ELECTRICAL INFLUENCE MACHINES.

A FULL ACCOUNT OF THEIR HISTORICAL DEVELOPMENT,

AND MODERN FORMS, WITH INSTRUCTIONS

FOR MAKING THEM.

BY

JOHN GRAY, B.Sc.

ASSOCIATE OF THE ROYAL SCHOOL OF MINES; ASSOC. INST. ELECTRICAL ENGINEERS; MEM. PHYSICAL SOCIETY.

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WHITTAKER AND CO., 2, WHITE HART STREET,

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causing them to adhere; and as a consequence of this suggestion an attempt has been made to condense the fumes produced in the manufacture of lead. The attempt, however, has not as yet proved a practical success.

Another application, which has been more successful, is to the lighting of gas jets. Clarke has invented an instrument for gas-lighting, in which short electric sparks are produced by an influence machine inclosed in the

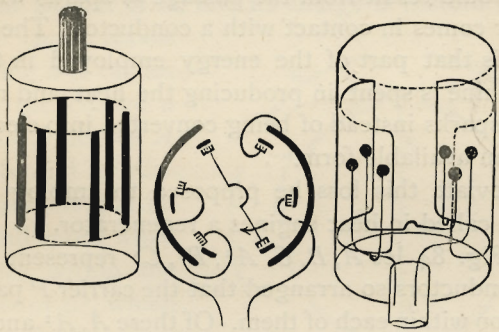

FIG. 83. CLARKE'S GAS LIGHTER MACHINE.

handle of the apparatus. The type of influence machine which he usually employs is a combination of the Thomson's replenisher and Voss machine. There are, Fig. 83, two field plates of tinfoil shaped as in the ordinary Thomson replenisher. Between the field plates is a rotating ebonite cylinder, having eight pieces of metal foil fixed on it to serve as carriers. A pair of neutralizing brushes are fixed to a cross conductor; a pair of replenishing brushes are connected to the field plates; and, lastly, a pair of collecting brushes are con-

nected to the wires, which lead up through the stem of the instrument to the sparking points.

Clerk Maxwell's Machine.—We shall conclude our account of modern influence machines by a description of a machine of very great theoretical interest, invented by the late Clerk Maxwell.

Maxwell pointed out that a great loss of efficiency, even though loss by leakage were to be entirely eliminated, would result from the passage of sparks whenever a carrier comes in contact with a conductor. The reason of this is that part of the energy employed in turning the machine is spent in producing the heat and noise of electric sparks instead of being converted into electrification in an available form.

To obviate this loss he proposed to employ a contrivance called in heat engines a regenerator.

"In Fig. 84 let A, B, C, A^1, B^1, C^1 represent hollow fixed conductors so arranged that the carrier P passes in succession within each of them. Of these A, A^1 and B, B^1 nearly surround the carrier when it is at the middle point of its passage, but C, C^1 do not cover it so much.

We shall suppose A, B, C to be connected with a Leyden jar of great capacity at potential V, and A^1, B^1, C^1 to be connected with another jar at potential $-V^1$.

P is one of the carriers moving in a circle from A to C^1, etc., and touching in its course certain springs, of which a and a^1 are connected with A and A^1 respectively, and e and e^1 are connected with the earth.

Let us suppose that when the carrier P is in the