No. 620,839. Patented Mar. 7, 1899.

W. B. BERNARDINI & W. ELY.

ELECTRIC SWITCH.

(Application filed Aug. 11, 1896. Renewed Oct. 6, 1898.)

(No Model.)

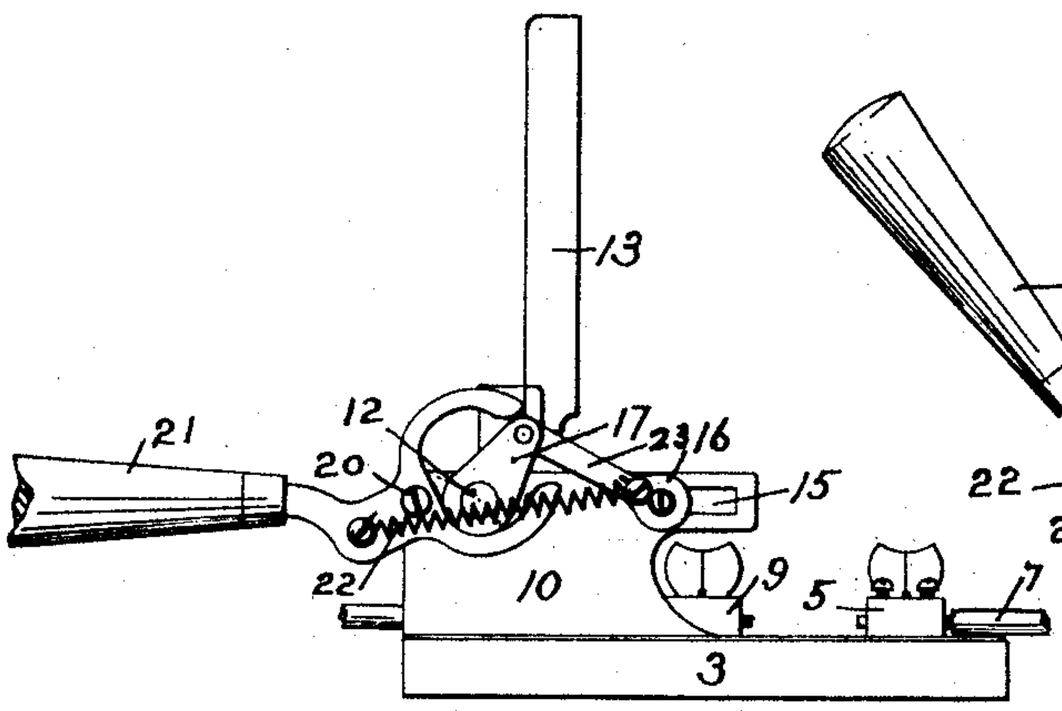

FIG. 1.

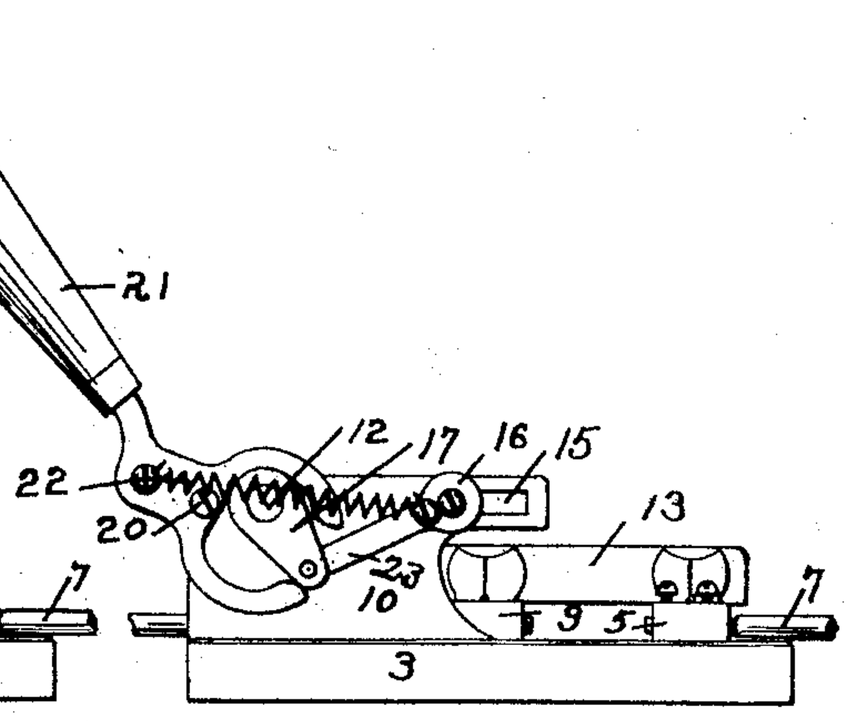

FIG. 2.

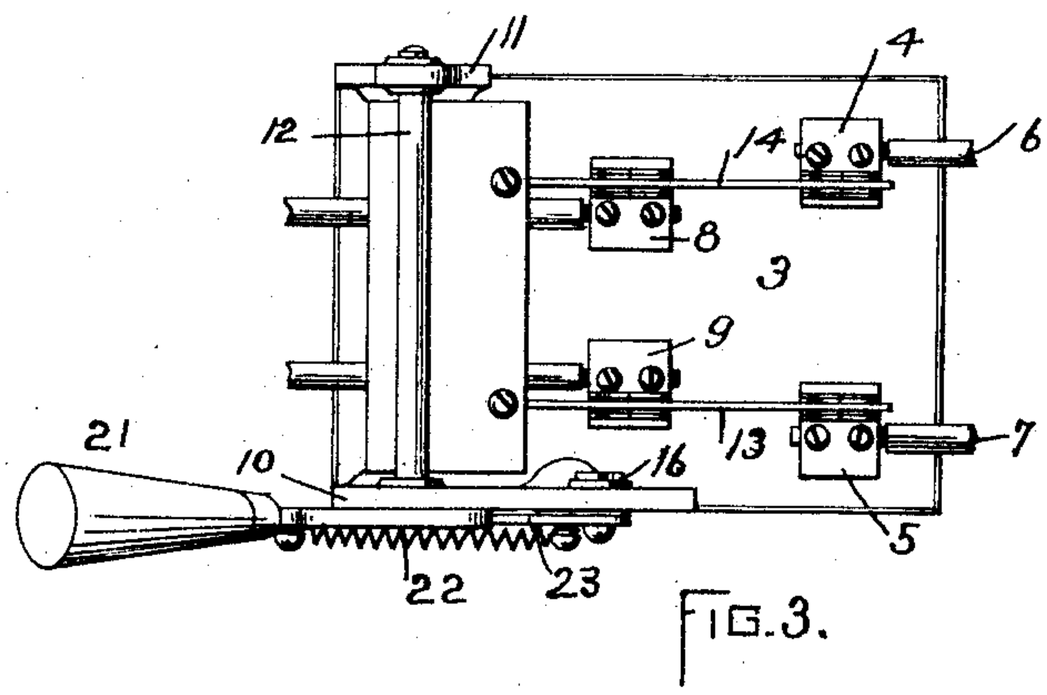

FIG. 3.

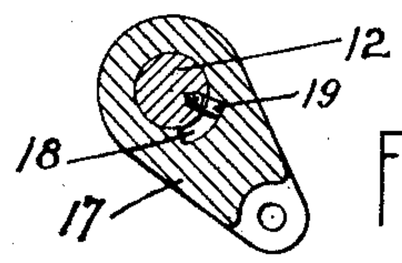

FIG. 4.

WITNESSES:
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UNITED STATES PATENT OFFICE.

WALTER B. BERNARDINI, OF LAKEWOOD, AND WILLIAM ELY, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS TO THE HOPE ELECTRIC APPLIANCE COMPANY, OF PROVIDENCE, RHODE ISLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 620,839, dated March 7, 1899.

Application filed August 11, 1896. Renewed October 6, 1898. Serial No. 692,862. (No model.)

To all whom it may concern:

Be it known that we, WALTER B. BERNARDINI, residing in Lakewood, in the county of Kent, and WILLIAM ELY, residing in the city and county of Providence, State of Rhode Island, citizens of the United States, have invented a new and useful Electric Switch, of which the following is a specification.

Our invention relates to electric switches in which pivoted knives or arms connecting the contact-posts in pairs or series are actuated to make or break the circuit with sudden positiveness, and thereby prevent short-circuiting or the formation of an arc between said knives or arms and the contact-posts.

Our invention consists in the novel construction and arrangement of the knife-actuating mechanism.

In the accompanying drawings, Figure 1 is a side elevation of an electric switch, showing the knives or arms disengaged from the contact-posts and the circuit broken. Fig. 2 is a similar view showing the knives or arms connecting the contact-posts to make the circuit. Fig. 3 is a top plan of the same. Fig. 4 is a sectional view showing the rotatable shaft and the actuating-arm loosely pivoted thereon.

Similar reference-numerals indicate like parts where they occur in the drawings.

3 represents the base, which is of non-conducting or insulating material. 4 and 5 are contact posts or brushes secured upon said base and connected to the main wires 6 and 7. 8 and 9 are other contact-posts arranged in line with the posts 4 and 5 and serving also as the binding-posts in which the service-wires are secured. In case multiple circuits are employed other contact-posts may be arranged in line with those above mentioned, thereby consituting a series of posts adapted to be connected at the same time by the pivoted arms or knives. Secured upon said base or forming, if desired, an integral part thereof are upright housings 10 and 11, in which a rotatable shaft 12 is journaled. Secured upon said shaft is a block of hard rubber or other suitable insulating material, to which are secured knives or arms 13 and 14. In one of said housings, as 10, we form a stationary guideway 15, in which a cross-head 16 reciprocates as the actuating mechanism is operated to make or break the circuit. Upon said shaft 12 (preferably near its outer end) and extending at right angles therefrom we loosely pivot an arm 17, provided with a recess, as at 18, for engagement with a projecting pin or lug 19 on the shaft 12. It is obvious that by this arrangement of the shaft and arm each is capable of partial rotation without reference to the movement of the other.

Upon the housing 10, as at 20, we pivot, independently of said shaft, an actuating-lever 21, adapted to engage with said arm to actuate the same and having a limited movement independently of said arm. An extensible spring 22 extends from said actuating-lever to said cross-head 16, connecting the two, and is extended as said cross-head is actuated in its guideway 15 by the action of said lever upon said arm 17. Said arm 17 and said cross-head 16 are connected by a link 23, pivoted to each.

In practical operation of our invention force applied to an actuating-lever 21 in either direction actuates the loose arm 17, and through it and the link 23 the cross-head 16 is caused to reciprocate in its way 15, thereby bringing the arm and link into central alinement with each other and distending said spring 22. The lever 21 then exerts further force upon said arm, carrying it by the center and overcoming the frictional resistance between the knives or arms and the contact-posts, when the tension of said spring acts to instantly withdraw the knives from the contact-posts, thereby preventing short-circuiting or the formation of an arc between said knives and posts. In closing the circuit the actuating-lever acts in a similar manner upon the loose arm and through it and the link upon the cross-head to bring the arm and link into central alinement with each other to distend said spring, and then further imparts positive motion to said arm to depress the same, thereby allowing said spring to contract and throw the knives into contact with the posts, thereby in-

suring an instantaneous positive connection between said knives and posts.

We claim as our invention and desire to secure by Letters Patent—

1. In an electric switch, a stationary guideway, a rotatable shaft, an arm extending at right angles from said shaft and pivoted thereon in such manner that each is capable of partial rotation without reference to the movement of the other, a cross-head adapted for reciprocating movement in said stationary guideway, a link pivoted to said arm and cross-head and connecting the two, an actuating-lever pivoted independently of said shaft and adapted for engagement with said arm, and an extensible spring connecting said lever and cross-head, all combined with each other and with a base.

2. In an electric switch, a rotatable shaft, one or more contact knives or arms carried by said shaft, an arm extending at right angles from said shaft and loosely pivoted thereon for limited independent movement, a link jointed to said arm, guiding means for the outer end of the link, the actuating-lever pivoted independently of said shaft and adapted to engage the loose arm with independent movement of both lever and arm, and the spring connecting the outer end of the link with the actuating-lever beyond the pivoting-point of the said lever, all combined with each other and with a support base or frame.

3. In an electric switch having contact-posts arranged in pairs or series, and knives or arms carried by a rotatable shaft for connecting said posts in pairs or series, and also having a stationary guideway, combined with said parts, an arm 17 pivoted upon said shaft and capable of partial rotation thereon without reference to the movement thereof, a cross-head 16 capable of reciprocating movement in said guideway, a link 23 pivoted to said arm and cross-head and connecting the two, an actuating-lever 21 pivoted independently of said shaft and arm, and adapted for engagement with said arm, and an extensible spring 22 connecting said lever and cross-head.

In testimony whereof we have hereunto set our hands, in presence of two witnesses, this 7th day of August, 1896.

WALTER B. BERNARDINI.
WILLIAM ELY.

Witnesses:
HENRY MARSH, Jr.,
EDWARD C. ALLEN.