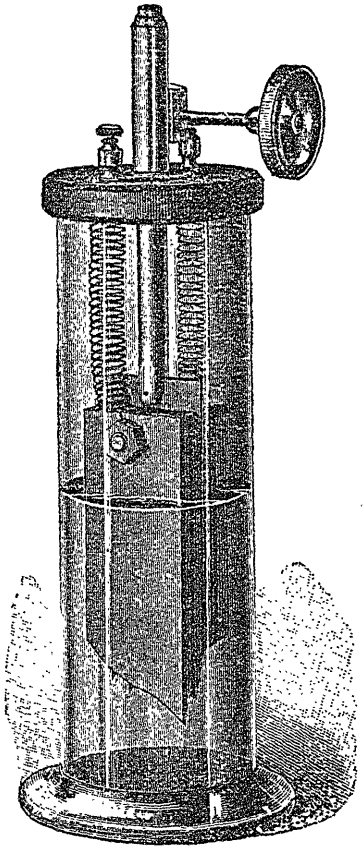
the consulting room. From this battery of 60 cells a cable containing 61 wires was conducted to a very complicated and formidable-looking switch-board erected at one side of the room. On this switch-board was a double commutator, so arranged that, to those initiated into the mysteries of certain plugs and switches, either one cell or any number of cells up to 60 might



THE BAILEY RHEOSTAT OR CURRENT REGULATOR.

This new rheostat supplants the commutator or switch-board. It imposes equal work upon all the cells of the battery.

be brought into the circuit as desired. Now, by the use of the rheostat and the milli-ampère meter all this paraphernalia may be dispensed with, when only two wires from the battery will be required, the one being connected with the positive and the other with the negative pole of said battery,—the strength of the current being regulated wholly by the rheostat, that is, by interposing an artificial resistance into the circuit, which may be increased or diminished at pleasure. The new rheostat which is here exhibited, was devised by Mr. H. L. Bailey, an American electrician. Two large wedge-shaped plates of carbon are insulated from each other, and made to dip into a tall glass jar containing water. To each of the inferior pointed ends of carbon is attached a pyramidal-shaped piece of sponge. When immersing the sponges, or when withdrawing them, a very small column of water with very high resistance connects the two carbon plates through the water into which the sponges dip. When the plates are fully immersed, there is no artificial resistance or obstruction to the flow of the current, but when the plates are withdrawn from the water the resistance is so great that we may say that practically no current flows through the circuit.* By this ingenious arrangement any desired resistance from zero to infinity (or a few ohms to millions of ohms) may be gradually interposed or removed from the circuit at pleasure. This is a feature attained by no other instrument. The rheostats now in use do not interpose a resistance of more than about 500 ohms, which is much less than the resistance of the body; hence, when these instruments are used, a commutator is also used to prevent a shock to the nervous system when the current is applied or removed.

3. In the means and methods of applying the electric current, improvement has been made in two directions: firstly, by increasing the size of the electrodes; and, secondly, by making the electrodes so that they may be more accurately adapted to the surface. For instance, in applying the galvanic current to the head, instead of using an electrode only one or two inches in diameter, a concave electrode is used large enough to cover the whole of the upper part of the head, while the other electrode, called the "indifferent electrode," also large, is placed either on the sternum or on the spine. By this means, strong currents can be applied with greater safety and less discomfort than formerly. Again, in passing strong currents through the uterus, as for intance in the Apostoli-treatment of fibroids, the abdominal or indifferent elect-

* The resistance of the body varies from 1,000 ohms to 5,000 ohms according to the moisture of the skin and the part of the body operated upon.