No. 648,555. Patented May 1, 1900.

W. ELY.

ELECTRIC SWITCH.

(Application filed Feb. 19, 1897.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 4.

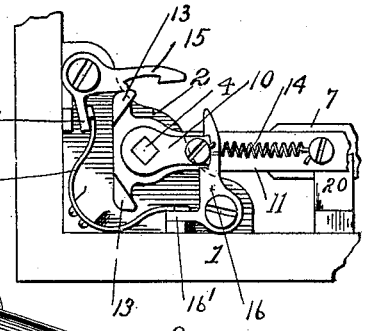

FIG. 1.

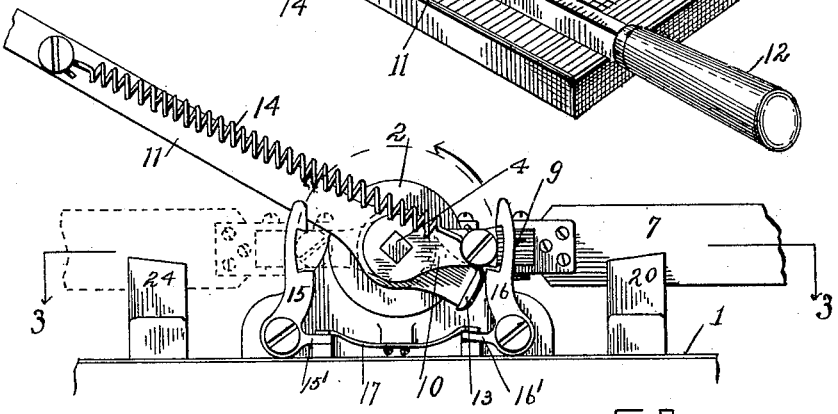

FIG. 2.

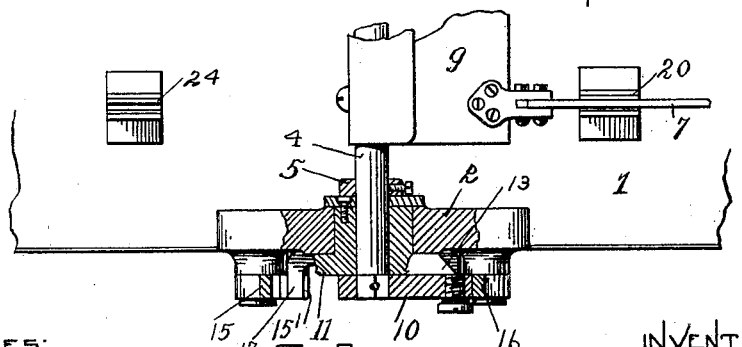

FIG. 3.

WITNESSES:

Harry J. Garceau

James B. Richardson

INVENTOR:

William Ely

BY Henry Marsh Jr.

ATTY.

No. 648,555. Patented May 1, 1900.

W. ELY.

ELECTRIC SWITCH.

(Application filed Feb. 19, 1897.)

(No Model.) 2 Sheets—Sheet 2.

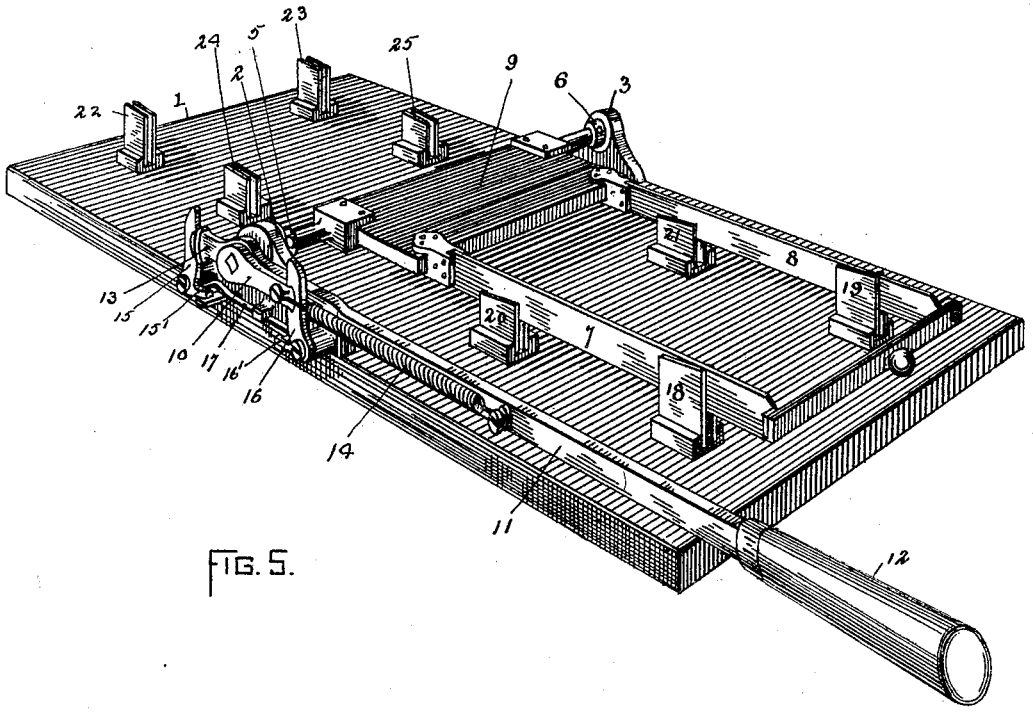

FIG. 5.

WITNESSES:
Henry J. Garrigan
James B. Richardson

INVENTOR:
William Ely
By Henry Marsh Jr.
ATTY.

UNITED STATES PATENT OFFICE.

WILLIAM ELY, OF PROVIDENCE, RHODE ISLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 648,555, dated May 1, 1900.

Application filed February 19, 1897. Serial No. 624,185. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ELY, a citizen of the United States, and a resident of 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 purpose of my invention is to provide an electric switch adapted to make or break with sudden rapid positive movement one or more circuits or to transfer the load with like movement from one or more circuits to other circuits located either in the same plane or at an angle of one hundred and eighty degrees or less relatively to each other and to automatically lock itself releasably at the termination of each movement.

My invention consists in the novel construction, combination, and arrangement of the knife actuating and locking mechanism.

In the accompanying drawings, Figure 1 is a perspective view of an electric switch constructed according to my invention. Fig. 2 is a side elevation showing the knife actuating and locking mechanism. Fig. 3 is a partial section on line 3 3 of Fig. 2. Fig. 4 is a side elevation showing the application of my invention to a switch having a throw of only ninety degrees. Fig. 5 is a perspective view illustrating another feature of my invention.

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

1 represents the base, constructed of insulating material, its surface being formed either in a single plane or by two plane surfaces arranged angularly to each other. 2 and 3 are supports or housings rigidly secured upon said base. 4 is a shaft journaled in said housings and provided, if desired, with means, as adjustable collars 5 and 6, for preventing endwise movement or play of said shaft. The knives or contact-arms 7 and 8 are preferably beveled on their upper and lower edges and are secured to an insulating-block 9, in turn secured upon the said shaft and carried thereby. A crank or arm 10, rigidly secured upon said shaft, extends at right angles therefrom and is rotatable therewith. The free end of said crank-arm is fitted for engagement releasably, at the termination of its movement in either direction, with a spring-controlled pivoted catch 15 16, whereby it is locked in position. Said catches may be formed, as shown, with laterally-extending lugs 15′ 16′, adapted for engagement by a spring 17, by which the pivotal movement of said catches is controlled. Pivotal movement of said catches, respectively, is induced by the contactual engagement with them for the purpose of releasing them from engagement with the free end of the crank-arm 10 of an extension-arm 13 of a lever 11, loosely pivoted upon the shaft 4 and provided, if desired, with an insulated handle 12. Such extension-arm may be either in line with said lever, as shown in Figs. 1 and 2, or laterally directed therefrom, as shown in Fig. 4. An extensible spring 14, secured to the free end of said crank-arm 10 and to the said lever 11 at a point intermediate of the length of the latter, serves both as a means for connecting said lever and crank and as a means for actuating said crank after it is released from the catches 15 or 16.

18 and 19 are contact posts or brushes secured upon the base in the ordinary manner and connected with the main wires (not shown) of a circuit. 20 and 21 are other contact posts or brushes similarly secured upon the base in line with the first-mentioned posts and connected with the service-wires. (Not shown.) The described posts are arranged, as shown, at one side of the shaft. On the other side of said shaft are other contact-posts 22 and 23, secured upon said base and connected with the main wires (not shown) of another circuit, and 24 and 25 are still other contact-posts secured upon said base in line with the posts before mentioned and connected with the service-wires (not shown) of said other circuit.

It will be noted that the lever 11 being pivoted loosely upon the shaft will have movement thereon without reference to the movement of said shaft and that its extension end (offset, if necessary, for the purpose) will at nearly the completion of the rotation of the lever contact with the under side of the crank-arm 10 and serve as a means for imparting initial positive movement to said crank and its shaft to start the contact-knives from the contact-posts and overcome the frictional and other resistance which might tend to retard the movement of the knives.

Modifications in the parts shown may be made without departing from the principle of my invention. Other forms of spring may be employed to control the movement of the catches. Springs as a means for controlling the movement of the catches may be dispensed with, in which case the catches may have capacity to yield and react spring-like for purposes of locking and releasing the crank-arm 10. The catches may also be dispensed with, and in this form of my invention the extension end of the lever 11 will when brought into contact with said crank-arm act, as hereinbefore described, to impart initial positive movement to the said crank-arm, shaft, and the parts carried by the latter to overcome the frictional and other resistance between the contact knives or plates and the contact posts or brushes. The extensible spring 14 will, as hereinbefore described, act to accelerate and complete the rotative movement of said crank-arm and the parts connected to and moved by the latter.

I prefer to dispense with the insulating-block 9 and to construct the rotatable shaft 4 entirely of insulating material and to secure the contact knives or plates directly upon said shaft. I have shown in Fig. 5 a convenient form of embodying this feature of my invention, in which the shaft 9 is constructed of insulating material and provided at either end with journals, preferably of metal. Such shaft is mounted upon the base for rotatable movement, as hereinbefore described. By this construction I am enabled to obviate the liability of the current jumping from one contact member to the metallic shaft and thence to the other contact member, and thereby forming a short circuit.

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

1. The combination with the base-plate of insulating material, the shaft arranged parallel with said base-plate, and one or more contact knives or blades carried on one side of said shaft, of the corresponding sets of circuit-terminals arranged at opposite sides of the shaft in the plane of the movement of the contact-blade, the actuating-lever loosely held upon said shaft, and the spring connecting the shaft with the actuating-lever, whereby upon the movement of the actuating-lever in either direction the spring connection will cause the independent sudden transference of the contact-blade from one set of circuit-terminals to the opposite set in a plane perpendicular to the plane of the base-plate.

2. The combination with the base, the shaft of insulating material arranged parallel with said base, and one or more contact knives or blades carried on one side of said shaft, of the corresponding sets of circuit-terminals arranged at opposite sides of the shaft in the plane of the movement of the contact-blade, the actuating-lever loosely held upon said shaft, and the spring connecting the shaft with the actuating-lever, whereby upon the movement of the actuating-lever in either direction the spring connection will cause the independent sudden transference of the contact-blade from one set of circuit-terminals to the opposite set in a plane perpendicular to the plane of the base, substantially as specified.

3. In an electric switch, the combination with a base, of a shaft of insulating material rotatably mounted on said base one or more contact knives or blades carried on one side of said shaft, a crank-arm secured upon said shaft, spring-controlled catches adapted to engage and lock said crank-arm at the termination of its movement in either direction, a lever loosely pivoted upon said shaft and rotatable without reference to the movement of the latter, and adapted to move said respective catches against the resistance of their controlling-spring, and a spring connecting said lever and crank-arm and adapted to rotate said crank-arm when the latter is otherwise released.

In testimony whereof I have hereunto set my hand, in presence of two witnesses, this 18th day of February, 1897.

WILLIAM ELY.

Witnesses:
HENRY MARSH, Jr.,
WILLIAM H. FREDRICKS.