No. 654,239. Patented July 24, 1900.

W. ELY.

ELECTRIC SWITCH.

(Application filed May 24, 1897.)

(No Model.) 2 Sheets—Sheet 1.

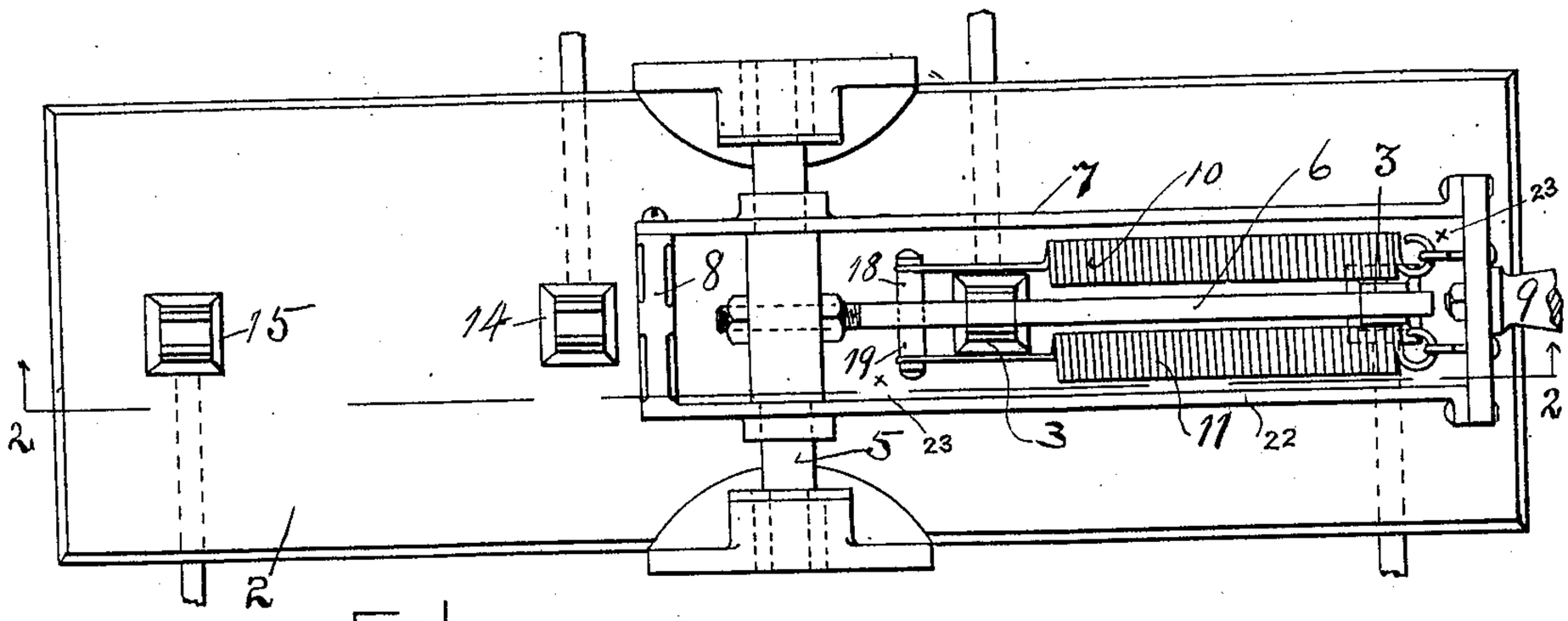


FIG. 1.

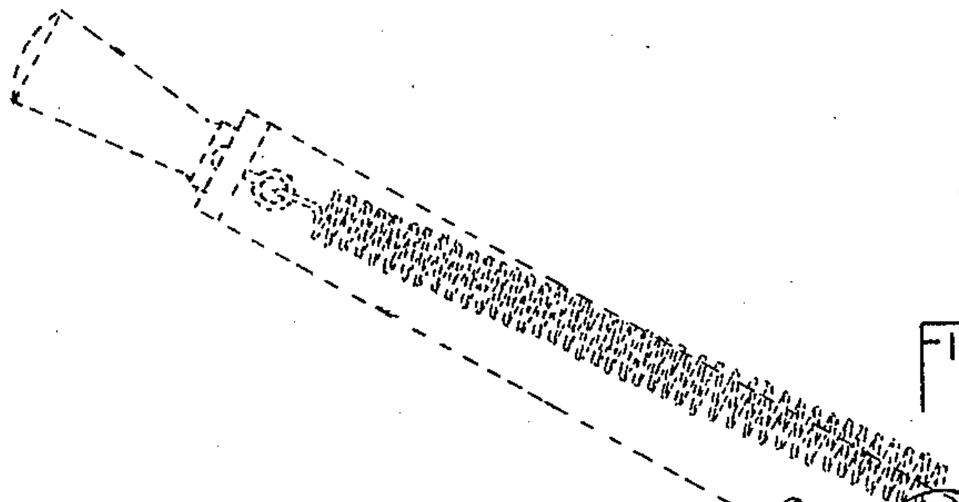


FIG. 2.

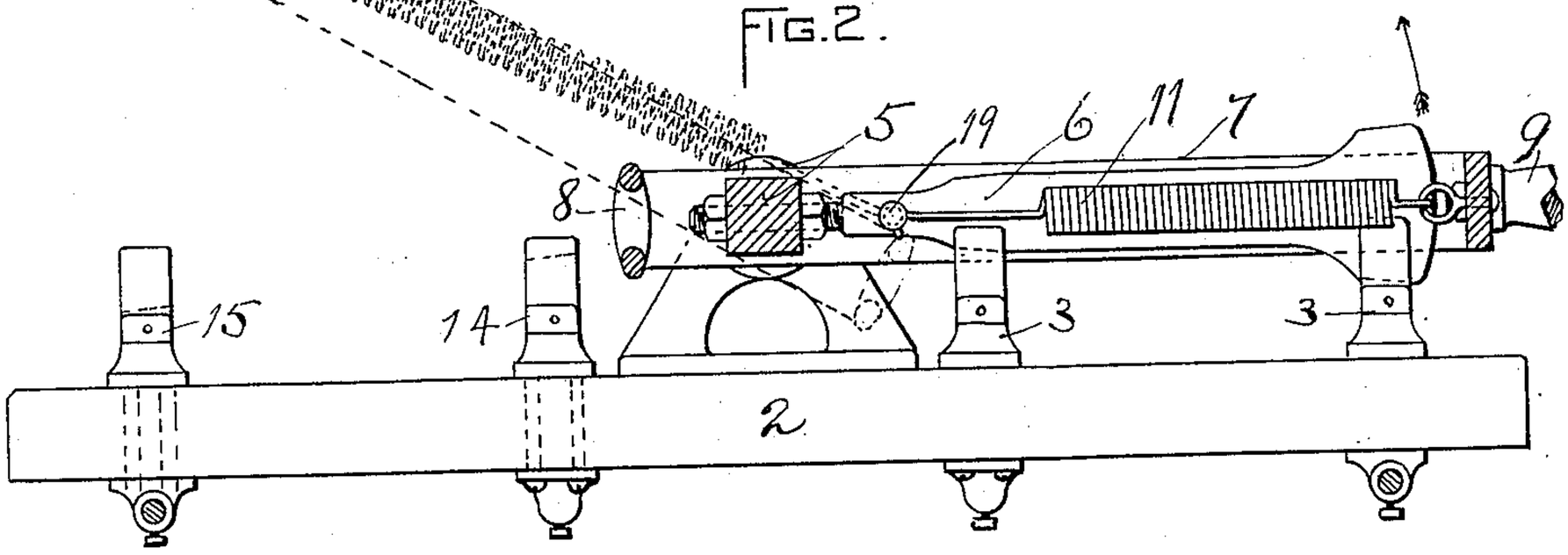


FIG. 4.

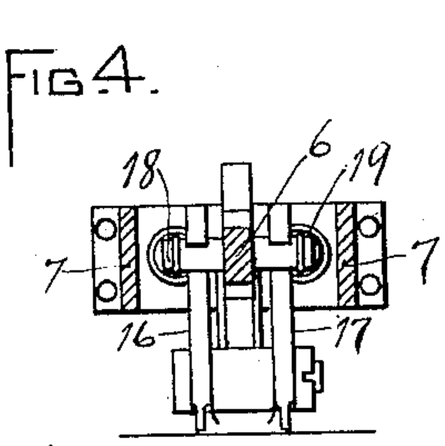
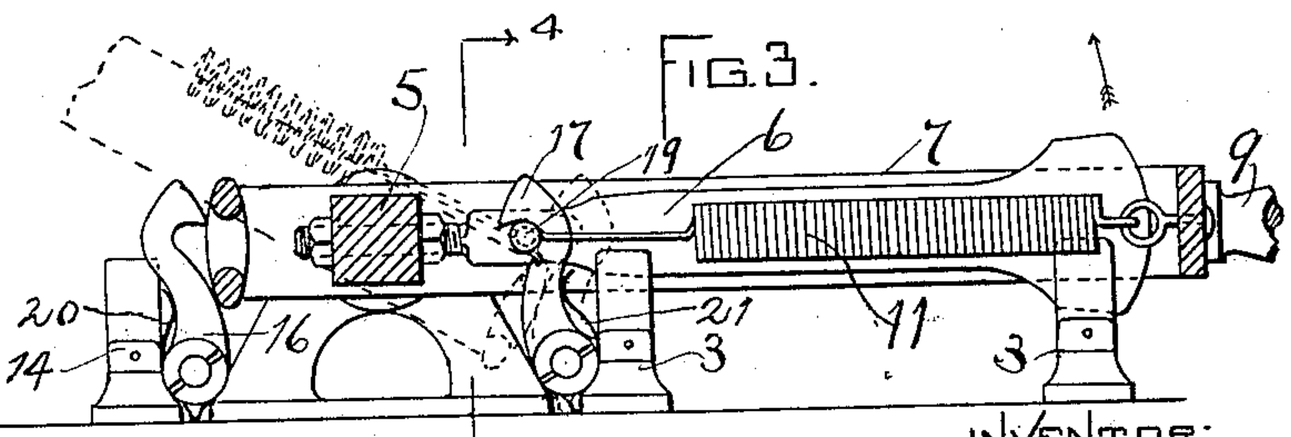


FIG. 3.



WITNESSES:

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James B. Richardson

INVENTOR:

William Ely

BY Henry Mauro ATTY.

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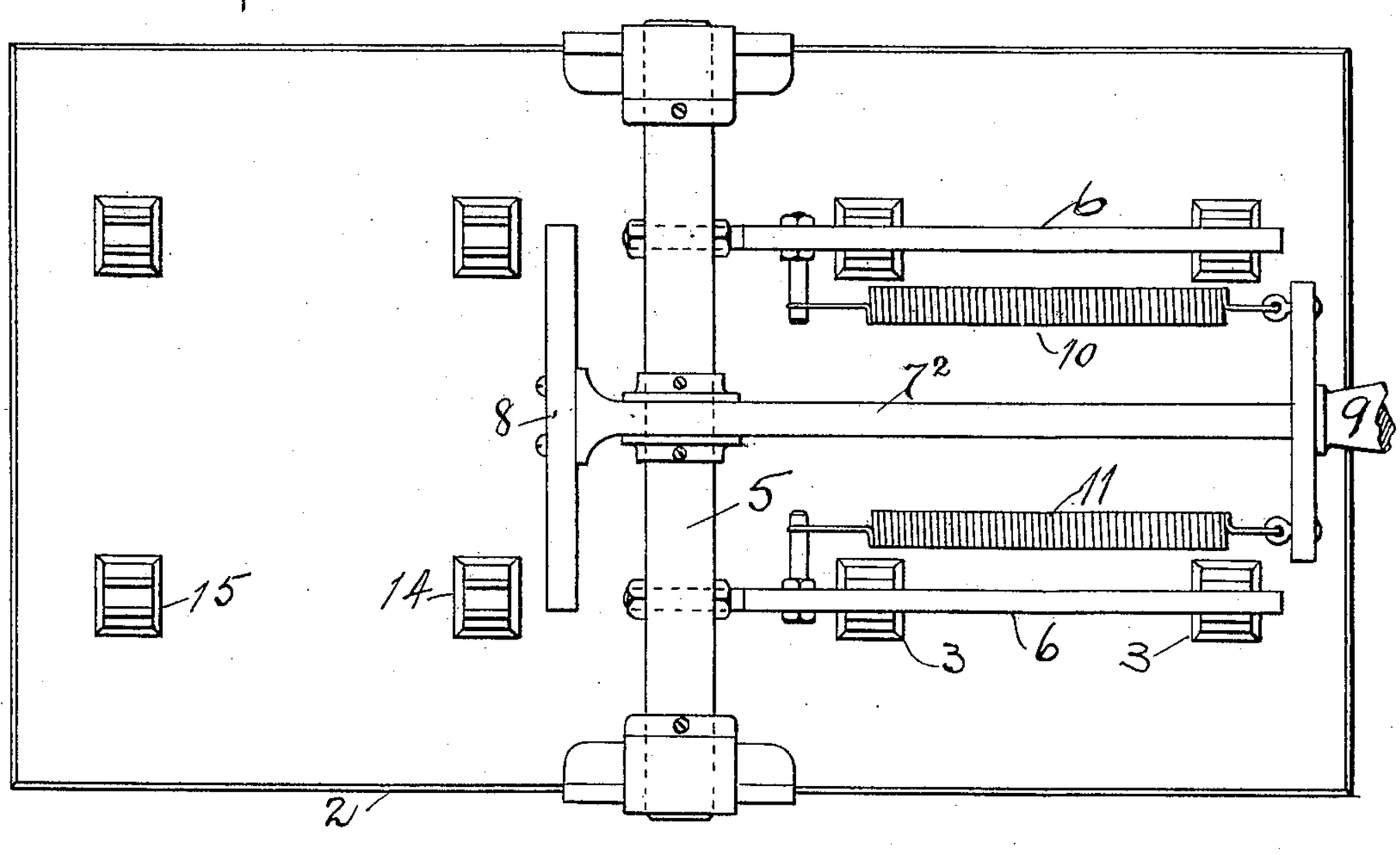
FIG. 5.



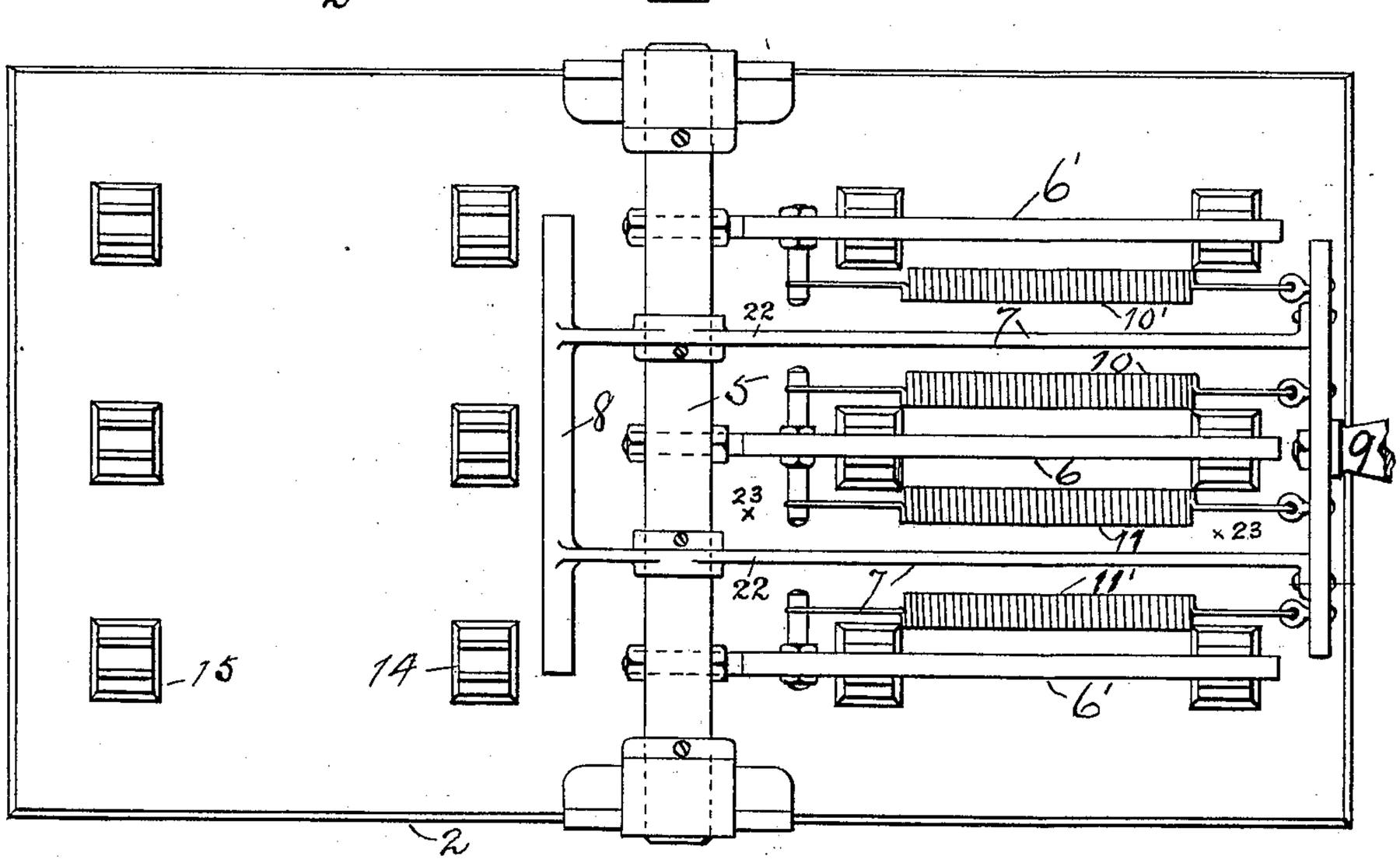


FIG. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM ELY, OF PROVIDENCE, RHODE ISLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 654,239, dated July 24, 1900.

Application filed May 24, 1897. Serial No. 637,883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ELY, a citizen of the United States, residing in the city and county of Providence, in the State of Rhode Island, have invented a new and useful Electric Switch, of which the following is a specification.

The objects of my invention are to produce an electric switch of simple construction and to provide therein means for imparting to movable connecting members an initial positive movement in either direction to overcome the frictional and other resistance between said connecting parts and the contact posts or members and other means for automatically moving said connecting members to instantaneously make or break their connection with the contact members, and thereby remove all liability of short-circuiting or "sparking."

The details of construction and the arrangement and combination of parts are more fully described hereinafter and shown in the accompanying drawings, in which—

Figure 1 is a plan view of my invention as applied to a single-pole switch. Fig. 2 is a section on line 2 2 of Fig. 1, showing in dotted lines the actuating member at the point of initiating the movement of the connecting member from the contact-posts. Fig. 3 is a similar view showing in addition the devices for locking the connecting member in its open and closed position. Fig. 4 is a transverse section on line 4 4 of Fig. 3. Figs. 5 and 6 are plan views showing, respectively, my invention applied to switches having two and three sets of contact and connecting members.

Similar numerals of reference refer to like parts where they occur in the drawings.

2 represents the base, upon which are secured contact-posts or circuit-terminals 3 3 in the usual manner. 5 is a shaft rotatably mounted upon said base and carrying one or more connecting members 6. Loosely mounted upon said shaft is the actuating member 7, provided with the parallel arms 22 22 at opposite sides of the connecting member 6 and with the engaging cross-bar 8 at the inner end and the cross-bar and handle 9 at the outer end, thus forming a slot-opening 23 in the actuating member through which the connecting member 6 may pass in its sudden independent movement from one set of contact-terminals 3 3 to the opposite set 14 15. The cross-bar 8 is adapted upon the movement of the actuating member to engage with the connecting member 6 to forcibly impart the initial releasing movement to the said connecting member from its frictional engagement with the circuit-terminals. Said actuating member and the connecting member are connected by extensible springs 10 and 11, adapted by the rotation of the member 7 to be distended and to accumulate energy until the member 6 has by the operation of the engaging cross member or bar 8 been started sufficiently to overcome the resistance between it and the contact-posts, when said spring reacts and automatically moves said connecting member instantaneously to make or break its connection with the contact-posts or circuit-terminals, which movement is absolutely automatic and beyond any control or restraint by the operator.

In Fig. 6, in addition to the connecting member 6, the connecting members 6′ 6′ are arranged at opposite sides of the actuating member 7 and connected to the said actuating member by means of the extensible springs 10′ 11′, thus balancing the tension or strain upon the actuating member in its operation, and a similar balanced connection of the connecting members at each side of the single-bar actuating member 7^2 is shown in Fig. 5.

Where it is desired to use the invention only as a cut-out, the posts 14 and 15 may be dummies, serving simply as rests or supports for the connecting member in its open position or when the circuit is broken. I have shown my invention applied to a switch in which the connecting member is moved through an arc of one hundred and eighty degrees; but it is obviously applicable efficiently to a switch where it is desirable that the connecting member move through a shorter arc.

16 and 17 represent spring-controlled pivoted catches, each adapted, respectively, to engage with a lug or pin 18 and 19, secured upon the connecting member 6, to lock the latter in its open and closed positions and to be disengaged therefrom by the impact of the cross member 8 as the actuating member 7 is rotated. The springs 20 and 21 control the action of their respective catches. Said

catches and springs may, however, be dispensed with, as shown in Fig. 2.

I claim as my invention and desire to secure by Letters Patent—

1. In an electric switch having a base, a rotatable shaft arranged parallel with said base, and circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of a connecting member carried on one side of said shaft, an actuating member loosely mounted upon said shaft for movement independent of the connecting member, and provided with parallel arms at opposite sides of said connecting member, and with a cross member and handle at its outer end, and a cross member at its inner end which latter is adapted to forcibly impart the initial releasing movement to the said contact member from its frictional contact with the circuit-terminals, and springs connecting said connecting member and the actuating member, substantially as set forth.

2. In an electric switch having a base, a rotatable shaft arranged parallel with said base, and circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of a connecting member carried on one side of said shaft, and provided with lugs or pins 18 and 19, an actuating member loosely mounted upon said shaft for movement independent of said connecting member and provided with parallel arms at opposite sides of said connecting member, and with a cross-bar and handle 9 at its outer end, and with a cross-bar 8 at its inner end adapted to forcibly impart the initial releasing movement to the said connecting member from its frictional contact with the circuit-terminals, the springs 10 and 11 connecting said connecting member and actuating member, and spring-controlled catches 16 and 17 adapted to releasably engage said lugs or pins 18 and 19 to thereby lock said connecting member in its engagement with the circuit-terminals, and also to serve as aids in the accumulation of energy in said springs 10 and 11.

3. In an electric switch having a base, a rotatable shaft arranged parallel with said base, and circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of a connecting member carried on one side of said shaft, an actuating member loosely mounted upon said shaft for movement without reference to the movement of the connecting member, and provided with the cross-bars forming a slot-opening, extending on opposite sides of said shaft, through which the connecting member may pass in its rapid independent movement from one set of circuit-terminals to the opposite set, the innermost one of said cross-bars being adapted on the rotation of said actuating member to forcibly impart the initial releasing movement to the connecting member from its frictional contact with the circuit-terminals, and the springs connecting said actuating member and connecting member and adapted to transfer with rapid uninterrupted movement said connecting member from one set of circuit-terminals to the opposite set.

4. In an electric switch having a base, a rotatable shaft, and corresponding sets of circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of an actuating member loosely mounted on said shaft, a plurality of connecting members carried on one side of said shaft for movement independent of the said actuating member, the said actuating member being provided with a slot-opening extending on both sides of said shaft, and at its inner end with a cross bar or member adapted on the rotation of said actuating member to forcibly impart the initial releasing movement to the several connecting members from their frictional contact with the circuit-terminals, one of the connecting members being arranged to pass through the slot-opening of the actuating member and the others to pass at each side of said actuating member, and the springs connecting said actuating and the several connecting members and adapted to cause the rapid transfer of said connecting members from one set of circuit-terminals to the opposite set.

5. In an electric switch having a base, a rotatable shaft, and corresponding sets of circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of an actuating member loosely mounted upon said shaft and provided at its inner end with a cross bar or member adapted upon the rotation of said actuating member to impart the initial releasing movement to the connecting members from their frictional contact with the circuit-terminals, a plurality of connecting members carried upon one side of said shaft and arranged at opposite sides of said actuating member, and the springs connecting the actuating member with the connecting members, whereby the strain or tension on said actuating member is balanced, and the said springs are adapted to cause the rapid uninterrupted transfer of said connecting members from one set of circuit-terminals to the opposite set.

6. In an electric switch having a base, a rotatable shaft, and corresponding sets of circuit-terminals arranged at opposite sides of said shaft, the combination with said parts of an actuating member loosely mounted upon said shaft, a plurality of connecting members carried on one side of said shaft and arranged at opposite sides of said actuating member for movement without reference to the movement of the latter, and springs connecting said connecting members with said actuating member and so arranged as to cause the rapid independent transfer of said connecting members from one set of circuit-terminals to the opposite set.

7. In an electric switch having a base, a rotatable shaft, and corresponding sets of circuit-terminals arranged at opposite sides of

said shaft, the combination with said parts of an actuating member loosely mounted on said shaft, a connecting member carried on one side of said shaft for movement without reference to the movement of said actuating member, said actuating member being provided with arms arranged at opposite sides of said connecting member and connected at their outer ends thereby forming in conjunction with said shaft a slot-opening through which said connecting member may pass independently from one set of circuit-terminals to the opposite set, and springs connecting said connecting member with said actuating member and so arranged as to cause the rapid independent transfer of said connecting member, in either direction, through the slot-opening of the actuating member from one set of circuit-terminals to the opposite set.

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 19th day of May, 1897.

WILLIAM ELY.

Witnesses:
HENRY MARSH, Jr.,
ROBERT FESSENDEN.