

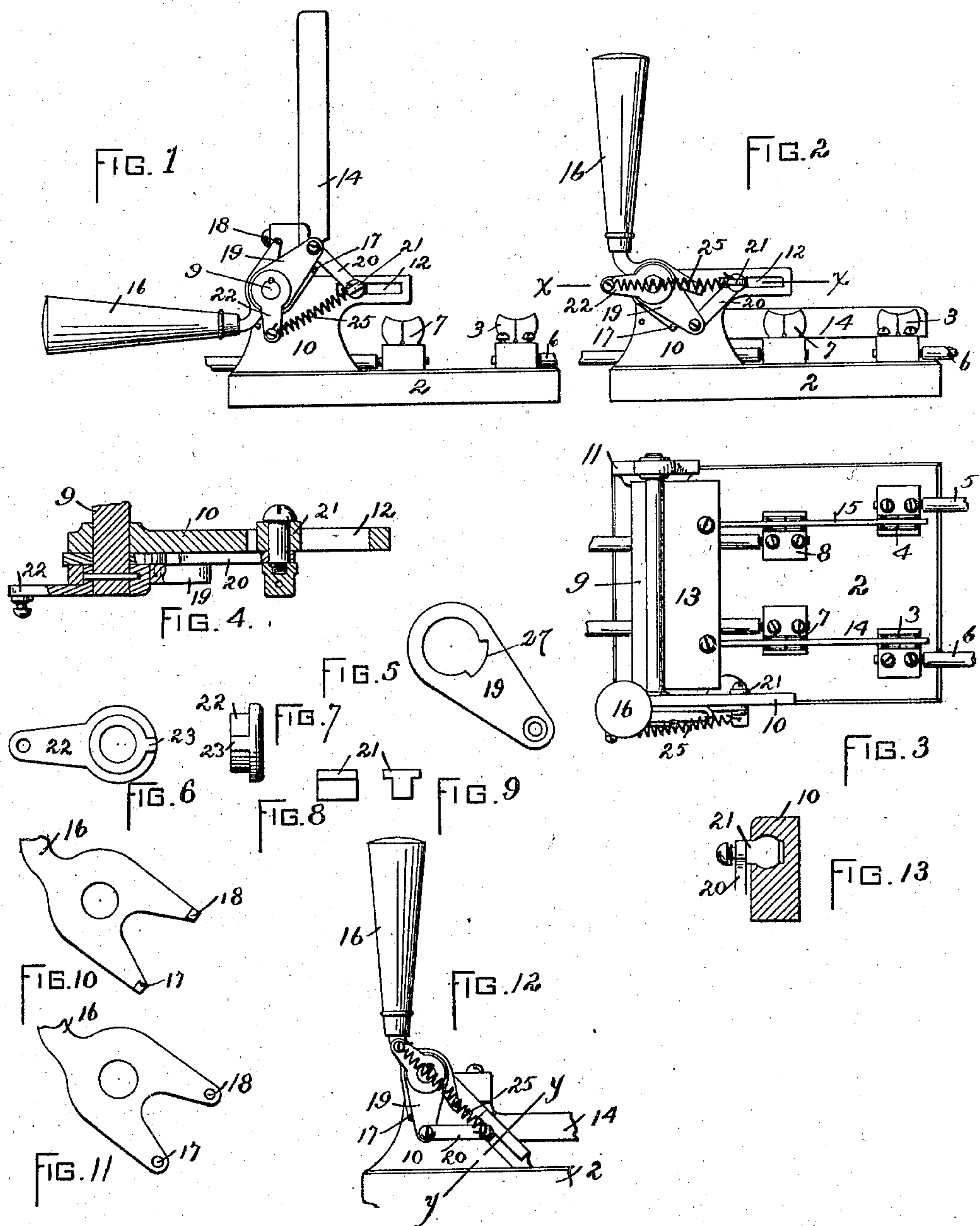
No. 613,129.

Patented Oct. 25, 1898.

W. ELY & W. B. BERNARDINI.
ELECTRIC SWITCH.

(Application filed July 29, 1896.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

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

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 613,129, dated October 25, 1898.

Application filed July 29, 1896. Serial No. 600,864. (No model.)

To all whom it may concern:

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

The purpose of our invention is to produce a switch in which quick positive movement is imparted to pivoted knives or arms connecting the contact-posts in pairs or series, to thereby open or close the circuit and make or break the circuit or circuits with requisite rapidity and positiveness to prevent short-circuiting or the formation of an arc between the said knives or arms and the contact-posts.

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

In the accompanying drawings, Figure 1 is a side elevation of our electric switch, showing the connecting knives or arms disengaged from the contact-posts and the circuit broken. Fig. 2 is a similar view showing said knives in contact with the contact-posts of both sides of the circuit and the circuit closed. Fig. 3 is a top plan of the same. Fig. 4 is a section on line X X of Fig. 2. Fig. 5 is a plan view of the loose arm attached to the rotating shaft. Fig. 6 is a plan view of the crank-arm rigidly attached to the shaft. Fig. 7 is an end view of the same. Fig. 8 is a side elevation of the cross-head. Fig. 9 is an end view of the same. Fig. 10 is a plan view of the forked actuating-lever. Fig. 11 is a similar view of a modified form of said lever. Fig. 12 is a side elevation showing a modification of our invention in which the cross-head ways are milled in the body of the upright housing and inclined therein instead of being placed horizontally, and the cross-head is fitted to slide in said milled ways. Fig. 13 is a section on line Y Y of Fig. 12.

Similar reference-numerals indicate like parts where they occur in the drawings, in which—

2 represents the base, constructed in the or-

dinary manner of non-conducting or insulating material.

3 and 4 are contact posts or brushes connected to the main wires 5 and 6, and 7 and 8 are other contact posts or brushes alined with the posts 5 and 6 and constituting also the binding-posts in which the service-wires are secured. All of the aforementioned parts are constructed and assembled in the usual well-known manner.

Rigidly secured to the base 2, or forming integral parts thereof, if desired, are upright housings 10 and 11, in which the shaft 9 is journaled. In the housing 10 we form a slot 12, which constitutes a stationary way in which the cross-head 21 reciprocates as the mechanism is actuated to raise or lower the knives or arms 14 and 15 to make or break the circuit. Said knives are secured to a block 13 of hard rubber or other suitable insulating material, which in turn is secured upon the shaft 9. Upon said shaft 9 and near its outer end we loosely pivot an actuating-lever 16, having a bifurcated end and provided on each bifurcation with a projecting lug or boss, as 17 and 18. Said lugs are adapted and intended to engage with their respective side of the loose arm 19, pivoted upon the shaft 9, and connected by means of a link 20, pivoted to the free end of said arm and also to a cross-head 21, capable of reciprocating movement in said way 12. Said loose arm 19 extends at right angles to said shaft and is internally recessed, as shown at 27 in Fig. 5, to receive a lug or projection 23 on the crank-arm 22, which is rigidly secured to the end of the shaft 9 and extends at right angles to the shaft and angularly in the opposite direction from the arm 19. The free end of the crank-arm 22 is connected by an extensible spring 25 with the cross-head 21. Said spring 25 attains its extreme tension at the moment it reaches to central line of the link 20, and as the action of the actuating-lever 16 upon the loose arm 19 throws said central line of said link out of coincidence or parallelism in either direction with the central line of said spring the latter acts to draw the cross-head and free

end of the crank-arm toward each other, thereby causing the shaft to rotate more rapidly than the actuating-lever and without reference to the movement of the latter, thus causing the knives to enter and leave the brushes or contact-posts with a rapid and positive movement, which is essentially necessary to prevent the short-circuiting or formation of an arc between the said knives and contact-posts.

Modifications in the construction and arrangement of the parts shown and described may be made without departing from the principle of our invention or impairing its efficiency. We have in Figs. 12 and 13 shown a modification in which the way is inclined instead of horizontal and is milled in the body of the upright housing and the cross-head fitted to slide therein. Said ways may be formed of guides secured to the side of the upright housing and the cross-head fitted to slide therein.

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

1. 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, an internally-recessed arm extending at right angles from said shaft and loosely pivoted thereon and adapted to be partially rotated thereon without reference to the movement of said shaft, a stationary guideway, a cross-head adapted to reciprocate in said guideway, a link pivoted to said arm and cross-head and connecting the two, a crank-arm rigidly secured to the said shaft and extending at right angles therefrom and angularly inclined relatively to the loose arm, and adapted to be actuated thereby, an extensible spring connecting the free end of said crank-arm with said cross-head, and means for actuating said loose arm all combined with each other and with a rotatable shaft.

2. In an electric switch having contact-posts arranged in pairs or series, and knives or arms carried by a rotatable shaft for connecting the said posts in pairs or series, an arm extending at right angles from said shaft

and loosely pivoted thereon, and adapted for partial rotation without reference to the movement of the shaft, a stationary guideway, a cross-head adapted to reciprocate in said guideway, a link pivoted to said arm and cross-head and connecting the two, a crank-arm rigidly secured to said shaft and extending at right angles therefrom and angularly inclined relatively to said loose arm and adapted to be actuated thereby to rotate said shaft, an extensible spring connecting the said crank-arm and cross-head, and a rotatable shaft all combined with each other and with an actuating-lever loosely pivoted upon said shaft and adapted to engage with said loose arm and thereby actuate the same.

3. The combination of the base, the rotatable shaft mounted on said base, the contact-blade carried by said shaft, the crank-arm secured to the shaft, the loose arm pivoted upon said shaft and arranged for limited rotatable movement thereon without reference to the movement of the shaft, the link pivoted to said arm, guide means for the outer end of the link, the spring connecting the link and the crank-arm, and the actuating-lever loosely pivoted upon said shaft and rotatable thereon without reference to the movement of either the shaft or the loose arm, substantially as described.

4. 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, the combination with said parts of a loose arm 19, link 20, cross-head 21, stationary guideway 12, crank-arm 22 rigidly secured to said shaft, extensible spring 25, and actuating-lever 16 loosely pivoted upon said shaft.

In testimony whereof we have hereunto set our hands, in presence of two witnesses, this 28th day of July, one thousand eight hundred and ninety-six, (1896.)

WILLIAM ELY.

WALTER B. BERNARDINI.

Witnesses:

HENRY MARSH, Jr.,

EDWARD C. ALLEN.