BALANCE OF WORK

MACHINES

C

OPERATION

QUANTITY	TIME ALLOWED
DATE SCHEDULED	**MACH. CLASS**

Fig. 4. Machine Ticket (Yellow).

The Labor Ticket is identical except that "Labor" replaces "Machines" and the color is pink; on the Tools Ticket the word "Tools" replaces "Machines" and the color is buff.

by weeks, and our schedule which we hope to meet by weeks, and also the balance of work which we have on hand.

CARL G. BARTH[1]: Mr. Hemmerly's paper would seem to imply that the idea of a balance of work is a new one, and that Mr. Taylor never had anything of the kind, while, as a fact, he had a highly developed combination scheme of recording the progress of the work in hand and the still available or unapportioned productive capacity of the equipment up to any stated time. An attempt to put this into effect at the Tabor Manufacturing Company's plant was made rather too early in the course of the development of scientific management, when not enough competent help was available to see it through, for which reason I persuaded Mr. Taylor to let us drop it for the time being.

Mr. Taylor always acknowledged his indebtedness to Wm. Sellers & Company of Philadelphia for the simple fundamental idea of his scheme. That company, with which Mr. Taylor kept in close touch during his engagement with the Midvale Steel Company, ran a balance of work for each group of similar machines, during the early years of that period; and I remember well when Mr. Taylor told me that it was given up because somebody ran it into the ground by thoughtlessly deducting from the total estimated time of work ahead of a group of machines the actual time a finished job had required, instead of the originally estimated added time for that job. As a part of Mr. Taylor's

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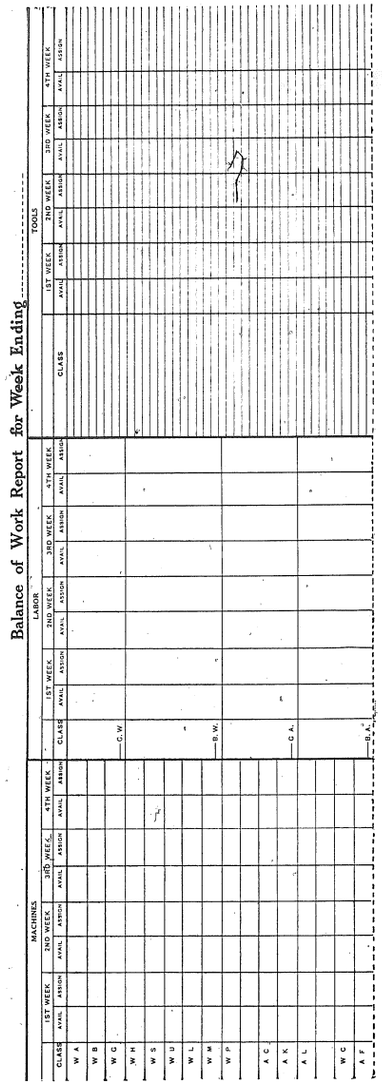

Fig. 5. Top Section of Balance of Work Report. Original Size 17x17.

full scheme, as he put us on to it at the Tabor plant, two totally different kinds of route sheets were made up for each machine to be built, viz., one set consisting of a sheet for each part and listing in consecutive order the several operations to be performed on it, in the now commonly practiced manner; and another a set of sheets on which all the operations for all the parts entering into each sub-assembly of the complete machine was relisted according to its kind, such as turning, planing, milling, drilling, etc., together with the estimated time for each operation, and all of these added to a total of estimated time for each kind of operation into what was called batches of operations.

The progress sheet for the whole machine was then a short résumé of these batches of operations for the several sub-assemblies, arranged with the usual Taylor check lines for the instant disclosure of the batches of operations completed to date as against those not yet completed or even not started. Mr. Hemmerly, you must surely remember that progress sheet?

MR. HEMMERLY: The only progress sheet I remember is where they kept a record of the various parts that entered into assemblies and sub-assemblies, and checked them when completed.

MR. BARTH: Well, it was the frequent failure to check off a completed operation on the batch of operation sheet after first checking it off on the route sheet for the proper part to which the completed operation belonged, that caused the kind of progress sheet for the whole machine in use at that time invariably to show less actual progress than had been made, and that finally led to its abandonment in the Tabor plant. However, I still consider the scheme an excellent one, and much regret that I have never had a chance to reinstate it nor to take it up elsewhere. My recollection is that this happened only after Mr. Hemmerly had become production clerk for the Tabor Company, but I am evidently wrong about this. If Mr. Hathaway were here he could probably set me straight on this point.

However, to give you another instructive illustration of the numerous ways in which excellent schemes may be so carelessly handled as to prove utter failures unless somebody has the experience or knack of quickly laying his hand on the difficulty. At the Link Belt Engineering Company, as part of Mr. Taylor's policy of complete financial surveillance, the new auditor of purchases was started on keeping a running balance of the total value of outstanding purchase orders. After some three or four months he came to me one day and said that he so far had failed to keep his balance correct, as proven by a substantial discrepancy between this balance at the end of each month and the actual total of outstanding purchase orders, which he had taken the trouble to ascertain for comparison. Each month he had corrected his balance, but still it was always again out at the end of the month.

From what Mr. Taylor had told me about the reason for Mr. Wm. Sellers & Company's difficulty with their balance of hours of work, I at once suspected that our auditor's trouble was of the same nature, and so it proved.

Some of the purchase orders he received could give only an estimated value, and in a case where this was only $20.00 he had correctly added this to the balance; but when the bill for $22.00 finally came in he had deducted this actual value instead of only the $20.00 estimated. Immediately I showed this up he exclaimed: "Well, how could I ever do it?" and I said: "Yes, how could you ever do it?"

The ultimate difficulty in installing and maintaining scientific management is after all the training and keeping together of an organization that will do the little commonsense thinking that is necessary to success in any undertaking or action; and it is indeed discouraging continually to be handicapped in one's effort to accomplish something worth while, by the careless and thoughtless acts on the part of numerous members of the average organization. There is something radically wrong somewhere, but I don't just know where the fault lies.

MR. HEMMERLY: I should like to suggest that a careful reading—my delivery may not have been as good as it should have been—but a careful reading of the paper, I hope, will demonstrate that the purpose of the balance of work is not a duplication of the bulletin board or the planning board, as we call it; but that it is in a sense a cross-index. In other words, if you make two tickets instead of one for each operation and used one as a cross-index, you would then have just what you get through the balance of work, but you would only have the information in so far as actual jobs planned is concerned.

With the use of the balance of work function—and I don't claim to be the originator of this by any means—you can plan work practically as fast as orders are received, and, therefore, you can through this cross-index arrangement, as you might call it, ascertain a whole lot more than you can from the tickets representing work planned ahead of actual machines on the planning board.