(No Model.)

K. W. HEDGES.

ELECTRIC LIGHTING.

No. 284,420. Patented Sept. 4, 1883.

Fig. 1.

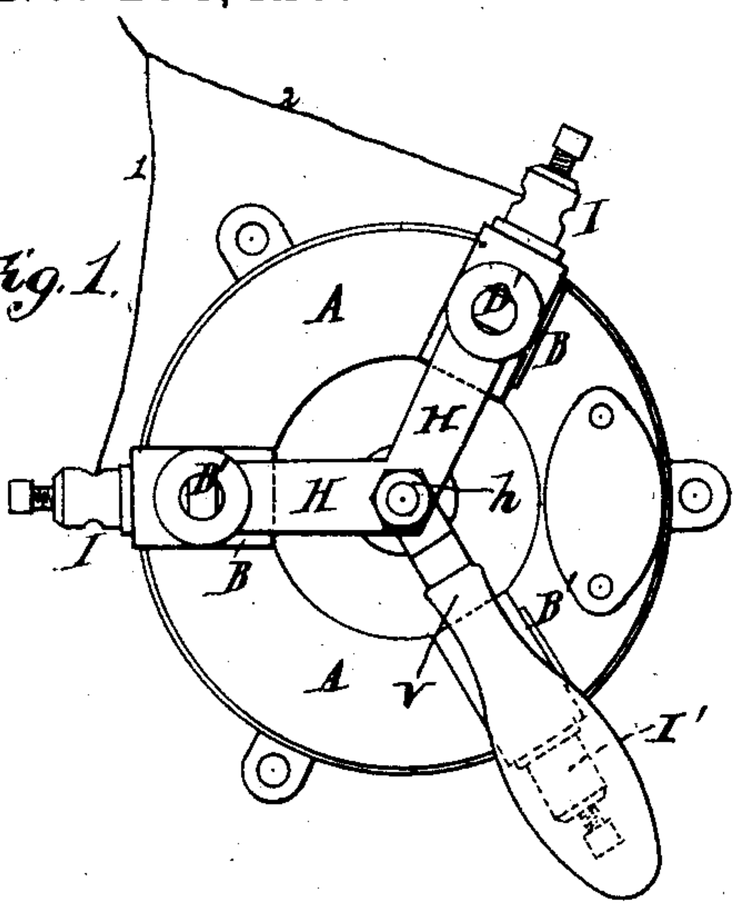


Fig. 2.

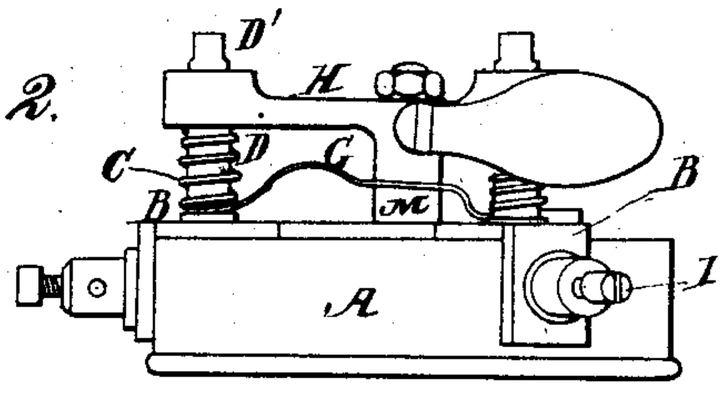


Fig. 3.

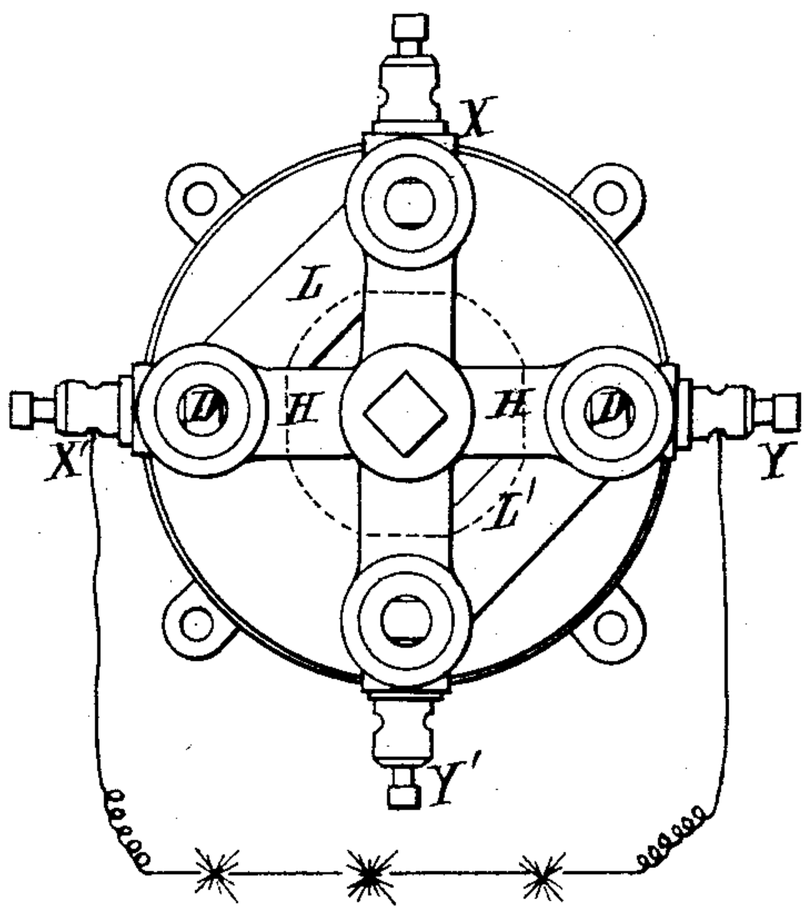


Fig. 6.

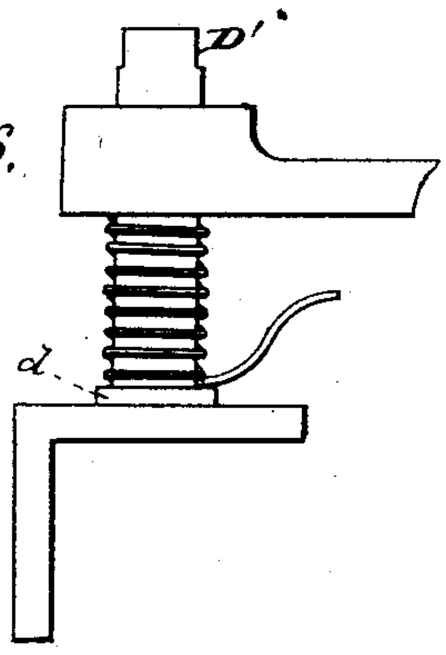


Fig. 5.

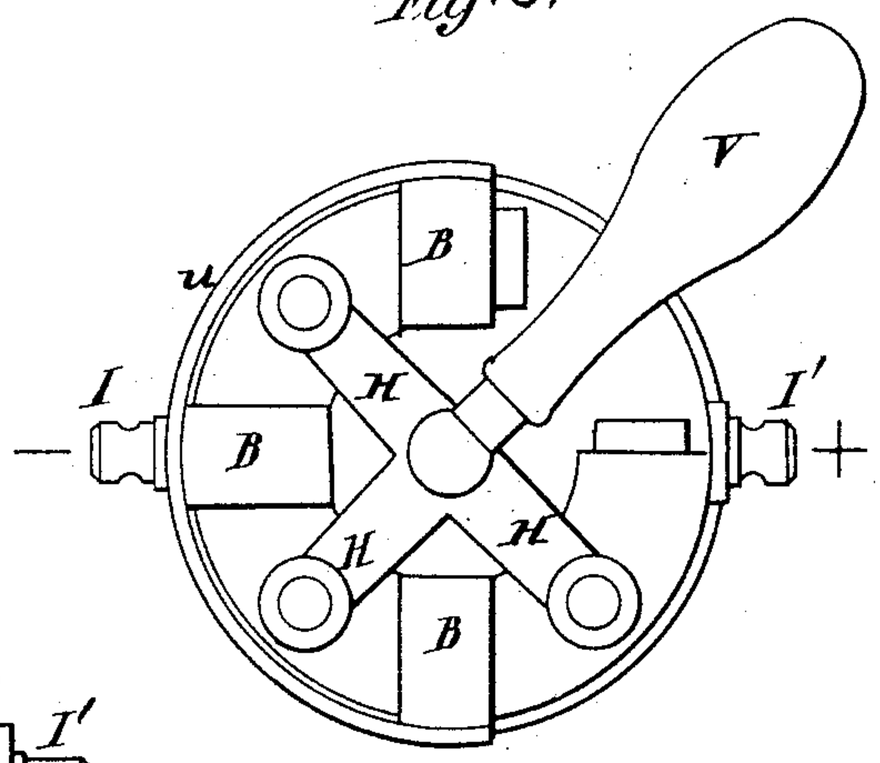
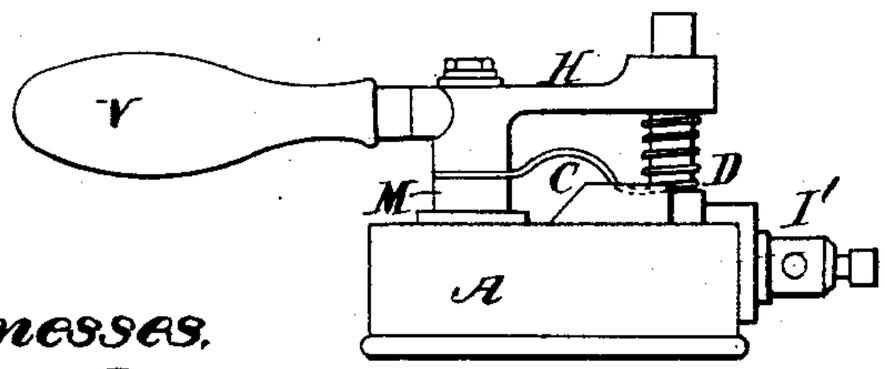


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

KILLINGWORTH W. HEDGES, OF WESTMINSTER, COUNTY OF MIDDLESEX, ENGLAND.

ELECTRIC LIGHTING.

SPECIFICATION forming part of Letters Patent No. 284,420, dated September 4, 1883.

Application filed May 22, 1882. (No model.) Patented in England August 3, 1881, No. 3,369.

To all whom it may concern:

Be it known that I, KILLINGWORTH WILLIAM HEDGES, a subject of the Queen of Great Britain, residing at 25 Queen Anne's Gate, Westminster, in the county of Middlesex, England, have made certain Improvements in Electrical Switches or Contact-Breakers, (for which I obtained a patent in Great Britain, dated August 3, 1881, and numbered 3,369;) and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

The ordinary contacts or switches heretofore used have proved defective with the electric currents used for many purposes—for instance, electric lighting, electric motors, &c. Such currents are usually of large quantity and high electro-motive force, causing large sparking at the points of contact, resulting in oxidation and abrasion thereof and increasing the resistance in the circuit, causing comparatively rapid destruction of the contacts. To remedy these evils I make my switch with relatively large contacts, the contact being so mounted in the lever-arm as to be capable of rotation therein, so that fresh or new points may be exposed or turned to the place of first or last contacts in making or breaking circuit, respectively. This rotatable contact is subjected to the stress of a spring to keep it firmly to its seat and insure good contact, and to lessen the resistance which normally would be due to the joints or fulcrums in the switch mechanism. A spring-connector unites it electrically to the switch-lever. In order to lessen the amount of spark, I may attach several such spring-seated rotatable contacts to one lever, so as to simultaneously make or break the circuit at several points. By using four, electrically united in pairs, the pairs being insulated from each other, I am enabled to utilize the same principle in a reverser. The base upon which the switch mechanism is mounted should be of some very hard but good insulating material—say vulcanized fiber or compressed asbestus—whose general surface should be on a plane with the anvils or blocks on which the rotatable contacts take. These features are illustrated in the drawings, in which—

Figure 1 is a plan, and Fig. 2 a side view, of a duplex switch; Fig. 3, a plan view of a reverser; Fig. 4, a side view of a single switch; Fig. 5, a plan view of a triplex switch. Fig. 6 is an enlarged view of a rotatable contact.

In Figs. 1 and 2, A is the base of some hard insulating material—say vulcanized fiber—in which are embedded the blocks or anvils B B B′, binding-posts I I being attached to B B and I′ to B′. Upon the center of A is a post or base M, to which is secured by bolt *h* the lever-switch V, forking or dividing at *h* into the two arms H H, electrically connected. In the end of each arm H is a loose contact, D, (more clearly shown in Fig. 6,) its lower end being a smooth plane and having a small shoulder or lug, *d*, against which takes one end of a spring, C, coiled around D, its other end taking against the under side of the arm H, the resilience of the spring tending to force D downwardly, and to cause it to make good contact with the block or anvil B when slid thereon. The upper end of D passes up through H, and is so fashioned at D′ that force may be applied thereto to rotate D in its seat in H.

As the pivot or fulcrum *h* and the space necessary for D to rotate in H do not always give the best electrical connections, I use an additional spring-connector, G, one end of which is fixed to D and the other end to the base M, on which H turns. This is clearly shown in Figs. 2 and 4. If desired, the spring G may be placed so as to bear on the top of D and aid by its resilience in securing good contact between D and B.

From I′ electrical connection is made through the base A to the base M, on which H rotates, from which electrical connection is made by the spring-connectors G to each D in the arms H H. I I are connected to the same branch of the circuit, as shown in Fig. 1, by the branches 1 2 from the wire 3. Supposing, now, the current enters at I′, it passes, *via* M C D, to I I; thence by 1 2 to 3, to the point of consumption; but if V be moved so that D D are slid off from B onto A, the circuit is broken simultaneously at two points. Fig. 5 embodies the same general features of construction, except that the circuit is broken or made at three points, B B B, the lever V having three arms, H. In this case, however, the three blocks or anvils B B B are electrically united by a band, *u*, connected to the binding-post I, while I′ is

connected to the center of V, as in the other instance. As the most of whatever spark may occur will be at the edge of D nearest B on making or breaking contact, the erosion and wear will be there. By this provision of rotatability, as the edge becomes eroded in one spot, a fresh or uneroded edge may be presented to B by turning D in its seat, which may be done by applying a key to D′, or by any other means for its rotation may be used. In fact, I propose to apply automatic means therefor, so as to turn D at regular intervals, for which subsequent application for patent will be made. In Fig. 3 the same principles of construction are applied to a reverser. In this case there are four arms H, divided into two pairs, the individuals of each pair being electrically connected by L in one case and L′ in the other, the two pairs being insulated from each other. The wires from the source of electricity enter at the binding-posts X′ Y′, while from X Y they lead to points of consumption. Supposing the positive enters at X′, the path of the current is X′ L D X Y L′ Y′. If, however, the switch be turned one-fourth to the right, its path would be X′ L Y X L′ Y′, reversing its path through the consumption-circuit between X and Y.

Having thus described my invention, what I claim is—

1. In an electrical switch, the combination of a lever-arm, a loose rotatable contact-piece carried thereby, and a spring acting on the contact-piece to insure contact between it and its anvil, substantially as described.

2. In an electrical switch, the combination of a lever-arm, a rotatable contact-piece carried thereby, a spring acting on the contact-piece, and a metallic connector between the point of the lever-arm and the contact-piece, substantially as described.

3. In an electrical switch, the combination of a rotating lever-handle, two or more branches therefrom, a loose rotatable contact-piece in each branch, blocks or anvils below the contact-pieces, springs acting on the contact-pieces to insure contact between them and the anvils, and a metallic connection between the lever and each point, substantially as and for the purpose set forth.

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