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**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**

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Official Publications

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**Cost Accounting for Self
Laying Track Tractors**

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

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Cost Accounting for Self Laying Track Tractors

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

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National Association of Cost Accountants

COST ACCOUNTING FOR SELF LAYING TRACK TRACTORS

Cost accounting for a Self Laying Track Tractor is somewhat different than might be supposed. Considerable money has been spent by the pioneer manufacturers of the Self Laying Track Tractor for the purpose of determining costs, and experience has proved the Specification Cost System to be the only economical and efficient system adaptable to the business.

DESIRABILITY OF SPECIFICATION COST SYSTEM

During the war, owing to Government contracts, it was necessary to install a complete cost system in all detail, covering material, labor and overhead. The system, however, had but a short life, because it was unprofitable both to the Company and to the Government, and as far as the system went, could not be operated on a satisfactory commercial basis. The enormous accumulation of papers, the poor and inefficient help and the large increase in expense of the Cost Department resulted in a big increase in the overhead and nothing in figures that could be called satisfactory. In fact, it produced a constant change in the cost of the Tractor, owing to the fluctuations in production and other causes, and a continual friction between the factory and the Cost Department as to "whys and wherefores." Therefore, as above stated, it was found, after thorough investigation, that the Specification Cost System could be used to the best advantage, and that calls for the cost of a certain quantity of individual parts every month and the complete cost of the Tractor three or four times a year.

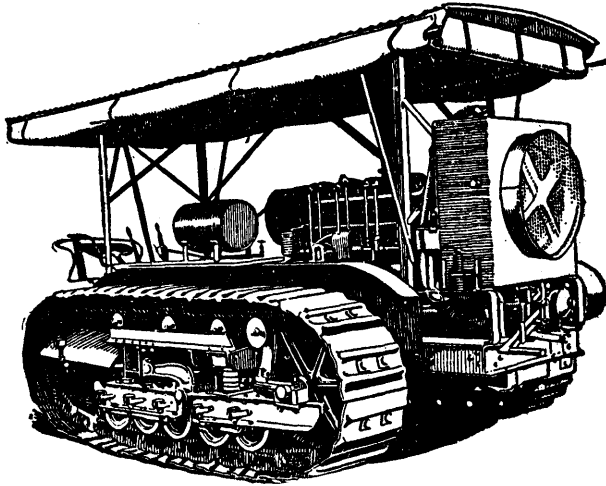
In the first place, the Cost Department's results do not immediately change the selling price, for catalogs and price lists must be issued long before the Cost Department can acquire and assemble the detailed cost of manufacturing a Tractor in process of production. The selling price has to be fixed and is usually based on material (made or purchased) in stock, approximately three to six months prior to assembly. Practically speaking, the detailed cost would be the basis of selling the Tractor from four to six months after the date of production.

DESCRIPTION OF TRACTOR

A Self Laying Track Tractor is made up of many individual parts and pieces, and approximately 70% are manufactured, assembled and finished by the factory and the balance required purchased

from outside firms. The Tractor is made up of four prime Group Assemblies, namely: 1. Motor, 2. Transmission, 3. Frame, and 4. Tracks. Sub-assemblies of these four prime Assemblies are made to cover such articles as Pumps, Tanks, Radiator, Canopy Top, etc., etc.

The cut below shows the way the Tractor looks.



BILL OF MATERIAL

The foundation of procuring cost for a Tractor is a complete and accurate Bill of Material that shows part number, title, class of material, number of parts per Tractor, and if produced or purchased. To this Bill of Material, the Cost Department works to acquire the complete cost of a Tractor: First, by the individual parts; second, by Group Assemblies; and third, by Sub-assemblies.

The method of obtaining from the factory the various parts which make up a Tractor is first on a schedule or order given by the management to manufacture so many Tractors per month for a given time. Of course, the Bill of Material for a Tractor has already been prepared by the Engineering Department, also the blue prints and all other engineering data.

MASTER SCHEDULE

The Production Department immediately prepares the Master Schedule for the quantity of Tractors to be built in a given time, and such schedule shows a list of all the parts in a Tractor and the quantity to be manufactured or produced, and to be purchased outside.*

*This form and the one on page 7 did not reproduce well but they are carefully explained in the context.

Form No. 602
MASTER SCHEDULE

TIME SCHEDULE			
Start Date	End Date	Start Time	End Time

Order No. _____
 Qty. _____
 Date _____

FACTORY DEPT.

MATERIAL ACQUISITION

PART

The Master Schedule shows the number of parts or pieces per Tractor, the part number, title, the number of parts or pieces required for the complete schedule of Tractors to be made, the parts in stock and the parts to be made. There is allowed an over-run to cover spoilage and scrappage, but should the percentage not be sufficient to cover spoilage on account of unforeseen conditions, a Replacement Order is put through for the shortage. From the Master Schedule, the Production orders are placed with the various factory departments, namely, Foundry, Machine Shop, Blacksmith Shop, Tin Shop and so on. All Foundry orders for iron, brass, copper and aluminum parts call for delivery to Rough Stores and the Machine Shop makes requisition on Rough Stores for the parts to be furnished under the Production order as required. It should be understood that the information the Cost Department requires is gathered from Foundry costs, time cards, invoices, requisitions and "burdens" supplied from the General Accounting Department.

The Cost Department, as already stated, has a Bill of Material supplied to them which specifies the nature of the material by classifications, namely, brass, copper, iron and so on. It also states whether the material is purchased outside. Should the material be purchased outside, such costs per unit are supplied from the Material Accounting Department. This procedure gives the raw

material costs. Information about work performed by the Machine Shop, Blacksmith Shop or other departments is obtained from the time cards. Inasmuch as all parts and pieces have a number, the time cards are sorted by the Cost Department to the part or piece number and resorted to the operation symbols or numbers.

COST OF FOUNDRY PARTS

The cost of Foundry parts, made on the premises, is obtained from the Foundry reports. Inasmuch as the Foundry operations vary each month, an average production cost, over a four to six months' period, is taken and such parts are figured (excepting for core work or special work) on an average "cost per pound" basis. The weight per piece is obtained from the Foundry production report (which gives daily, a list of parts made and the average weight per part), making it an easy task to figure the Foundry cost per unit piece or part. It should also be stated that the Cost Department keeps a record of the Foundry costs per unit piece. The Material Accounting Department, which controls Rough Stores, obtains costs for inventory and other purposes from the Cost Department. As the Foundry system is much the same as in any other Foundry, it is not within the scope of this article to make any reference other than the fact that Foundry costs are obtained per unit piece on the average weight per piece, based on the total cost of the Foundry considering its production of good parts for an average production of from four to six months.

RELATION OF COST FORMS

The chief forms used in the Cost Department are shown on page 7 and the arrows make an attempt to explain the operation of the forms in relation to the Cost Assembly Sheet.

COST OF COMPLETE TRACTORS

In order to obtain the cost of a complete Tractor, the Cost Department transfers from the Bill of Material to a Cost Assembly Sheet the various parts under the headings of the four prime Group Assemblies and various Sub-assemblies, obtaining the complete cost of a Motor, Transmission, Track, and Frame, respectively, and the complete cost of other parts and Sub-assemblies.

From the Unit Cost Card the cost information is transferred to the Cost Assembly Sheet under the various headings of Material, Labor, Departmental Burden, and General Burden. The total of all of these figures, plus the assembly costs, which are procured from the time cards, give the complete cost and weight of a Tractor and, at the same time, the unit cost and weight of every individual part in the Tractor, the four prime assemblies and all the Sub-assemblies.

The image shows a collection of interconnected forms used in a factory setting. At the top left is a 'Bill of Material' form with a grid for listing materials. To its right is a 'UNIT COST CARD' form with various data fields. Below the Bill of Material is a 'REQUISITION' form, which includes a 'FACTORY ORDER' section with a 'No.' field. To the right of the Requisition is an 'OPERATION CARD' form, which has a table for recording production data. Arrows from the Bill of Material and Unit Cost Card point to the Operation Card, indicating that data from these forms is used to populate the Operation Card. The Operation Card table has columns for 'DATE', 'MACH. No.', 'QTY. MADE', 'QTY. SPOILED', 'QTY. PASSED', 'QTY. IN STOCK', 'QTY. IN WIP', 'QTY. IN HAND', 'QTY. IN TRANSIT', 'QTY. IN STORE', 'QTY. IN USE', 'QTY. IN REPAIR', 'QTY. IN DISPOSED', 'QTY. IN WASTE', 'QTY. IN OTHER'. The 'REQUISITION' form also has a table for recording material usage, with columns for 'QTY. ORDERED', 'QTY. DELIVERED', 'QTY. SPOILED', 'QTY. PASSED', 'QTY. IN STOCK', 'QTY. IN WIP', 'QTY. IN HAND', 'QTY. IN TRANSIT', 'QTY. IN STORE', 'QTY. IN USE', 'QTY. IN REPAIR', 'QTY. IN DISPOSED', 'QTY. IN WASTE', 'QTY. IN OTHER'.

OPERATION CARD

The Operation Card is used to check the various factory operations, per unit part, and the assembly of such operations is recorded on the Unit Cost cards. The material is received from the factory by the storeroom on the delivery tags and the various quantities, the quantities ordered, delivered and spoiled are accounted for in the Production Department on the duplicate copy of production orders on file in that office.

TIME CARDS

Time cards are given out in the factory by the Time Clerk and show operator's number, piece number, quantity ordered, quantity made, quantity spoiled, quantity passed by the Inspector, time taken on the job and the rate per hour per man. The rate is obtained from the Pay Roll Department and all extensions in respect thereto are made in the Cost Department.

FOUNDRY COSTS

The Foundry costs take care of the spoilage in the Foundry, and to cover spoilage in the Machine Shop and other departments

of the factory a percentage is added to the raw material cost. Experience has proven that an average percentage to cover loss in the Machine Shop is sufficient for all evils as the records show very little variation in percentage.

BURDEN AND COST COMPARISONS

As with many other concerns, Departmental Burden and General Burden are distributed over productive and non-productive factory department labor. The expense or burdens are the overhead figures of the expenditure ledger. To obtain Departmental Burden is an easy task, as it simply means the non-operating burden of the individual departments, namely, non-productive labor, operating material and overhead burdens, such as taxes, insurance and depreciation. General Burden is the general office and factory office expense distributed to the various operating departments, based on productive and non-productive labor of the operating departments. Although the overhead labor and expense is distributed monthly, the Cost Department uses a percentage as shown by the consolidated figures for six months, distributed over the productive labor for a like period. Where labor or material is known to affect one department more than another, the cost is distributed accordingly, but the major portion of the general burden is distributed to the productive departments, as above stated, on the percentage of the labor to the departments.

In figuring the percentages of burdens to productive labor of the productive departments, the burden taken by the Cost Department for its costs is the burden percentage of the various departments according to work performed. Such burden is on a percentage to the productive labor of the departments and consists of non-productive labor, operating expense, taxes, depreciation, insurance and general burden. Naturally, these percentages will differ in various departments on account of variation in productive labor and the work performed.

The Cost Department also keeps a Comparison Card which gives the cost of the various unit parts at various dates and this enables the Management and the Cost Accountant to check and make comparisons.

Vol. I

No. 7—Accounting for By-Products, *Research Dept. N. A. C. A.*

Vol. II

No. 7—Purchase Orders and Purchase Records, *Homer N. Sweet*

No. 9—Cost Accounting for Public Utilities, *E. D. Bistline*

No. 15—What Is Wrong with Cost Accounting? *G. Charter Harrison*

No. 16—A Method of Distributing Factory Payroll, *Matthew Porosky*

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Vol. III

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No. 16—Standard Costs—How to Establish and Apply Them. *William F. Worrall*

No. 17—A Method of Collecting Direct Labor Costs and Statistics, *George H. Friesel*

No. 18—Cost Accounting for Self Laying Track Tractors, *Percy Ehrenfeldt*

Copies of the above publications which are not out of print may be obtained from the office of the Secretary of the Association, 130 W. 42nd Street, New York City, at the price of 75 cents per copy.