THE ELECTRIC DRIVE FOR TEXTILE MILLS.

The application of electric motors for the operation of textile machinery is a growth of the last few years only and its adaptability to all conditions and circumstances has hardly yet been fully worked out, although certain standard forms have been found to be best suited to the requirements of textile mills and have been pretty well perfected. This application of electric motors for power purposes is commonly called the "electric drive," and as such is usually spoken of.

The use of the electric drive in textile mills, its drawbacks and its advantages, have been so much discussed of late years that there is very little to be said upon the subject that will be new. The application of electric power to textile machinery has ardent advocates and equally ardent opponents, but it is a significant fact that the strongest supporters of the electric drive are those men who have used it in their mills and tested its capabilities and possibilities, and added to this is the equally strong argument in its favor that no mill fitted up to use electric power has yet reverted to the use of either steam or water power. The chief cause of the success of the electric drive is that it increases the output of the mill, as a prominent engineer has said "the main reason for the adoption of the electric drive lies in the increased efficiency of human energy that is secured by it." That is, the same person and the same machine can turn out more goods and better goods with the electrical operation of machines than otherwise, and since the cost of labor and machinery are the largest items in the operation of a textile mill, an increased efficiency of either of these means increased profits.

Indeed, so thoroughly has the superiority of the electric drive been demonstrated that its adoption has now largely become a matter of cost, and one hears more discussion of which type of motor or drive to adopt than he does of the question whether or not electric power shall be used. There are several different types of motors, which, in turn, are divided into two classes, direct current motors and alternating current motors, so there is often a question of which style or class to adopt for a particular purpose. In modern textile mills there is a good deal more than just spinning and weaving machines to be considered, for instance, there are fans and blowers, elevators for freight or communication, machines and tools for repairing broken machinery, etc., the electric lighting, etc., etc. To meet the particular requirements of each of these operations, different types of motors have been developed, which are the result of severe evolution, painstaking care and endless experimenting, and only those fittest have survived the ordeal. So perfectly has the differentiation of types been worked out that it would be wasteful folly to use one motor for work to which another is better suited.

The following brief references to the different styles of electric motors and the work or service for which they are best suited may be of interest to the practical mill man, as showing the type of motor that can be most economically and efficiently used not only for textile machinery but for the secondary machinery of the mill as well. The nature of the electric current employed, whether direct or alternating, must also be taken into consideration, as a motor wound for one of these currents should never be put to work on the other current, unless specially built to work with both.

Motors are divided into two different classes according to the kind of current they use; these are:—

DIRECT CURRENT MOTORS. ALTERNATING CURRENT MOTORS.

Direct current motors include the following types:—the Shunt Motor, the Series Motor and the Compound Motor.

Alternating current motors include the Single-phase Induction Motor, the Poly-phase Induction Motor, the Single-phase Series Motor and the Single-phase Repulsion-Induction Motor.

Each of these types is built with certain conditions of current, work and operation in view, and each have special advantages and uses. The different uses to which these motors are best adapted are easiest explained by reviewing the various kinds of work for which the electric drive is adapted. Under this system the classification would be about as follows:—

1. Service requiring constant speed with varying loads, with no control of speed beyond that which keeps it automatically constant at a given speed when once so adjusted.

For such work either direct current shunt motors or single-phase or poly-phase induction motors on alternating currents may be used. If the service is varied by having a large number of stops, starts and possibly reversals, compound motors can be used with better advantage than shunt motors; where a constant speed is not required, shunt motors may be used as well.

The conditions named are those prevailing in textile mills, for ring frames, mules, looms, etc. For operating this class of machinery, the poly-phase induction motor on an alternating current is the most suitable, on account of its freedom from sparking and its positive transmission of power. Direct current motors are unsuited for textile work on account of their liability to sparking.

2. Service requiring large starting torque (or turning moment) for rapid acceleration of the load and a comparatively small running torque with frequent starts, stops and reversals.

For this service, it is customary to use direct current series motors, although the recently developed single-phase series motors, (alternating current), have equally as good capacity for this kind of service.

(*To be continued*)