HIGH POWER ENGINES AND THREE-PHASE GENERATORS AT PARIS.

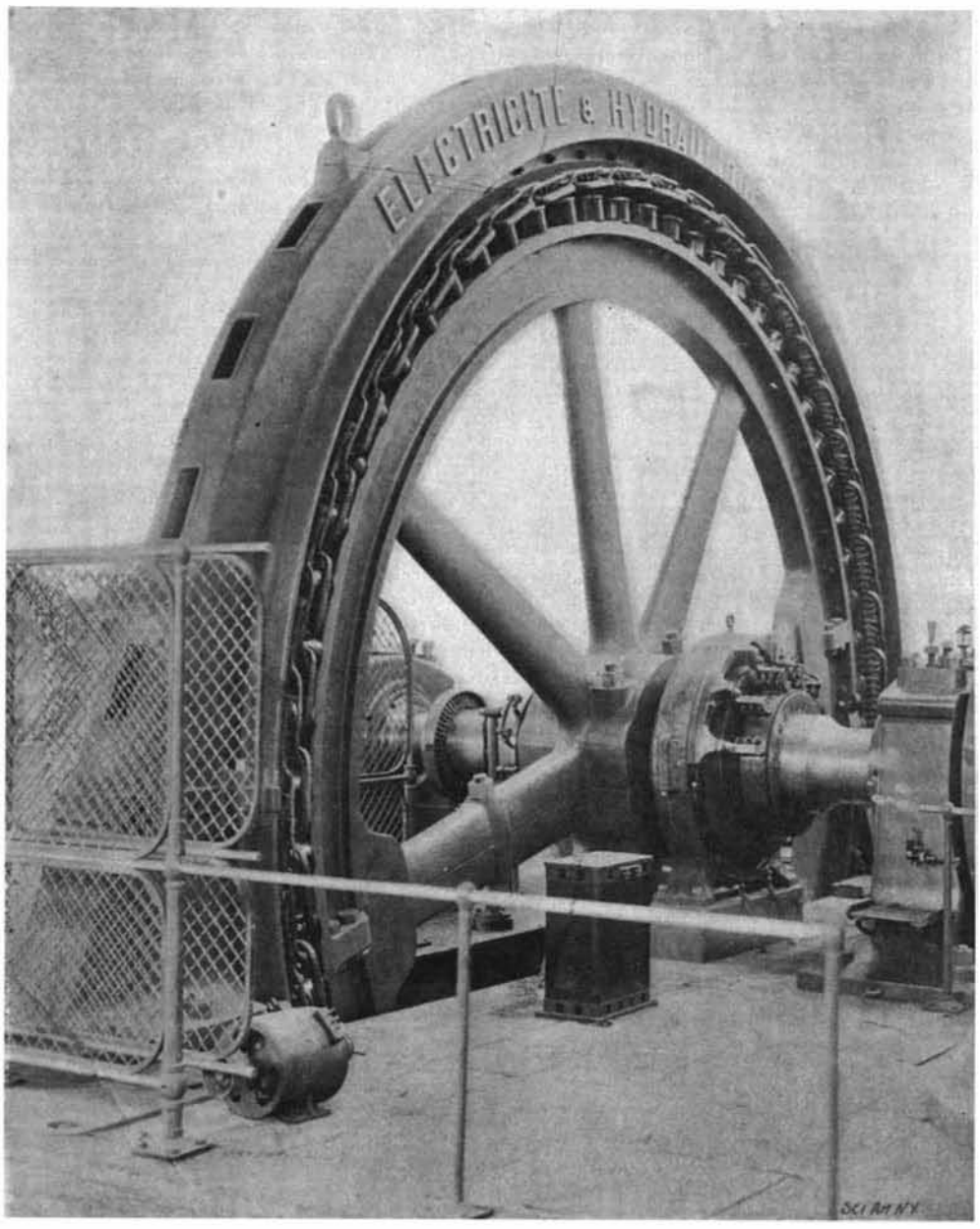
BY FRANK C. PERKINS.

Some of the most interesting as well as important exhibits at the Paris Exposition this year are the large direct-connected Drehstrom alternating current generators and high power triple expansion engines, the largest of which are of European make.

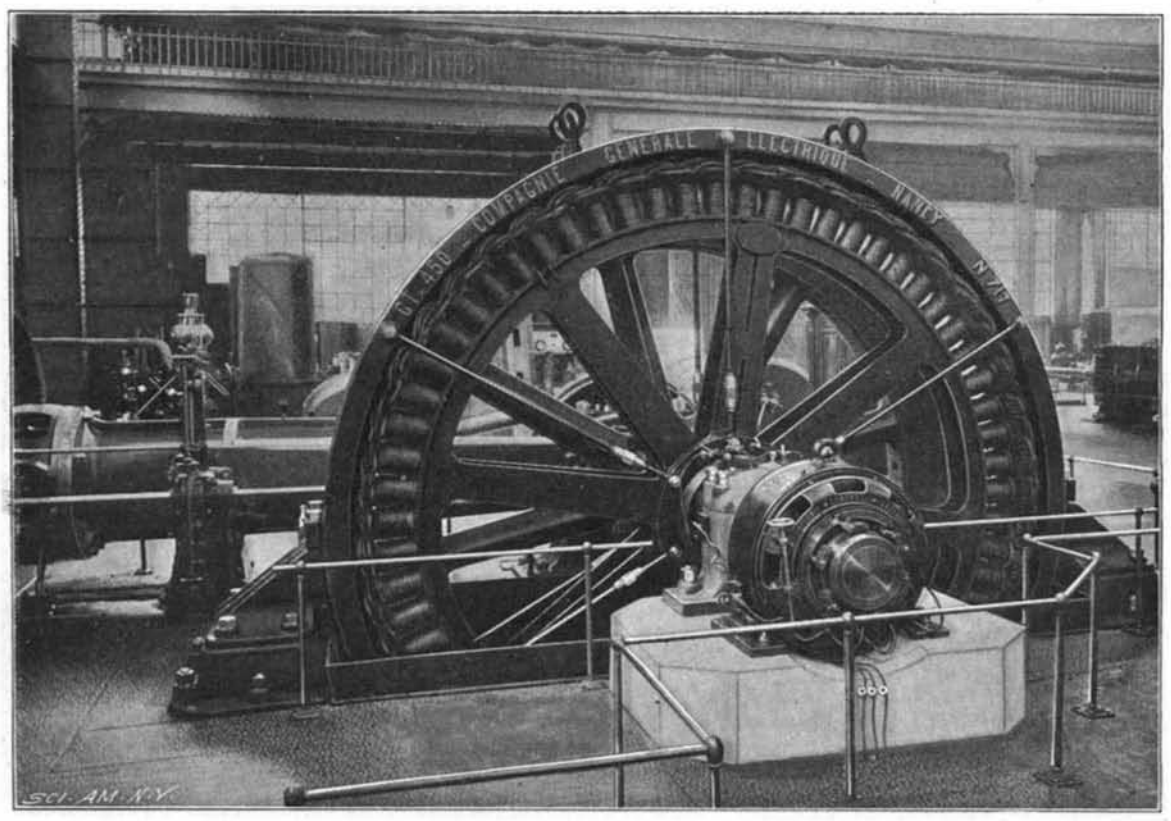
A three-phase alternator which is of considerable interest is the one built and installed at the Exposition by the French firm the Compagnie Générale Electrique of Nancy, shown in the smaller engraving. This is of the type of alternators having revolving field magnets and stationary armatures. This fly-wheel field magnet has a speed of 93·5 revolutions per minute and has a frequency of current in the armature of fifty periods per second. In each phase it generates a current of 87 amperes at a potential of 3,000 volts. In order to secure mechanical rigidity in the armature, it will be noted that on each side there are six rods of forged iron terminating at a collar piece, each of which can be adjusted by set screws. This stationary armature has the appearance of great lightness. This firm in their construction greatly decrease the gross weight of cast iron parts relatively to the active weight of the plates of the armature.

The direct current dynamo used to excite the fields of this alternator is seen in the foreground in the small engraving, and it will be noted is directly connected to the driving shaft of the main machine. The collector brushes of this machine are seen on the end of the shaft, the commutator being placed on the extreme outside, while the slip rings and brushes of the alternator are inside the main bearing.

The three-phase alternator shown in the larger engraving is directly connected to a 1,000 horse power horizontal compound engine manufactured by Weyher & Richemond, of Paris. This engine is on exhibition in the French section, and is capable of delivering a current of 250 amperes at a potential of 2,200 volts. The speed of the revolving field magnet is 95 revolutions per minute, and the frequency at this speed is 50 periods per second. The field magnets consist of 64 pole pieces, which are excited as described in the other case.



THREE-PHASE ALTERNATOR, WITH 1,000 HORSE POWER ENGINE.



THREE-PHASE ALTERNATOR AT PARIS EXPOSITION.

Application of Aniline Dyestuffs to Leather.

Mr. M. Chas. Lamb, head of the Leather Dyeing and Finishing Department, Herold's Institute, Bermondsey, read a paper on the dyeing of leather early this year before the West Riding Section of the Society of Dyers and Colorists, and reprinted in the journal of the society. The author writes:

"The dyeing of leather, I may say without fear of contradiction, is the most difficult branch of the art of dyeing. The difficulties encountered by the leather dyer are numerous; one of the many is that skins which have been tanned with different tanning materials take the dye very differently. This is due to the fact that the vegetable material, with which the skins have been tanned, itself contains coloring matter which is imparted to the leather. Another of the dyer's difficulties comes of the very marked and characteristic differences in the fibrous structure of the skins derived from different sources, some skins being open and loose in texture, and others firmer and more compact, which affects the dyeing, in that an open, coarse-textured skin will absorb more dye than will a skin of firmer texture, the resulting shade being much deeper in the former case than in the latter. Skins of the same class, moreover, exhibit in a more or less degree this difference in texture, and it is a fact well known to leather dyers that in a number of skins which have been dyed in the same bath, there are always one or two which are not exactly the same shade as the rest. I have been consulted from time to time by leather manufacturers, who have found difficulty in dyeing level, that is, obtaining in one and the same skin the same shade throughout. This is usually due, not to the dyestuff used, or the method of dyeing, but to the preparatory treatment being insufficient."

Mr. Lamb gives an account of the operations preliminary to the actual dyeing, and then proceeds to describe the three distinct methods of dyeing in use in this country, viz. the "tray," the "paddle," and the "drum" methods. He specially alludes to bookbinding and furniture leathers, and refers to the movement among bookbinders and others interested in the preservation of books for the investigation of the causes of decay, which has caused the appointment by the Council of the Society of Arts of a committee to consider the whole question of leather for bookbinding. Mr. Lamb writes:

"During the past few months there has been considerable controversy among the principal bookbinders in London with regard to leather used in bookbinding, so perhaps it may not be out of place for me to say a few words on the matter. Bookbinders contend that the leather used in bookbinding perishes in the course of a comparatively short period. The chief cause of these leathers rotting in a comparatively short time is undoubtedly the reckless use of sulphuric acid in clearing and dyeing, and insufficient precautions being taken to remove the acid, or to neutralize it, after dyeing. If the least trace of acid is left in the leather, it becomes concentrated in the fiber when the leather is thoroughly dry, and completely destroys the leather. I have here a few specimens of leather that were dyed with acid colors about two years ago; these, as you will see, though the leather was well washed after dyeing, are completely rotten, the fiber being entirely destroyed. I have found that it is practically impossible to remove sulphuric acid from leather by washing in water, as samples of leather which were dyed with the acid colors, and the addition of the requisite amount of sulphuric acid, on analysis still showed traces of the vitriol, after they had been left in a running stream of water for a period of five weeks. I think that another matter which has been to some extent overlooked by those authorities who have been consulted on the matter by the bookbinders is the use of soda for stripping the natural tannage of many of the foreign tanned leathers, as I mentioned earlier in this lecture; this, in my opinion, causes the leather to be unreliable, though undoubtedly sulphuric acid is the chief cause of the mischief. In my opinion, bookbinding leathers and leathers for furniture purposes should not be dyed with the acid colors together with the addition of sulphuric acid. If the acid colors are used, they should be used either without any addition, or, if any, only the addition of acetic acid, or a little bisulphate of soda, which latter agent, so far as I have been able to test, has apparently no injurious effect upon the leather, if not used in great excess. The leather should on no account be stripped of the tanning with an alkali, nor should it be cleared with vitriol or any other acid that has an injurious effect upon leather; practically the only one permissible being acetic acid. It would be much better to use the basic dyes, where no acid is required, when dyeing these leathers, though unfortunately this class of coloring matter has the reputation of not being so fast to light as the acid dyes."

A PETROLEUM spray is used on the Missouri Pacific line for lighting the fires of locomotives. The reservoir for the oil is mounted on wheels. Compressed air is used to spray the oil. The air can be taken from any Westinghouse receiver or pump. In using the apparatus, the bed of coal is first placed on the grate, and then the jet spray is ignited and directed on to the coal, being moved over the surface until the whole is ignited, which usually requires about fifteen minutes.