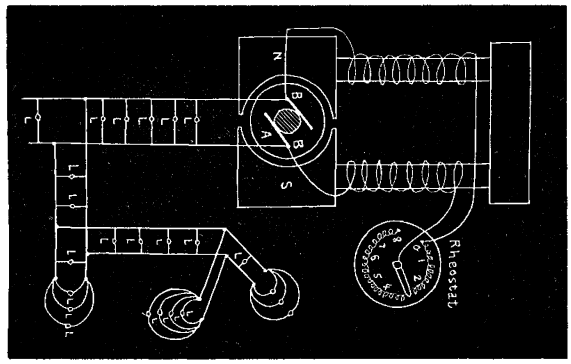

FIG. 6.—Mounting of the Edison machine.

the lights with alternate currents produce a peculiar humming owing to the nature of the currents which traverse them; this humming is often sufficient to forbid their use in places where it is necessary to have comparative silence.

The ensemble of a system of lighting by dynamo-electric machines, with alternative currents always includes two distinct machines: a machine with continuous currents or *generator*, and a machine with alternate currents, or *distributor*. This distributor consists of a variable number of circuits. Figure 8, simplified to show the

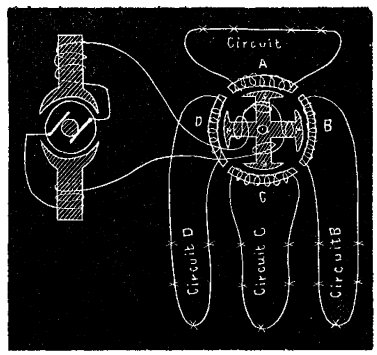

FIG. 8.—Mounting of a machine with alternate currents for candles.

principle, represents the mounting of a Gramme machine with alternative currents, supplying twenty Jablochkoff candles, arranged on four circuits of five candles each. The *movable* inductor bears eight poles, the successive ones with contrary names, in place of four. The generator can be of any system, whatever; it is only necessary to have a continuous current.

The power is regulated by the reciprocal velocities of the generator and the distributor. Sometimes the two machines mounted on the same axis turn with the same velocity, forming in reality but one. These machines are *self-generators*. In this case, we can no longer regulate the generator by its velocity, since this velocity is conjointly acting with the distributor; the regulating is then effected by the resistances introduced in the generating circuit. We have supposed the inducted bobbins *fixed* and the inductors *movable*. It is the case with the Lontin, Gramme, and Lambotte-Lachaussée machines. At other times, as in the Wilde and Siemens machines with alternate currents, the inducted bobbin is movable and the inductors fixed, but nothing is changed for this in the general principle. We see from these several examples that the art of the engineer allied with the science of the experimentalist, offers some resources to convert mechanical energy into electric energy and then to distribute it to the lights which utilize it.

MICROSCOPISTS.

The first meeting of the State Microscopical Society of Illinois, for the present season was held at the rooms of the Society, in the Academy of Sciences, Friday evening October 14, the President, Dr. Lester Curtis in the chair.

After the transaction of routine business, Mr. Stuart described the microscopical structure of some vegetable drugs. The subject is not suitable for abstraction, and requires illustrations to be useful.

His paper was followed by one by Dr. Curtis, describing a new stand made for him by Bulloch. This stand presented some novel features, among the most striking was a mechanical stage of extreme thinness, admitting light at an angle of 160°. The movements were effected by a double pinion above the stage, an arrangement pronounced by those familiar with the operation of the contrivance, as exceedingly useful and convenient.

The stand excited considerable interest, as did also a right angled camera lucida of German manufacture which was adapted to it, the superiority of which over the ordinary form was so marked as to be unmistakable on trying it, even under the disadvantages of a crowded room and constant jar. After a discussion of the papers, the meeting adjourned. E. B. STUART.

Secretary pro tem.

PERMANGANATE OF POTASH USED AS AN ANTIDOTE TO THE POISON OF SERPENTS.

Very interesting experiments have been made in Brazil, by M. de Lacerda, which have established the fact that permanganate of potash is one of the most energetic antidotes to the venom of snakes. M. de Lacerda has addressed a memorial of his important works to the Academy of Sciences (meeting of the 12th of September, 1881).

The result of these researches is really astonishing; thus in a series of experiments, frequently renewed, of injecting the active venom of *boshrops*, diluted with distilled water, in the cellular tissues, or the veins of dogs, M. de Lacerda found that the permanganate of potash was able *to stop completely the manifestation of local injuries from the venom.* Yet the same poison, which had served for these experiments, being injected without antidote into other dogs, always produced great local tumefactions, with loss of substance and destruction of tissue.

These very remarkable results have been stated on various occasions, not only by the Emperor of Brazil, who assisted at these experiments, but also by physicians, professors of faculties, and members of the diplomatic corps.

MEANS OF DETECTING THE SOPHISTICATIONS OF OLIVE OIL WITH OTHER OILS.—The oils employed at Marseille for the adulteration of olive oil are the oils of colza, sesame, cotton, and earth-nuts, Colza oil is detected by means of the sulphur which it contains; 10 grms. of the sample are saponified in a glass capsule with an alcoholic solution of caustic alkali free from sulphides. The mixture is stirred with a silver spoon, and if this is blackened, colza, or at least some cruciferous, oil is present. For the detection of the oil of sesame a little sugar is added to hydrochloric acid at 30° (Baume?) which is then mixed with an equal bulk of the oil in question. The mixture is well shaken up, and the least traces of oil of sesame are indicated by a red coloration. For the detection ot cotton-seed oil there is added to the sample an equal volume of nitric acid at 40°. On stirring the mixture takes a coffee color. The detection of oil of earth-nuts is less simple. The sample is saponified with an alcoholic solution of potash, the soap separated as completely as possible, heated to expel the alcohol, and treated with enough hydrochloric acid to neutralize the alkali. The supernatant fatty acid—arachidic acid—is collected and dissolved in boiling alcohol, from which it separates in a characteristic white nacreous form.