

FIG. 1.

The first step on entering upon this experimental career was to verify, fundamentally and completely, the various bases upon which rests the theory proclaimed at the Congress, explained, afterwards, before the Academy, and produced before the public in *La Lumière Electrique*.

The details already given embody the most striking results of these experiments. As may be supposed, these are merely instances selected from a great many others. Especially as regards the characteristic curves, it was established by means of machines as numerous and as different as possible. Thus a very complete knowledge of the various types are acquired; the instruction collected was very precious for future improvements, and for preparing designs of machines which may be constructed hereafter.

In the meantime, everything was being prepared for experiments on transmission to a great distance. It will be remembered that one of the first theoretic researches of M. Deprez (*La Lumière Electrique*, Aug. 24th, 1881) consisted in showing that with existing types of machines we might, by the aid of a transformation mathematically calculable, succeed in effecting a transfer to a great distance. The calculations were based on experiments made by English Engineers at Chatham with electric light machines. The data furnished by these experiments were very vague, as they had not been undertaken for the object aimed at by M. Deprez. The first experiments, however, carried out in the laboratory permitted them to be completed, and a transformation could be undertaken conformably to theory, and which must effect the purpose aimed at.

The utility of this experiment may be conceived. Of course, it cannot completely answer the conditions to be fulfilled, and can yield result only with difficulties, in a troublesome manner, and liable to accidents. In order to succeed fully it was necessary to construct new machines. This fact was not overlooked, but this construction presupposed long studies. It was necessary to examine separately the influence of each part. Then, when the type was determined, time was still needful to effect any required correction. The use of these machines allowed of rapid experiments at a moderate cost, and had the immense advantage of placing the principle beyond doubt, of replying to objections, and of securing the future by establishing a firm point of departure.

The machines selected for conversion were two Gramme machines of the workshop model. They were fitted with new coils of finer wire, were modified in several of their parts, and were finally used in the experiments. On February 13th, 1882, M. Marcel Deprez was able to announce to the Academy that he had succeeded in transmitting 27 kilogrammetres against an artificial resistance of 786 ohms, representing a

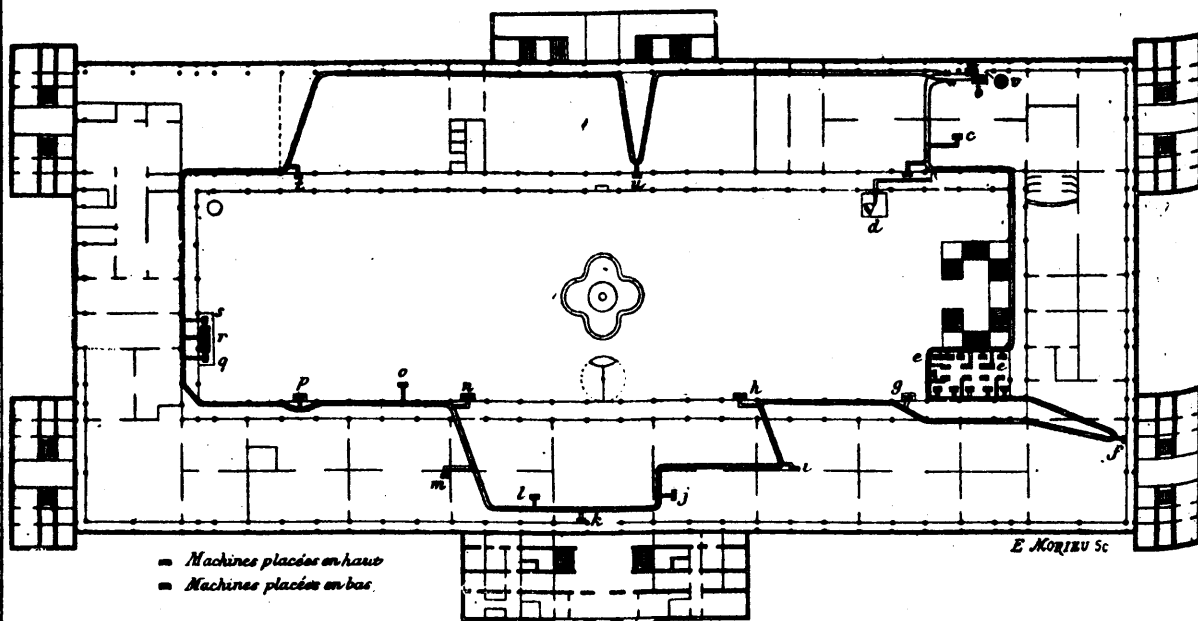


FIG. 2.—PLAN OF MARCEL DEPREZ'S SYSTEM OF DISTRIBUTION, PARIS EXHIBITION, 1881.