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## Cost methods in a woodworking plant

J. J. McCaffrey

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**NATIONAL ASSOCIATION  
of  
COST ACCOUNTANTS**



**Official Publications**

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**Vol. III SEPTEMBER 1, 1921 No. 1**

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**BUSH TERMINAL BUILDING  
130 WEST 42nd STREET, NEW YORK**

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SEPTEMBER 1, 1921

# National Association of Cost Accountants

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## COST METHODS IN A WOODWORKING PLANT

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In the development of the science of cost accounting in this country greater attention has been paid to the metal working trades than to other lines of industry. In fact, there are many important lines of manufacture in which no material on cost accounting of any real value is available. Very little has been written on cost accounting in the various woodworking trades although there are few lines of business in which there is greater necessity for sound cost methods.

While this article is based upon a cost system in operation in a plant manufacturing office supplies, including other items in addition to fabricated wood products, it is devoted chiefly to the woodworking side of the business. While it does not by any means constitute a complete system, nor even the outline of such a system, it describes how some of the problems in this field have been solved in one plant and it is hoped may present suggestions which will be found worth while for men who are called upon to deal with similar situations. Most of the principles set forth, while they are based on the particular practices of one plant, are applicable to almost any woodworking shop.

The product manufactured in the plant under consideration consists of three distinct lines wood office equipment, steel vault and office equipment, and paper supplies for filing systems. The plant has three factories and makes over three thousand stock items, in addition to handling considerable special steel work for banks, and public buildings. While this article deals chiefly with the woodworking plant, it must be borne in mind that the cost system must necessarily be so designed as to be applicable to all three factories and to all goods manufactured.

The expenses of the entire organization are divided into two classes, selling and manufacturing. The manufacturing expenses which are general in the sense that they apply to all three plants are distributed to the plants. Items applicable solely to each individual plant are charged to the departments of that plant. The manufacturing cost ceases when the goods are transported to the stock department, all further expenses in connection with their handling being treated as selling expenses and distributed over sales according to the nature of the articles sold.

## DEPARTMENTAL ORGANIZATION

One of the first requirements for the construction of an accurate cost system is the proper division of the plant into departments, according to the nature of the product, the type and location of the operations and the lines of responsibility. Proper departmentalization is necessary among other reasons for efficient production and for the proper distribution of overhead charges. The departmental organization of a woodworking plant is a comparatively simple task because the operations are of such a character that they can be grouped without much difficulty.

Departmentalization raises the question of the necessity for a draughting, engineering or planning department. The establishment of such a department depends upon the size of the plant and the nature of the work handled. In most cases such a department is required. Some planning departments of course have a much wider scope of work than others but at least their functions should be to see that work is properly routed through the plant. In short, the function of this department should be to see that the production departments receive all the information necessary for the completion of orders, and that the necessary materials of the proper quality and quantity are ordered.

The woodworking departments arranged according to sequence of operations are: engineering, machine, glue, cabinet, finish, trimming, yard and dry kilns, finished part stock and raw material stock. This list of departments does not include those which serve all three plants, such as the power, shipping, repair and finished stock departments. All of these departments, as well as others, might possibly be required in the operation of a woodworking plant by itself.

All the woodworking departments are numbered and named. The use of numbers has many advantages. One is that reference by number is easier than by name. Another advantage is that it facilitates the reporting of cost information from the factory.

## ORDER SYSTEM

Since a good order system like proper departmentalization is essential in order to obtain accurate costs in a plant which makes a variety of articles, care should be taken to see that all orders are properly checked. The original copy of each order which accompanies the goods through the plant is first sent to the engineering department. A copy of each order is also sent to every department which has anything to do with that order. When this plan is followed, the foremen are familiar at all times with the work ahead in their departments and are able to plan the work so that experienced workers are available for those jobs which require special attention.

Orders are numbered and classified into three groups. Class A consists of all manufactured goods for resale; Class B of orders for the installation or the building of additional equipment; and Class C of orders for repairs of any kind.

#### DIRECT LABOR

As a rule factory workers are not interested in cost work and are likely to be careless in preparing cost reports. Consequently, it is very important that the time cards or sheets should be as simple as possible in order that the clerical work necessary to fill them out properly may be reduced to a minimum. In the writer's opinion, the best results are obtained by having the worker register his own time, provided time recorders are used, because he alone is then responsible for any variation in his direct labor cost on one order as compared with the previous order for the same article. Nothing discourages an honest workman more than to be shown an increased cost which is due to the fact that his foreman has guessed at the time he has spent on the order.

In addition to securing departmental labor costs, it is also advisable to obtain operation labor costs. With this information it is a simple matter to detect and investigate cost fluctuations or to determine actual savings by the elimination of any operation. This information is secured by having all operations in the plant numbered and listed alphabetically. A card listing the different operations is printed and posted in a place convenient to the workmen. Every worker has a number, each department being allotted a group of numbers for its workers sufficient for expansion. Reference to a worker's number immediately indicates the department in which he belongs.

The time card used in the plant under consideration is a five by three card. It is so arranged that very little writing is required. One card is used for every operation on every order. If a workman is on one operation all day, then one card is all that is necessary. If he works on five orders during the day, then five cards are necessary. The amount of time needed to fill out a card is so small that the extra number of cards does not make much additional clerical work.

One of the foreman's duties in each department is to lay out the work of his department. Each department has a supply of time cards stamped with the department number, the foreman or his assistant fills in the order number and the worker's number on the card, and places it in the "work ahead" rack, in the department. All the operation numbers are printed on the time card so that all the workman has to do is to mark out the number of his operation by using an X, and register the time he begins work on that operation. He retains this card until the operation is completed and after registering the stopping time, places the card in



the "work completed" rack and then proceeds with his next order. A sample time card filled out is shown below.

DEPT. <b>11</b>	<b>EMPLOYEES' TIME CARD</b>								ORDER No. <b>1082</b>			
EMPLOYEE'S NUMBER <b>18</b>	REMARKS <b>#7000 Desks</b>											
SIGNED <b>Foreman.</b>								MONTH <b>Aug</b>	YEAR <b>21</b>			
OPERATION NUMBERS												
MANUFACTURING					EXPENSE					OPERATION COMPLETED <input checked="" type="checkbox"/>	CLASS <b>A.</b>	
<b>X</b>	11	21	31	41	51	101	111	121	131	<b>S</b>  <b>B</b>	ELAPSED TIME	S <b>\$12.2</b>
<b>2</b>	12	22	32	42	52	102	112	122	132			
<b>3</b>	13	23	33	43	53	103	113	123	133		B <b>\$9.7</b>	
<b>4</b>	14	24	34	44	54	104	114	124	134			
<b>5</b>	15	25	35	45	55	105	115	125	135			
<b>6</b>	16	26	36	46	56	106	116	126	136			
<b>7</b>	17	27	37	47	57	107	117	127	137			
<b>8</b>	18	28	38	48	58	108	118	128	138			
<b>9</b>	19	29	39	49	59	109	119	129	139			
<b>10</b>	20	30	40	50	60	110	120	130	140		EXTENSION	

The only other writing necessary on the time card is under the heading "remarks." In this space the worker or the foreman writes the number or name of the article which is being manufactured. This notation acts as a check against the order number because if the order number does not agree with the number on the time card it is at once apparent that either the order number or the notation in the remarks section is wrong. This fact is discovered when the cards are filed the day after the operation is performed and can therefore be corrected before the error can affect the cost figures of either article.

It is also the foreman's duty to check the cards each morning before he sends them to the time department, to make sure that they contain all the necessary information and that they represent the total time worked. These cards are kept in an envelope which is printed with the employee's number and with spaces for each day of the week, in which the foreman marks each day the total number of hours to be credited to the employee's pay roll account. When these cards are received in the time department, the number of hours as shown on the time cards is checked against the number entered on the envelope by the foreman. The envelopes are later returned to the department for use during the next day.

Each working hour is divided into six-minute periods or tenths. This facilitates calculation. By examining the sample time card mentioned above, it will be noted that the lower figure "B"—beginning time subtracted from the upper figure "S"—stopping time will give the amount of elapsed time. After the time has been calculated on the time cards, the cards are priced at the em-

ployee's wage rate and the value of the labor shown by each card is marked on it. The total value is then credited to the employee's pay roll account. The time cards are then filed behind guide cards which bear the order numbers. They are also filed according to department numbers.

Each day the time department submits a labor report to the accountant showing the total pay roll, and the amount of direct and indirect labor in each department. This information is compared daily and any unusual increases are investigated at once. These daily reports also facilitate the prompt compilation and presentation of monthly reports.

Each department sends a daily report of completed orders to the cost department which immediately totals the labor costs on these orders and makes a comparison with the previous and standard labor costs. If there is an unusual decrease or increase, it is at once reported and investigated.

### BONUS SYSTEM

What is known as an "extra pay" or bonus system is in use in all productive departments. It is based on each individual operation. It is very similar to piece work except that instead of paying the employee for the number of pieces at the rate set, the value of the "day time" of workers is totaled and applied against the value of the work done, the difference representing the gain or loss on the operation. In the case of a gain, the employee receives one-half of it; in the case of a loss the company bears the entire loss. The following example illustrates the method of figuring the bonus or extra pay and also the loss in case there is one:

Assembling: 10 Desks at \$2.00 each . . . . .	\$20.00
28 hours actual time at 50c per hour	14.00
	Total Saving \$ 6.00
	"Extra Pay" 3.00
50 Cabinets at 20c each . . . . .	\$10.00
24 Hours actual time at 50c per hour	12.00
	Total Loss . \$ 2.00

Under this system employee's wages are guaranteed under all conditions, while at the same time they have the opportunity to increase their earnings in proportion to their increase in output. The same daily time card used for reporting "day time" work is used for reporting bonus work with the exception that in the case of the latter the time card is stamped with the words "extra pay". The cards are handled in the same way as "day time" cards, the value of the elapsed time being credited to the pay roll account. They are then turned over to those who handle the "extra pay" system.

An extra pay statement card is made out by the foreman when each operation is started. He retains it until the operation is completed, except in cases where the operation requires several weeks' time and it is possible to make an accurate report of the quantity completed each week. In these cases, he sends in a statement card each week to the extra pay department which figures out the result of the operation and credits the employee with the amount earned. The extra pay is included in the regular pay envelope each week with a statement of all completed work. A record of the results of every operation is kept on an 8 by 5 card which shows the operation number, the order number, the employee's number, the quantity done, the price, the number of hours required, and the gain or loss on the operation. This record enables the cost department to furnish immediate reports of any excessive increases. Extra pay rates for the different operations are based upon time studies and actual records. A complete list of extra pay rates for each department is kept by the foremen and can be seen by the employees at any time.

#### EXPENSE LABOR

Expense operations are named and numbered in the same manner as production operations, and are listed on the same operation time cards, the same type of card being used in all cases. No order number is used, but for labor chargeable to a department the letter "N" is used as a classification; for labor chargeable to the wood plant only the letter "W" is used. In addition there are certain expense operations that cannot be charged to a single department or to any one plant. These must be distributed to all three plants. For items of this kind, the letter "M" is employed. Of course, it makes no difference what letter is used as long as it fits in with the general system of classification or symbols. Expense time cards are sent to the time department, and are treated in exactly the same way as production time cards. They are also filed according to department numbers and operation numbers. At the end of each month the total of each expense operation is compiled and reported. This phase of cost accounting will be discussed later in this article in the section on Reports.

#### MATERIAL

As already stated, when a production order is issued, it is first sent to the engineering department in order that all the necessary materials may be ordered. In the case of lumber, a cutting bill is made out which describes the number of pieces, sizes, kinds of lumber and grade to be used. This bill is then sent with the order to the machine department. When the foreman is ready to proceed with the order, he gives the cutting bill to the man at the breaking-out saw, who cuts the materials according to instructions. Occasionally it is necessary to substitute material not called for by the

cutting bill, in which case he marks the bill accordingly. The amount of lumber used is then figured and charged to the order from a regular requisition. The cutting bill is then returned to the truck and stays with the goods until they are assembled, when it is sent to the cost department.

In the case of raw materials or finished parts, a requisition is made out on the stock department for the goods required. These goods are delivered to the departments which assemble them. This type of requisition is made in triplicate, the third copy being a plain sheet which is retained by the engineering department for reference. The original and duplicate copies which are attached are sent to the stock keeper, where they are separated when the goods are delivered. The requisition forms are perforated for this purpose. After filling in the quantities delivered, the duplicate is sent with the goods to the production department, where the foreman signs it and sends it to the cost department. Here it is used as a receipt for the goods and acts as a check against the original charge. When detached the original is sent to the office, where the deliveries are "carded off" the perpetual inventory cards, priced, extended and passed on to the cost department. The perpetual inventory cards are under the direct control of the purchasing agent, who is thus enabled to keep close check on the stock on hand. When the amount on hand according to the inventory cards nears the minimum, a stock check card is sent to the stock keeper, who checks up the actual amount on hand and returns the card with the information to the inventory clerk. In this way close control over the stock is always maintained.

Each foreman requisitions his own supplies. The same requisition form is used and is handled in the same manner as requisitions for direct material. A yearly order is issued to cover these charges and all requisitions are filed accordingly. The charges are totalled and listed monthly and included in the expense report, which will be explained under the heading of reports.

### BURDEN

There are a great many expense items under the head of burden that are common to all manufacturing plants, the distribution of which is not open to much argument. There are other items, however, that must be handled in accordance with local conditions. For example, repairs to machinery and equipment are, in many cases, charged to the department or building benefited as they occur. This method, however, tends to cause considerable fluctuation in the burden rates. The method used in the plant under consideration is to estimate the amount of repairs and to include the amount in the depreciation charges for the year, distributing the total amount equally over the twelve months. The actual cost of the repairs as they take place is then charged against the amount set aside for this work, the difference between the actual repairs

and the estimated amount for repairs and depreciation being written off as the depreciation for the year.

Another item which is not handled uniformly as far as accounting is concerned, is finishing material. Undoubtedly, the best method is to charge the actual amount used to each order, provided accurate measurements of the amounts consumed can be secured.<sup>1</sup> This method is not difficult if the products made are numerous and are manufactured in large lots. If, however, the articles are not numerous and are made in small quantities, it is almost impossible to secure proper measurements. As the line of goods under consideration are of the latter type all finishing materials are charged as a department expense and thereby included in the department burden rate.

Another item which is not always treated uniformly is glue. Some concerns charge this item at so much per lineal foot of joint. But since the number of joints is bound to vary according to the quality of lumber used, and as a decrease or increase in the number of joints glued will necessarily affect the length of time required, it is the opinion of the writer that distributing this cost as a percentage of direct labor is not only more accurate but is accomplished with less detailed clerical work.

Another burden item is shop transportation, which includes several costs. The first one is the cost of delivering the materials from the stock departments to the manufacturing departments. This cost is distributed as a percentage of the cost value of the goods delivered and is applied in this manner owing to the great variety of material handled. It costs no more to deliver a lock costing eight dollars than it does to deliver one costing fifty cents, nor does it cost more to deliver one hundred parts costing ten cents each than it does to deliver one hundred pieces of like size costing fifty cents each. This cost in many cases is distributed according to weight, but owing to the amount of extra work this method entails in the plant under consideration, it has been found that the distribution as a percentage of the value is more economical, and makes very little difference, if any, in the final cost figures. In some cases this percentage is applied to goods for manufacturing orders only and is not applied to department expense materials. Every article, whether expense or direct material, is included in the distribution, since the cost of handling oils, varnishes, and similar materials often entails more labor than any other items, and it would appear that this cost should be included in the department expense.

The cost of transporting goods within the departments and from one department to another is charged directly to the department which benefits from it. The cost of transporting or handling

<sup>1</sup>For a discussion of the method of measuring materials consumed in an electric cable plant see Vol. II, No. 19, of the Official Publications of the National Association of Cost Accountants.

lumber from the cars to the yard; from the yard to the kilns; and from the kilns to shop storage is easily obtained by means of the operation cost system, and because it is unnecessary to kiln dry all the lumber used, it is necessary to have cost figures on the kiln drying separate from the yard handling. In this way lumber not kiln dried carries yard burden only. This cost is sometimes distributed as a percentage of the value, but since it costs no more to handle lumber that costs \$300 per thousand than lumber costing \$75 per thousand, the unfairness of the percentage charge is at once apparent. The lumber report from which the value of the lumber consumed is taken, also shows the number of feet consumed, so that it is just as convenient to distribute this expense at a rate per thousand feet. Furthermore, this method is more accurate.

One of the most important burden charges in a woodworking plant is lumber waste. Extra care must be taken in figuring the cutting bills and in taking the periodical inventories. Inventories in storage should be taken at least every three months, and more frequently if possible. A complete report showing the total consumption of each kind of lumber; the amount charged to cutting bills; and the waste shown both as a percentage figure and also in actual number of feet should then be made up. Copies of this report should be sent to those interested in order that they may investigate excessive wastes and be in a better position to judge the most profitable grades of lumber to buy. In many cases the highest priced grade is the cheapest to buy. This fact, however, can only be definitely determined by the waste report.

The method of figuring lumber consumption has a vital bearing on final waste figures. Some concerns bill lumber at what is known as "roughing out sizes," which is usually a couple of inches larger than the finished size. If the lumber consumption is figured on the "roughing out size" instead of the finished size, there is bound to be a difference in the waste percentage. In the plant under consideration it is customary to bill everything at the finished size, the machine operator allowing extra according to the nature of the pieces being machined.

It often happens that certain small articles can be made from the cuttings or waste from larger articles, in which case some concerns assume the position that their material cost for the smaller articles is zero. It may be quite true that these cuttings would be absolute waste were it not for the smaller article, but, on the other hand, if there are no cuttings on hand, these smaller articles will have to be taken from good stock, in which case the order must be charged with the amount of lumber required. By charging every order with the amount of lumber required at finished size regardless of whether taken from cuttings or good stock and distributing the waste as shown by the inventories, every order bears its just share of this expense and the total

waste of all operations is taken care of. In comparing waste percentage figures with those of other concerns it is well to compare first the methods of figuring the actual amount of material consumed.<sup>1</sup>

#### DISTRIBUTION OF BURDEN

In the plant under consideration department burden is distributed on the basis of direct labor, but it must be admitted that distribution on the machine-hour basis or the man-hour basis may be more accurate where the wage rate per hour is not uniform. If the wage rates, however, are fairly uniform, it is more economical to distribute burden on the direct labor basis.

#### STANDARD COSTS

The burden rate for each department is established from estimates and remains in force throughout the year. The total cost for each manufactured article is also established, and subdivided into standards for each department and for each operation. Monthly reports show the actual burden compared with the standard burden, and also the actual cost of production, compared with the standard cost of production. The value of the month's output is calculated from the standard rates. The difference between the actual and standard cost, known as cost fluctuation, is either debited or credited, as the case may be, to the sales of the articles which cause the fluctuation.

#### REPORTS

Cost figures are of little use unless they are exhibited in a manner that will demand attention. The fact that cost figures are compiled and submitted after the work has been completed gives the study of them the nature of a post mortem. In making out reports care should be taken, therefore, to have them carry a definite message told in such a way that those to whom they are submitted can understand them and fully comprehend their relation to the business in general. In the plant under discussion three distinct reports are submitted. The first report shows the cost value of the goods produced in each plant. This report is itemized, but the totals only are submitted to the management.

The second report is the department expense report, which includes detailed figures for the benefit of the factory superintendents, but not unnecessary detail for the managing director. This report shows the value of all materials used by the department during the month, and also the cost of the labor for the different expense operations. As already explained, the expense labor charges sent in each day are filed according to the department and operation numbers, while the expense material requisi-

<sup>1</sup>In this connection see Bulletin No. 5 (New Series) of the National Association of Cost Accountants.

tions are also filed according to department numbers.<sup>1</sup> At the end of each month the time cards and requisitions are tallied and itemized on a report form. This form, which includes every item of operating expense, covers the entire twelve months and enables splendid comparisons to be made. The general estimated expenses and the cost of power, heat and light, over which the foremen or superintendents have no control, are shown as a total figure, but are not itemized. The summary on the report shows the total monthly expense, the total direct labor, the actual burden rate for the month, the yearly standard rate, and the average burden rate month by month. Copies of this report are sent to the general superintendent and to the plant superintendents. One of the duties of the latter is to check over these items and to consult the foremen of each department in regard to any unusual charges. A sample copy of this report is shown below.

**1921**  
**Detail of Monthly Expense**  
**Department 11**

Labor:	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Supervision .....	123.05	155.77	174.10			
Overtime Expense .....	3.81	.....	2.38			
Oiling .....	14.10	16.59	19.60			
Lacing Belts .....	14.10	16.59	19.59			
Sweep and Clean .....	57.16	86.66	60.15			
Piling Stock .....	.28	.....	.....			
Filing Saws .....	71.58	88.69	92.47			
Grinding Knives .....	71.58	88.69	92.47			
Work on Machines .....	37.07	39.28	28.94			
General .....	10.81	4.11	11.67			
Inventory .....	86.27	.....	.....			
<b>Material:</b>						
Brooms .....	2.55	.79	2.43			
Brushes .....	.40	.....	.....			
Oils .....	15.64	10.80	13.40			
Belt Hooks .....	3.44	3.75	1.72			
Dovetail Cutters .....	17.28	17.28	34.44			
Screws, etc. ....	1.18	.....	.06			
Waste .....	4.56	.....	2.74			
Tools .....	2.91	2.00	.41			
Elec. Supplies .....	2.66	.....	2.28			
Sandpaper .....	45.10	.....	29.68			
Wax .....	.48	.....	.....			
Stationery .....	4.83	2.16	5.72			
Miscellaneous .....	2.53	.36	.....			
Hdlg. Material .....	3.09	1.24	3.09			
Cutters .....	4.45	4.54	8.82			
Empty Barrels .....	Cr. 5.00	Cr. 5.00	.....			
Belt Dressing .....	.....	4.26	.....			
Twine .....	.....	.29	.....			
Grease .....	.....	.....	1.03			
Emery Cloth .....	.....	.....	.23			
<b>Class "C" Orders:</b>						
Jan: .....	.....	.....	.....			
Feb: .....	.....	.....	.....			
Mar: .....	.....	.....	.....			
Power, Heat and Light.....	357.83	400.30	545.78			
Deprec. and Gen. Expense.....	1044.37	1286.91	1073.90			
<b>Total Expense .....</b>	<b>1998.11</b>	<b>2226.06</b>	<b>2227.10</b>			
<b>Direct Labor .....</b>	<b>2037.40</b>	<b>2012.35</b>	<b>2081.68</b>			
<b>Actual Burden .....</b>	<b>98%</b>	<b>111%</b>	<b>107%</b>			
<b>Standard Burden .....</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>			
<b>Average Burden .....</b>	<b>98%</b>	<b>104%</b>	<b>105%</b>			

<sup>1</sup>See page 8.



## CHARTS

Since selling prices for stock goods are based upon standard costs, it is very important that the management at all times be familiar with the actual costs in comparison with the standard costs. In order to keep this information before the management, monthly charts for each class of goods manufactured are submitted which show the percentage difference between the actual and standard costs. In the plant being discussed there are fourteen different charts which cover all three plants. For a wood-working plant only this number could be greatly reduced. This information is valuable to the management at any time, but is especially valuable during a season of close prices, since it shows at a glance just which articles are being produced at a profit and to what extent the selling prices may be adjusted.

## APPENDIX

*Prepared by the Research Department of the National Association of Cost Accountants.*

The Millwork Cost Bureau in June, 1917, copyrighted a uniform cost system, consisting of a set of blue print sheets known as the Fundamentals of Standard Cost Finding System. It should be emphasized that the Bureau regards this system simply as a set of principles. It has not issued any publication describing the system in detail, since the principles of the system are adapted to fit the needs of each plant in which it is installed.

The system points out, among other things, that in order to apportion burden in stock mills, it is necessary to obtain a distribution of the plant investment, and to find out the values of the different classes of assets by means of an appraisal. A table showing the way in which these values are listed after they are obtained appears in the first section of the system. The broad classes of assets listed in columnar form are land, brick buildings, wood buildings, machinery and equipment, horses, wagons and harness, autos, office equipment and average stock. Division totals are also shown which are the cross-footings of various items listed in the columns.

The accounting methods of handling insurance, taxes, depreciation, and interest on investment, are briefly described. The major costs of the average mill that makes both stock and odd work are listed.

The rest of the system consists of 10 charts with explanations. Chart 1 shows the components of cost and the application of cost to any individual order. Charts 2 to 8, inclusive, show the items that make up the various burdens, consisting of yard lumber burden, kiln burden, other material burdens, machine burden, general mill overhead, total amount departmental bench burdens, commercial burden, and a brief statement of the accounting treatment of each one of these burden items. In connection with Chart No. 8, which shows commercial burden, a recapitulation of all costs—material, labor and burden—is shown with hypothetical figures. Chart No. 9 indicates the items that make up the power cost. The explanation of this chart indicates the disposition of the power costs. Chart No. 10 shows the items that comprise the hauling expense and how it is accounted for.

The Millwork Cost Bureau has also issued a seven-leaf folder entitled "Are You Applying Burden Properly?" which is a reprint from the "Sash-Door Finish Magazine" of September,

1920. It includes examples and explanations of the following methods of applying burden, per thousand board feet of material, percentage of labor, man-hour, and M. C. B., i. e., the plan of the Millwork Cost Bureau. It also contains a short statement in regard to burden compilation.

### Vol. I

- No. 1—Organization and Objects (replaced by Vol. II, No. 2)
- No. 2—Constitution and By-Laws (replaced by Vol. II, No. 1)
- No. 3—Calculation and Application of Departmental Burden Rates, *Research Dept. N. A. C. A.* (out of print)
- No. 4—Overhead Distribution, Compilation and Presentation, *Research Dept. N. A. C. A.* (out of print)
- No. 5—Industrial Accounting as an Aid to Management, *Homer N. Sweet* (out of print)
- No. 6—Distribution of Defective and Spoiled Material Costs, *C. H. Smith* (out of print)
- No. 7—Accounting for By-Products, *Research Dept. N. A. C. A.*
- No. 8—Foundry Costs, *J. P. Jordan*

### Vol. II

- No. 1—Revised Constitution and By-Laws
- No. 2—Organization and Objects
- No. 3—Cost Accounting for Brass and Bronze Foundries, *A. H. Barrett* (out of print)
- No. 4—Chapter Organization
- No. 5—Managerial Uses of Foundry Costs, *J. P. Jordan*
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### Vol. III

- No. 1—Cost Methods in a Woodworking Plant, *J. J. McCaffrey*

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