Significant Savings in Textile Mill Operations[1]

Results of the Substitution of Scientific Management for Tradition in the Jackson Mills

By NORMAN T. THOMAS
Superintendent, Jackson Mills, Nashua Manufacturing Co., Nashua, N. H.

THE cotton manufacturing industry is old and well established in New England. Starting over a century ago, it has been for a long time its largest and most important industry. In general it has not given as intensive study to the possibilities along the lines of "scientific management" as some other industries. Tradition and old customs have played a very important part in the operation of a cotton mill. The industry has been seriously handicapped by customs, built up by the experience of its century's existence. Henry Ford in his book, "My Life and Work," tells in a few words about his business, "We fortunately did not inherit any traditions and we are not founding any. If we have a tradition it is this: Everything can always be done better than it is being done." The textile industry on the contrary has been built up by tradition. A mill agent whose opinion is held in very high regard has often said, in discussing the possibilities of remarkable savings in textile mill operations, that if a cotton manufacturer could get off to some place entirely isolated from other mill centers and build a new mill, hire all new people whom he could train properly, and build up new methods, the results would be startling! In some cases, however, old customs are being gradually overcome, and a new attitude is evident. Mill operatives, after they have been shown, realize the advantages to themselves which result from a rearrangement of their work. Mill managers, on the other hand, realize the necessity for increasing the efficiency of operatives and machinery. They know that the most important step of progress is to break away from the long established methods of operation, in cases where the methods are obviously inefficient but difficult to break down because of custom.

There is urgent need for savings in textile mill operations at the present time, especially in the New England mills. The prices of cotton are high and will probably remain upon a much higher level than in previous years. Wages today are higher than ever and will remain probably upon a much higher level than that of about ten years ago. Much has been said in regard to the rapid development of the textile industry in the southern states. Twenty to twenty-five years ago there was hardly any cotton manufacturing outside of New England. Today there are twenty million spindles in New England and fifteen million in the cotton-growing states. Since 1900, when there were fifteen million spindles in New England and four and one-half million in the South, there has been an increase of 34 per cent in New England against 248 per cent in the cotton growing states, according to figures of the United States Department of Commerce. There is constant agitation in the legislatures of the New England states to bring about the enactment of 48-hour laws, which are aimed directly at the textile industry. The difference in the legal running time of the mills in New England and the South is a serious handicap to the industry here.

It is of great importance in striving for economy in the production of goods to have a good layout of machinery and buildings. In a continuous process, such as there is in the cotton mill, it is necessary to have a steady flow of material from operation to operation with no backward steps and with a minimum amount of handling. In drawing up specifications for a new mill, engineers and mill managers of today plan for a building which is radically different from the popular conception of a cotton mill. Re-inforced concrete buildings with large windows replace the former brick mill construction with small windows. Dustless stripping systems in the card rooms are perfected, so that the card tenders are able to do the stripping, thereby eliminating "strippers," who usually work only a small percentage of their time. Automatically controlled heating and humidifying systems, which provide uniform temperature and humidity, result in better operating conditions and increased

[1]Paper presented at a meeting of the Taylor Society, Boston, Mass., April 26, 1924.

production throughout the mill. A "humidifier man" in each department to look after the old system of humidifying is unnecessary, because one or two men can look after the entire mill, the heart of the new system being located in the basement. Individual motor drives are important aids in increasing production and in eliminating bad work due to overhead shafting troubles, and some saving is accomplished by eliminating shafting men in each department. Power floor-scrubbing outfits are means of savings and give better results as compared with the old method of having scrubbers in each department, who usually worked a small percentage of their time.

Probably most of the long established mills move the material from operation to operation by means of hand trucks and freight elevators. Cotton storehouses in some cases are not located in proper relation to the opening room, necessitating an auto truck with a crew of five or six men to transport cotton from storehouse to mill. In some cases cotton is piled several bales high in the older types of storehouses — a practice which results in extra labor and cost. Picker laps, boxes of roving and yarn are trucked to and from the elevators and delivered by the elevator man to the carding, spinning, and weaving departments. The cloth rolls are piled on trucks and carried to the cloth room, usually at some distance from the weave rooms. This method means lap carriers, roving and yarn truckers, filling carriers, cloth handlers and elevator men. It also means a large number of trucks and boxes, which take up valuable space, cause more or less confusion, and represent a good deal of money in upkeep.

At the Jackson Mills a complete conveyor system which handles the entire product from the raw cotton to the finished cloth is in operation.[2] The bales of cotton stored on the upper floors are sent down a spiral chute to the opening room on the first floor. After passing through the machines the cotton is blown through pipes to the sixth floor, where the picker room is located. The picker laps, as they are made by the pickers, are put into cradles on the conveyor, and delivered to the card rooms by means of a gravity-roller conveyor, a spiral chute, and a horizontal belt conveyor, from which the card tenders take the laps while the cradles are traveling along very slowly. The empty cradles continue on and are returned to the picker room on an inclined elevator. The boxes of roving and yarn are put onto horizontal belt conveyors by the machine tenders as soon as they doff their machines, these boxes traveling by spiral chutes and belt conveyors to the spinning, dressing and weaving rooms, where they are automatically diverted onto unloading stations. The empty boxes and bobbins are returned on inclined and vertical elevators. The cloth rolls are put onto an inclined elevator as they are taken from the looms, and then a belt conveyor delivers them to platforms in the cloth room which is located in another building across the yard.

In making use of a complete conveyor system the material in process can be moved from one department to another with marked savings in cost. A report of a study made by the engineers showed an actual saving of about twenty-five hands throughout the mill. In addition the jobs are made easier for the employees by the special trucks, which eliminate heavy lifting, and this increases the efficiency of the mill as a whole. The stock is in much better condition than in the average mill, due to the absence of trucking. There is a marked saving in the number of bobbins used in the carding and spinning rooms, due to the method of returning empty bobbins. There is constant and quick control of the amount of stock in process because the surplus or storage is wholly on the conveyor system.

New methods of operation or a rearrangement of the work result in economy and increased efficiency. Planning the work for each department in order to eliminate unnecessary waiting for material and at the same time to keep always a minimum quantity of stock in process is important. It is a general practice for the overseer of each department to run the right number of machines and to assume the responsibility of keeping the next department properly supplied. Without central control, however, there is constant fluctuation in departmental production, friction between department heads, large stocks on hand, and decreased efficiency throughout the mill.

One of the problems is to keep the looms in operation by providing a supply of warp yarn on loom beams, properly sized and with the harnesses and reed tied in, ready for weaving. With the looms running on different grades of cloth, the warp beams vary as to the number of threads, harnesses, and kind of reed. In the preparation of these beams the judgment and experience of the overseer of the dress room was

[2]For a good description of this system, with illustrations, see Robert T. Kent, "A Conveyor System that Revolutionized a Cotton Mill," *Management and Administration*, April, 1924, p. 411.