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# Cost finding for warehousemen

Chester B. Carruth

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Cost Finding  
*for*  
Warehousemen



AMERICAN  
WAREHOUSEMEN'S  
ASSOCIATION



# COST FINDING *for* WAREHOUSEMEN



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Under direction and by authority of the  
CENTRAL BUREAU COMMITTEE  
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American Warehousemen's Association.

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## A QUESTION

may still remain in the mind of the warehouseman:

*Of what use is an exact knowledge of costs, if under present conditions the profit and loss account shows a satisfactory balance? What if there is no exact justice? What if Jones is paying for the loss on Robinson's goods?*

We need only refer to recent history,—the effect of Prohibition on the restaurant business, where the profit on liquors formerly absorbed losses occurring in other departments.

*If Jones now pays for the loss on Robinson's business, beware the day when Jones leaves you and Robinson becomes the principal customer!*

[From Page 39]

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Press of  
R. T. Lewis Co.  
Pittsburgh, Penna.

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American Warehousemen's Association  
Charles L. Criss, General Secretary,  
1110 Bessemer Bldg., Pittsburgh, Pa.

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## PREFACE

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*The purpose of conducting a business is to make money, and the only way to make money is to sell something for more than it costs. The first essential, then, is to know the cost. It is the belief of the Commission that the small margin of profit existing in so many of our industries is due to the ignorance on the part of the manufacturers of what their goods actually cost to produce. This ignorance causes them to make unprofitable prices, which the manufacturer who does know his cost is forced to meet to a large extent.*

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The above quotation from a report of the Federal Trade Commission published in 1916 sets forth perhaps as simply as possible the warehouseman's problem of existence, and it is to solve this problem that the American Warehousemen's Association has published its various reports and articles on Cost Accounting and has established its Central Bureau. The following is a reprint, with amendments, of what has appeared in the Bulletin of the Association during the last year. No apology is necessary for thus bringing together the series of articles on cost finding in the Labor Departments of the industry. It remains to be pointed out that this pamphlet is a companion to the 1920 Report of the Central Bureau Committee of the General Merchandise sub-division (2nd edition, published March 1921). In that Report the Central Bureau Committee has gone into great detail in the matter of storage classification, and when it publishes, as is probable in the near future, a classification of commodities following the methods outlined in that Report, the making of storage rates as such will be merely a matter of proper bookkeeping.

On pages 25 and 26 of the Report reference is had to handling, and the general principles of scientific labor rate making are enunciated. It has been the desire of the authors of the following pages to elaborate on these principles and to point out the methods to be followed in applying them. It must be clearly understood, however, that while these methods are perfectly general and will work in almost every case, it is for the warehouseman to study his own business and make such changes in the clerical details of the system outlined as may seem advisable. In doing so it is desirable that he have the advice of competent and experienced accountants. He should not, however, attempt to make changes in the final tabulations desired, otherwise the great advantages of uniformity and comparable reports will be lost.

At this stage of business development it seems hardly necessary either to go into a defense of cost accounting or to explain the advisability of co-operative competition, but the following from the report of the Federal Trade Commission quoted above is so pat to the purpose that it will repay careful reading:

*"It is a fact too little realized that an accurate determination of costs is fundamentally related to manufacturing effi-*

ciency. More and more concerns are joining the ranks of those who realize the necessity of knowing accurately their costs of manufacturing and selling. Every business man who joins in this work can feel that he is doing his part toward the improvement of business conditions generally and his own business conditions in particular. This bulletin has been prepared with a view to aiding the campaign of education by explaining what a cost system is, how it operates, the results obtained, and the benefits to be derived from its operation.

"There are a number of objections in the minds of business men who have not installed cost systems to taking the matter up. One of these is the feeling that exists in the minds of so many that their business is unique and different from any other and that no system could be devised which would give them true costs. It is unquestionably true that some lines of manufacture lend themselves more readily to the installation of a cost system than others, but it is also true that no line of manufacture is so complicated that a system can not be devised which will give reasonably accurate results.

"The most common objection is that of the cost of installation and the expense of operation. Many manufacturers are of the opinion that a cost system means an interminable amount of detail and red tape and the assistance of a number of extra clerks. It is true, in many cases, that some extra labor may be required, but not to the extent that the manufacturer fears. There is in nearly every office that is not systematized sufficient unnecessary work done to cut the extra work down to a minimum, and, in fact, in some cases, where an office has been systematized, it has not been necessary to employ any extra help at all. If the manufacturer will look upon a cost system as an investment which he expects to produce for him a fair return in the same manner that an investment in improved machinery would, the objection as to the expense is not a valid one. A number of business men think that money spent for stationery is wasted and that a cheap ready-made book will answer as well as one specially designed for his business. If a \$10 book which lasts a year will save half an hour a day for a \$12-a-week clerk as compared with the use of a ready-made book which can be bought for \$1 the additional investment of \$9 has brought in a revenue or effected a saving of \$39 for the year. This holds true of nearly all specially designed forms as well.

Other business men are of the opinion that they do not need a cost system because they know what their goods cost. They may, and a number of them do have an approximate idea of what their goods cost, but in a large number of instances this supposed knowledge is based on foremen's guesses in advance as to the time necessary to do the work or as to the time spent on the work after it is done. Guesswork is unsafe and poor business practice.

"Formerly the necessity for the determination of true manu-

facturing costs was not as imperative as it is today. Margins between cost and selling price in most lines were larger. Costs could be ignored except in a general way and a good return still be made on the investment; but today margins of profit in most lines of trade are very much narrower than formerly, and the necessity for the most efficient management and closest analysis is felt as never before.

*"It is necessary today for the business man's success that he know on what articles he is making a profit and on what he is incurring a loss. Competitive conditions are seriously disturbed where losses on one or more articles are recovered by profits on other articles. It is obvious that a manufacturer should not only know the cost of each article he manufactures but that he should see that every article manufactured bears its proper share of factory and general overhead.*

*"Most manufacturing plants have grown to a size which renders personal supervision impossible. The only reliable way, therefore, by which an executive can judge of the efficiency of an organization is through a system of periodical statistical reports. These reports can only be accurately obtained when a good cost system is in operation.*

*"New methods are being introduced and improved machinery installed in the factory every day, with a view of reducing costs either by the elimination of waste or by increasing efficiency. It is impossible to know whether the introduction of these improvements will reduce costs unless the manufacturer knows not only what his total cost is but exactly what items make up the total. Items of cost are frequently lost track of when the total only is considered, while if these items were properly segregated so as to show what they were they could be materially reduced and in some instances eliminated altogether.*

**"A system will not run itself; neither will it in itself reduce costs nor increase efficiency. This is strictly up to the manufacturer himself. A system will give him the information, and if this information is properly used, he will unquestionably find that his system is not an item of expense, but a very valuable asset.**

*"If a manufacturer purchases a new machine before his old one is worn out, he does so because he expects the amount expended to increase his profits either from economy in operation or from an increase in production. He looks on this as an investment and not an expense. Office methods have been improved to quite as large an extent as machinery, and an investment in improved methods will produce a return just as will an investment in improved machinery.*

*"One of the strongest arguments in favor of installing a practical cost system is the fact that every manufacturer who has installed one and who has operated it for at least a year is firmly convinced that it is a paying proposition.*

*"The Federal Trade Commission is urging manufacturers*

*to give the subject of accurate costs the attention it deserves. It has found that unreliable costs of production and distribution cause a great deal of unfair competition and a heavy business death rate.*

*“While the claim is not made that a cost system will save a man from failure, the claim is made that a man who knows where he stands day by day is very much less likely to make a failure of his business than one who is directing his business by guesswork.”*

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#### **“EXCHANGE OF STATISTICAL INFORMATION BENEFICIAL**

*In the past many manufacturers disliked to give out information concerning their business. Today the reverse is the case. Trade associations are compiling statistics as to production, shipments, and costs for the benefit of their members, and the manufacturer instead of trying to keep this information to himself welcomes the opportunity to supply the data, knowing that his competitors are doing the same thing and that these statistics will be of benefit to himself and to his industry. The Federal Trade Commission is keenly alive to the value of this information.*

*The Commission is urging manufacturers to determine their costs accurately in the interest of better trade conditions. It believes that anything that is of benefit to an industry is of benefit to the public, and it is also of the opinion that the nearer cost systems approach uniformity the more valuable will be the results.”*

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*What applies to manufacturers dealing in tangible commodities applies with equal if not greater force to warehousemen dealing in intangible services.*

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**YOU ARE CHEATING YOURSELF  
IF YOUR COMPETITOR  
IS LOSING MONEY**



# I

## INTRODUCTION

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That modern business conditions render a knowledge of costs absolutely essential to success no one will venture to deny. It has long ago been demonstrated that whether it be bridges or clothes pins that one is selling, the cost should be known as accurately as possible before the selling price is set. He who would attempt to pilot his concern through the stress and storm of the business world without such a knowledge is as criminally guilty as the mariner who, without chart or compass, would trust his craft to the mercy of the seven seas.

And this is of particular importance where what is sold is service. In every industry where labor is a large factor there will be found an estimator whose business it is to figure the cost of the product before fixing a price. All his estimates are based upon a knowledge of **present** costs and **past** experience. "I know no way of judging the future except by the past," and the warehouseman who expects to continue in business and keep out of the bankruptcy courts must have available for his use today the experience of yesterday.

Yet many warehousemen are today without this knowledge. They are still blundering along under the old "rule of thumb" method, making a little money, it is true, not so much because of their own ability as because the circumstances of the moment are such that they can't very well do otherwise. But the pendulum cannot always swing in one direction. There must be a reverse action. "The north winds will blow, and we shall have snow and what will the warehouseman do then, poor thing?" He will be straining every nerve to keep two jumps ahead of the sheriff until one day he'll stub his toe 'n the sheriff'll get him 'f 'e don't watch out.

Probably every warehouseman in the country, no matter how small, prepares or has prepared for him, some sort of an income statement from which he judges the result of his business. In making the ordinary income statement of a warehouse business all kinds of merchandise are included in one total irrespective of the individual earnings. Some kinds of merchandise for various reasons yield the warehousemen a better return than others and to separate the sheep from the goats is one of the functions of cost finding. The average business-man who has not had an accounting training looks upon cost accounting or cost finding as a nightmare of red lines, blue lines, black lines, and multitudinous forms of various lengths and dimensions, some punched with round holes, some with square holes and some not even punched at all; but it will be our endeavor to present the matter in a clear and concise form without requiring the use of expensive systems or even the aid of a public accountant.

"But a cost system is too complex for me to install," you say.

*"The only way to make money is to sell something for more than it costs. The first essential, then, is to know the cost."*

—Federal Trade Commission.

What is complexity? What is simplicity. Both terms are purely relative. Anything is complex compared with something else. Anything is simple in relation to something else. Compared with a speaking tube a telephone is a complex thing but who'n blazes would be without a telephone? The complexity of a cost system will depend on the complexity of your own individual conditions. If you operate several units and handle commodities from trucks, cars, lighters, piers and subways; general merchandise, cold storage and household goods, it naturally follows that your cost system must of necessity be more complex than though you operate but a single unit and handle only general merchandise from and to the trucks. The vaster, the more complicated your proposition the bigger will be your cost department, the better you can afford it and the more you need it. The smaller your business, the simpler your cost department—simpler, **but none the less important**. One company we call to mind, with one warehouse, handling general merchandise only, maintains a cost department with one man who attends to the work of the department in conjunction with his other duties as assistant bookkeeper and that company is acquiring a very valuable knowledge at a very small expense. Another company operating several units has a department comprising five people and costing fully five thousand dollars per year to maintain; yet the department would not be given up if it cost twice five thousand, so valuable has it proved to the company. Still another company operating over 2,000,000 sq. ft. of general storage and 1,000,000 cubic ft. of cold storage has maintained a cost department of three people for quite a number of years and intends to maintain it indefinitely, as the results obtained have not only given figures as to costs, but have made possible the elimination of waste motion and dissatisfied employes, and brought about the reduction of the proportion of overhead expense from 200 per cent to less than 50 per cent of the actual productive cost.

We will now consider the items which constitute the costs in the warehouse industry and the methods of ascertaining them.

*“An accurate determination of costs is fundamentally related to (manufacturing) efficiency.”*  
—Federal Trade Commission.

## II

### THE COSTS IN A WAREHOUSE

Analysis of the warehouse business shows that the warehouseman is primarily a landlord, and to that phase of the business has been gradually added other activities, each entirely separate though correlated and each with different, ascertainable costs.

The warehouseman was originally a landlord. He merely provided the space for the use of a customer. The customer's employe or some public truckman brought the goods to the warehouse and stacked them there. Delivery was made in similar manner. The warehouseman provided no labor of any kind, except that, where he issued a receipt for the goods, he or his bookkeeper or watchman checked the receipts and deliveries to make certain that they were in order. In some places this condition still prevails. As the business grew the warehouseman added new functions, the first and most common of these being the providing of labor to handle the goods inside the warehouse. After that came car loading and unloading, weighing, sampling, grading, etc.

In this development process most warehousemen came to look upon these extra services as something to be a necessary burden in the business and in the vast majority of cases quoted rates that did not even cover the bare actual payroll cost, permitting the balance to be absorbed in the storage rate. To illustrate clearly the manner in which this condition may be readily corrected is the purpose of this pamphlet.

In our analysis of costs all we need do is follow this natural historical division in order to arrive at the truth. It is obvious, if the historical development be taken into account, that each of these services could exist and be provided by a distinct company and it therefore follows that, although departments of the same company, their costs are as entirely distinct as though each department were independent of the other.

The first of these services, storage, lends itself easily to analysis and the determination of space cost for each commodity. All carrying and operating costs\* applicable to storage are obtainable and may be calculated per sq. ft., and it then becomes necessary merely to apply this cost per sq. ft. to the space consumption of each commodity. This matter has been gone over so many times in so many different ways by various associations in their reports that it need hardly be discussed further here.

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\*See Report of the Central Bureau Committee, General Merchandise subdivision, American Warehousemen's Association, 2nd edition, March, 1921.

*"The nearer cost systems approach uniformity the more valuable will be the results."*

Federal Trade Commission.

These costs are:

**A. RENT**

1. Interest on investment:  
Building  
Land, portion occupied by building only  
Organization  
Interest, taxes and insurance during construction.
2. Depreciation, building above foundation
3. Obsolescence
4. Fire insurance 90% of value of building above foundation
5. Taxes, Federal, State and Municipal
6. Repairs to buildings
7. Landlord's risk, amortization and profit on investment.

**B. ADMINISTRATION AND OPERATING EXPENSES.**

1. Portion of executives' salaries, salaries of departmental heads, office salaries, general office and miscellaneous expense (that portion of salaries, etc., which would continue if goods remained in store without moving.)
2. Watchmen and watching supervision
3. Advertising
4. Interest on working capital
5. Taxes
6. Contingencies.

Item A of these costs, Rent or its equivalent, should be based on current values. It is obvious that for rate making purposes the rent should be as of today no matter what the terms of the lease or the original cost of the building. This will leave the rate unaffected by the warehouseman's striking a good or a poor bargain with his landlord or building contractor.

All services outside of storage, such as loading and unloading of cars, trucking and piling the goods in the warehouse, delivering the goods, sampling, weighing, remarking, etc., are primarily labor charges. In each of these the primary cost is the cost of labor actually engaged in the work. This is usually called the "productive labor" and it is the only cost which may be directly applied to a lot or commodity. It is the actual amount of time and money spent in handling the goods, no other factors being considered.

But there are other factors. And these other factors quite frequently are of far greater importance than the absolute labor cost itself, being often from 1½ to 2 times as great. It is evident that each year a large sum of money is spent in the warehouse, which, were the goods merely lying there, would not be expended. In the first place, the laborers must be employed the year round, all day, every day. They are productively employed, however, only a part of the time and the unemployed time, "non-productive labor," is the first great item of expense which cannot be directly applied to the various

*KNOW your business,—and MIND your business.*



commodities. It is obvious that in order that goods be handled when wanted these men must be always on hand, and it follows that the cost of keeping them on hand is directly a cost of handling the goods, and therefore that the unemployed time is wholly a handling cost. Even when the men are engaged in such work as sweeping, re-tiering, and consolidating, their work is performed merely to facilitate the handling of future business and is not applicable to any particular commodity. It is, therefore, part of the non-productive labor. Similarly liability insurance, maintenance of handling equipment, supervision, power and light and the greater portion of executive and office salaries are applicable to these services and would not exist if these services were not performed.

These other factors, these costs of handling other than the productive labor, constitute what is known as "overhead." This is the factor of cost which the warehouseman is constantly forgetting in his estimating. This factor is ever present and cannot be eliminated, and, if profitable business is to be done, must be taken into account when the warehouseman figures.

Consideration of these matters seems to indicate that investigation of handling costs must proceed along these lines: First of all, the warehouseman must determine the productive labor cost; secondly, he must find the overhead so that both factors may be known and the whole cost ascertained.

Productive labor, being measurable without difficulty, can easily be ascertained in dollars and cents for each commodity or each lot. Overhead can not be measured so easily and must therefore be found for the total labor service as a whole and then prorated in some arbitrary way. It has been found easiest to do this on a percentage basis. All that is then necessary is to find the relationship between the overhead and the productive labor and apply to the productive labor cost, as ascertained for each commodity, the percentage overhead thus found. For example, if it is found that the overhead for a given period is twice as great as the productive labor, then the overhead is 200 per cent, and if the cost of handling lot No. 1745 from sill (the warehouse door) to pile (the actual place of storage) was \$10 in productive labor, then the overhead was \$20 and the total cost \$30. If the overhead had been found to be only 150 per cent then it was \$15 for lot No. 1745 and the total cost of the lot \$25.

It is not the purpose of the Authors to enter upon an exhaustive and exhausting treatment of warehouse accounting, but rather to outline a complete system yet a simple one for the warehouseman operating a business of the simpler sort, since the underlying principles are the same in all cases, and he who requires a system applicable to a more complex situation needs but to amplify the system outlined to meet the exigencies of his particular case.

*Take opportunity into partnership, lest it leave you for other company.*

### III

#### DON'T DABBLE! KEEP COSTS CORRECTLY

Few are the warehousemen who do not ask themselves, at one time or another, "Is the warehouse business profitable?" Fewer still are they who answer that question correctly.

The stumbling block is always "simplicity." Possessed of an overwhelming fear of intricacies, the warehouseman usually, if he investigates costs at all, attempts extreme simplicity. He makes no effort to follow the methods of employers in other industries. He tries to solve the problem in his own way, and the result of his devotion to "simplicity" is failure.

Disregarding entirely the fact that it is the purpose of all book-keeping to give information of value, and that bookkeeping was not invented for the convenience of bookkeepers, the warehouseman at first attempts to obtain cost figures from his general books of account. Lumping together eggs and apples, corn flakes and canned goods, large lots and small, carload and retail deliveries, bags and boxes, barrels and bales, the warehouseman arrives at an average cost per ton for the year and speaks quite proudly of his "tonnage cost."

What do these "tonnage costs" mean?

*Exactly nothing.*

A slight change in the kinds of merchandise handled renders these figures worthless for rate making purposes. There can be no justification for unnecessary complexity, but simplicity which destroys the value of the product is not only unjustified—it is criminal waste of energy.

The observant warehouseman soon notes that just as a ton of corn flakes cannot possibly be stored in the space required by a ton of beans, so too it is impossible to handle the cereal as cheaply as the beans. He notes that the cost of handling the various commodities varies considerably and that even for the same commodity a different style package means a different handling cost. Beans and cotton, apples and cheese, bags and bales, barrels and cases, car deliveries and truck deliveries, all are different.

The next step is obvious. The warehouseman attempts to segregate his costs by commodities, packages and services. Here again he heads toward fancied simplicity and comes to grief. He attempts to obtain costs by taking samples or "tests." He keeps time on a few lots of each commodity which he handles. He soon discovers, however, that this method is unsatisfactory. The laborers learn that they are being timed and take care to make a showing; besides this, the weather, the season, the time of day and a host of other factors each affect the handling cost and decrease the value of the tests. The tests are, as a result, not at all representative of true costs.

*"Unreliable costs cause a great deal of unfair competition and a heavy business death rate."*

—Federal Trade Commission.

A little experience soon convinces the warehouseman that there is an easy way out of this apparent difficulty. He finds that cost accountants in all other industries have made the same errors, and that all have agreed that there is but one way to find costs, and that is to keep track of all labor and to prove it with the payroll. He finds, furthermore, that it is necessary to keep these costs for each commodity, for each style package, for each class of service, as these costs are all different. In doing this, he is doing no more than the smallest manufacturer. The added expense, if it exists at all, is microscopic. The results obtained are trustworthy and we will show how they may be obtained with a minimum outlay of effort.

"But," you say, "my plant is small. I handle few commodities in large quantity. I handle a large variety of commodities which come to me frequently. Of what value is all this to me, when I do not handle more than one or two lots of the same commodity a year and frequently handle commodities entirely new to me?" The answer is in three parts. First, you will have reliable figures for the commodities you handle frequently; secondly, a little information is better than none at all; and, thirdly, there is the Central Bureau.

The A. W. A. Central Bureau solves the problem. One of its functions is the collection of all sorts of information pertinent to costs and cost finding. It will publish regularly the average cost of handling commodities, and you will have available not only your experience but also the experience of your fellow members. The Bureau will not tell you what it costs Jones or Smith to handle beans, but it will tell you what the average cost of handling beans is. Other members will furnish their experience for your use, and if you do as much for them, co-operative competition will be established with a resulting gain to the warehousemen, the merchant and the public. Your figures will be treated confidentially. No one will know your costs—they will be merged in the published averages. And these averages are worth more to you than your own limited experience.

Perhaps you have another objection. It's about Jones, who is a rate cutter and your closest competitor. "And," you say, "what if I do know all this, how can I let these facts affect my rates when I must meet Jones's competition?" There is no answer to this except that which lies in the experience of your fellow members in other parts of the country, and perhaps in your own city. Jones, no more than yourself, is in business for nothing except a profit, and he will be just as ready as you are to cut out unprofitable business. If he sees these cost-averages he will begin to think about his own costs, just as you are thinking about yours. One thing is certain, he can take no more business away from you than he does now. If your rate on a particular commodity is 2c, Jones's rate today, as likely as not, is  $1\frac{1}{2}c$ , and if your rate tomorrow for the same commodity were 5c, Jones's, as sure as you're born, will be  $4\frac{1}{2}c$ . He wants as much as he can get but he will charge less than you do simply because it's in his blood to be a rate cutter, and it is quite unnecessary for you to meet his prices at a loss.

*You pay for what you need whether you buy it or not.*

Be the fact as it may regarding Jones, it still remains true that **neither you nor he can afford to lose a little on each customer and hope to make it up by having a large number of customers.**

If, however, Jones is not a born rate-cutter, but you have found it necessary to make your rates because of certain rates made by Jones, is it not just as true that Jones has made certain rates of his to meet some of yours? If the rates for any commodities you take are unremunerative, you will be better off if you do not accept such merchandise. **It is far better to have your house half full with profitable business than to have it full and take a loss on each item.** It is this fictitious element of competition that has done more to impoverish the warehouse business than any other single factor.

One more question arises. How can these figures be compared or combined? Wage rates are extremely variable. In different parts of the country, in different warehouses in the same section, in the same warehouse at different times and even in the same warehouse at the same time, laborers will, for many reasons, receive different wages. It is obvious that, because of this, productive labor costs obtained in terms of dollars and cents could not be compared with each other, nor averaged together with any comprehensive results. We must perforce have a system that will put everything on the same basis. If we eliminate the wage entirely and compile our figures in terms of time, we shall have figures which are comparable absolutely without possibility of error. It is readily seen that if five men work two hours the cost is the same as one man working 10 hours, and we shall therefore speak of all costs in terms of the one man. For convenience there has been invented the name "man-hours," which means nothing more nor less than the actual time consumed in the performance of an operation reduced to the terms of a single laborer. If the five men worked two hours delivering 250 cases of canned goods, it follows that the work took 10 man-hours and that the productive labor cost per case was .04 man-hours. If each of the cases weighed 60 lbs., it is then merely a question of arithmetic to reduce the proposition to a cost of .067 man-hours per 100 lbs. Such figures are comparable with similar figures obtained anywhere and it is such figures that the Central Bureau will publish. *It must be understood that no extra labor is involved in the finding of man-hours*, as the man-hours must be known before the cost in dollars and cents can be calculated and it becomes necessary merely to provide space in your records for the entry of this calculation.

When man-hour costs are determined by the warehousemen, and when man-hour cost averages are published by the Bureau, it is a simple matter to translate them into terms of dollars and cents by multiplying them by the wage rate of the particular warehouse. In any one house it will be found that there is rarely a uniformity of wages and that it is quite immaterial what a man's wages may be, he is put on a particular job, more frequently than not, because he does not happen to be otherwise employed at that particular time. It is

*Safeguard your stockholders with a cost system.*



**TABLE OF MAN-HOUR VALUES  
WITH MONETARY EQUIVALENT AT 52 CENTS PER HOUR.**

No. of Men	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5 min.	\$ .04	.09	.13	.17	.22	.26	.30	.35	.39	.43	.48	.52	.56	.61	.65	.69	.74	.78	.82	.87
hrs.	.08	.17	.25	.33	.42	.50	.58	.67	.75	.83	.92	1.00	1.08	1.17	1.25	1.33	1.42	1.50	1.58	1.67
10 min.	\$ .09	.17	.26	.35	.43	.52	.61	.69	.78	.87	.95	1.04	1.13	1.21	1.30	1.39	1.47	1.56	1.65	1.73
hrs.	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	2.83	3.00	3.17	3.33
15 min.	\$ .13	.26	.39	.52	.65	.78	.91	1.04	1.17	1.30	1.43	1.56	1.69	1.82	1.95	2.08	2.21	2.34	2.47	2.60
hrs.	.25	.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
20 min.	\$ .17	.35	.52	.69	.87	1.04	1.21	1.39	1.56	1.73	1.91	2.08	2.25	2.43	2.60	2.77	2.95	3.12	3.29	3.47
hrs.	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33	5.67	6.00	6.33	6.67
25 min.	\$ .22	.43	.65	.87	1.08	1.30	1.52	1.73	1.95	2.17	2.38	2.60	2.82	3.03	3.25	3.47	3.68	3.90	4.12	4.33
hrs.	.42	.83	1.25	1.67	2.08	2.50	2.92	3.33	3.75	4.17	4.58	5.00	5.42	5.83	6.25	6.67	7.08	7.50	7.92	8.33
30 min.	\$ .26	.52	.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	2.86	3.12	3.38	3.64	3.90	4.16	4.42	4.68	4.94	5.20
hrs.	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00
35 min.	\$ .30	.61	.91	1.21	1.52	1.82	2.12	2.43	2.73	3.03	3.34	3.64	3.94	4.25	4.55	4.85	5.16	5.46	5.76	6.07
hrs.	.58	1.17	1.75	2.33	2.92	3.50	4.08	4.67	5.25	5.83	6.42	7.00	7.58	8.17	8.75	9.33	9.92	10.50	11.08	11.67
40 min.	\$ .35	.69	1.04	1.39	1.73	2.08	2.43	2.77	3.12	3.47	3.81	4.16	4.51	4.85	5.20	5.55	5.89	6.24	6.59	6.93
hrs.	.67	1.33	2.00	2.67	3.33	4.00	4.67	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00	10.67	11.33	12.00	12.67	13.33
45 min.	\$ .39	.78	1.17	1.56	1.95	2.34	2.73	3.12	3.51	3.90	4.29	4.68	5.07	5.46	5.85	6.24	6.63	7.02	7.41	7.80
hrs.	.75	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25	12.00	12.75	13.50	14.25	15.00
50 min.	\$ .43	.87	1.30	1.73	2.17	2.60	3.03	3.47	3.90	4.33	4.77	5.20	5.63	6.07	6.50	6.93	7.37	7.80	8.23	8.67
hrs.	.83	1.67	2.50	3.33	4.17	5.00	5.83	6.67	7.50	8.33	9.17	10.00	10.83	11.67	12.50	13.33	14.17	15.00	15.83	16.67
55 min.	\$ .48	.95	1.43	1.91	2.38	2.86	3.34	3.81	4.29	4.77	5.24	5.72	6.20	6.67	7.15	7.63	8.10	8.58	9.06	9.53
hrs.	.92	1.83	2.75	3.67	4.58	5.50	6.42	7.33	8.25	9.17	10.08	11.00	11.92	12.83	13.75	14.67	15.58	16.50	17.42	18.33
1 hr.	\$ .52	1.04	1.56	2.08	2.60	3.12	3.64	4.16	4.68	5.20	5.72	6.24	6.76	7.28	7.80	8.32	8.84	9.36	9.88	10.40
hrs.	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
2 hrs.	\$ 1.04	2.08	3.12	4.16	5.20	6.24	7.28	8.32	9.36	10.40	11.44	12.48	13.52	14.56	15.60	16.64	17.68	18.72	19.76	20.80
hrs.	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00
3 hrs.	\$ 1.56	3.12	4.68	6.24	7.80	9.36	10.92	12.48	14.04	15.60	17.16	18.72	20.28	21.84	23.40	24.96	26.52	28.08	29.64	31.20
hrs.	3.00	6.00	9.00	12.00	15.00	18.00	21.00	24.00	27.00	30.00	33.00	36.00	39.00	42.00	45.00	48.00	51.00	54.00	57.00	60.00
5 hrs.	\$ 2.60	5.20	7.80	10.40	13.00	15.60	18.20	20.80	23.40	26.00	28.60	31.20	33.80	36.40	39.00	41.60	44.20	46.80	49.40	52.00
hrs.	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00

obvious, therefore, that for cost accounting purposes, the wage to be considered in determining the cost in dollars and cents should be the average wage for the entire plant. For example, if it is found that in one plant some men are getting \$25 a week, some \$26 a week, and one or two \$30 a week, but that the average wage comes to 52 cents an hour, it is this average wage that should be used for determining the costs. We found above that it cost .04 man-hours per case to deliver a certain lot of canned goods. Apply to this our rate of 52 cents an hour and we find that the productive labor cost of delivering these goods was 2.08 cents per case.

It will be convenient for the Cost Department to have as a time-saver, a table of man-hour values combined with monetary equivalents. As an illustration, such a table, as used by the Standard Warehouse Co., is shown on the next plate. This company employs 5 gang foremen and 50 laborers. The total payroll for the week of 50 hours (five hours on Saturday and nine on other week days inclusive of overtime) is \$1,430. The average wage, therefore, is \$26 per week per man, or 52 cents an hour. With these figures as a basis the table is constructed to show, first, the decimal fraction of an hour, and, secondly, the cost for such fraction in terms of dollars and cents. With the construction of this table we are ready to weigh anchor and embark upon the sea of cost finding.

NOTE: As the Standard Warehouse Co. is called upon frequently to perform a considerable amount of special service it is necessary to employ a much larger force than would probably be required for the average warehouse.

*“Creation’s cry goes up  
From age to cheated age,  
Give us the men who do the work  
For which they get the wage!”*  
—Kipling.

## IV

### FINDING MAN-HOURS

Every warehouseman keeps some record for payroll purposes so that he may know how much is due each of his employees. It may be a book or a time card or a time clock or some other recording instrument, but there is always some device that he uses to record the time that his employees have worked. It is this record, with some slight variations, that is the basis for our cost accounting. All we need to do is to make provision for recording the details of the work done as well as the time worked and we have all the information we need for finding productive costs. These records may be kept either by the gang foremen or by the laborers themselves. If kept by the laborers it is possible to have in convenient form a complete summary of the daily occupation of each man. This method, of necessity, puts considerably more work upon the bookkeeper than the other. The alternative method, wherein the time records are kept by the checkers or foremen, is the one more commonly used and provides a summary of the work done and the time taken by each gang.

In some warehouses time-clocks are placed at convenient points and the time of starting and finishing an operation stamped on the record. The advantage of this system is obvious since it prevents any "juggling" of time. In some warehouses, where it is not feasible to use time-clocks, watches have been adopted, care being taken that all watches used are synchronized. A good method is to provide an inexpensive watch for each foreman. These should be returned each night and regulated before they are delivered to the foreman in the morning.

It is highly important that the men be taken into your confidence. They must have impressed upon their minds the fact that you are using the Time Records not for the purpose of keeping watch over them but because you must know what it costs you to handle merchandise in order that you may do so profitably. They must realize that a profitable labor department is an advantage to them as well as to you. If you carefully explain to your employees that their interests and yours are identical, they will be interested in their work and your records will be trustworthy. If, on the other hand, in starting your cost accounting system you inadvertently antagonize your employees your cost figures will be worthless, your men dissatisfied, and failure all around will be yours.

There are many different kinds of time records, the simplest being the time card. By way of illustration, let us examine the time card of the Standard Warehouse Co. This card is kept by the foreman and is so arranged that correct records may be easily kept by him and the completed card conveniently handled by the bookkeeper.

This card has a space at the top for the gang foreman's name and the date. In the first column there is a space for indicating how the goods were received, whether by truck, car, lighter, etc. In the

*Saving time is wasted effort unless you utilize the time you save.*

second column a space is provided for similar information for deliveries. The third column provides for the number of packages handled. The fourth column is for the file or lot number or the special service rendered. The subdivisions of the next column are for indicating the number of men performing the work. R stands for receiving, D for delivering, C for car loading or unloading, W weighing, S sampling and Ex extra work. In the next column there is provided space for the time, F meaning finished and B begun. The time finished is entered above the time begun to simplify the process of subtraction to determine the elapsed time, which is placed in the last column by the bookkeeper.

On February 16, 1920, the time card handed in by foreman Tom Ryan appeared as in the accompanying illustration.

*No warehouse business is too large, too small, too rich, or too poor to have cost finding methods.*



FOREMAN.

*Ryan*

DATE

*Feb. 16, 1920*

REC'D FROM	DEL TO	NO. OF PKGS	LOT OR-FILE NO. OR SERVICE	NO. MEN			CLOCK RECORD	ELAPSED TIME	
			<i>Making Room</i>	R	C	S	F 7.15		
				D	W	EX/2	B 7.00		15
<i>Truck</i>		<i>96</i>	<i>7701</i>	R/2	C	S	R 9.45		
				D	W	EX	B 7.15	<i>2</i>	<i>30</i>
<i>Truck</i>		<i>25</i>	<i>7678</i>	R/2	C	S	F 10.25		
				D	W	EX	B 9.45		<i>40</i>
<i>Truck</i>		<i>9</i>	<i>7694</i>	R/2	C	S	F 10.45		
				D	W	EX	B 10.25		<i>20</i>
<i>Truck</i>		<i>20</i>	<i>7657</i>	R/10	C	S	F 11.15		
				D	W	EX	B 10.45		<i>30</i>
			<i>Moving</i>	R	C	S	F 11.35		
				D	W	EX/10	B 11.15		<i>20</i>
	<i>Car</i>		<i>6875</i>	R	C 3	S	F 12.00		
				D 6	W 1	EX	B 11.35		<i>25</i>
	<i>Car</i>		<i>6875</i>	R	C 3	S	F 2.25		
				D 5	W 1	EX	B 1.00	<i>1</i>	<i>25</i>
	<i>Car</i>		<i>7420</i>	R	C 4	S	F 3.00		
				D 4	W 1	EX	B 2.25		<i>35</i>
	<i>Car</i>		<i>7420</i>	R	C 4	S	F 5.00		
				D 5	W 1	EX	B 3.00	<i>2</i>	<i>00</i>
TOTAL TIME									<i>9.00</i>

Let us now proceed to translate foreman Ryan's card:

From 7 to 7:15 A. M., Ryan and 12 men were making room. From 7:15 to 9:45 the same gang received 96 packages from trucks. The lot No. 7701 indicates to the bookkeeper the merchandise handled and for whose account. From 9:45 to 10:45 two more lots were received by these men. At 10:45 Ryan turned over two of his men to another foreman. With his remaining men he received another lot during the next half hour. From 11:35 to 12 a lot of goods was weighed and delivered by car. The trucking from the pile to the platform took 6 men, 3 men were used to load the car and 1 man for the weighing. The subsequent entries are just as easily understandable.

What was the cost of these operations to the Standard Warehouse Co. in man-hours and in dollars and cents? The first operation from 7 to 7:15 took 15 minutes. Referring to our man-hour monetary chart (see chapter 3) 12 men and a foreman working 15 minutes consumed a total of 3.25 man-hours, which, (at 52c per hour) indicates a cost of \$1.69 for making room. The second operation consumed 2 hours and 30 minutes of the same 13 men's time at a productive cost of 32.50 man-hours or \$16.90. The third job took 25 minutes and consisted of the following: Six men brought the goods to the scales, 1 man weighed and 3 men stacked the goods in the car. The cost for these men was, therefore:

1—Delivering to platform—2.50 man-hours.....	\$1.30
2—Weighing, .42 man-hours .....	.22
3—Car loading, 1.25 man-hours .....	.65

It now becomes necessary to pro-rate the work of the foreman and probably the best way of doing this is to assign his time in proportion to the man-hours which he supervised. He directed the work of 10 men for 25 minutes, or .417 man-hours. The first operation consumed 6/10 of this time, the second 1/10 and the third 3/10. His own time, .42 man-hours or 22c, should, therefore, be distributed in that proportion. We would have:

Operation	Laborers Man-hrs.		Foreman Man-hrs		Total Man-hrs.	
Delivering to platform....	2.50	\$1.30	.25	\$ .13	2.75	\$1.43
Weighing .....	.42	.22	.04	.02	.46	.24
Car loading .....	1.25	.65	.13	.07	1.38	.72
Totals .....	4.17	\$2.17	.42	\$ .22	4.59	\$2.39

It will be noted that the total elapsed time on the card must equal the total number of hours in a day, in this case 9, that each of the men employed by the company must be accounted for when all cards have been turned in and that the time of the foreman or checker must be included in the record of each lot or service. To accomplish the latter, and, incidentally, to prove out the payroll, to find the productive and non-productive time, and to provide the necessary entries, where desired, for tying up the general books of account with the cost records, the bookkeeper summarizes the daily cards to show the pro-

*Some are born lucky,—but the wise install cost systems.*

ductive time, etc. In the Standard Warehouse Co. office this is done as follows:

Each day, when the time cards for the previous day are received they are analyzed to provide the information required by the payroll analysis form (see illustration). It will be noted that this form provides for details regarding canned goods, and lumps all other information. This is done by this company so that it may have particular information regarding the commodity in which it specializes. In the general ledger the labor billed is similarly separated.

One of these forms is used each week. When the month ends in the middle of a week, two forms are used, so that the records of each month may be complete. These forms are the bases for the distribution of the payroll in the general ledger. A Journal entry is passed at the end of each week to record the cost of the work done. The Standard Warehouse Co.'s entry for the week ending February 28, 1920, was as follows:

Productive Labor—Rec. & Del.	canned goods .....	\$120.00
“ “ “ “	miscellaneous .....	583.13
“ “ “ “	Car Service, canned goods .....	93.15
“ “ “ “	miscellaneous .....	210.50
“ “ “ “	Weighing .....	42.00
“ “ “ “	Sampling .....	11.20
“ “ “ “	Extra Service .....	67.50
Non-Productive Labor—Handling	.....	110.50
“ “ “ “	Car Service .....	52.52
“ “ “ “	Undistributable .....	139.50
	To Payroll Accrued .....	\$1,430.00

Office salaries and the wages of the watchmen and the superintendent are charged directly to appropriate accounts, to be included later in the overhead, the first of these being distributed over all services, the second being charged to storage only, and the third to all services except storage. These charges will be discussed later, in dealing with Overhead Expense.

All cards having been carefully checked and the entire time accounted for by means of the above forms, the next step in the work of the bookkeeper is to rearrange the information in such form as to make it useful for quoting rates.

*He who laughs last knows his costs.*



## V

### COMMODITY COSTS

There is but one guide to the future and that is the past. Although cost finding in the warehouse industry is, of necessity, of the nature of a post-mortem, it is extremely valuable for future use. Were it possible to know costs absolutely before rates are made, little difficulty would be experienced. If all work were done on a "cost plus" basis the warehouseman would have an ideal condition to face. But this condition rarely prevails in his business. The warehouseman, if he gets to know his costs at all, becomes acquainted with them only after the work has been done and a considerable time has elapsed since he has quoted the rate. Hence these costs, although of little or no value for the particular services rendered, are of great value for similar services *to be rendered*. And it is because these figures can be used for future reference that cost accounting is so valuable.

The recognition of the existence of this condition has been a large factor in the establishment of bureaus throughout the country for the exchange of handling cost data. The American Warehousemen's Association has established a Central Bureau for the purpose of assembling handling costs reported to it from the various sections of the country. The information which will be distributed by that Bureau will be helpful to a warehouseman in quoting rates on merchandise of which he has no cost figures of his own, or which has been so infrequently handled that his cost figures are not truly representative.

In the preceding chapter we demonstrated the method of finding man-hour costs and showed how to apportion them so as to account for the payroll and enable us to distribute it to the various productive and non-productive labor costs. In order to make these statistics of value for rate making purposes also, we must compile them in a different manner. As has already been stated, it is necessary to segregate these costs by commodities, packages and services, and we shall now discuss how that may best be done.

Here again we have recourse to experience. Many ways of compiling costs for this purpose have been devised. It has been found, however, that the best method and the most profitable one is to follow that used in other industries, that of compiling a job cost sheet for each lot handled.

The merchandise subdivision of the Central Bureau Committee of the American Warehousemen's Association has adopted the "Lot System" of cost accounting and rate making. The basis of this system is the substitution of "lot unit" weights in place of the present unscientific, inequitable, and absurd minimum carload ratings. The "lot unit" is defined as that quantity of goods which can be stored in bulk on 120 sq. ft. of storage space, not exceeding 8½ ft. high nor 250

*Knowledge is an asset; ignorance a liability greater than any on your books.*

lbs. per sq. ft. of floor space occupied. For class A (high density goods) this would be 30,000 lbs. As the floor-load of a commodity decreases so does the "lot unit" decrease proportionately. The report of the Committee contains the floor-load classification table and table of corresponding "lot units." (A similar lot system, based on 60 sq. ft. has been adopted by the cold storage sub-division).

When goods are stored in bulk the rate is to be based upon the relation which the total weight of the lot bears to the "lot unit" of the commodity and if the goods are in assortment then each mark, brand or size should be treated as an individual unit. The initial rate applies to a full "lot unit" quantity; when the quantity is less than a full "lot unit" but not less than  $\frac{1}{3}$  "lot unit" the rate is increased 25%; when the quantity is less than  $\frac{1}{3}$  "lot unit" but not less than  $\frac{1}{10}$  "lot unit" a modification of 50% applies, and when the quantity is less than  $\frac{1}{10}$  "lot unit" there is a modification of 100% over the initial rate. This last division is to include Individual Package Delivery. By way of illustration let us suppose a lot of canned fruits is offered for storage and that the lot weighs 60,000 lbs.; and let us suppose further that there are four varieties, each in 60 lb. cases as follows:

Variety A @ 30,000 lbs.  
Variety B @ 18,000 lbs.  
Variety C @ 9,000 lbs.  
Variety D @ 3,000 lbs.

As this is a class A commodity, the "lot unit" is 30,000 lbs., consequently variety A is a full "lot unit," variety B falls into the  $\frac{1}{3}$  "lot unit" group (10,000 lbs.—29,999 lbs.) and varieties C and D into the  $\frac{1}{10}$  "lot unit" group (3,000 lbs.—9,999 lbs.). If the initial storage and handling rates are 4c and 5c respectively, then these rates are to be applied to variety A, while variety B would be quoted at 5c and 7c, and varieties C and D would be quoted at 6c and 8c. (See Package Rate Table in Report of the Central Bureau Committee.)

The Lot Cost Form used by the Standard Warehouse Co. is shown herewith. At the top is entered the commodity, the lot or file number, and the type and gross weight of package. With the inward costs is provided space for a description of the lot. This information should be of value in comparisons of the cost of handling similar commodities in packages of like type and weight. Columns for special services, such as lighter-unloading, etc., are provided, as well as a column for remarks, in which may be entered a description of the condition of the lot, or any reason explaining an unusual cost or other information. With the outward costs there is a column in which should be entered the size of unit delivered. An examination of this column, when the lot is completed, will show at a glance whether or not there is an unusual number of deliveries and their nature. When the lot has been entirely delivered and all costs have been posted to the lot cost record there is available full information

*In cost accounting to educate your competitor is to help yourself.*



as to this particular lot, which, if combined with like information for similar lots, will give all that is requisite for proper rate making.

To accomplish this end it is essential that lot costs be accumulated in such form as to parallel the natural division of the work. Consideration of labor costs will show that there is a difference between the costs of delivery to the tailboard of a truck and the loading of a car. Also, it is evident that the receiving of assorted goods, which necessitates the examination of each and every package, makes for additional cost over the receipt of straight lots. As an example of a Cumulative Cost Form, that of the Standard Warehouse Co. is shown. Hereon is to be entered the commodity, the type of package and gross weight of package. Separate forms should be used for bulk, assortment and Individual Package Delivery, or if desired, bulk and assortment may be combined on one sheet since the Central Bureau will, for the present, publish costs so grouped; but the former method is to be preferred. Where the package is of standard weight such weight should be used. There are, however, certain commodities, such as canned goods, where there is a large variation in weights. It is manifestly impracticable to segregate costs for each and every weight of package. In such circumstances it is recommended that they be classified as follows:

By 25 lb. steps up to 100 lbs.; by 50 lb. steps from 100 lbs. to 300 lbs.; by 100 lbs. from 300 lbs. to 500 lbs.; by 250 lbs. from 500 to 1,000 lbs.; by 500 lbs. from 1,000 lbs. to 2,000 lbs.; and by 1,000 lbs. from 2,000 lbs. up. Packages should then be grouped with the nearest of such steps. The resulting classification is:

#### COMMODITY COSTS

Packages weighing	up to	37 lbs. with	25 lbs. as a center
Packages weighing	38 up to	62 lbs. with	50 lbs. as a center
Packages weighing	63 up to	87 lbs. with	75 lbs. as a center
Packages weighing	88 up to	125 lbs. with	100 lbs. as a center
Packages weighing	126 up to	175 lbs. with	150 lbs. as a center
Packages weighing	176 up to	225 lbs. with	200 lbs. as a center
Packages weighing	226 up to	275 lbs. with	250 lbs. as a center
Packages weighing	276 up to	350 lbs. with	300 lbs. as a center
Packages weighing	351 up to	450 lbs. with	400 lbs. as a center
Packages weighing	451 up to	625 lbs. with	500 lbs. as a center
Packages weighing	626 up to	875 lbs. with	750 lbs. as a center
Packages weighing	876 up to	1,250 lbs. with	1,000 lbs. as a center
Packages weighing	1,251 up to	1,750 lbs. with	1,500 lbs. as a center
Packages weighing	1,751 up to	2,500 lbs. with	2,000 lbs. as a center
Packages weighing	2,501 up to	3,500 lbs. with	3,000 lbs. as a center
Packages weighing	3,501 up to	4,500 lbs. with	4,000 lbs. as a center

Columns are provided for the number of deliveries and for special services.

Periodically, or at such time as new rates are to be discussed, the grand totals should be ascertained and the average cost for the period over which costs have been kept should be the basis for the rates to be made. The bookkeeper must, however, be cautioned against averaging the averages. The correct method for finding the true average

*No detail is too small to repay careful study.*





is to divide the grand total of man-hours by the number of packages and total weight.

Besides rate making data, these cost records give other information of great value. Accumulating data by commodities and comparing with man-hour averages as published, will show the warehouseman which commodities he can handle most advantageously and he will know which business to seek and which to avoid. If, after the lot has been completed, the handling cost records of goods stored by various customers are compared, they will show which are exacting and cantankerous and which are desirable and the warehouseman will be able to judge whose business to invite and whose to reject. Similarly, if day by day, while the lot is being handled, the entries on the handling cost record are compared with the records for similar commodities, the warehouseman will be able to determine whether there is a leak in his labor, and, if so, who is responsible. He will be able to remedy the condition immediately and, if necessary, eliminate the employees who may be lazy or dissatisfied. Many other uses for these records will be found by the warehouseman in his daily work.

The Bureau Report form provides for the insertion of such information as will be required by the Central Bureau and, as it is merely a transcript of the Cumulative Cost Form, it needs no explanation except perhaps that the warehouseman should, in that column devoted to the "average weight of package," insert the weight as entered on the cumulative sheet, either the actual weight or the weight group, as the case may be.

In the forms presented in this and the previous article it has been assumed that there will be a physical division of labor at the sill and that there will be one set of men loading or unloading cars, etc., and another handling the goods between the sill and pile. It will be found in most cases that this is the most practicable method. If, however, it should be found in any particular warehouse that such a division is not advisable, it will be necessary in such cases to keep the records to show costs for delivering to and from car, including loading and unloading the car, the difference between the costs of car service and truck service being presumably the cost of loading and unloading the cars. This is not nearly so accurate as the method outlined and should be avoided wherever possible.

Having accumulated the acquired productive labor costs, all that is then required is to decide as to what will be the probable per cent overhead, and here again we must have recourse to experience. Adding the overhead to the productive labor costs, and adding to the total a fair percentage for profit, the warehouseman will arrive at a figure for his rates which will be absolutely fair and just to everybody and defensible under all circumstances.

NOTE: In the preparation of forms the spacing should be so arranged as to make possible their use with the typewriter,—that is, horizontal rulings, three to the inch, and vertical rulings in multiples or sub-multiples of ten to the inch.

*The benefit of all is of concern to each one.*



## VI

### OVERHEAD

In the preceding chapter we discussed the methods of ascertaining the productive labor cost of handling commodities. There are, however, other costs which, although they cannot be definitely assigned to any one commodity, are ever-present, and must be taken into account if the labor portion of the ledger is to show a balance on the right side.

These other costs constitute "Overhead," which here includes all costs of operating the labor departments, except "Productive Labor."

It is particularly important that these other costs be emphasized, for more frequently than otherwise they are completely forgotten by the warehouseman in his rate making. His true costs include these as well as the productive labor. The total only should be his basis for doing business. We must needs, therefore, ascertain the labor overhead.

Our efforts being directed toward the ascertaining of LABOR costs, it becomes necessary to segregate the overhead expenses according as they apply to storage or labor. Some of these items may be readily assigned to one or the other. Storage expense is that which continues even while the goods are at rest. Labor expenses are those which occur only while or because goods are in motion. Night Watchmen are needed solely for the protection of the goods in store; their wage is wholly a storage expense. Elevators, Power and Light are needed only for the handling of commodities; they are chargeable to labor alone.

Some expenses cannot be so easily assigned. For example, office and executive salaries; these are chargeable to both storage and labor and it becomes necessary to make an arbitrary division. In the Standard Warehouse Co. it was found that about one-third of the time of management and the office force was necessary to carry on the work of the storage department and that approximately two-thirds was devoted to the labor department. This is therefore assigned to each department in these proportions. These proportions are substantially correct for the average warehouse and should be applied unless a careful analysis discloses a different condition. Other office expenses, such as water, telephone, stationery, office supplies and other items not definitely chargeable to a particular department, are similarly distributed. This distribution being completed, the overhead is known, and is usually added on a percentage basis to the productive costs, as shown later.

Further consideration of the labor departments will disclose the fact that the overhead costs of work done within the building differ from those of outside work. This difference is due, mainly to the fact that the equipment in each case is different, resulting in a different set of charges for interest, depreciation, etc. As the overhead is to

*If we may not choose our circumstances, let us give thought to shaping them.*

be applied as a percent of the productive time, we find it necessary to further sub-divide the items to show those applicable to service inside the house, such as sill to sill handling, weighing, sampling, etc., and those resulting from service outside the house, such as car loading and unloading. The Standard Warehouse Co. finds that while most items can be definitely assigned to one or the other, there are some which make necessary an arbitrary rule. Such cases will be specifically treated as they later occur.

Let us examine the inside handling and car service statements of the Standard Warehouse Co. as they hereinafter appear.

#### I. Inside Handling Statement.

(A)—Productive Labor. The total regular pay-roll of laborers and foremen for the month was at the rate of \$1430.00 per week or \$5720.00. In addition the Superintendent received \$46.00 per week or \$184.00 for the month and there was paid out for overtime work \$71.00. The total pay-roll for the month was therefore \$5975.00. The Pay Roll analysis (see chapter 4) indicates that the productive labor expense for Receiving and Delivering was \$2700.00, for Weighing and Sampling \$220.00, and for Extra Service \$250.00, a total of \$3170.00.

#### (B)—Overhead.

1. Non-Productive Labor. This comprises five items: Idle Time, Holiday Time, Cleaning, Undistributable Labor (Including Supervision) and Making Room. Some parts of these are chargeable directly to handling or car service, being the time of men exclusively engaged in each department, others must be pro-rated, and it is found simplest to make the division in proportion to the gross billing for each department. The direct charges for the month were \$350.80, out of which \$142.40 was chargeable to handling and \$208.40 to car service. The indirect non-productive labor amounted to \$1,289.00 which being divided in proportion to billings (8/11 to inside handling and 3/11 to car service) indicated that \$937.60 was chargeable to handling and \$351.60 to car service. This made a total charge to Handling of \$1,080.00.

2. Liability Insurance. As the premium is based on the Pay-roll, so this item of expense should be pro-rated between Inside Handling and Car Service in proportion to the division of the Pay-roll. As shown above, the productive labor for Inside Handling Department was \$3,170.00, and the non-productive labor was \$1,080.00, making a total of \$4,250.00. The expenditure for Liability Insurance for the month was \$183.33, and on being divided in proportion to the Pay-roll in each department the result is a charge of \$130.40 to Handling and \$52.93 to Car Service.

3. Interest on Equipment. The cost of the equipment of this Company was set at \$50,000.00. Interest on this amount at 7% makes this item \$3,500.00 for the year or \$291.67 for the month.

4. Taxes on Equipment, amount to \$1,600.00 per year or \$133.33 for the month.

*A published Tariff makes for efficiency.*

5. Depreciation on Equipment at 10%, which is, therefore, \$5,000.00 for the year, or \$416.67 for the month.

6. Repairs to Equipment. This expense for February, 1920, was \$200.00.

7. Power and Light. This item is wholly chargeable to Handling, and cost the Standard Warehouse Co., \$250.00 for February.

8. Claims. The expenditure for this item is \$50.00 for the month.

9. Salaries and General Expense. The amount for February was \$1,800.00 for salaries and \$700.00 for General Office Expense not directly chargeable to any one service, making a total of \$2,500.00 of which one-third is to be charged to Storage Overhead and two-thirds, or \$1,666.00, to Labor. This latter amount is to be pro-rated in proportion to the billings and, therefore, 8/11, or \$1,212.08, is chargeable to Inside Handling and 3/11, or \$454.58, to Car Service.

10. Interest on Working Capital. In order to carry accounts receivable a certain amount of working capital is necessary, estimated to be the equivalent of about two months average billings. This capital should turn over every two months or, in other words, the cash paid out for operating expense should return to the warehousemen in two months. A fixed sum should be determined on by the warehouseman as being a fair amount for working capital and 7% per year thereof is chargeable as interest. The amount of working capital necessary to the Standard Warehouse Co. was fixed at \$26,000.00, which at 7% would make \$1,820.00 chargeable as interest for the year, or \$151.67 for the month.

11. Miscellaneous expense directly chargeable to Handling. For the month of February this was \$114.60.

The statement shows a net profit of \$799.58 on handling, which is 11.1% over cost. The overhead for this month is found to be 127.1% of the productive labor, which, if representative of the average month, is the amount which, with an allowance for profit, should be added to actual productive labor cost in making rates.

## II. Car Service.

(A) Productive Labor. The pay roll analysis indicated this to be \$1,165.00. (See corresponding paragraph under Inside Handling.)

### (B) Overhead.

1. Non-Productive Labor. As shown in the discussion of the corresponding item in the Inside Handling statement the direct charges were \$208.60, making a total of \$560.00.

2. Liability Insurance. (See corresponding paragraph in "Handling Overhead.") The amount chargeable to Car Service is \$52.93.

*An injury to one is the concern of all.*

3. Interest on Investment. The Standard Warehouse Co. values the land (for tracks and platform) at \$16,000.00 and the tracks and platform at \$8,000.00 making a total investment of \$24,000.00, upon which is allowed interest at 7%. This amounts to \$1,680.00, which sum, divided by 12 allows \$140.00 for the month.

4. Taxes annually amount to \$750.00 of which 1/12, or \$62.50, is chargeable for the month.

5. Depreciation on Tracks and Platforms. \$8,000.00 at 5%, or \$400.00 divided by 12 gives \$33.33 for the month.

6. Repairs to Tracks and Platforms. For February this expense is \$62.50.

7. Interest on Working Capital. The sum determined necessary for working capital was \$7500.00 which, at 7%, would make \$525.00 per year or \$43.75 per month, chargeable as interest. (See corresponding paragraph under Inside Handling.)

8. Salaries and General Office Expense. (See corresponding paragraph in "Handling Overhead".) The amount allowed is \$153.32.

9. Miscellaneous Expense directly chargeable to Car Service is \$153.32.

The statement shows a net profit of \$272.09 on handling, which is 9.9% over cost. The overhead for the month is found to be 134.1% of the Productive Labor, which, if representative of the average month, is the amount which, with an allowance for profit, should be added to actual productive labor costs in making rates.

In Chapter V were shown some costs pertaining to the handling of Canned Vegetables. It was found that the cost of unloading the car was 9.60 man-hours or, since the labor rate of the Standard Warehouse Co. was 52c per hour, the monetary cost would be \$4.99 on 800 cases of 70 lbs. each for productive labor. Now we found that the Car Service Overhead for February was 134.1%, so the actual cost of unloading that car was \$4.99 plus \$6.69 (134.1%) or \$11.68, and if we allow for a profit of 10%, which is by no means excessive, we must expect to receive for unloading the car \$12.85, or 1.61 cents per case, which is the equivalent of 2.29c per 100 lbs. The Handling to the pile cost 22.40 man-hours and the delivery 17.60 man-hours, a total of 40.00 man-hours, which, at 52c per hour, equals \$20.80 for the productive labor. Had the lot been delivered in February, when the overhead was shown to be 127.1%, the actual cost of handling the lot would have been \$20.80 + \$26.44 (127.1%) = \$47.24, or 5.9 cents per case, equaling 8.43c per 100 lbs. Allowing for a profit of 10%, we arrive at a fair rate of 6.49c per case, or 9.28 per 100 lbs.

We have now shown how the productive labor cost and the

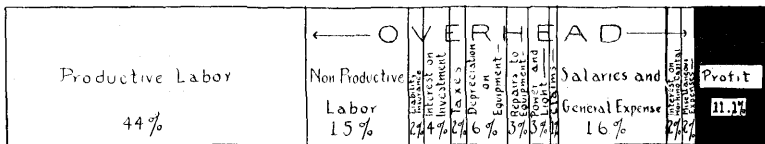
*Good service is the best advertisement, and a satisfied customer the best solicitor.*

overhead may be ascertained, and how the information acquired should be used for rate making purposes. We have pointed out how this information is an aid to the discovery of inefficient help and un-profitable business. A method for finding other uses for it will be discussed in the final chapter.

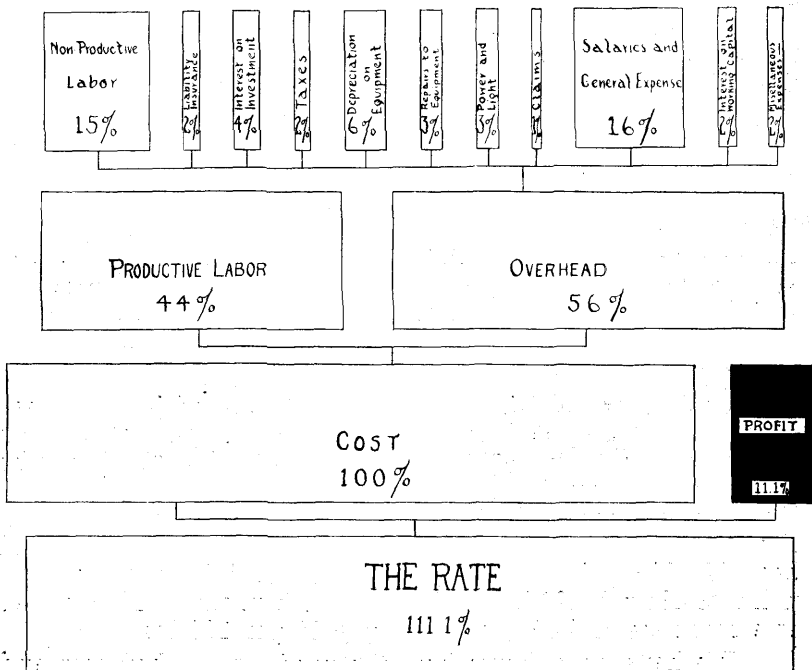
If the above ratio is uniformly applied to the handling rate for all commodities the result is per \$1,000. of income:

Income .....	\$1,000
Productive Labor .....	\$386
Overhead .....	504
Total expense .....	900
Profit .....	\$ 100

## THE RATE



### HOW IT IS BUILT UP



JRC

*Every service rendered should produce a reasonable profit.*



## INSIDE HANDLING COST REPORT

February, 1920

### INCOME

Receiving and Delivering .....	\$6,750.00
Weighing and Sampling .....	500.00
Extra Service .....	750.00
	\$8,000.00

### EXPENSES

(A)—Productive Labor .....	\$3,170.00
(B)—Overhead	
1—Non-productive Labor .....	\$1,080.00
2—Liability Insurance .....	130.40
3—Interest on Equipment .....	291.61
4—Taxes .....	133.33
5—Depreciation on Equipment .....	416.67
6—Repairs to Equipment .....	200.00
7—Power and Light .....	250.00
8—Claims .....	50.00
9—Salaries and Expenses .....	1,212.08
10—Interest on Working Capital .....	151.67
11—Miscellaneous Expenses .....	114.60
	4,030.42
Total Overhead .....	4,030.42
Total Expenses .....	7,200.42
Net Profit .....	\$ 799.58

Per cent overhead equals overhead divided by productive labor:

Equals  $\$4,030.42 \div \$3,170.00 = 127.1\%$

Per cent profit equals profit divided by cost

Equals  $\$799.58 \div \$7,200.42 = 11.1\%$

## CAR SERVICE COST REPORT

February, 1920

### INCOME

Loading and Unloading Cars .....	\$3,000.00
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### EXPENSES

(A)—Productive Labor .....	\$1,165.00
(B)—Overhead	
1—Non-productive Labor .....	\$ 560.00
2—Liability Insurance .....	52.93
3—Interest on Investment .....	140.00
4—Taxes .....	62.50
5—Depreciation, Tracks, etc. ....	33.33
6—Repairs on Tracks, Etc. ....	62.50
7—Interest on Working Capital .....	43.75
8—Salaries and General Office Expense.....	454.58
9—Miscellaneous Expenses .....	153.32
	1,562.91
Total Overhead .....	1,562.91
Total Expenses .....	2,727.91
Net Profit .....	\$ 272.09

Per cent overhead equals overhead divided by productive labor

Equals  $\$1,562.91 \div \$1,165.00 = 134.1\%$

Percent profit equals profit divided by cost

Equals  $\$272.09 \div \$2,727.91 = 9.9\%$

*The seed of knowledge has been sown; the fruit is yours for the cultivating.*

## VII

### THE DOUGHNUT AND THE HOLE

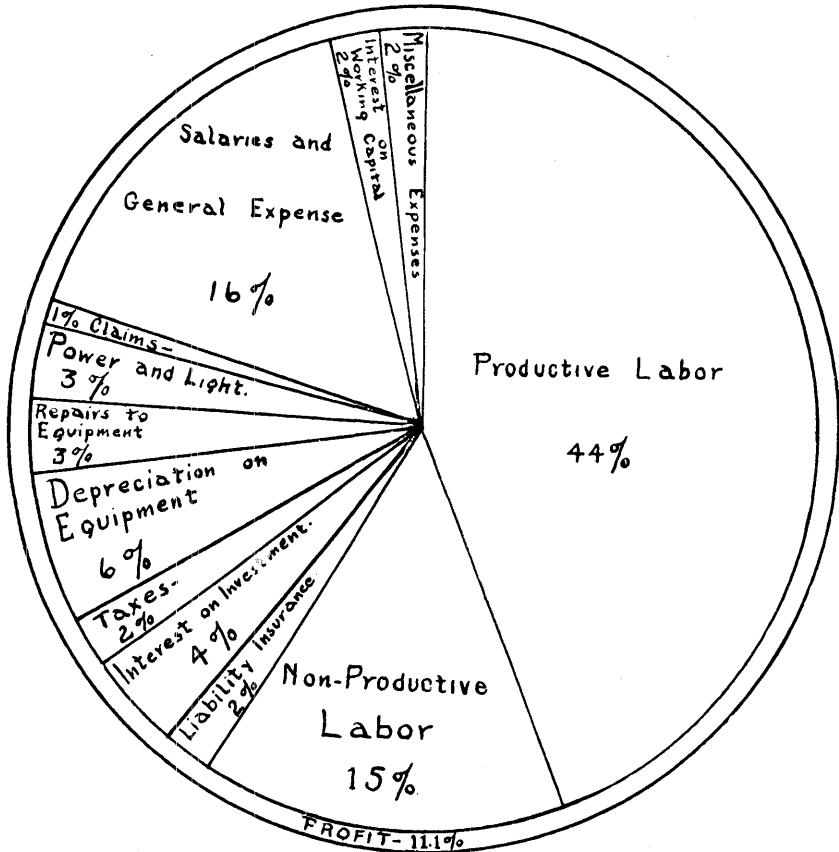
At income tax time, certainly, if at no other time, the warehouseman has prepared for him a statement of income and expenses, and in discussing these statements warehousemen have been known to speak quite proudly of their labor income as though it were all profit, entirely neglecting to consider whether there was anything left of this income after expenses, depreciation, etc., were properly provided for. The warehouseman has always spoken of his income as though it were a solid cruller, somewhat uncertain, indefinite, and not quite accurately measurable, but still all good to eat and all solid food. Examination of this cruller, however, brought to the attention of the observant warehouseman that there was considerable hole in it and that it was not a cruller at all, but a doughnut, and that occasionally, indeed quite frequently, it was not even a doughnut, but all hole, and altogether too frequently, there was a sufficient amount of hole remaining after what was apparently a doughnut had been entirely consumed, to take a considerable bite out of storage income.

When the warehouseman receives a dollar in labor income, more frequently than not no part of the dollar remains to him and if any part of it does remain, it is measurable with difficulty.

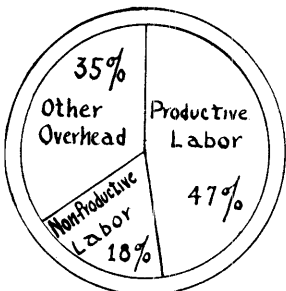
How much is doughnut—How much is hole? We have so far indicated how the various expenses incidental to the labor services of the warehouse business are apportioned. It now remains to be seen how the labor income is apportioned. Most everybody has seen the circle which a prominent Chicago packer uses to indicate the final destination of the various portions of the dollar which he receives from his customers. And a familiar sight to practically all travelers on street cars has been the little circle whereby the Railway companies have advertised various expenses incidental to their business. These latter, in speaking of their case have, in common with the warehousemen, addressed the public as "patrons". The transportation companies having been long guilty of the near slaughter and pseudo-transportation of a long suffering public—to take the public's say-so—have been requesting a modification of their contracts with the municipalities and, under the circumstance, it may be proper for them to address the party of the other part as a "patron." The warehouseman, however, has no such excuse and the only reason, apparently, that can be found for doing so is that he never has been quite sure of himself, and, being guilty of innumerable malpractices, such as rate cutting and cut-throat competition, he has assumed the attitude of a beggar for business and has forgotten that he deals with customers in a legitimate business, honestly run and as important and dignified as a bank. He may, however, follow their lead in drawing for himself a chart showing where his dollar goes, and disclosing the enor-

*Though you may well afford the straw hat now, don't overlook next winter's coal.*

# THE WAREHOUSEMAN'S DOLLAR

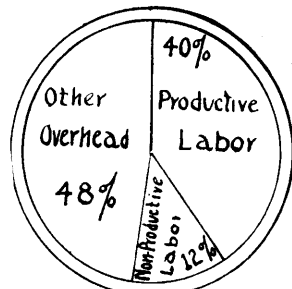


FEBRUARY, 1920  
 Inner Circle = Cost = 100%  
 Outer Circle = Income = 111.1%  
 Outer Ring = Profit = 11.1%



YEAR TO DATE  
 Cost 100%  
 Profit 12.5%

## INSIDE HANDLING



LAST YEAR  
 Cost 100%  
 Profit 9.8%

mous size of the hole. Then, having seen and become convinced, he will perhaps follow in the footsteps of the Standard Warehouse Co., whose doughnut has, indeed, a large hole, but also a few bites of food.

Let us then examine the Standard Warehouse Co.'s chart.

The inner portion, the hole, represents the 90 cents which the company must needs spend out of every dollar received. The outer portion, the food, represents the 10 cents which this company earns. This diagram presents for easy comprehension the figures contained in the tabulation of Handling Costs, presented in the preceding chapter as follows:

Productive labor .....	\$3,170.00	44%
Non-productive labor .....	1,080.00	15%
Liability insurance .....	130.40	2%
Interest on investment .....	291.67	4%
Taxes .....	133.33	2%
Depreciation on equipment .....	416.67	6%
Repairs to equipment .....	200.00	3%
Power and light .....	250.00	3%
Claims .....	50.00	1%
Salaries and general expense .....	1,212.08	16%
Interest on working capital .....	151.67	2%
Miscellaneous expenses .....	114.60	2%

This chart shows clearly the fact that fully one-quarter of the pay-roll is spent for labor which yields no direct return, and the relationship of costs to each other. Variation in these relationships from month to month point the way to economies of organization and operation.

In drawing the chart care should be taken to represent the facts truthfully. It must be remembered that the diagram is one of areas. The sectors (cost details) are proportional to the angles at the center. The ratio of the radius of the circle of cost to that of the circle of income equals the square root of the cost divided by the square root of the income. A table of roots can be bought at any book store, and is inexpensive. The cost circle may, of course, be shown alone if so desired.

One question may still remain in the mind of the warehouseman. Of what use are all these figures when under present conditions the profit and loss account shows a satisfactory balance? What if there is no exact justice? What if Jones is paying for the loss on Robinson's goods? The answer is contained in very recent history. We need only refer to the effect of prohibition on the restaurant business. Liquor used to absorb the loss on food, just as storage in our industry carries the labor. Jones pays for the loss on Robinson's business. But beware the day when Jones leaves you and Robinson becomes the principal customer!

*Life photographs and measures you every day.*

## THIS DAY

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*FINISH* each day and be done with it. You have done what you could. . . . Some blunders and absurdities no doubt crept in; forget them as soon as you can.

*TOMORROW* is a new day; begin it well and serenely, with too high a spirit to be cumbered with your old nonsense.

—Emerson.

*“Anything that is of benefit to an industry is of benefit to the public.”*  
—Federal Trade Commission.

*Intelligent co-operation is better than ignorant competition.*