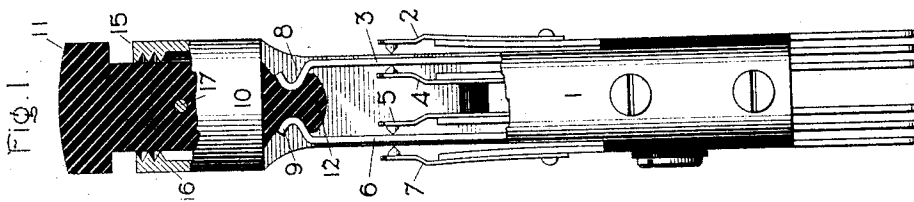
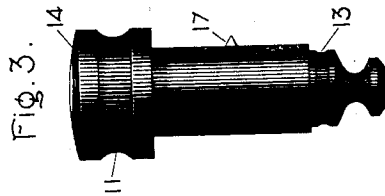
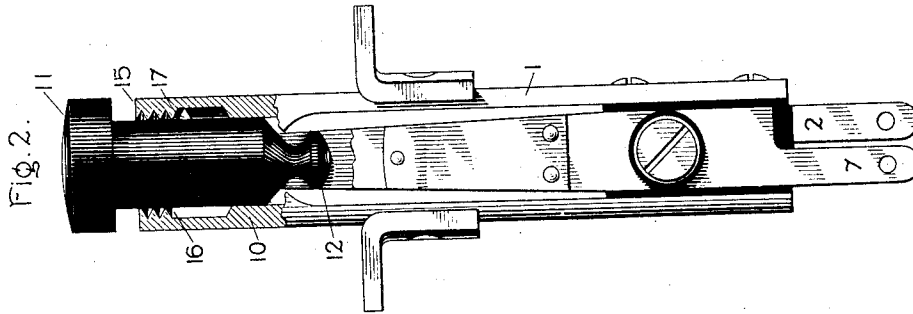


Patented Sept. 17, 1912.

1,038,776.



Witnesses:
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UNITED STATES PATENT OFFICE.

ERNEST S. McLARN, OF NEW YORK, N. Y., ASSIGNOR TO WESTERN ELECTRIC COMPANY,
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PLUNGER-SWITCH.

1,038,776.

Specification of Letters Patent. **Patented Sept. 17, 1912.**

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To all whom it may concern:

Be it known that I, ERNEST S. McLARN, citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Plunger-Switches, of which the following is a full, clear, concise, and exact description.

My invention relates to electrical keys. Its object is to provide a simple, substantial and efficient key structure.

By my invention I have provided a key structure wherein the plunger which actuates the springs, or switching element may be readily removed and replaced; said plunger when in place being longitudinally movable between substantial limiting stops, and also free to rotate so that it may present new contact surfaces to the parts against which it bears and thereby distribute the wear and prolong the operative life of the device.

My invention may be more readily understood by reference to the accompanying drawings, in which—

Figures 1 and 2 are side elevations, partly in section, showing my invention as applied to a non-locking key, and Fig. 3 is an elevation showing a plunger adapted for use with the key of Figs. 1 and 2, when it is desired to transform it into a locking key.

Similar letters of reference designate similar parts throughout the different figures.

Referring to Figs. 1 and 2, 1 is a frame on which switch springs 2, 3, 4, 5, 6 and 7 are mounted in opposing sets, one spring of each set terminating in a curved or inclined end 8 or 9. The upper part 10 of the frame 1 is of tubular form and serves as a mounting or guide for a plunger 11. If it is desired that the key shall be non-locking, the plunger 11 may have a lower end formed as shown at 12 in Figs. 1 and 2. If, however, it is desired that the key shall be locking, the plunger may be formed as shown at 13 in Fig. 3. This feature, however, is too well understood by those skilled in the art to require detailed description.

The upper portion of the plunger terminates in a cap or button 14 adapted to engage with the upper edge 15 of the frame 1, when said plunger is depressed, and thereby limit the downward movement. The upper

tubular portion of the frame 1 is internally threaded as shown at 16. A pin or projection 17 carried by said plunger makes striking engagement with the threaded portion 16 of the frame 1 if the plunger be lifted, and thereby serves to limit the upper movement of said plunger and prevent its removal from the frame by a purely longitudinal movement. When, however, it is desired to remove the plunger, an upward unscrewing movement will cause the pin 17 to engage with the threads 16 and allow said plunger to be removed from the frame. A plunger of the same or another form may then be inserted by a reverse operation. When in operative position, the plunger is, therefore, free to rotate and present any portion of its curved end to the springs with which it engages; its movement longitudinally is limited by substantial stops; and its removal and replacement may be accomplished simply and rapidly. It will be readily understood that with the structure described, the key may be quickly transformed from a locking to a non-locking type, or vice versa, by the mere interchange of plungers of suitable form without involving dismantling, dismounting, or any modification of the parts associated with the plunger.

I have chosen to illustrate my invention as embodied in a single unit key structure of the well known tubular type. Obviously it may readily be applied to other forms of key, as, for example, keys in which the springs are mounted transversely with respect to the plunger, keys mounted in strips or groups, and other allied devices. I have also preferred to show the guide or mounting as threaded and the pin carried on the plunger. It is evident, however, that the reverse might be employed.

Having described my invention, I claim:

1. In a key, the combination with a switch, of a plunger for controlling said switch, and a mounting for said plunger having an opening through which said plunger may be screwed into operative relation to said switch, and be thereafter free to reciprocate to operate the same.

2. In a key, the combination with a mounting, of a switch, a plunger movable longitudinally in said mounting for controlling said switch, stops for limiting the longitudinal movement of said plunger, said plunger and

mounting being constructed to permit the insertion and withdrawal of the plunger by a relative screwing motion.

3. In a key, the combination with a frame 5 having a threaded opening, of a switch, and a plunger for controlling said switch, said plunger having a part adapted to traverse said threaded opening by a screwing motion of the plunger, and said frame being con- 10 structed to permit the free longitudinal and rotary movement of said plunger after said part has passed through the threaded opening.

4. In a key, the combination with a switch, 15 of a mounting, and a plunger for controlling said switch, said plunger being freely rotatable and longitudinally movable between limits in said mounting, and said mounting being constructed to permit the insertion and 20 withdrawal of the plunger by a rotary motion of said plunger.

5. In a key, the combination with a switch, of a plunger for controlling said switch, a 25 mounting for said plunger having a threaded opening, and a projection on said plunger adapted to engage with said threaded part,

and after a limited engaging movement to be disengaged therefrom and rendered free to reciprocate to actuate said switch.

6. In a key, the combination with a switch, 30 a guideway, a plunger therein having a limited reciprocating movement and an unlimited rotary movement, and locking devices carried by said plunger and guideway constructed and arranged to permit of removal 35 of said plunger.

7. In a key, the combination with a switch, a guideway, a plunger therein, and devices 40 carried upon said guideway and plunger adapted to initially cooperate and after a limited relative movement to be interlocked, with the plunger free to have a limited reciprocating and a free rotary movement, the 45 said parts being released only by a reversal of said initial cooperating movement.

In witness whereof, I, hereunto subscribe my name this 15th day of March A. D., 1909.

ERNEST S. McLARN.

Witnesses:

RUSH F. NEWCOMB,
IRVING MACDONALD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."