthly Balance Sheets the Contingent Metal Exchange account, if a credit balance, can be deducted from the inventory of old wheels, and if a debit balance can be added to the inventory of old wheels, or the account can be entered in the Balance Sheet as a separate item.

The effect of overshipments on the Old Wheels Due account and the Old Wheels Redeemable account as well as on the Contingent Metal Exchange account should be watched closely, particularly where the exchange price is in excess of the market price. The exchange records should be carefully and regularly scrutinized so that an overshipment may be promptly detected. The customer should be immediately notified of any overshipments and requested either to discontinue shipments or advised that overshipments will be applied on a subsequent contract for new wheels at the price to be stated in the later contract.

OLD WHEELS EXCHANGE SUMMARY

July 31, 1920.

	Old Wheels Contract Price		Old Wheels Due Beginning of Month		New Wheels Shipped During Month		Old Wheels Received During Month		Adjustments During Month†		Old Wheels Due End of Month‡	
	G. T.	Cwt.	Weight	Amount	Weight	Amount	Weight	Amount	Weight	Amount	Weight	Amount
A. & B. R.R....	\$16.80	\$.75	1,000,000	\$ 7,500	500,000	\$ 3,750	400,000	\$ 3,000	.....	.....	1,100,000	\$ 8,250
C. & D. Ry....	33.60	1.50	750,000	11,250	750,000	11,250	50,000	750	.....	.....	1,450,000	21,750
E. & F. R.R....	39.25	1.75	750,000	13,125	200,000	3,500	300,000	5,250	.....	.....	650,000	11,375
G. & H. Ry....	22.40	1.00	2,000,000	20,000	1,000,000	10,000	2,000,000	20,000	.....	.....	1,000,000	10,000
K. & L. R.R....	44.80	2.00	1,000,000	20,000	500,000	10,000	600,000	12,000	.....	.....	900,000	18,000
M. & N. Ry....	33.60	1.50	500,000	7,500	500,000	7,500	400,000	6,000	.....	.....	600,000	9,000
Total.....			6,000,000	79,375	3,450,000	46,000	3,750,000	47,000	.....	.....	5,700,000	78,375
Base Market Value.....	33.60	1.50	.....	90,000	.....	51,750	.....	56,250	.....	.....	.....	85,500
				\$10,625		\$ 5,750	.....	\$ 9,250	.....	.....	.....	\$ 7,125

† Any adjustment in weight allowed by or to the customer would be entered in the column provided, the value of the tonnage involved being entered at the old wheel contract price.

‡ In case of an overshipment under any particular contract, enter the weight and value in red and deduct when footing the columns.

Old Wheel Exchange Accounts

Uniform Cost Accounting System

Journal Entries

Old Wheels Due from Customers	\$79,375	
Old Wheels Redeemable Under Contracts		\$79,375
To record old wheels due from customers under exchange contracts as of June 30th, and our liability for payment.		
Contingent Metal Exchange	10,625	
Surplus Suspense Account		10,625
To record the contingent profit on old wheels due, as of June 30, at exchange prices less than market price.		
Old Wheels Due from Customers	46,000	
Old Wheels Redeemable Under Contracts		46,000
To record old wheels due from customers under exchange contracts on account of new wheels shipped during July.		
Old Wheels Redeemable Under Contracts	47,000	
Old Wheels Due from Customers		47,000
To record old wheels received from customers under exchange contracts during July.		
Contingent Metal Exchange	5,750	
Sales Equalization		5,750
To adjust sales under exchange contracts specifying old wheels at less than market to the basis of old wheels at market.		
Old Wheels (stock account)	9,250	
Contingent Metal Exchange		9,250
To take old wheels into stock at market value which were received under exchange contracts at prices less than market.		

Classification of Accounts

Classification of Accounts

While it is highly desirable that all the members of the Association follow the same fundamental principles of cost accounting it is not so essential that they adopt identical cost accounts as long as they observe the same general cost divisions. Companies that care for but little detailed information can follow the scheme of a general classification of accounts by consolidating the accounts under a given head while companies that want and make use of a greater amount of detailed information than that shown by a classification of accounts can further divide them. When general heads or cost divisions are observed by different companies, even though the accounts thereunder in number and in name differ, the results for group totals still afford a true comparison.

The following general classification of accounts is recommended. In some instances the accounts under the several cost divisions can be consolidated, or they can be further subdivided as desired.

MELTING DEPARTMENT:

- 11 Melting Labor
- 12 Melting Fuel
- 13 Melting Supplies
- 14 Cupola Relining Labor
- 15 Cupola Relining Materials

MOLDING DEPARTMENT:

- 20 Molding Direct Labor
- 21 Molding Indirect Labor
- 23 Molding Supplies

COREMAKING DEPARTMENT:

- 30 Coremaking Direct Labor
- 31 Coremaking Indirect Labor
- 32 Core Fuel
- 33 Core Supplies

Uniform Cost Accounting System

CLEANING AND SHIPPING DEPARTMENT:

- 41 Cleaning and Shipping Labor
- 43 Cleaning and Shipping Supplies

GENERAL PLANT EXPENSE:

- 56-1 Works Administration—Salaries
- 56-2 " " —Supplies and Expense
- 66-1 Power, Heat and Light—Labor
- 66-2 " " " " —Fuel
- 66-3 " " " " —Supplies and Expense
- 66-4 " " " " —Purchased Power
- 76-1 Yard—Labor
- 76-2 " —Supplies and Expense
- 86-1 Equipment Repairs—Labor
- 86-2 " " —Materials
- 96-1 Building Repairs—Labor
- 96-2 " " —Materials
- 106 Depreciation
- 116 Taxes
- 126 Fire Insurance
- 136 Employes' Liability Insurance
- 146 Medical and Hospital Expense
- 156 Laboratory Expense
- 166 Failed Wheels

GENERAL OFFICE EXPENSE:

- 207 General and Administrative Expense
- 217 Selling Expense

Definition of Accounts

MELTING

11. MELTING LABOR:

To include all labor operations in the handling of melting materials and supplies from pile or bin to the cupola, for the daily care of the cupolas and bull ladles, and for the care of the hot iron until delivered into pouring ladles:—

- Rolling old wheels from storage to drop,
- Breaking old wheels,

Classification of Accounts

MELTING LABOR—*Continued*

Breaking and crushing other materials to size,
Loading charging cars,
Pushing cars,
Weighing,
Running elevators,
Charging gang,
Cupola melters and helpers,
Slagmen,
Bull ladle operators,
Patching cupolas, spouts, bull ladles, and hand
ladles used for pouring test pieces.
Sawing and splitting wood,
Getting up wood; shavings; sand, cinders, brick,
and mixing mud,
Care of fuel oil burners,
Cleaning up around cupolas,
Foreman.

12. MELTING FUEL:

To include the cost of all coke and other fuel used for melting the iron, including freight and switching charges.

13. MELTING SUPPLIES:

To include the cost of flux; wood; and brick, blocks, fire clay, etc., used for the daily patching of the cupolas.

14. CUPOLA RELINING LABOR:

To include all labor in the periodical relining of cupolas and bull ladles.

15. CUPOLA RELINING MATERIALS:

To include the cost of all materials used in connection with the periodical relining of cupolas and bull ladles, including freight and switching charges.

MOLDING.

20. MOLDING DIRECT LABOR:

To include all labor of molders and helpers in putting up molds; operating molding machines; pouring; shaking out; and cutting sand when done by molders and helpers.

21. MOLDING INDIRECT LABOR:

To include all labor operations for the care of the iron from the time it is delivered into the pouring ladles until the wheels are delivered from the pits—

Delivering iron to molding floors,
Delivering wheels to and from pits,
Skimmers,
Mixing facing,
Wheeling in sand,
Chill changers,
Shellacing chills,
Chaplet men,
Handling of pattern and flask equipment from
and to stores,
Raising and lowering copes,
Gathering up scrap and heads,
Cleaning and relining pouring ladles,
Preparation of wood for heating pouring ladles,
Care of fuel oil burners for heating pouring
ladles,
Cleaning up department,
Pouring, shaking out and cutting sand when
not done by molders or helpers,
Foreman.

23. MOLDING SUPPLIES:

To include the cost of all supplies and small tools used in molding—sand; seacoal; mineral facing; flour; chaplets; skimmers; riddles; bellows; brooms; brushes; shovels; coke and wood for drying pouring ladles; etc., including freight and switching charges.

Classification of Accounts

COREMAKING.

30. COREMAKING DIRECT LABOR:

To include all labor of coremakers and helpers in making and assembling cores and in operating core machines.

31. COREMAKING INDIRECT LABOR:

To include all coreroom labor other than that of actual making cores—

Wheeling in sand,
Mixing sand,
Loading ovens,
Oven tenders,
Inspectors,
Delivering cores to the foundry,
Cleaning up department,
Foreman.

32. CORE FUEL:

To include the cost of all fuel used for baking cores, including freight and switching charges.

33. CORE SUPPLIES:

To include the cost of all supplies and small tools used in the coreroom—core sand; core oil; core binders; core compounds; core wash; mineral facing; brushes; brooms; small tools, etc.

CLEANING AND SHIPPING.

41. CLEANING AND SHIPPING LABOR:

To include all labor operations of cleaning, finishing, weighing and delivering wheels to shipping platform, loading wheels into cars or trucks, and labor boxing and blocking shipments—

Cleaning,
Chipping,
Taping,
Weighing,

Uniform Cost Accounting System

CLEANING AND SHIPPING LABOR—*Continued*

Stenciling and marking,
Inspecting,
Loading,
Boxing,
Blocking,
Delivering defective wheels, to storage or to
drop,
Foreman.

43. CLEANING AND SHIPPING SUPPLIES:

To include the cost of all supplies and small tools used in the cleaning and shipping department—emery wheels; chisels; brooms; brushes; shovels; files; eye shields; hand leathers; lumber; nails; etc.

GENERAL PLANT EXPENSE.

56-1 WORKS ADMINISTRATION—SALARIES:

To include the salaries of superintendent; assistant superintendent; general foreman; and plant clerks, including time-keepers, store room and inventory clerks.

56-2 WORKS ADMINISTRATION—SUPPLIES & EXPENSE:

To include the cost of all supplies and expense of the works office—stationery; printing; postage; and all other expense at the plant office.

66-1 POWER, HEAT AND LIGHT—LABOR:

To include all labor in connection with the generation of power, heat and light—

Engineers,
Firemen,
Coal passers,
Removing cinders and ashes,
Oiling and daily care of power plant equipment.

Classification of Accounts

66-2 POWER, HEAT AND LIGHT—FUEL:

To include the cost of all fuel consumed in the generation of power, heat and light, including freight and switching charges.

66-3 POWER, HEAT AND LIGHT—SUPPLIES & EXPENSE:

To include the cost of all supplies and expense of the power plant—water; oils; waste; tools; fittings; also fuel for heating offices and shops.

66-4 POWER, HEAT AND LIGHT—PURCHASED POWER:

To include the cost of all purchased current.

76-1 YARD—LABOR:

To include all miscellaneous yard labor (including labor in unloading materials when it is not practicable to charge such labor to the commodity unloaded).

Transferring materials in yard,
Cleaning tracks and turn tables,
Cleaning roofs and windows,
Cleaning yard,
Oiling and daily care of motors, shafting,
pulleys, cranes, elevators, fans, etc.
Watchmen,
Gatemen,
Locomotive crane operators,
Handling refuse, slag, etc.
Handling replacement wheels,
Yard foreman.

76-2 YARD—SUPPLIES AND EXPENSE:

To include the cost of all yard supplies and expense—Truck hire and drayage; feed; gasoline and oil for trucks; repairs to stable equipment; shovels; forks; fuel and supplies for locomotive crane; demurrage charges; etc.

Uniform Cost Accounting System

86-1 EQUIPMENT REPAIRS—LABOR:

To include all labor in repairing equipment. Labor in relining cupolas is charged to account No. 14.

86-2 EQUIPMENT REPAIRS—MATERIALS:

To include the cost of all materials used in repairing equipment. Materials for relining cupolas are charged to account No. 15.

96-1 BUILDING REPAIRS—LABOR:

To include all labor in repairing buildings; bins; tracks; fences; platforms; etc.

96-2 BUILDING REPAIRS—MATERIALS:

To include the cost of all materials used in repairing buildings; bins; tracks; fences; platforms; etc.

106 DEPRECIATION:

To include charges to cover the deterioration in the value of buildings and equipment due to wear and tear and obsolescence. Charge the account monthly with one-twelfth of the total cost of the annual depreciation and credit "Depreciation Reserve" account.

116. TAXES:

To include all taxes other than Federal Income and Excess Profits Taxes. Charge the account monthly with one-twelfth of the annual expense and credit "Accrued Taxes" account.

126. FIRE INSURANCE:

To include all premiums for fire insurance and all costs of fire protection. Charge the account monthly with one-twelfth of the total annual expense and credit "Prepaid Insurance" account.

Classification of Accounts

136. EMPLOYEES' LIABILITY INSURANCE:

To include monthly premiums on employer's liability insurance policies, or, in case of self insurance, the charges made therefor.

146. MEDICAL AND HOSPITAL EXPENSE:

To include all forms of medical and hospital expense; personal injury payments when not covered by liability insurance, and legal expense in connection therewith.

156. LABORATORY EXPENSE:

To include the salary of chemists and all expense of the laboratory in testing materials and products.

166. FAILED WHEELS:

To include a charge per net ton of wheels produced, based on past experience, sufficient to cover anticipated loss due to time or mileage guarantee of new wheels. Credit an account "Wheel Reserve Guarantee." When defective wheels are returned for credit they should be charged into stock at the base market price and there should be a charge to the "Wheel Reserve Guarantee" account equal to the difference between the credit allowed the customer and the scrap value of the returned wheels. When defective wheels are returned for replacement the cost of the new wheel, less scrap value of the old wheel returned, should be charged to the "Wheel Reserve Guarantee" account. If guarantee claims are settled on a cash payment basis, the payment is a direct charge to the "Wheel Reserve Guarantee" account.

Uniform Cost Accounting System

GENERAL OFFICE EXPENSE.

207. GENERAL AND ADMINISTRATIVE EXPENSE:

To include the salaries of all general officers, and general office clerks, and all expenses incidental to the office other than selling.

217. SELLING EXPENSE:

To include the salaries and expense of salesmen, and all expenses incidental to selling, such as traveling, advertising, collection, commissions, etc.

Forms of Records and Statements

Uniform cost methods do not require that records for gathering cost data be similar in form or arrangement nor is it required that all statements be prepared in an exactly similar manner. It is highly desirable though that each member of the Association use substantially the same methods of gathering and classifying cost information and the same form of presenting it in monthly cost statements. Recommended illustrated forms for gathering and presenting costs are shown, the arrangement of the data conforming to the preceding classification of accounts.

DAILY CUPOLA REPORT

..... Foundry

..... Works

Cupola No.

Date *June 1, 1920*

Material	Woodward Pig	Clifton Pig					Steel Scrap	Cast Scrap	Old Wheels	Return Scrap	Ferro-Mang.	Total Metal Charged	Coke	Flux
Car or Bin No.	146220	10645					S2	S4					C2	F1
Charge 1	200						150	150	2,500		6	3,006	4,000	
2	300						75	125	3,500		6	4,006	425	
3	300						75	125	3,500		6	4,006	425	80
4	300						75	125	3,500		6	4,006	425	80
5	300						75	125	3,100	400	6	4,006	425	80
6	300						75	125	3,100	400	6	4,006	425	80
7	300						75	125	3,100	400	6	4,006	425	80
8	300						75	125	3,100	400	6	4,006	425	80
9	300						75	125	3,100	400	6	4,006	425	80
10	300						75	125	3,100	400	6	4,006	425	80
11	300						75	125	3,100	400	6	4,006	425	80
12	300						75	125	3,100	400	6	4,006	425	80
13	300						75	125	3,100	400	6	4,006	425	80
14	300						75	125	3,100	400	6	4,006	425	80
15	150	150						200	3,100	400	6	4,006	425	80
16	150	150						200	3,100	400	6	4,006	425	80
17	150	150						200	3,100	400	6	4,006	425	80
18	150	150						200	3,100	400	6	4,006	425	80
19	150	150						200	3,100	400	6	4,006	425	80
20	150	150						200	3,100	400	6	4,006	425	80
21	150	150						200	3,100	400	6	4,006	425	80
22	150	150						200	3,100	400	6	4,006	425	80
23	150	150						200	3,100	400	6	4,006	425	80

24

Uniform Cost Accounting System

24	150	150					200	3,300	200	6	4,006	425	60
25	150	150					200	3,300	200	6	4,006	425	60
26	150	150					200	3,300	200	6	4,006	425	60
27	150	150					200	3,300	200	6	4,006	425	60
28	150	150					200	3,300	200	6	4,006	425	60
29	150	150					200	3,300	200	6	4,006	425	60
30	150	150					200	3,300	200	6	4,006	425	60
31	150	150					200	3,300	200	6	4,006	425	60
32	150	150					200	3,300	200	6	4,006	425	60
33	150	150					200	3,500		6	4,006	425	
34	150	150					200	3,500		6	4,006	425	
35	150	150					200	2,000		6	2,508		
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
Total.....	7,250	3,150				1,125	5,975	110,600	9,400	210	137,710	18,025	1,800

Blast on..... M

Bottom Dropped..... M

Correct.....

First Iron..... M

First Tap..... M

Melter

Forms of Records and Statements

SUMMARY OF DAILY CUPOLA REPORTS

..... Foundry

..... Works

Cupola No.

Month of *June, 1920.*

Material	Woodward Pig	Clifton Pig					Steel Scrap	Cast Scrap	Old Wheels	Return Scrap	Ferro-Mang.	Total Metal Charged	Coke	Flux
Car or Bin No.	146,220	10,645					S2	S4					C2	F1
June 1	7,250	3,150					1,125	5,975	110,600	9,400	210	137,710	18,025	1,800
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
Total.....	200,000	165,000					30,000	60,000	3,640,000	300,000	5,000	4,400,000	500,000	40,000
Price.....	\$ 2.00	2.00					1.20	1.50	1.50	1.50	12.00		80c	20c
Cost.....	\$4,000.00	3,300.00					360.00	900.00	54,600.00	4,500.00	600.00	68,260.00	4,000.00	80.00

Uniform Cost Accounting System

Forms of Records and Statements

PAY ROLL DISTRIBUTION.

Plant..... Month of *June, 1920.*

Acct. No.	Account Name	Wheel Foundry	Total
	MELTING		
11	Melting Labor.....	\$3,000.00	\$3,000.00
14	Cupola Relining Labor..	400.00	400.00
	MOLDING		
20	Molding Direct Labor...	4,000.00	4,000.00
21	Molding Indirect Labor..	2,200.00	2,200.00
	COREMAKING		
30	Coremaking Direct Labor	400.00	400.00
31	Coremaking Indirect Labor.....	200.00	200.00
	CLEANING AND SHIPPING		
41	Cleaning and Shipping Labor.....	880.00	880.00
66-1	Power, Heat and Light— Labor.....	200.00	200.00
76-1	Yard Labor.....	40.00	40.00
86-1	Equipment Repairs— Labor.....	1,000.00	1,000.00
96-1	Building Repairs—Labor	80.00	80.00
	Total.....	12,400.00	12,400.00

Uniform Cost Accounting System

REPORT OF SUPPLIES CONSUMED

Plant..... Month of *June, 1920.*

Acct. No.		Quantity	Price	Amount
	MELTING SUPPLIES			
13	Flux.....	40,000	20c cwt.	\$ 80.00
13	Fire Brick.....	1,800	5.00	90.00
13	Cupola Block.....	200	10.00	20.00
13	Fire Clay.....	4,000	25c	10.00
	Total.....			200.00
	CUPOLA RELINING MATERIALS			
15	Fire Brick.....	1,500	5.00	75.00
15	Cupola Block.....	3,000	10.00	300.00
15	Fire Clay.....	10,000	25c	25.00
	Total.....			400.00
	MOLDING SUPPLIES			
23	Sand.....	120,000	10c	120.00
23	Sea Coal.....	16,000	50c	80.00
23	Mineral Facing.....	5,000	1.20	60.00
23	Chaplets.....	800	5c lb.	40.00
23	Riddles.....	4	2.50	10.00
23	Bellows.....	5	4.00	20.00
23	Brooms.....	12	20.00 doz.	20.00
23	Brushes.....	10	1.00 ea.	10.00
23	Shovels.....	16	2.50	40.00
	Total.....			400.00
	CORE FUEL			
32	Coke.....	12,000	50c	60.00
32	Wood.....	2	10.00 cord	20.00
	Total.....			80.00
	CORE SUPPLIES			
33	Sand.....	120,000	10c cwt.	120.00
33	Oil.....	20	50c gal.	10.00
33	Compounds.....	22,500	2.00 cwt.	450.00
33	Wash.....			
33	Mineral Facing.....	800	1.25 cwt.	10.00
33	Brushes.....	10	1.00 ea.	10.00
	Total.....			600.00

Forms of Records and Statements

REPORT OF SUPPLIES CONSUMED—Continued.

Plant..... Month of *June, 1920.*

Acct. No.		Quantity	Price	Amount
	CLEANING AND SHIP- PING SUPPLIES			
43	Lumber.....	400	50.00 M.	20.00
43	Nails.....	200	5c lb.	10.00
43	Hand Leathers.....	40	50c ea.	20.00
43	Emery Wheels.....	6	5.00 ea.	30.00
	Total.....			80.00
	POWER, HEAT AND LIGHT—FUEL			
66-2	Fuel.....	120	5.00	600.00
	POWER, HEAT AND LIGHT—SUPPLIES			
66-3	Oil.....	40	50c gal.	20.00
66-3	Waste.....	200	10c lb.	20.00
66-3	Tools.....			30.00
66-3	Fittings.....			10.00
	Total.....			80.00
	YARD SUPPLIES			
76-2	Feed.....			
76-2	Gasoline.....	80	25c gal.	20.00
76-2	Oil.....			
76-2	Shovels.....	4	2.50	10.00
76-2	Forks.....	4	2.50	10.00
	Total.....			40.00
	EQUIPMENT REPAIR MATERIALS			
86-2	Metal.....	4,000	5c lb.	200.00
86-2	Lumber.....	1,500	80.00	120.00
86-2	Belting.....			80.00
	Total.....			400.00
	BUILDING REPAIR MATERIALS			
96-2	Lumber.....	1,000	70.00 M.	70.00
96-2	Bolts.....			10.00
	Total.....			80.00

MONTHLY COST

	Weight	Price	Amount	Cost per 100 lbs.
Old Wheels (market price).....	3,640,000	\$ 1.50	\$54,600.	.....
Pig Iron—Woodward.....	200,000	2.00	4,000.	.....
—Clifton.....	165,000	2.00	3,300.	.....
Remelt, incl. Bad and Test Wheels	300,000	1.50	4,500.	.....
Steel Scrap.....	30,000	1.20	360.	.....
Malleable Scrap.....				.....
Cast Iron Scrap.....	60,000	1.50	900.	.....
Ferro-Manganese.....	5,000	12.00	600.	.....
Total Metal Charged.....	4,400,000	1.55	68,260.	1.706
Less Remelt (Heads and Sprue)...	200,000	1.50	3,000.	.....
Less Bad and Test Wheels.....	100,000	1.50	1,500.	.....
Total Scrap Recovered.....	300,000	1.50	4,500.	.112
Net Metal Cost.....	4,100,000	1.55	63,760.	1.594
Melting.....			8,000.	.200
Molding.....			6,600.	.165
Coremaking.....			1,280.	.032
Cleaning and Shipping.....			960.	.024
General Plant Expense.....			6,680.	.167
Works Cost.....			87,280.	2.182
General Office Expense.....			6,000.	.150
Total Cost.....			93,280.	2.332
Deduct Value of Old Wheels.....				1.500
Differential Cost.....				.832

Total cost per net ton, as above, on basis of using old wheels at market price.....	\$46.64
Total cost per net ton on basis of using old wheels, pig iron, and scrap at market prices.....	47.20
Differential cost per net ton on basis of using old wheels, pig iron, and scrap at market prices.....	17.20

	Rail-road	Street Car	Miscellaneous	Total
Wgt. of Good Wheels Made (N.T.)	1,800	200	.....	2,000
No. of Good Wheels Made.....	5,294	956	.....	6,250
Avg. Wgt. Good Wheels Made (lbs.)	680	418	.....	640
No. of Bad Wheels Made.....	112	13	.....	125
No. Test Wheels Made (Company)	8	2	.....	10
No. Test Wheels Made (Customer)	45	5	.....	50
Total No. of Wheels Made.....	5,459	976	.....	6,435
Percentage Bad.....	2.0	1.4	.....	1.9
Percentage Test.....	1.0	.7	.....	.9
Total Productive Floor Days.....	265	48	.....	313
Average Production Good Wheels per Floor per Day (pounds)...	13,600	8,360	.....	12,800

STATEMENT

Month *June, 1920*

	This Month		Previous Month	
	Amount	Per 100 lbs.	Amount	Per 100 lbs.
MELTING:				
Melting Labor	\$3,000.	.075	.....	.....
Melting Fuel	4,000.	.100	.....	.....
Melting Supplies	200.	.005	.....	.....
Cupola Relining Labor	400.	.010	.....	.....
Cupola Relining Materials	400.	.010	.....	.....
Total	8,000.	.200	.....	.....
MOLDING:				
Molding Direct Labor	4,000.	.100	.....	.....
Molding Indirect Labor	2,200.	.055	.....	.....
Molding Supplies	400.	.010	.....	.....
Total	6,600.	.165	.....	.....
COREMAKING:				
Coremaking Direct Labor	400.	.010	.....	.....
Coremaking Indirect Labor	200.	.005	.....	.....
Core Fuel	80.	.002	.....	.....
Core Supplies	600.	.015	.....	.....
Total	1,280.	.032	.....	.....
CLEANING AND SHIPPING:				
Cleaning and Shipping Labor	880.	.022	.....	.....
Cleaning and Shipping Supplies	80.	.002	.....	.....
Total	960.	.024	.....	.....
GENERAL PLANT EXPENSE:				
Works Administration—Salaries	1,000.	.025	.....	.....
Supplies and Expense	200.	.005	.....	.....
Power, Heat and Light—Labor	200.	.005	.....	.....
Fuel	600.	.015	.....	.....
Supplies and Expense	80.	.002	.....	.....
Purchased Power .....	.....	.....	.....	.....
Yard—Labor	40.	.001	.....	.....
Supplies and Expense	40.	.001	.....	.....
Equipment Repairs—Labor	1,000.	.025	.....	.....
Materials	400.	.010	.....	.....
Building Repairs—Labor	80.	.002	.....	.....
Materials	80.	.002	.....	.....
Depreciation	1,600.	.040	.....	.....
Taxes	160.	.004	.....	.....
Fire Insurance	160.	.004	.....	.....
Employes' Liability Insurance	80.	.002	.....	.....
Medical and Hospital Expense	80.	.002	.....	.....
Laboratory Expense	80.	.002	.....	.....
Failed Wheels	800.	.020	.....	.....
Total	6,680.	.167	.....	.....
GENERAL OFFICE EXPENSE:				
General and Admin. Expense	4,000.	.100	.....	.....
Selling Expense	2,000.	.050	.....	.....
Total	6,000.	.150	.....	.....

Cost of Producing Wheels of Different Weights

In the manufacture of wheels, it is evident that certain items of cost per ton of wheels produced are constant regardless of the weight of the wheels, while other items of cost per ton of wheels produced are variable depending upon the weight of the wheels.

The constant costs are those of metal and melting, that is to say, the cost of molten metal per ton of product is the same whether the product is a 400 pound wheel or an 850 pound wheel. All other costs of conversion, however, per ton of product, are in direct relation to the weight of wheels produced unless for the lighter weights of wheels different molding rates are paid. Generally, the molding rates are the same for all weights of steam car wheels and for the heavier weights of street car wheels as well. It is evident, therefore, that molding costs, handling costs, pitting costs, cleaning costs and general expense, per ton of wheels produced, are in direct relation to the weight of the wheel.

It is possible, therefore, knowing the cost of all wheels produced and their average weight to readily arrive in a very accurate manner at the cost of producing wheels of different weights. The manner of ascertaining the production cost of different weights of wheels is illustrated below and this procedure is recommended in all cases where molders' and helpers' rates are the same for different weights of wheels.

Production Costs of Wheels of Different Weights

	No.	Av. Wgt. lbs.	Total Cost	Cost per 100 lbs.
Good Wheels Made	6,250	640	\$93,280	\$2.332
Constant costs per 100 lbs. for all weights of wheels (metal and melting)			71,760	1.794
Variable costs per 100 lbs. for different weights of wheels			21,520	.538
Average weight of wheels produced		640 lbs.		
Average variable cost per 100 lbs.			\$0.538	
Average variable cost per wheel			3.443	

Cost of Producing Wheels of Different Weights

The total variable cost per 100 lbs. of any weight of wheel produced is found by dividing the average variable cost per wheel (\$3.443) by the weight of the wheel.

Classification of weights of wheels produced	Constant costs per 100 lbs. wheels produced	Variable costs per 100 lbs. wheels produced	Total cost per 100 lbs. wheels produced	Differential cost per 100 lbs. wheels produced
850 lbs.	\$1.794	\$0.405	\$2.199	\$0.699
800	1.794	.430	2.224	.724
750	1.794	.459	2.253	.753
700	1.794	.492	2.286	.786
650	1.794	.530	2.324	.824
600	1.794	.574	2.368	.868
550	1.794	.626	2.420	.920
500	1.794	.689	2.483	.983
450	1.794	.765	2.559	1.059
400	1.794	.861	2.655	1.155
350	1.794	.984	2.778	1.278
300	1.794	1.148	2.942	1.442

Importance of Accurate Weights of Materials Consumed

Accurate monthly costs in the wheel industry depend in no small measure on the correctness of the weight of the monthly consumption of materials, particularly of metal and of coke. All wheel manufacturers, as a matter of necessity, weigh their charges of metal and coke but with some it seems to be more a matter of form than of necessity with the result that their weights are very unreliable necessitating extremely large inventory adjustments at the close of the year when a physical inventory is taken and the exact consumption in that way determined. Inventory adjustments which often loom so big at the end of the year very largely are the reflection of the extent of inaccuracy of weights during the year and the failure to make reconciliations from time to time. With carefulness in weighing, the importance of which can not be over emphasized, and with minor current adjustments when particular stocks become low, adjustments at end of the year are practically eliminated.

Uniform Cost Accounting System

In the interests of accurate current costs it is highly important, therefore, that constant care be exercised to obtain correct weights and that any discrepancy in receipts and consumption be adjusted immediately upon ascertaining the fact. The stock clerk should be instructed that when the stock of any material gets low he is to check it against the book inventory so that any difference can be immediately corrected. In addition, it is well to demand from time to time actual inventories of different operating supplies.

Depreciation

The life of property depends upon its character, the use to which it is put, and the conditions under which it is used. Within an industry, however, the character of plant equipment and the use to which it is put is essentially the same at different plants and rates of depreciation are fairly uniform. In a number of industries appreciable progress has been made in adopting uniform rates and they are being followed with very satisfactory results. Standard rates can be followed in the chilled iron car wheel industry with satisfactory results. The effect would be to more nearly equalize production costs and to establish proper depreciation standards for purpose of determining income taxes.

Experience has proven that the following annual rates for depreciation covering the principal kinds of foundry buildings and equipment used in the manufacture of chilled iron car wheels are necessary to fully maintain plant and equipment values:—

ANNUAL DEPRECIATION RATES

FIREPROOF BUILDINGS:

Concrete, Steel Frame.....	3%
Brick, Steel Frame.....	3%
Brick and Concrete, Steel Frame.....	3%
Tile.....	4%
Corrugated Iron, Steel Frame.....	7½%

Depreciation

NON-FIREPROOF BUILDINGS:

Brick, Wood Frame.....	4%
Corrugated Iron, Wood Frame.....	10%
All Wood—Well Built.....	10%

MISCELLANEOUS STRUCTURES:

Platforms and Bins—Concrete and Brick.....	5%
Bins—Wood.....	10%
Trestles—Wood.....	10%
“ Steel.....	5%
Fences—Wood.....	10%
“ Wood and Wire.....	10%
Retaining Walls—Concrete.....	3%
“ “ Wood.....	10%
Stacks—Brick.....	5%
“ Steel.....	10%
Frame Stables and Sheds.....	10%
Sewerage—Tile.....	5%
Railroad Tracks.....	6%
Floor Plates.....	5%

EQUIPMENT:

Machinery and Foundations.....	10%
Cupolas.....	10%
Annealing Pits.....	7½%
Core Ovens.....	10%
Moulding Machines—All Kinds.....	15%
Horses, Wagons and Stable Equipment.....	10%
Furniture and Fixtures.....	10%
Piping, Heating, Ventilating and Sprinklers.....	6%
Industrial Tracks and Elevators.....	10%
Electric Wiring, Fire Alarms, Etc.....	10%
Power Plant Equipment.....	10%
Laboratory Equipment.....	10%
Auto Trucks, Industrial Trucks and Tractors.....	25%
Locomotive Cranes.....	10%
Hoists and Cranes.....	10%
Scales.....	15%
Belting.....	12½%
Shafting and Pulleys.....	10%

Repairs to and replacements of pattern and flask equipment and the relining of cupolas and annealing pits are properly treated as current charges to operations.

One-twelfth of the amount provided to represent the annual depreciation in plant and equipment values

due to wear and tear should be charged monthly to costs of production and credited to Depreciation Reserve accounts. Against the reserve accounts should be charged the depreciation previously set up on the particular equipment which has been replaced or renewed.

Failed Wheels

There does not seem to be any uniformity in the method of accounting for wheels that have failed in service and have been returned to the wheel manufacturer for adjustment or for replacement.

The sales contracts of most wheel manufacturers contain clauses whereby the wheel manufacturer guarantees, on either a mileage or tonnage basis, against manufacturing defects. Under their sales guarantees, to a more or less extent, they are constantly being called upon to replace or to reclaim wheels that have not given the normal or the guaranteed amount of service, although only a few look upon the cost of replacement or the cost of adjustment as an item of operating expense. The most common practice is to consider the invoice price of the defective wheels returned, less scrap value of the old wheels, as a sales deduction. In cases where this practice is followed it is evident that the production cost of new wheels does not provide for or reflect the cost of replacing defective wheels.

Conservative accounting practice calls for the inclusion in the monthly cost statement of a provision covering the cost of reclaiming or replacing failed or returned wheels. It is recommended that provision be made to take care of this added cost in the form of a reserve by a charge of a determined amount per ton of wheels manufactured. At the end of the year should the provision made in this way be found to exceed the adjustment or the replacement cost any excess balance of the reserve account can be transferred to

Distribution of General Overhead Expense

Profit and Loss account or to Surplus account. The recommended accounting practice is covered on page 21 in the definition of the account "Failed Wheels."

Distribution of General Overhead Expense

Several of the members of the Association manufacture products other than chilled iron car wheels such as chilled iron rolls, axles, grey iron castings, steel castings and steel wheels. In such cases the distribution of general overhead and administrative expense has a very important effect on costs. Plant expenses such as power and general supervision that are common to all products as well as general management expense such as administrative salaries and expense of the general office must of necessity be distributed on some basis or bases over the different products manufactured. The basis that should be used is the one which will give the most equitable distribution and which will not put an insufficient burden or an undue burden on any one product. The basis will depend upon individual circumstances and the proper one is largely a matter for determination at each plant where products other than chilled iron car wheels are manufactured.

The best basis for the distribution of the cost of power, heat and light is that of consumption, and generally speaking, plant supervision is most equitably distributed upon the basis of labor costs while departmental selling values generally afford the most satisfactory basis for distributing administrative and general office expense.