in proportion to its capacity. Often this increase in units will not require an increase in attendance. If desired, the initial installation may consist of two units, each of sufficient capacity to normally carry from 70 to 75 per cent. of the total load at its most economical point of operation, and in the event of an accident to either of the prime movers the remaining one could by reason of its overload capacity carry the entire demand for power until such time as repairs were made on the damaged units.

The space required by the engine driven electric generator is but very little larger, in fact, usually no larger than a similar Corliss type of engine, and if the steam turbine is used, much smaller, and with the turbine the foundations will be considerably less than with the Corliss engine equipment The necessity for belt towers, heavy main shafts and belts, and all of the details which go with a rigid belted system are avoided, as well as the loss of power consumed by these belts and shafts, permitting lighter walls and detail of building construction.

The enormous use of electricity as motive power in street railways, in industrial establishments of all kinds, and by electric lighting companies, demanded the most economical generation of power in the prime mover, and to-day engines and steam turbines are in operation using much less steam per horse-power than was considered possible a few years ago. Therefore it is fair to credit the use of electrical power with some of the great improvements now existing in steam apparatus.

Owing to the intimate relation existing between steam turbines and electrical distribution of power, it seems proper that we should discuss briefly this subject of steam turbines. The first commercial development of the steam turbine took place in England in 1884, by the Hon. Charles A. Parsons, and within four years turbines of an aggregate capacity of some 4,000-h.p. were in operation. Up to the present time, approximately, 200,000-h.p. are in operation throughout England. It was not until 1898 that the Parsons turbine was introduced in America by the Westinghouse Machine Company. An estimate which is conservative, places the combined use of turbine generators now installed at about 300,000-h.p., and on order one-half million horse-power additional.

The turbine development is by no means confined to a single company, it having been taken up in this country by several manufacturers, two of which were organized to manufacture steam turbines only and the other companies have been manufacturing steam engines. It will, therefore, be seen that the engine builders realized the rapidly increasing demand for steam turbines which in the end will materially affect their production of reciprocating engines, and for this reason are taking up this form of prime mover.

The general principles of steam turbines are undoubtedly well known to the members of this organization and for this reason we will not dwell upon the details of construction.

The partial success of the steam turbine as a power generating device lies in its extreme simplicity, it having a rotary motion without reciprocating parts, and owing to the high speed at which the turbines run, the moving elements are much lighter than those existing in steam engines of equivalent capacity.

An important detail in connection with the turbine is that no internal lubrication is required, consequently the condensed water may be returned directly to the boiler; thus, the cost of feed water and the necessity for a purifying process is eliminated. It follows, therefore, that considerable saving in operating expenses is made as well as the item of cylinder oil, while the cost of bearing oil is really insignificant.

In a particular instance on which data have been obtained, after several years of operation, the cost of oil for a 600-h.p. turbine is approximately five cents per day of twenty-four hours, which, we believe, is hardly ten per cent. of that usually required by a reciprocating engine of equivalent capacity.

The space occupied by the horizontal type of turbo-generator is in the neighborhood of .6 of a square foot per electrical horse-power, or, to state it another way, approximately two-thirds of that required by the vertical type, and one-fifth of that required by the horizontal type of piston engine of the cross-compound Corliss type operated in connection with condenser. The height of the turbine is about two-thirds the height of the horizontal and three-tenths of that of the vertical engine.

Owing to the uniform rotary motion and perfect balance of the turbo-generator a foundation of only sufficient size and depth to support the weight of the outfit is required, it not being found necessary to use foundation bolts. It is, therefore, apparent that a very large saving in the cost of foundations is made when compared with Corliss engines of either vertical or horizontal type.

The steam economy of the turbine is another of its important factors and it is well to know that this does not vary much with the size of turbine.

(To be continued.)

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UNITED STATES HOSIERY IN CHEMNITZ.

(Correspondence of the Hosiery Trade Journal, Nottingham.)

The story of Chemnitz, Saxony, as a great hosiery centre is as old as the hills. For many years this city has controlled wide markets in all parts of the world. It has annually exported from four to five million dollars' worth of hosiery to the United States alone. No markets have been surer for the Chemnitz manufacturer than those of the States. Both in spring and fall dozens of buyers flock into the city. And now, after all these years of absolute supremacy, like the irony of fate, we find American sellers of hosiery follow the footsteps of the buyer.

Incredible as it may seem, a good beginning has already been made in the introduction of American hosiery into Germany. This movement is significant. The aim is not so much to sell American hose on the German markets as it is to compete directly with the Chemnitz hose in the trade of the Levant and Orient. Scores of buyers of hosiery from India, Turkey, and other Eastern countries annually visit Chemnitz to buy up cheap grades of hose. From now onwards they will also have the opportunity to buy American hose right in Chemnitz, as good lines of cheap grades have been sent over there. Most business is done in the cheap $1 seamless ribbed hose. Cheap plain hose in this grade is also being tried, though as yet with but varied success. American manufacturers are able to compete in the line of cheap hose, because of their gigantic and economic scale of machine manufacture. Whilst Germany has the well-known great advantage of extremely cheap labor, this is more than offset by the economy effected through organization upon a large basis, and the possibility of one man managing a number of the excellent hosiery machines.

In the matter of packing, American exporters still have much to learn. Hose are put up in what appears to be a careless manner. Some boxes are too big for their contents. The cartons are not tastily made, and frequently consist of plain cardboard made up in crude fashion. Such cartons form a pathetic contrast to the tasty colored boxes of German hose. The German manufacturers have attained the par excellence in packing. Every detail is attended to, and scrupulous care is visible everywhere. While the local