

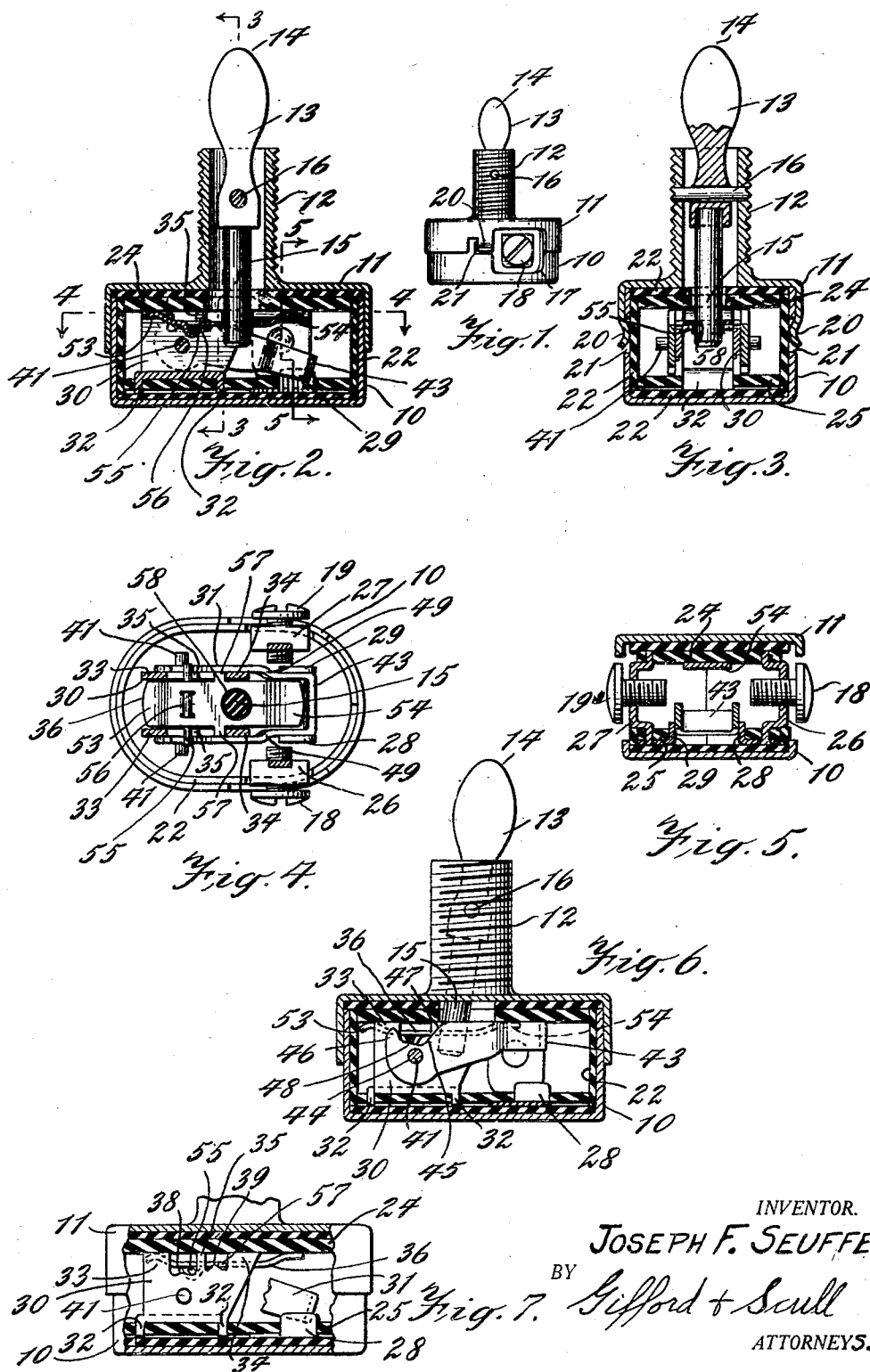
Oct. 7, 1930.

J. F. SEUFFERT

1,777,330

ELECTRICAL SWITCH

Filed Oct. 16, 1926



INVENTOR.

JOSEPH F. SEUFFERT

BY

Gifford + Scull

ATTORNEYS.

UNITED STATES PATENT OFFICE

JOSEPH F. SEUFFERT, OF NEW YORK, N. Y.

ELECTRICAL SWITCH

Application filed October 16, 1926. Serial No. 141,937.

My invention relates to an electrical switch, more particularly to a snap switch, operable by a lever in the style of a tumbler switch.

5 An object of my invention is to provide a simple effective switch which will be equally good in small sizes as well as in large sizes, which will be positive in its action, and one in which the switch member may be posi-
10 tively retained in an open or a closed position. Further objects and advantages will be apparent from a consideration of the invention as set forth.

My invention has a special application in
15 a single circuit switch, such as is used in an automobile on the dash board, or on the instrument board of an aeroplane to control lights, ignition, or signals, or for electric lighting fixtures particularly of the wall
20 type, but is not restricted to this use.

My invention will be best understood from the following description and drawings showing an embodiment thereof, in which:

Fig. 1 is a side elevation of the switch member in its casing;

Fig. 2 is a central elevational section showing on an enlarged scale the switch member in closed position;

Fig. 3 is a section on line 3—3 of Fig. 2;

30 Fig. 4 is a section on line 4—4 of Fig. 2 with the cover removed;

Fig. 5 is a section on line 5—5 of Fig. 2;

Fig. 6 is a sectional elevation showing the switch open; and

35 Fig. 7 is a fragmentary elevation showing in detail the member which pivotally supports the U-shaped switch member.

Like reference characters indicate like parts throughout the drawings.

40 In the illustrative embodiment of my invention shown in the drawing, a casing 10 is closed by a cap or cover 11 carrying a neck extension 12 on the outer side thereof. This extension is threaded externally to remov-
45 ably secure it within a socket on any suitable support, such as a dash or instrument board, canopy or similar wall fixture.

The neck 12 is made hollow for the reception of an operating member 13 having
50 an outwardly extending knob 14 and an in-

wardly extending insulated point or tip 15, for actuating the switch member. This operating member is pivotally mounted to have a limited movement within the hollow portion of the neck 12 on a pivot 16 passing
55 through the neck and through the operating member. The cap and casing are recessed at 17 for the projecting terminal screws 18 and 19 and have complementary snap fastening parts comprising hooks 20 on the cap for en-
60 gagement in notches 21 on the casing. Thus the casing may be readily opened for cleaning or repairing the switch member. The casing if of metal, as shown, is interiorly lined with insulation 22. If however such a
65 material as bakelite or vulcanite is used, the insulation may be dispensed with.

The switch unit proper is a complete unitary structure housed within the casing
70 10 and is easily insertable therein and removable therefrom as it has no fastening connection to the case. The switch unit is entered and operated by the tip 15 of the operating member 13. The unit is con-
75 structed and partially enclosed between parallel top and bottom plates 24 and 25 made of stiff insulating material, such as vulcanite. The plates are spaced from each other at one end and held together by the metal terminal posts 26 and 27 which carry the ter-
80 minal screws 18 and 19. These posts are electrically joined to contacts 28 and 29 of the switch proper. At the other end of the plates is a metal member 30 U-shaped in cross section, which serves as a support for
85 the switch member 31. The member 30 has extensions 32 bent down from the extreme ends of its bottom portion and secured into the plate 25. At the top end corners of this supporting member 30 are opposed pairs of
90 extensions or lugs 33 and 34 entering plate 24 for aligning with or securing member 30 to the top plate 24.

This main supporting member 30 has a
95 stub post 35 placed on each side approximately midway between posts 33 and 34 to serve as a limit or stop to the movement of the sliding switch actuating member 36. The post 35 may be extended to or through the top plate 24 if desired. Detents 38 are placed
100

on each side between lugs 33 and posts 35 and detents 39 are similarly placed between posts 35 and lugs 34 to retard the movement of the switch actuating member 36 in its longitudinal movement from one extreme position to the opposite extreme position, as will be described below. This is to ensure a quick and full movement of the switch actuating member and of the switch member itself on movement of the operating member 13. Perforations 40 in the member 30 provide a support for the pivot pin 41 upon which to mount the switch member 31 pivotally on the supporting member 30.

Switch member 31 consists of a strip of metal, bent into a U-shape. The bar 43 of the switch member furnishes a short electrical path between the contact points 28 and 29. A perforation 44 in the extremity of each leg of the switch member matches with the perforations 40 of the supporting member and holds pin 41 about which the switch member pivots or oscillates in its movement from open to closed position or in the reverse movement. A notch 45 is formed on each leg or arm of the U-shaped member adjacent the pivot, and directly above the same. The notch terminates in end portions 46 and 47, and is provided or formed with a slight central projection or detent 48. The notch is shown in Fig. 6 to be shallower at the side of the detent adjacent the outer end portion 46, for reasons that will be seen later. The U-shaped switch member 31 is bent in at points 49 to make the switch member narrower at the extremity between the contact points to permit bringing these contacts as close together as possible to reduce the size of the finished switch.

The switch actuating member 36 consists of a spring plate bent at its ends to form lugs or upstanding flanges 53 and 54 which resiliently press against the upper plate 24. A pin or rod 55 is secured to this plate through a struck-out loop portion 56 adjacent one end of the flat portion of the plate 36. The pin projects beyond the sides of the plate 36 to engage in the notches of the supporting member between the lugs 33 and posts 35, and in movement passes over the detent 38. Integral lugs 57 extend from the sides of the actuating member 36 and rest upon the supporting member 30 between the posts 35 and lugs 34 of the supporting member and ride or move over the detents 39 on the sides of the supporting member. A hole 58 is formed in the plate or switch actuating member 36, a short distance from the rod 55, and is of such a size as to accommodate the small end 15 of the operating member 13. This spring plate member or switch actuating member 36 is reciprocated by the small end 15 of the operating rod. This movement takes place from one end to the other of the notch 45 in the

switch member 31, to move the switch member.

The operation of this device is as follows: When the switch member is in open position, as seen in Fig. 6, the rod 55 of the spring plate 36 bears in notch 45 of the switch member between the detent 48 and the end 46 of the notch. The opposed end flanges of the spring plate pressing against the top plate 24 push the rod 55 downwardly against the outer end of the switch member and furnish a force to retain the switch member in open position.

Movement of the knob 13 of the operating member forces the spring 36 to flatten a little to permit the rod 55 to pass over the detents 38 and 48 and the lugs 57 to pass over the detent 39. The rod 55 is thus moved across the vertical plane of the pivot pin 41 to bear against the bottom of notch 45 on the opposite side of the pivot 41 and the detent 48. The force in the compressed spring will now impel the switch member downwardly. The bar end 43 of the U-shaped switch member is thus quickly thrown into circuit closing position between the electrical contacts 28 and 29. This movement, because of the independent effort or spring action of the plate 36, is very quickly performed so that arcing between the contact and the switch member is avoided. The switch being now in circuit closing position furnishes the path for the current to flow through.

To open the circuit or open the switch member an opposite movement of the knob 14 causes a quick reversal of the preceding movement, that is, the rod 55 and the lugs 57 pass backward over the detents 38 and 39, respectively, and the downward force of the rod 55 on the extremity of the switch member at the opposed side of the pivot quickly raises or snaps the switch member to open position. This circuit opening movement is aided by the shallowness of the portion of the notch adjacent the end portion 46. This causes a greater deformation and therefore greater compression in the spring 36 when it is moved into circuit opening position, than when it is moved to circuit closing position. A quicker start is thus given the switch member on opening movement.

It will be noted that a very slight movement of the rod 55 in the notch 45 will give a greatly magnified movement of the loop or bar of the U-shaped member. The rod 55 due to its close relation to the pivot about which the switch member swings, must exert a relatively great force to move the switch member but acts through only a relatively short distance. The quick movement of the switch that is thus made available prevents arcing of the contacts and ensures a long life for the switch member.

This switch has a special application in places where a compact, single circuit switch is required. Tight fitting of the working

parts is not essential to operation. This simplicity of the device and of the parts renders injury unlikely and simplifies the upkeep and repair. It is apparent that this invention furnishes a simple, effective, and cheap switch member of a very useful and desirable nature.

I claim:

1. In a snap switch, spaced plates of insulating material, opposed contact and terminal members mounted between said plates and on one of them, a switch member movable between said terminals to engage said contacts to close a circuit therethrough, an actuating member for said switch member including a spring plate with its extremities bent to press against said other insulating plate, and means on said actuating member to move said switch member and to retain it in open or closed position.

2. In a snap switch, spaced plates of insulating material, opposed contact and terminal members mounted between said plates and on one of them, a switch member movable between said terminals to engage said contacts to close a circuit therethrough, an actuating member for said switch member including a spring plate with its extremities bent to press against said other insulating plate, means on said actuating member to move said switch member and to retain it in open or in closed position, and means operable from outside the plates to open or close said circuit.

3. In a snap switch, spaced plates of insulating material, opposed contact and terminal members mounted between said plates and on one of them, a switch member movable between said terminals to engage said contacts to close a circuit therethrough, an actuating member for said switch member including a spring plate with its extremities bent to press against said other insulating plate, means on said actuating member to move said switch member and to retain it in open or in closed position and means operable from outside the plates to open or to close said circuit, said last means being operable through a perforation in one of said insulating plates and including a rocking lever pivotally mounted to reciprocate one end in said perforation.

4. In a snap switch, in combination, a support, a switch member pivotally mounted thereon adjacent one end, upstanding portions forming a notch in said switch member, and adjacent said pivot, a spring pressed rod operable in said notch to cross the plane of the pivot and bear on portions of said switch member oppositely disposed relatively to said pivot, and a projection on said support interposed between the projections forming said notch to insure the rod remaining at rest in extreme positions only.

5. In a snap switch, a plate of insulating

material, a bifurcated support thereon, a U-shaped switch member straddling said support and pivoted thereto adjacent the ends of its arms, and a switch actuating member disposed between the two parts of said support and provided with portions extending beyond said support to forcibly engage said switch member, adjacent said pivot, to rock the switch member to open or closed position and to retain it in position.

6. In a snap switch, a plate of insulating material, a bifurcated support thereon, a U-shaped switch member straddling said support and pivoted thereto adjacent the ends of its arms, a switch actuating member disposed between the two parts of said support and provided with portions extending beyond said support to forcibly engage said switch member, adjacent said pivot, to rock the switch member to open or closed position and to retain it in position and means to reciprocate said switch actuating member.

7. In a snap switch, opposed plates of insulating material, a bifurcated support spacing said plates, a U-shaped switch member straddling said support and pivoted thereto adjacent the ends of its arms, a resilient switch actuating member disposed between the two parts of said support and provided with portions extending beyond said support to forcibly engage said switch member, adjacent said pivot, to rock the switch member to open or closed position, upstanding flanges on said actuating member, to press against the adjacent plate and cause a pressure between said portions and said switch member.

8. In a snap switch, a casing having an opening therein, an operating member pivoted adjacent said opening and having its end projecting therethrough into the casing, a switch member pivoted within the casing and adapted to coact with a pair of contacts to open and close a circuit therethrough, a sliding spring plate having a hole receiving the end of said operating member and acting against the inside of the casing and against the switch member adjacent its pivot, whereby sliding of said plate will cause it to act upon said switch member on one side or the other of the pivot.

9. In a snap switch, a casing having an opening in a wall thereof, a sliding actuating plate within the casing and parallel to said wall, a pivoted operating member extending through said opening and having its end engaging said plate, a switch member pivoted within the casing, and means on the plate acting on the switch member adjacent its pivot, whereby sliding of said plate will cause it to act upon said switch member on one side or the other of the pivot.