

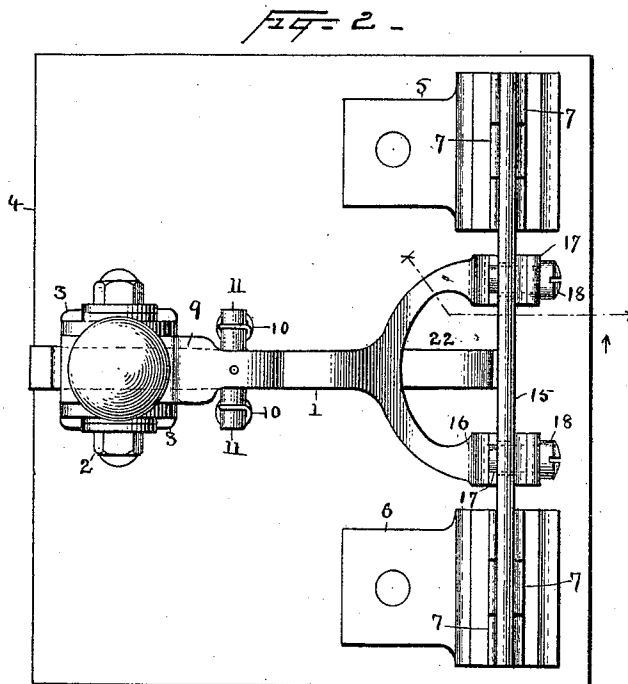
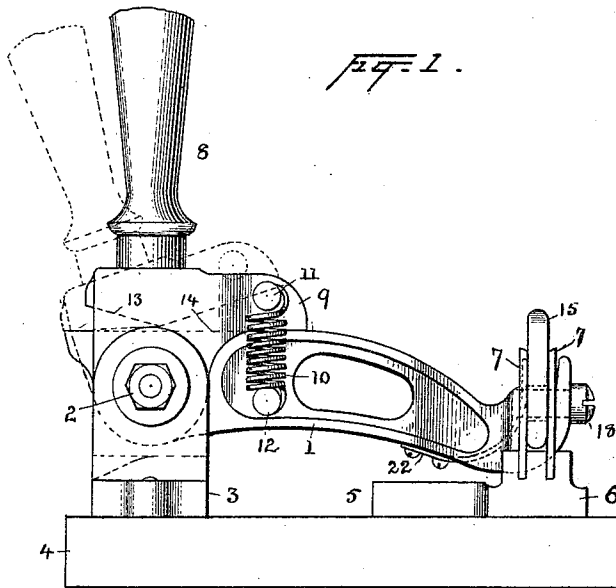
(No Model.)

2 Sheets—Sheet 1.

H. P. BALL.
SNAP SWITCH.

No. 461,561.

Patented Oct. 20, 1891.



Witnesses
J. A. Clark,
R. F. Oberly

Inventor
Henry Price Ball.
By his Attorney,
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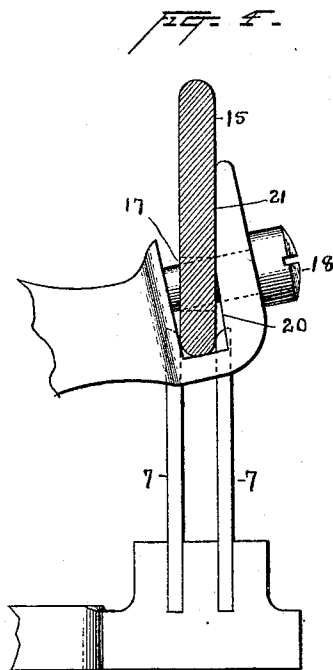
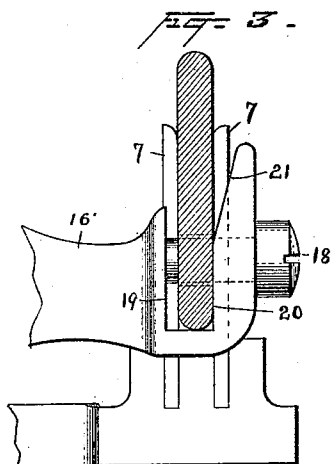
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2 Sheets—Sheet 2.

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SNAP SWITCH.

No. 461,561.

Patented Oct. 20, 1891.



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UNITED STATES PATENT OFFICE.

HENRY PRICE BALL, OF BROOKLYN, ASSIGNOR TO THE EDISON GENERAL ELECTRIC COMPANY, OF NEW YORK, N. Y.

SNAP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 461,561, dated October 20, 1891.

Application filed April 18, 1891. Serial No. 389,399. (No model.)

To all whom it may concern:

Be it known that I, HENRY PRICE BALL, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have invented a certain new and useful Improvement in Snap-Switches, of which the following is a specification.

The present invention relates to that class of switches commonly known as "snap-switches" and which are employed for making and breaking circuits in which heavy currents are used for the purpose of breaking the circuit instantaneously to prevent sparking at the contacts.

The object of the present invention is to provide a switch of the character indicated with a blade so mounted on the switch-arm that it shall move in a straight line and parallel with the stationary terminals of the switch, although the end of the switch-arm which carries the blade moves in an arc of a circle.

In the accompanying drawings, Figure 1 is a side view of the improved switch; Fig. 2 is a plan view thereof; and Figs. 3 and 4 are detail views on a larger scale, both being sections on the line *xx* of Fig. 2, looking in the direction of the arrow.

The switch-arm 1 is pivoted at 2 to a standard 3 on the slate or other insulating-base 4. On the same base are circuit-terminals 5 6, each of which has two contact plates or springs 7 7, parallel with each other and perpendicular to the base. The switch-arm is provided with a handle 8, having at its lower end a head 9, also pivoted at 2. This head is connected to the switch-arm 1 by means of two springs 10, connecting the pins 11 on the head with the pins 12 on the arm. It will be seen from Fig. 2 that the head 9 spans the switch-arm 1. Said head is provided with a face 13 at an angle with the face 14. When the switch is in its normal position, the latter face rests against the upper side of the switch-arm. When, however, the handle is pulled back to the dotted-line position, the spring is put under tension, the face 14 is raised, and the face 13 is depressed until the latter rests on the upper side of the switch-arm at the rear of the pivot. Any further movement of

the handle must, as will be evident, raise the switch-arm, and when the outer end of said arm, which carries the straight blade or plate 15, which is transverse to the switch-arm—that is, which lies across instead of in line with the switch-arm, as is most usual in snap-switches—is raised to such an extent that the blade is partially withdrawn from between the springs 7 7, the springs 10 will have sufficient tension to complete the throw of the switch, breaking the circuit instantly.

The main part of my present improvement resides in the arrangement of the transverse blade 15, which is of just sufficient thickness to fit snugly between the spring-terminals 7 7. The outer end of the switch-arm is forked or U-shaped, and each branch is provided with a holder or socket 16, in which said blade 15, which is perforated at 17, is held by means of the screws or bolts 18, which are somewhat smaller than the holes 17. The ends of the switch-arm have a straight face 19, a second face 20, parallel therewith, but at a greater distance therefrom than the thickness of the blade 15, and a third face 21 at an angle to 19 and 20. The arrangement of these faces is such that when the switch-arm is depressed and the blade rests between the terminal contacts the face 20 is parallel with the contacts 7, and the blade 15 is over against or near to said face. In this position the blade is at some distance from the face 19, as shown in Fig. 3. When the switch-arm is moved to raise the blade, the tendency of the arm is to move the blade in the arc of a circle the center of which is at 2. The effect of such a movement would be to strain or spread apart the straight parallel springs 7 and to prevent good surface contact between the blade and springs during movement of said blade; but in my arrangement the blade does not move in the arc of a circle, as indicated. As the blade, which is substantially parallel with the pivotal axis of the switch-arm, rises, it rocks or moves slightly relatively to the carrying-arm, and the lower edge gradually travels toward the face 19, while the upper edge travels toward the face 21, this movement being rendered possible by the distance between the faces 19 20 and by the fact that the holes 17 are larger than the

screws 18. When the blade has reached or about reached the top of the springs 7, it will rest flatly against the face 21, which at this time will be perpendicular to the base, as shown in Fig. 4. The spring 22, carried by the switch-arm and which presses against the blade above the screws 18, holds the blade in this position, so that it is in proper position to enter between the terminal springs in a straight line when the circuit is to be again made.

It will be evident that the rocking blade 15 need not be mounted in just the way above described. It is only necessary that it should be loosely or movably connected with the arm, so that it will be capable of moving in a line parallel with the straight terminal springs, while the switch-arm being pivoted moves in the arc of a circle. It will be evident, also, that one terminal of the circuit might be connected to the standard 3 and one of the terminals 6 be omitted.

Having thus described the invention, what I claim is—

1. The combination, in a switch or circuit-breaker, of a pivoted switch-arm and a switch-blade carried thereby, said blade being substantially parallel to the pivotal axis of the switch-arm and moving with the switch-arm, but having an independent rocking motion, whereby the blade moves in a straight line and not in an arc with the switch-arm, substantially as described.

2. The combination, in a switch or circuit-breaker, of a pivoted switch-arm, a blade substantially parallel to the pivotal axis of the switch-arm and carried by said arm, but having a rocking movement thereon, and a straight terminal or straight terminals in position to co-operate with said blade, substantially as described.

3. The combination, in a switch or circuit-breaker, of a pivoted switch-arm, a handle connected to the arm by means of a spring, a transverse blade or plate carried by said arm, but loosely connected thereto, so as to be movable, and straight terminal springs or plates in position to co-operate with said blade, substantially as described.

4. The combination, in a switch or circuit-breaker, of a pivoted switch-arm, a circuit-breaking transverse blade carried at one end thereof, circuit-terminals adjacent to the switch-blade and parallel to the plane of the blade when it is free and stands just above the terminals, and means, also carried by the switch-arm, for holding the blade in line with

the terminals and parallel thereto, substantially as described.

5. The combination, in a switch or circuit-breaker, of a pivoted switch-arm, a circuit-breaking blade or plate carried at one end thereof and at right angles thereto and movable in a direction toward and from the pivot of the switch-arm, circuit-terminals consisting of parallel plates or springs between which the blade is adapted to pass, said terminals being parallel with the blade, and means to hold the blade parallel with the terminals while the end of the switch-arm is moving in an arc, substantially as described.

6. The combination of a pivoted switch-arm, one or more holders at one end thereof, a switch-blade thinner than said holders, but held movably therein, and circuit-terminals in position to co-operate with the blade, substantially as described.

7. The combination of a switch-arm having holders at one end, a switch-blade thinner than the holders, said blade having holes through it within the holders, and bolts or pins in the holders and passing loosely through the holes in the blade, substantially as described.

8. The combination of a switch-arm having holders at one end, a switch-blade thinner than the holders, said blade having holes through it, bolts or pins in the holders and passing loosely through the holes in the blade, and a spring pressing against the blade, substantially as described.

9. The combination of circuit-terminals, a pivoted switch-arm carrying a switch-blade adapted to co-operate with the terminals and having a branched or U-shaped end, a holder in each branch, the faces of the holders farthest from the pivot being in two planes, the outer plane being parallel with the terminals when the arm is in position to hold the blade at the outer edge of the terminals, and the inner plane being parallel with the terminals when the arm is in position to hold the blade entirely inserted, and a spring pressing against the blade to hold it in the first-mentioned position when the blade is withdrawn, but capable of yielding to allow the plate to move while it is being inserted, substantially as described.

This specification signed and witnessed this 6th day of April, 1891.

HENRY PRICE BALL.

Witnesses:

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