SCIENCE

[Entered at the Post-Office of New York, N.Y., as Second-Class Matter.]

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

SEVENTH YEAR.
VOL. XIV. No. 342.

NEW YORK, AUGUST 23, 1889

SINGLE COPIES, TEN CENTS.
$3.50 PER YEAR, IN ADVANCE.

ARON'S ELECTRIC METER.

AN electric current meter which is attracting much attention in this country, where it has been introduced but recently, is shown in the accompanying illustrations. It is the invention of Professor H. Aron of Berlin, who claims for it that it surpasses all similar devices in point of reliability. It received a gold medal at the Melbourne Exhibition, and has been adopted, in preference to other meters, by the Siemens & Halske and Edison electric lighting companies of Berlin, and by the Berlin municipal electric lighting works. It is also used in Paris, Vienna, Constantinople, and other cities, where it has proved itself valuable for central station work.

The Aron electric meter is made to measure both direct and alternating currents, and from three-wire to nine-wire systems, from fifteen to twelve hundred ampères, and from a hundred up to any

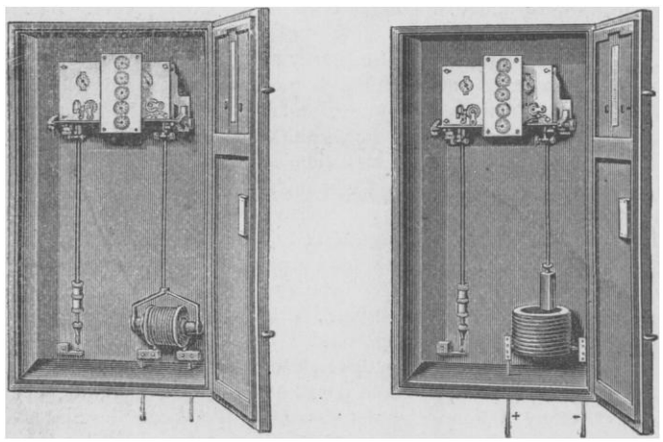

FIG. 1 AND 2.—ARON ELECTRIC METER.

desired number of volts. The action of the meter is based upon magnetic attraction. The mechanism consists of two sets of clock-work of ordinary construction, the pendulums of which swing synchronously while no current is passing through the meter. The left-hand pendulum is of the usual construction. The other varies according to the current to be measured. The measuring pendulum shown in Fig. 1, which is an alternating-current meter, carries a fork-shaped piece of brass fitted with a coil of fine wire, which swings freely through the interior of a fixed coil of large wire. The main current passes through the outer coil, the interior coil being in a shunt-circuit. The mutual action of the two coils upon each other effects a variation in the time of oscillation of the right-hand pendulum proportional to the product of the electric tension and the quantity of the current; hence the measuring pendulum swings faster the greater the tension and quantity of current passing through the meter. While the pendulums swing in unison, the dial train is idle, but when the current is passing, the dial-train registers the difference in the pendulum oscillations, the latter being greater or less according to the tension and quantity of the current.

In the direct-current meter, the right-hand pendulum carries as a weight a permanent steel magnet, which swings over a coil of copper wire, through which the current passes. As in the other meter, the pendulums swing in unison until the current begins to pass through the coil, when the measuring pendulum swings faster, its rate of swing being governed by the amount of current.

The measuring-pendulum of the meter for the three-wire system carries two permanent magnets attached to a cross-piece of brass,

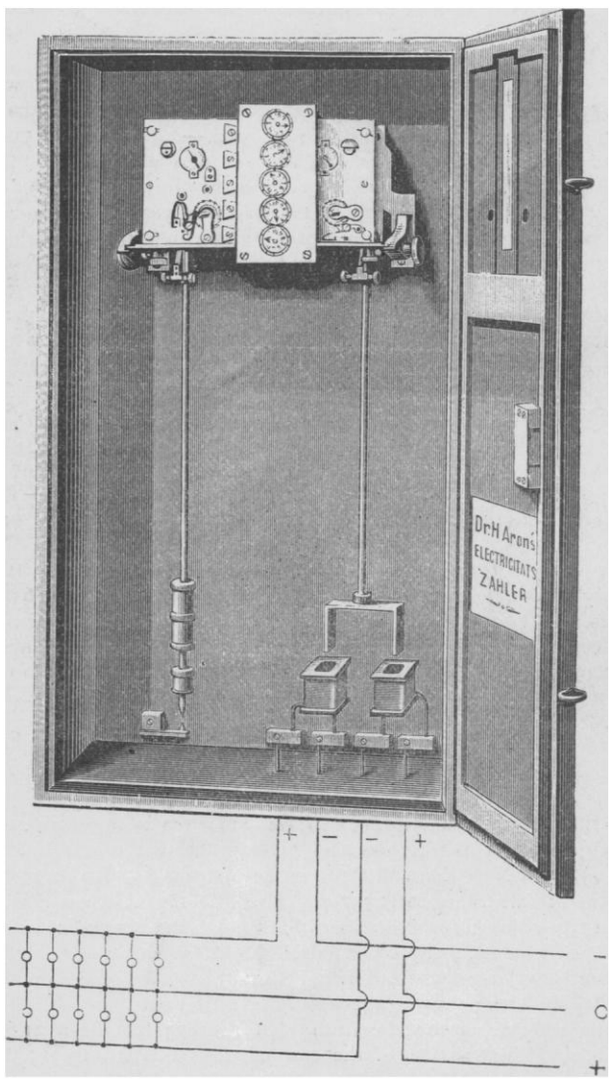

FIG. 3.—ARON ELECTRIC METER.

(For three-wire system.)

each magnet swinging immediately above a coil of wire through which the current passes, the main wires being connected to the coils as shown in the diagram at the bottom of Fig. 3. The meters for five, seven, and nine-wire systems differ only in the fact that they are provided with a greater number of permanent magnets on the pendulum and a corresponding number of coils.