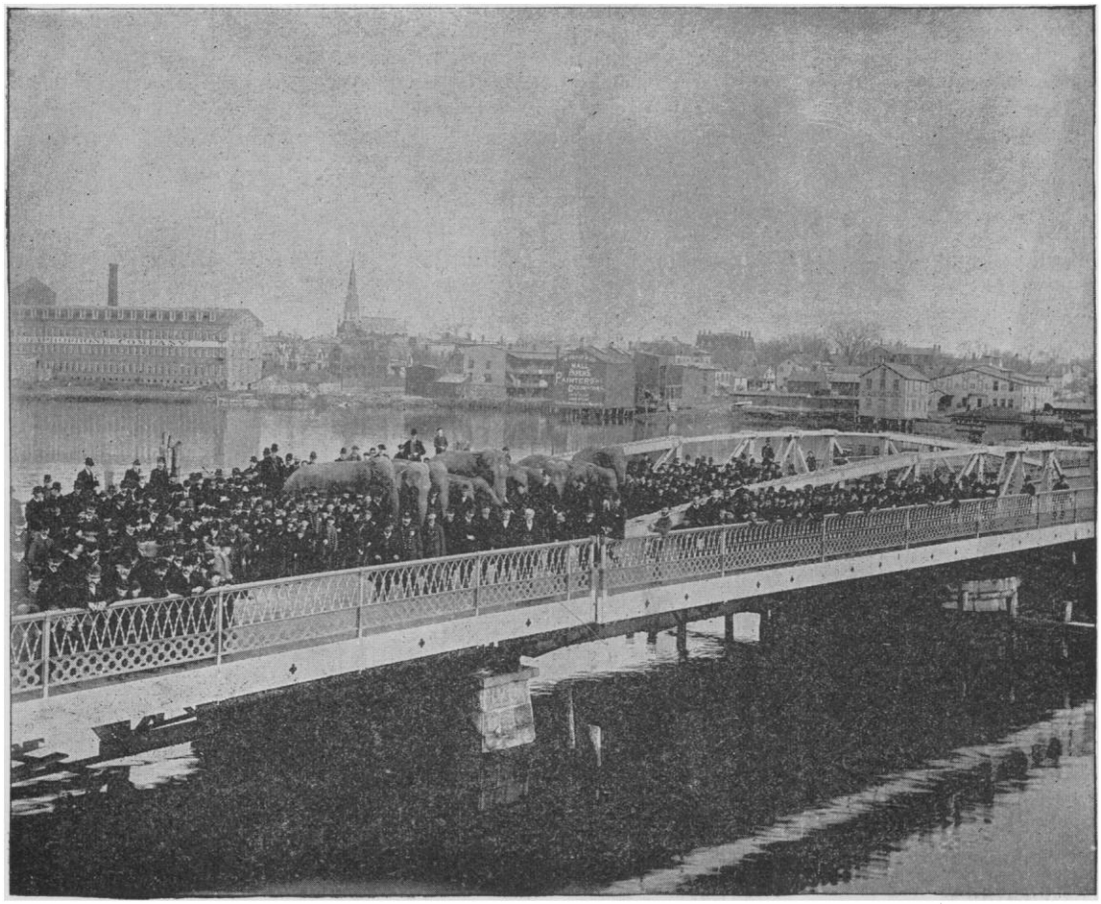
CONGRESS OF ELECTRICIANS AT THE PARIS EXHIBITION.

BY a ministerial decree dated July 16 last, it was decided to hold an international congress of electricians at Paris during the exhibition. All the arrangements are now completed, and the congress will open on Aug. 24, and remain open eight days. The following, relative to this congress, has been issued to those likely to be interested in its work : " The International Congress of Electricians, which met at Paris in 1881, marks an important date in the history of electricity. The consecration of practical unities has had on the development of science and industry an influence the significance of which cannot be exaggerated. The extreme rapidity and facility with which the decisions of the congress were accepted, in the study and in the laboratory, demonstrate their utility. The International Exhibition of 1889 offers a natural occasion of continuing and completing the work of 1881 ; not that the new congress may have to treat of problems of so general and elevated an order, but many questions still remain on which an understanding, or at least an exchange of views, is desirable. In the programme which it has prepared, the organizing committee has not been pretentious enough to indicate them all, and still less to impose limits to the field of activity of the congress : it has simply wished to call attention to those which appeared to it of more general and more immediate interest. We believe we respond to the unanimous feeling of electricians in placing the following questions foremost : practical measure of electrical energy in all its forms ; measure of the current in absolute value with standard of easy reproduction ; electricity meters for continuous and alternating currents ; practical evaluation of the lighting ; definition of the constant quantities of a machine from a commercial point of view ; etc. We hope that the *savants* and manufacturers who have contributed to the progress and application of electricity will readily respond to our appeal, and contribute to give this meeting the importance and authority of that which preceded it."

AN ELECTRIC DRAWBRIDGE.

ONE of the latest applications of the electric motor which has excited much interest, not only from its novelty, but also the excellence of its operation, is that of the turning of drawbridges. This is a matter to which a good deal of attention has been given both by bridge and electrical men ; but it is not until recently that the motor for this purpose has supplanted steam, and the slow, laborious method of the long lever worked by three men.

One installation, the details of which are shown in the accompanying cuts, has recently been made at Bridgeport, Conn., by the New England Electric Supply Company. The drawbridge, which is 180 feet long, 60 feet wide, and weighs 320 tons, was formerly operated by three men ; but this method was found to be open to serious objections, and attended by considerable expense, as it necessitated the constant attendance of the men, and, under the most favorable circumstances, it took six minutes to open and close the draw, which caused a jam on both sides, and seriously interfered with the traffic.



ELECTRIC DRAWBRIDGE AT BRIDGEPORT, CONN.

The problem of applying electricity as a motive power has been successfully worked out to the satisfaction of both the city officials and the bridge-builders. The draw can be opened and closed in two minutes, and the expense is limited to the hiring of one man and the monthly charge of the Electric Light Company, by which a considerable saving is effected. The details of the construction are as follows : —

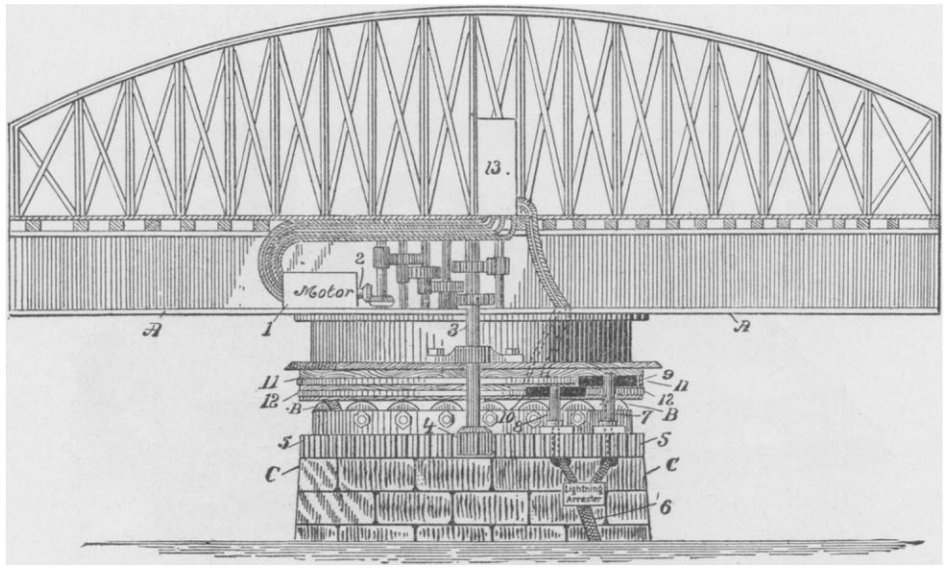
The current is conducted to the motor through two submarine cables, the core being equal to No. 4 B. & S. copper wire, which are protected from lightning by two Thomson-Houston lightning-arresters. The shore ends are connected to the incandescent-lighting current of the Bridgeport Electric Light Company by a double-pole switch, so that the current may be shut off at the pleasure of the draw-tender. The other ends are connected to vertical stationary posts, which are carefully insulated from the

structure, and which carry on their upper ends a pair of brushes which are in contact with two insulated copper bands attached to the circular support of the draw, and moving with it.

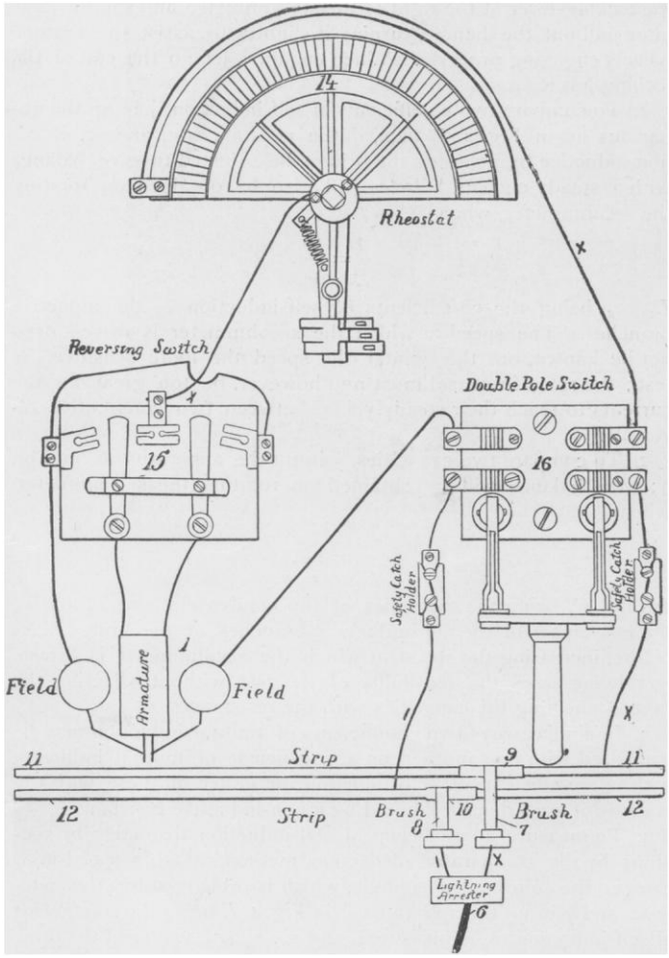
A rheostat is used to regulate the speed of the motor, and a reversing-switch to change the direction of rotation of the armature. The armature, rheostat, and fields are connected in series.

The double switch, fuses, reversing-switch, and rheostat are enclosed in a water-tight box in the framework of the bridge, and are easily accessible from the road-bed. The bridge-tender has every thing under complete control, and can easily regulate the speed and the direction of rotation of the drawbridge.

The motive power is furnished by a 7½-horse-power Thomson-Houston motor, securely fastened to the draw by iron braces. One end of the motor-shaft is a pinion, which drives a train of gears, the last of which turns the shaft formerly operated by the men.



ELECTRIC DRAWBRIDGE ELEVATION.



ELECTRIC DRAWBRIDGE PLAN.

This installation is complete in every detail. Its operation is excellent, and reflects much credit upon the Thomson-Houston apparatus. The New England Electric Supply Company has received much praise from mechanical and electrical engineers for the excellent work they have done here, and has applied for patents on the devices used, and is in communication with several cities contemplating installations of the same nature.

A NEW FORM OF SECOHMMETER.

AT a recent conversazione of the Salters Company in London, a new direct-reading secohmmeter of Professors Ayrton and Perry was shown. This has been designed as a cheaper form than the older instrument, and is intended to be used in comparison of the co-efficients of self and mutual induction. The apparatus, with the cover removed, is shown in the accompanying illustration, taken from the *London Electrician*.

In the earlier forms of the secohmmeter, only a make and break were successively made in the battery-circuit, and the circuit of a shunt to the galvanometer; but, by the use of the double commutator in the new form of secohmmeter, the sensibility of the arrangement is increased fourfold: for, if there be any want of balance in the co-efficients of self or mutual induction that are being compared with one another, or with the capacity of a condenser, the galvanometer receives an impulse in the same direction at every reversal of the battery, which impulse is twice as great, and occurs twice as often, as if the galvanometer-needle received an impulse either only at the making or at the breaking of the battery-circuit, as in the earlier forms of secohmmeter. The fly-wheels make 10 revolutions for every revolution of the handle; and although, by the simple alteration of the gearing previously referred to, the commutators can be driven at will, so as to make either two reversals or eight reversals for every revolution of the handle, the ratio of the speed of the fly-wheel to the speed of the driving-handle always remains the same, so that the fly-wheel action remains constant. The driving-handle can be conveniently turned by hand at speeds varying from about 60 to 200 revolutions per minute, producing with one arrangement of the gearing 120 to 400 commutations per minute; so that both the battery and the galvanometer circuits