

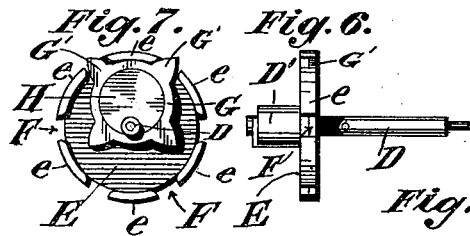
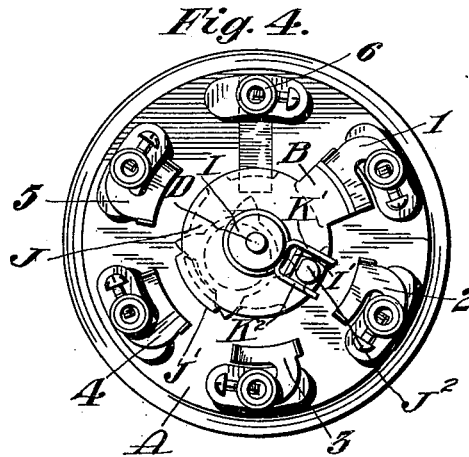
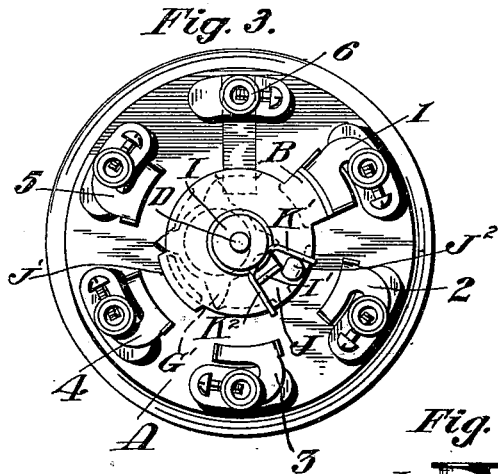
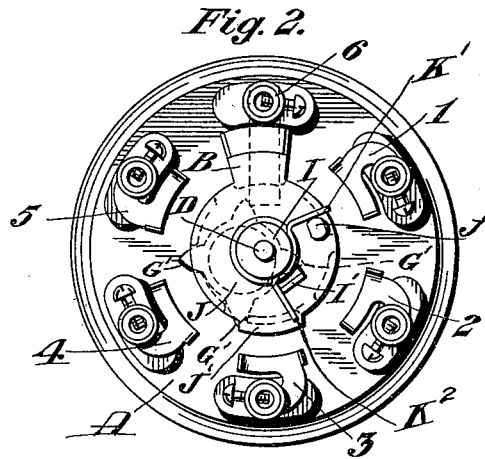
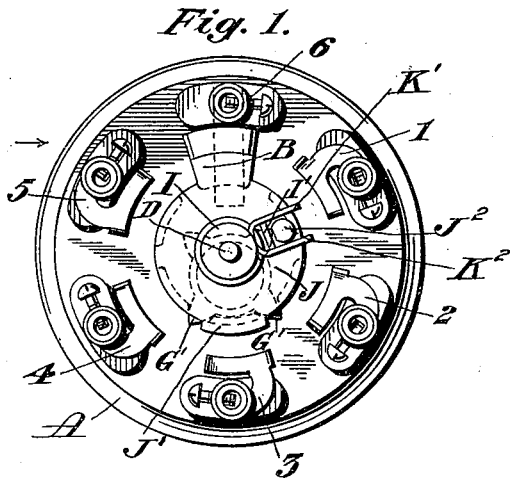
No. 646,146.

Patented Mar. 27, 1900.

G. W. HART.  
SNAP SWITCH.

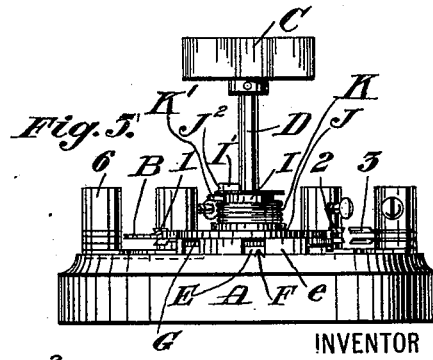
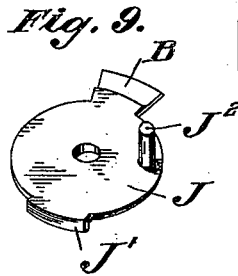
(Application filed June 21, 1899.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GERALD W. HART, OF WEST HARTFORD, CONNECTICUT:

## SNAP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 646,146, dated March 27, 1900.

Application filed June 21, 1899. Serial No. 721,303. (No model.)

*To all whom it may concern:*

Be it known that I, GERALD W. HART, a citizen of the United States, residing at West Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Snap-Switches, of which the following is a full, clear, and exact description.

My invention relates to an improvement in snap-switches for electrical service; and it consists in the novel combination and arrangement of the parts thereof hereinafter fully described.

Among the objects of my invention are the following: simplicity of construction, economy in manufacture, effectiveness in operation, and durability.

In the accompanying drawings, Figure 1 is a plan view of my switch with the thumb-piece and cap removed. Figs. 2, 3, and 4 are similar views showing the mechanism of the switch in various positions. Fig. 5 is a side elevation of the switch as shown in Fig. 1 looking in the direction of the arrow and with two of the nearest terminals removed. Figs. 6 and 7 are respectively side and plan views of details of construction. Fig. 8 is a side view of another detail, and Fig. 9 is a perspective view of still another detail.

A is a base supporting thereon suitable terminals 1, 2, 3, 4, and 5. These terminals are each insulated, preferably by making the base A of insulating material.

6 is a binding-post suitably mounted upon the base A and in electrical connection with the frame or support for the movable contact-blade B, the said binding-post frame and its related parts being insulated from the other terminals.

In the switch shown in the accompanying drawings I have illustrated one form in which by means of the movable contact-blade B it is possible to throw into or out of circuit one or more translating devices—such as, for instance, electric lamps. By rotating the thumb-piece C commonly employed to the right the contact-blade B is snapped into electrical connection with the terminal 1, and one or more lamps may be thrown in. Continuing, it is snapped into contact with terminal 2, and another combination of lamps may be thrown in, and so on. By the improved con-

struction herein the direction of travel of the contact-blade B may be reversed, and thereby the translating devices may be cut out of circuit one by one, or assuming that all the translating devices are connected with the terminal 5 then, starting from the position indicated in Fig. 1 and turning the thumb-piece C to the left, the contact-blade will be snapped into electrical connection with the clip on the terminal 5, and thus all of the translating devices will be thrown into circuit. It is the means by which the contact-blade may be snapped forward or backward and locked in the desired position that is chiefly the subject-matter of this application. This mechanism comprises a shaft D, to which the thumb-piece C is attached. This shaft may be suitably mounted in a bearing-support D' in the base A. E is a fixed plate which may also be mounted upon the base A, the said plate carrying upwardly-directed shoulders *ee*, between the ends of which spaces F F are left for the purpose hereinafter described.

G is a movable plate, preferably in the form of a star-wheel having teeth G' of a suitable number and length. This star-wheel is carried by any suitable means—such as, for instance, the well-known cam H, which is mounted upon the shaft D. Manifestly any other well-known means may be substituted in place of the cam H. By referring to Fig. 7 it will be seen that the cam H when moved by the shaft D causes the star-wheel G to travel around the fixed plate E. The openings F are spaced apart such a distance as to properly register with the teeth G' on the star-wheel as the said star-wheel is rotated, the cam H and shoulders *ee* serving to limit the path of movement of the star-wheel to a given circle. The length of the teeth G' is such that when in the position, for instance, Fig. 7 two adjacent teeth will be projected slightly through their respective openings F between the shoulders *e*. An advance of the star-wheel from this position in either direction will cause one of the teeth G' to be retracted and the other one to be momentarily pushed still farther through this opening in the plate E. Continuing the rotation of the shaft D, this last-mentioned tooth will be retracted and the next tooth in advance will be projected into and through the next opening. Therefore it

will be seen that at all times there is one tooth G' projecting through an opening F in the edge of the plate E and at other times there will be two teeth projecting outside the edge of said plate.

I is a collar, preferably having flanges at its upper and lower ends, mounted upon the shaft D. Carried by said collar is a dog I'. Located between this collar I and the stationary plate E is a contact-carrier J, carrying the contact-blade B and a depending shoulder J' and an upwardly-projecting post J<sup>2</sup>.

The parts may be assembled, for instance, in the position indicated in Fig. 1. In this figure the shaft D is so turned that two of the teeth on the star-wheel G project through openings F F in the stationary plate E. The contact-carrier J, which is loosely pivoted upon the shaft D, is then slipped into place, so that the shoulder J' will come between the two teeth G' G' of the star-wheel which project outside the plate E. In this position the parts will be so arranged that the dog I' is adjacent the post J<sup>2</sup>.

K is a spring, which is preferably a coil-spring, placed around the collar I and having two arms K' and K<sup>2</sup> projecting outwardly and straddling both the dog I' and the post J<sup>2</sup> and bearing against opposite sides of either or both of said parts when the parts are all in the normal position. The flanges upon the collar I are chiefly useful to hold the spring K in place, although of course they may be dispensed with.

Operation: To operate the switch and throw the contact-blade B from the position indicated in Fig. 1 to the position indicated in Fig. 3 the thumb-piece C is turned to the right. The dog I' carries forward the arm K<sup>2</sup> of the spring K, at the same time advancing the star-wheel in the same direction, one of the teeth thereof remaining in front of the shoulder J' of the carrier. The spring thus stretched causes its arm K' to press harder and harder against the post J<sup>2</sup>. When the parts have been advanced to a position just beyond that indicated in Fig. 2, the tooth G' upon the star-wheel which has been holding and has served to prevent the carrier J from being advanced is withdrawn from in front of said shoulder and leaves the same free to advance under action of the arm K' of the spring K. While this advance of the carrier takes place the next tooth in advance upon the star-wheel has been projected through one of the openings F and stands in the natural path of movement of the shoulder J', as indicated in Fig. 3, against which the said shoulder is checked, as shown, when the carrier is shifted from the position indicated in Fig. 2 to that shown in Fig. 3. This advance movement of the carrier causes the contact-blade B to engage with suitable clips upon the terminal 1. Upon releasing the thumb-piece C the dog I', the collar I, and the shaft D are turned back, under action of the arm K<sup>2</sup> of the spring K, from the position indicated in Fig. 3 to the posi-

tion indicated in Fig. 4, and this reverse movement of the shaft D will cause a slight retraction of the star-wheel from the position indicated in Fig. 3 to the position indicated in Fig. 4, in which latter position two teeth G' G' will be staggered on opposite sides of the shoulder J', thus locking the same in the position indicated in Fig. 4 and leaving the parts ready to be again moved in either direction. To advance the contact-blade B from the position indicated in Fig. 4 into a position where it will engage the clips of the terminal 2, the above-described operation is repeated. Obviously a reverse movement of the handle C will permit the contact-blade B to be shifted from engagement with terminal 2 to engagement with terminal 1, and thus it will be seen the contact-blade may be snapped in either direction at the will of the operator to engage successively with the terminals located in its path of movement. Obviously this principle may be employed in snap-switches of varying types, and instead of arranging the terminals in a circle they may be arranged in fan-shape order. Again, two terminals on opposite sides of the shaft D might be provided and the contact-carrier might be provided with a plurality of blades to engage therewith. Such changes would require only variations in shape and arrangement of the parts and would not involve a departure from the spirit and scope of the invention.

It is obvious that the contact-carrier might be made in one or more parts in any manner well known in the art, and in using the term "contact-carrier" in the claims it should not be understood that I mean an integral piece in which the contact-blade itself is a part of the carrier.

What I claim is—

1. In a snap-switch, a base, fixed terminals thereon, a central pivot, a terminal mounted thereon so as to be capable of concentric rotative movement only, with respect to said central pivot, and rotatable means to lock and unlock said movable terminal, said means being carried eccentrically of the axis of rotation of said movable terminal.

2. In a snap-switch, a base, fixed terminals thereon, a movable terminal rotatable in either direction and adapted to make electrical connection with any of said fixed terminals, a central pivot upon which said movable terminal is mounted to hold the same against longitudinal movement, means to lock said movable terminal comprising a rotating piece located eccentrically of the central support for said movable terminal, and a spring to move the latter when it is unlocked.

3. In a snap-switch, a base, fixed terminals thereon, a rotatable terminal movable in either direction and adapted to make electrical connection with any of said fixed terminals, a central pivot therefor to prevent the longitudinal movement thereof, means for locking the movable terminal in its position of rest, comprising a rotating part located ec-

centrically of the axis of rotation of said movable terminal, and a spring for shifting said movable terminal, one end of which bears against said movable terminal, an operating part for engaging the other end of said spring and in engagement with said locking means.

4. In a snap-switch, a spring-actuated contact-carrier, a shoulder thereon, a stationary plate and a movable plate cooperating therewith and actuated by an operating part, said movable plate having projections adapted to detachably engage the shoulder on said carrier.

5. In a snap-switch, a centrally-mounted spring-actuated contact-carrier having a shoulder, an operating part, a pivoted rotatable plate of substantially-circular form having projections around its perimeter and moved by said operating part, a stationary plate having shoulders adapted to engage with said projections to rotate said plate as it is being advanced in either direction around the axis of the operating part.

6. In a snap-switch, a base, fixed terminals thereon, a pivotally-mounted contact-carrier having a shoulder depending therefrom, a plate having upwardly-directed shoulders, said plate being stationary, an intermediary between said contact-carrier and said stationary plate, said intermediary having projections adapted to pass through the spaces between the shoulders upon the stationary plate and engage with the shoulder upon the contact-carrier, and a contact-blade carried by said carrier.

7. In a snap-switch, a base, fixed terminals, a centrally-mounted rotary contact-carrier, a shoulder thereon, a locking device for engaging said shoulder comprising a substantially-circular plate carried upon a pivot located eccentrically of the axis of rotation of said contact-carrier said circular plate having projections thereon adapted to engage the shoulder on the contact-carrier, and means to cause the rotation of said plate.

8. In a snap-switch, a base, a stationary plate thereon having upwardly-directed shoulders, an operating part comprising a rotary shaft and carrying to one side of its axis of rotation a star-wheel, the teeth of which project through the openings between said shoulders, a contact-carrier having a depending shoulder, a post on said contact-carrier, a dog carried by said operating part, and a spring carried by said operating part and embracing the said dog and post.

9. In a snap-switch, a main operating part comprising a rotatable shaft, a rotatable contact-carrier loosely mounted thereon but incapable of longitudinal movement, said contact-carrier having an upwardly-projecting post, a dog carried by said operating part, a spring carried by said operating part and embracing said dog and said post, and a revoluble locking device to engage said rotatable contact-carrier, said locking device being mounted eccentrically of the axis of rotation of said contact-carrier.

10. In a snap-switch, a rotatable contact-carrier and a lock therefor, a central pivot for said contact-carrier to prevent longitudinal movement thereof, said lock comprising a stationary substantially-circular plate having projections thereon, a movable plate of substantially-circular form having teeth on the perimeter thereof, the movable plate being of substantially-less diameter than the stationary plate, and movable upon a pivotal support located eccentrically of the stationary plate, said pivotal support for said rotatable plate determining the path of movement thereof and said shoulders upon the stationary plate engaging successively with the teeth upon said movable plate to impart rotative movement to the latter.

11. In a snap-switch, a stationary shouldered plate, a rotary operating part, a contact-carrier loosely pivoted thereon and having a depending shoulder, a locking means controlled by said operating part and carried eccentrically of its axis of rotation and cooperating with said stationary plate, a spring carried by said operating part, said spring having two projecting ends standing on opposite sides of a post carried by the contact-carrier, and a dog carried by said operating part.

12. In a snap-switch, a contact-carrier, a locking device therefor comprising a rotating piece having multiple projections, a shoulder in said carrier adapted to be engaged by said projections.

13. In a snap-switch, a locking means comprising a stationary plate, a rotatable piece having multiple projections coacting therewith, a rotatable contact device and means carried thereby adapted to be engaged by the projections upon said rotatable piece.

GERALD W. HART.

Witnesses:

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G. T. HACKLEY.