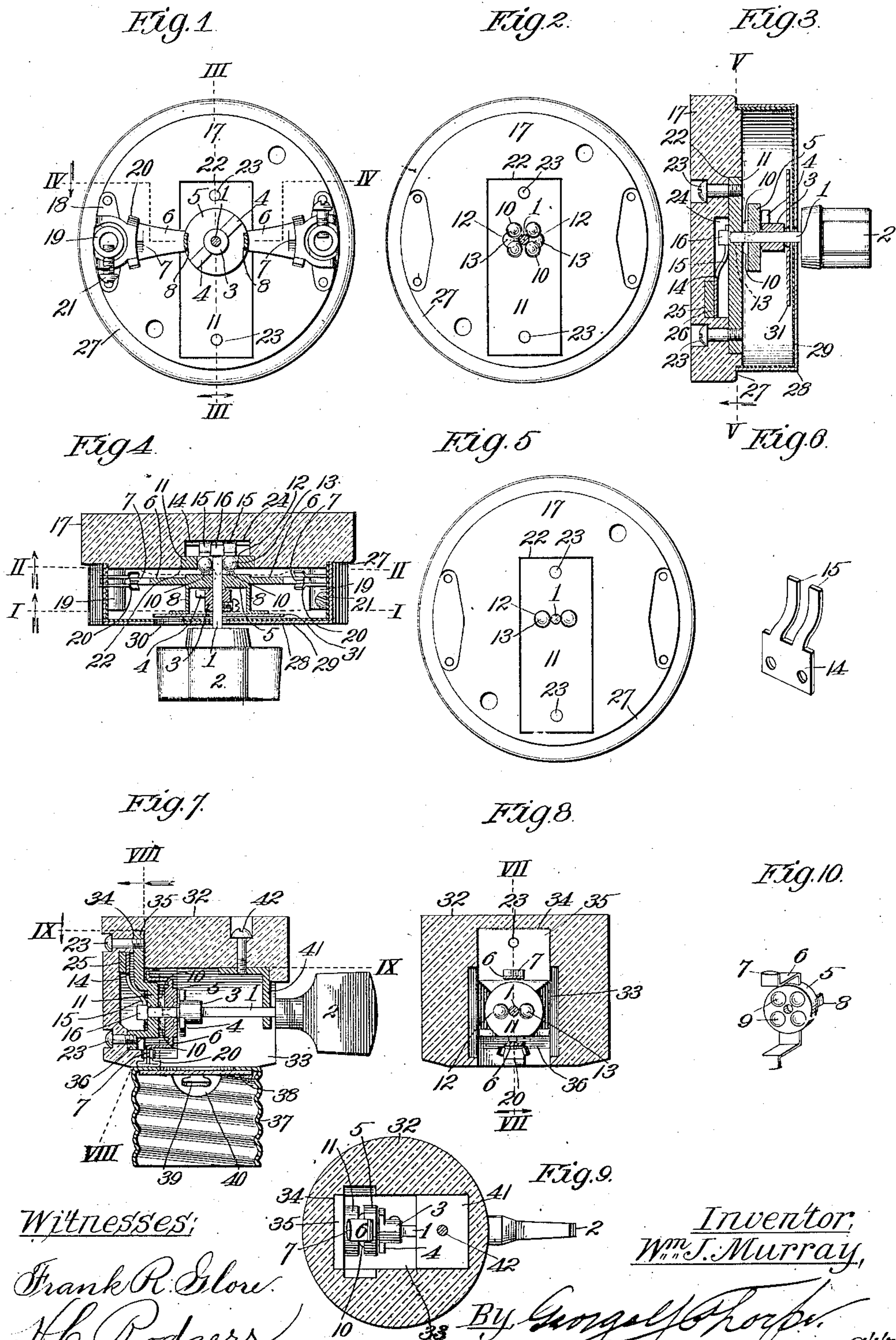


No. 837,241.

PATENTED NOV. 27, 1906.

W. J. MURRAY.
ELECTRIC SWITCH.
APPLICATION FILED MAY 2, 1905.



Witnesses:

Frank R. Glou.
H. C. Rodgers

Inventor:
Wm. J. Murray,

By George P. Hooper, atty.

UNITED STATES PATENT OFFICE.

WILLIAM J. MURRAY, OF LEAVENWORTH, KANSAS, ASSIGNOR OF ONE-
HALF TO HERBERT W. WOLCOTT, OF LEAVENWORTH, KANSAS.

ELECTRIC SWITCH.

No. 837,241.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed May 2, 1905. Serial No. 258,517.

To all whom it may concern:

Be it known that I, WILLIAM J. MURRAY, a citizen of the United States, residing at Leavenworth, in the county of Leavenworth and State of Kansas, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to that class of devices wherein a movable element is yieldingly retained in a fixed position against accidental movement and which after being moved a certain distance automatically continues such movement and cannot be restrained therefrom by the operator who started such movement, and is designed especially as the principal or essential part of what is known as a "quick-break switch"—that is, a switch which suddenly makes or breaks an electric circuit through its terminals to avoid danger of arcing within the switch.

The object of my invention is to produce a device of the character above outlined which operates efficiently and reliably and with a minimum of frictional resistance and in consequence with a maximum of durability.

The invention consists, essentially, in the combination, with a spindle provided with one or more arms and a holder containing one or more spring-advanced balls, of a plate journaled axially of the spindle and provided with one or more sockets, each socket containing a ball to travel upon the face of the holder and the ball or balls carried thereby, the device also necessarily embodying, when a part of an electric switch, circuit-terminals to be engaged at times by said plate, and thereby placed in electric connection.

The invention also embraces certain features of construction and organization, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figures 1 to 6, inclusive, represent what is known as a "snap-switch" and the remaining figures an incandescent lamp-socket. Fig. 1 is a section taken on the dotted line I I of Fig. 4 with the cap omitted. Fig. 2 is a section taken on the dotted line II II of Fig. 4 with the cap omitted. Fig. 3 is a section taken on the dotted line III III of Fig. 1 with the cap in place. Fig. 4 is a section taken on the dotted line IV IV of Fig. 1 with the cap in place. Fig. 5 is a section taken on

the dotted line V V of Fig. 3. Fig. 6 is a detail perspective view of the ball-advancing spring. Fig. 7 is a vertical section on the line VII VII of Fig. 8. Fig. 8 is a vertical section on the line VIII VIII of Fig. 7. Fig. 9 is a horizontal section on the line IX IX of Fig. 7. Fig. 10 is a detail perspective view of the rotary conducting-plate.

In the said drawings, where like reference characters refer to the same parts, 1 is a spindle, 2 the thumb-piece to rotate the spindle, and 3 a rigid collar on the spindle provided with one or more arms 4.

5 is a conducting-plate journaled on the spindle, 6 oppositely-projecting arms thereof, and 7 double-beveled or knife-edge ends for the arms to facilitate engagement, when rotating in either direction, with contacts hereinafter referred to.

8 indicates one or more shoulders projecting forward from plate 5 and adapted for engagement by arm or arms 4, whereby the conducting-plate is turned to establish or break an electric circuit.

9 indicates one or more sockets in plate 5. There will preferably be four of these sockets, arranged as shown, (see Figs. 2 and 10,) and in each socket is a ball 10, capable of turning, said balls projecting beyond the rear face of the plate and engaging, by preference, the face of a stationary holder 11, through which the spindle preferably extends. Holder 11 is formed with one or more passages 12, containing a ball or balls 13, normally protruding from the front face of the holder and adapted to be pushed back by the balls 10 as they successively pass under rotation of plate 5, caused by the arm or arms 4 being pressed against shoulder or shoulders 8. There may of course be as many of these balls as desired, but there must be two balls 10 for each ball 13. I prefer two balls 13 and four balls 10, as the balance of the parts is thereby better retained and no lateral pressure is applied on the spindle and connected parts.

14 is a spring-plate bifurcated to form a pair of spring-arms to bridge the rear end of passages 12 and hold the balls 13 advanced with a yielding pressure, the arms 15 straddling the collar or enlargement 16 on the rear end of the spindle to prevent the latter from being pulled forward from position.

17 indicates a porcelain or equivalent base

equipped with brackets 18, carrying binding-posts 19, and double-arm spring-contacts 20 of a type in common use, these contacts being adapted to be simultaneously engaged by the opposite beveled ends 7 of the rotary conducting-plate 5. The binding-posts are provided with clamp-screws 21 to secure the wires (not shown) in the posts.

22 is a recess in the inner or front face of the base to receive the holder 11, and 23 screws securing said parts together.

24 is a deeper portion of the recess to receive the collar 16 and spring-arms 15 and permit the latter to move back when the balls 10 ride over and repress the balls 13.

25 represents a further increase in the depth of recess 22 to receive the plate 26, to which spring 14 is preferably secured.

27 is an annular marginal recess in the base to receive the preferably metallic cap 28, provided with an insulating-lining 29, said cap and lining also having a slot 30, through which successively appear the words "off" and "on" (not shown) on the disk 31, carried by shoulders 8 or otherwise attached to rotate with the rotatable conducting-plate 5.

Referring now to Figs. 7 to 10, inclusive, 32 is the porcelain base of an incandescent lamp, and 33 a large opening or recess therein to contain the operative parts of a switch of substantially the construction and arrangement already described, the base having an offsetting recess 34 to receive the upper portion 35 of the holder, said portion being preferably of angular form, as appears in Fig. 7. Said holder is likewise formed with an angle-arm 36, the securing-screws 23 engaging said angular portion.

37 is the usual threaded metallic socket to receive the threaded end of the incandescent globe, (not shown), and to the upper end of said socket is secured the double-arm spring-contact 20 of the same general type of construction and operation as contacts 20, Figs. 1 and 4. The limited space of globe-base 32 suggested the advisability of bending the holder as already described in order to permit the rotary-contact-plate arms 6 to be bent to stair shape to dispose their beveled ends 7 in the plane of contact 20, so as to successively engage the latter when rotated.

38 is the usual mica disk in the threaded socket, and 39 the other circuit-terminal, the same being secured in the usual manner (not shown) to the base and projecting into the socket through the usual opening 40 thereof.

41 is a bracket secured to the base by screw 42 and providing a bearing for the outer end of the spindle, though this bearing is not indispensable.

The snap-switch or socket-switch is operated by turning the thumb-piece. The turning of the same one-eighth of a circle will either cause the conducting-plate to "jump" into or out of contact with the circuit-termi-

nal 20 of Fig. 7 or terminals 20 of Figs. 1 and 4 or if the pressure on the thumb-piece is prematurely relaxed will cause the part to jump back to its original position. The first eighth of any turning movement is stoutly resisted by the spring-pressed balls 13; but as soon as the balls 10 ride over the center of balls 13 the rotary plate 5 jumps forward under the pressure on said balls 13, and this jumping action cannot be prevented by the operator, because he cannot reverse the turning of the thumb-piece with sufficient quickness to arrest such movement by disposing an arm 4 in the path of a shoulder 8. The independent movement of the rotary plate is checked by the forward movement of balls 13, which spring forward after each repression between two of the balls 10, as will be readily understood.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a suitably-supported spindle, a plate journaled thereon provided with a socket, a ball fitting in and projecting from said socket, a holder to retain the ball in said socket, means yieldingly projected beyond the face of said holder in the path of travel of said ball, and means actuated by the rotative movement of the spindle, for rotating said ball-carrying plate.

2. The combination of a suitably-supported spindle, a plate journaled thereon provided with a socket, a ball fitting in and projecting from said socket, a holder to retain the ball in said socket, means yieldingly projected beyond the face of the holder in the path of travel of said ball, and an arm rigid with the spindle for rotating said ball-carrying plate until its ball passes the center of the means yieldingly projected in its path.

3. The combination of an apertured holder, a yieldingly-advanced ball in the aperture of said holder and normally projecting beyond the face of the same, a spindle suitably journaled, a plate journaled on the spindle and provided with a socket, a ball in said socket, adapted as the plate turns to ride upon and depress the yieldingly-advanced ball in the apertured holder and means actuated by rotative movement of the spindle to rotate said rotatable plate until its ball has ridden upon and past the center of the yieldingly-advanced ball.

4. The combination of a suitably-journaled spindle, a plate journaled thereon and provided with a plurality of sockets, balls resting in and projecting from said sockets, means actuated by rotative movement of the spindle for imparting like movement to the ball-carrying plate, a holder to retain the balls in the rotatable plate, a ball mounted in the holder; and means for yieldingly projecting said ball beyond the face of the holder and in the path of travel of the first-named

balls to yieldingly resist movement of the latter and to assume a position between contiguous balls to rotate them and their plate more rapidly than the movement imparted to them by the spindle and to then check such movement by occupying such position between contiguous balls.

5. The combination of a suitably-journaled spindle, a plate journaled thereon and provided with at least four equidistant sockets, a ball in and projecting from each socket, a holder to retain said balls in the sockets, a pair of diametrically opposite projections yieldingly projected beyond the face of said holder and in the path of travel of said balls, and means actuated by the rotatable movement of the spindle for rotating the plate journaled thereon until two of its balls ride upon and pass the centers of the yieldingly-advanced projections.

6. The combination of a suitably-journaled spindle, a plate journaled thereon and provided with at least four equidistant sockets, a ball in and projecting from each socket, a holder to retain said balls in the sockets, a pair of diametrically opposite balls adapted to move back and forth through the holder, a spring exerting constant forward pressure on said balls to project them beyond the face of the holder, and in the path of the balls of the journaled plate, and means actuated by the rotative movement of the spindle for rotating the plate journaled thereon until two of its

balls ride upon and pass the center of the yieldingly-advanced balls.

7. The combination of an insulating-base, a spindle projecting therein and suitably journaled, a plate journaled on the spindle and provided with a socket, a ball fitting in and projecting from said socket, a holder to retain the ball in said socket and secured to the base, means yieldingly projecting beyond the face of said holder in the path of travel of said ball, a contact suitably supported, and means actuated by the rotation of the spindle to cause the ball-carrying plate journaled thereon to engage the contact and become disengaged therefrom alternately.

8. The combination of a suitably-supported spindle, a plate journaled thereon, a projection carried by said plate, a holder contiguous to said journaled plate, a projection protruding from the holder toward said plate, means holding one of the projections yieldingly protruding into the path of travel of the other projection, and means actuated by the rotative movement of the spindle for rotating said journaled plate until its projection passes the center of the opposing projection.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM J. MURRAY.

Witnesses:

W. W. HOOPER,

CARL H. HASHAGEN.