May 23, 1933. E. M. SORENG 1,910,069

SWITCH

Filed July 24, 1931

FIG. 1.

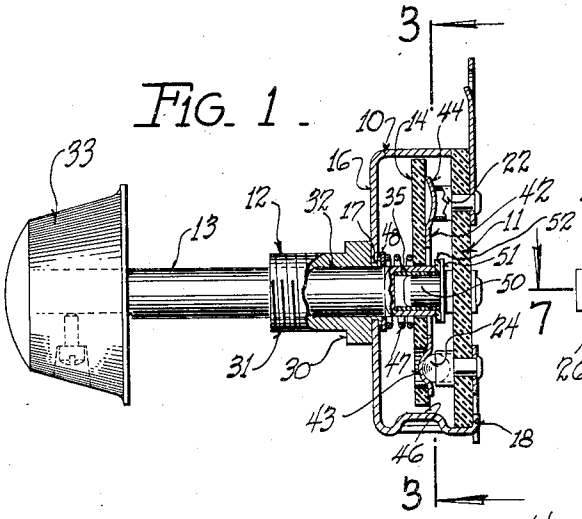


FIG. 2.

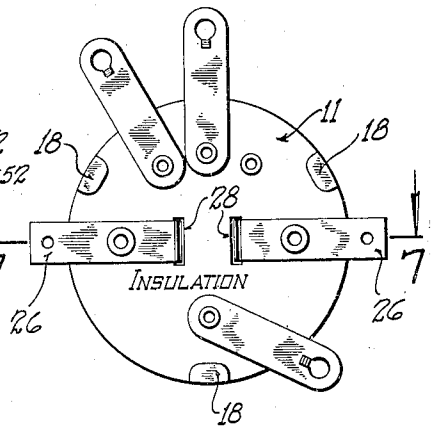


FIG. 3.

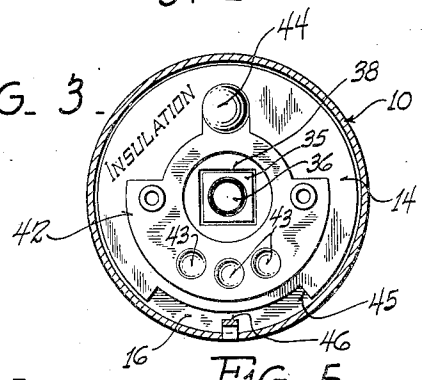


FIG. 4.

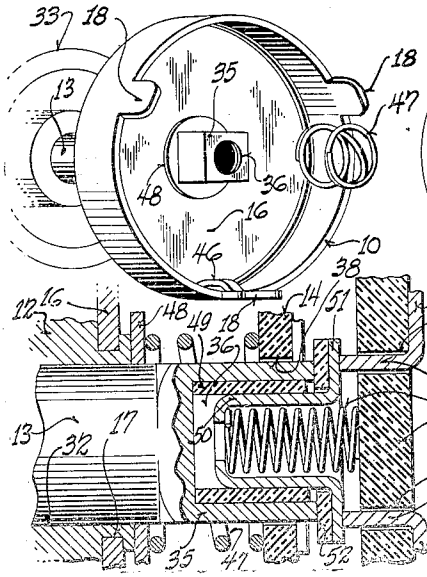


FIG. 5.

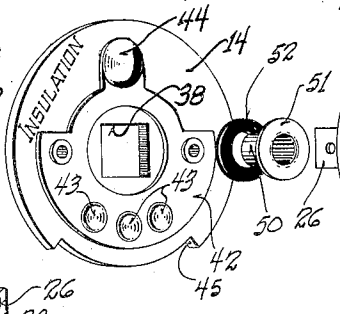


FIG. 6.

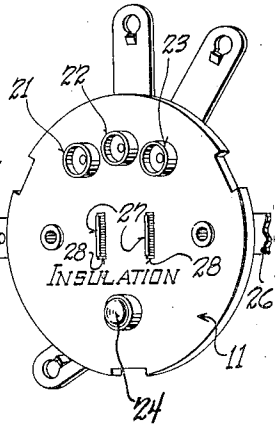


FIG. 7.

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UNITED STATES PATENT OFFICE

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SWITCH

Application filed July 24, 1931. Serial No. 552,883.

This invention relates to certain new and useful improvements in switches, and more particularly to an improvement to a standard radio switch which will permit the speaker to be cut out of the circuit temporarily and restore it in the circuit automatically upon release of the switch.

In tuning a radio, it is often desirable when going from one station to another, to eliminate the unnecessary noise and confusion that results in incidentally crossing other stations.

This result might be accomplished in several ways, such for example, as the provision of a separate switch in the speaker circuit or by turning off the power until the tuning means is set for the desired station. Both of these methods have obvious disadvantages. With the former method, a separate switch is necessitated, entailing additional cost and the additional possibility that the person operating the set will forget or not known that the speaker is "off" and think that the station is not on the air. While the latter method involves an undesirable delay while the tubes again heat.

The present invention involves a third method which elimniates the disadvantages incident to both of the above methods and contemplates temporarily short circuiting the speaker circuit while changing stations and automatically restoring the circuit when the tuning is completed.

It is a particular object of the invention to provide means to accomplish the above named objects in connection with one of the necessary switches on the radio.

It is obvious that such a switch is of broader application than the radio art and that it can be used wherever it is desired to make a connection temporarily and automatically break the circuit upon release of the making means.

With the above and other objects in view, the nature of which will appear as the description proceeds, the invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, there has been illustrated one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view partly in section, showing a preferred embodiment of the present invention;

Figure 2 is a rear end view of the switch;

Figure 3 is a cross section on the line 3—3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a perspective view looking in the inside of the casing, showing the spring for pressing the rotator plate spaced a slight distance outside of the casing;

Figure 5 is a perspective view of the rotator plate together with the central contactor and an insulating washer therefor;

Figure 6 is a perspective view of the inside of the cover plate showing the switch contacts thereon;

Figure 7 is a detail view illustrating the central contactor in place and short circuiting the auxiliary circuit.

Referring to the drawing, the switch comprises a casing 10 having a cover 11 at one side thereof, a bushing 12 fastened to the end of the cup and through which an operating shaft 13 projects, and a rotatable switch element 14 mounted in the casing to rotate with said shaft.

The casing 10 is formed of general cup shape configuration and has a flat end wall 16 formed with an aperture 17 therein and a plurality of tabs 18 spaced about the pe-

riphery of the rim thereof to hold the cover 11 in place.

The cover 11 has fastened thereto the various switch points for the incoming and outgoing current, it being shown as having switch points 21, 22, 23 and 24. Two of the points 21, 22, 23 may be live, while the third point may be dead, to form an off position of the switch.

It is obvious that a greater or lesser number of switch points than shown may be used, the particular number thereof or the arrangement of the circuits through the points 21 to 24 forming no part of the present invention.

Fastened to the lower portion of the cover are a pair of lead in strips 26, as best seen in Figures 2 and 7, which are bent inwardly as shown at 27, and pass through holes 28 in the cover 11 terminating on the inside of the casing 10 below the plane of the inner ends of the contacts 22 to 24 inclusive.

The bushing 12 may be fastened in the casing 10 by peening or other suitable method and comprises a shoulder 30, a threaded portion 31 for fastening the switch to a panel by means of lock nuts (not shown) and a smooth bore 32.

The bore 32 accommodates the shaft 13 which is fitted at one end with a suitable indicating knob 33 to facilitate turning the switch and to indicate the position of the contacts. The inner end of the shaft 13 is made polygonal in shape as shown at 35, best seen in Figs. 3 and 4, and has a hole 36 drilled concentrically therein for purpose to be brought out more fully below.

The polygonal end 35, of the shaft 13, fits a corresponding aperture 38 in the rotary portion 14 of the switch for turning that portion to various positions.

The member 14 has a ring-like contactor plate 42 fixed thereto and provided with a plurality of indentations 43 at one side thereof, into which the spherical contact 24 on the cover 11 is adapted to fit, and a single globular contact 44 adapted to selectively enter one of the cylindrical contacts 21, 22 and 23 on the plate.

The movement of the member 14 is limited by the groove 45 which cooperates with the instruck portion 46, struck in the side of the casing 10, to limit the movement of the member 14 so that the globular contact 45 is always in contact with one of the points 21, 22 and 23.

The ring member 42 is herein shown as being riveted to the plate 14, but any desired method of fastening thereto may be employed.

A spring 47 presses at one extremity against a washer 48 and at the other extremity against the plate 14 to resiliently urge the contacts 43 and 44 against the contacts 21 to 24 inclusive.

As has been brought out above, the polygonal end of the shaft is drilled out at 36, as best shown in Fig. 7. A bushing 49 made of suitable insulating material snugly fits into the bore and accommodates a cup shaped contactor 50 having a rim 51 formed integrally therewith.

A washer 52 of insulating material fits over the cylindrical portion of the cup shaped member and separates the rim 51 from the polygonal end 35 of the shaft 13. A spring 54 presses into the cup shaped member and rests at the other end thereof on the cover 11 to resiliently hold the end 35 of the shaft 13 together with the rim 51 of the contactor 50 in retracted position with the rim 51 of the cup shaped contact 50 out of contact with the inturned portion 27 of the strips 26.

In operation, the switch may be connected to send current through the contacts 21 to 24 inclusive, to the desired point of use. The contact strips 26 are connected in a circuit which it is desired either to short circuit or to make temporary. When it is desired to make the connection through the two connectors 26, the knob 33 on the shaft 13 is pressed inwardly moving the rim 51 of the cup shaped member 50 into contact with the inturned ends 27 of the strips 26 completing the circuit.

When it is desired to break this connection, all that is necessary is to remove the hand from the knob 33, the spring 54 taking effect to move the rim 51 out of engagement from the members 27. It will be noted that the making or breaking of the circuit through contacts 27 and the annular rim 51, does not affect the normal operation of the switch between the contact 24 and the contacts 21, 22 and 23, and that any of the circuits through the switch may be made or broken irrespective of the action of the supplemental switch 27—50.

It will thus be seen that the invention provides a relatively simple device for use in radios and many other connections, in which a circuit may be made, or short circuited temporarily and automatically restored to its original condition regardless of the main connection made by the switch.

It is realized that this invention is susceptible to various changes and modifications falling well within the scope of one skilled in the art, and it is, therefore, not desired to limit the invention to the precise form of the mechanism herein shown and described, but only by the scope of the appended claims.

What is claimed as new and desired to secure by Letters Patent, is:

1. In a switch of the character described, a casing, a cover for said casing, a plurality of spaced contacts mounted on said cover, a pair of spaced terminal members mounted on said cover, a rotatable shaft having a recess in one end thereof and projecting into said casing, a rotatable member mounted on said

shaft within the casing to rotate therewith, means on said rotatable member to bridge said contacts, a cup shaped member in said recess, a flange on the cup shaped member adapted to bridge said terminal members upon movement of the cup shaped member out of said recess, means to move said cup shaped member, and means resiliently urging said cup shaped member to inoperative position.

2. In a switch of the character described, a substantially cup shaped casing, a cover closing the casing, a plurality of spaced contacts mounted on said cover, a pair of spaced terminal members mounted on the cover and having their inner end portions projecting inwardly through the cover to be exposed on the inner surface thereof, a movable contactor within the casing adapted for engagement with the spaced contacts, a driving member for said contactor having a central polygonal opening, an actuating shaft for the driving member having a corresponding polygonal end portion engaged in said opening and having a round extension journalled in an opening in the bottom of the cup shaped casing, an actuating member on the round shaft extension, the polygonal inner end portion of the shaft having a recess formed directly therein, a contact member slidably mounted in said recess and engageable with the exposed inner ends of the pair of terminals to electrically bridge the same upon the application of inward axial pressure on the shaft, and an expansive spring confined between the contact member and the casing cover to yieldably oppose said inward axial movement of the shaft and contact member, the movement of the shaft by said expansive spring being limited by the engagement of the shoulder formed at the juncture of the round and polygonal portions of the shaft with the inner wall of the casing.

3. In a switch of the character described, a casing, rotary switch instrumentalities within the casing, a shaft to actuate said switch instrumentalities, said shaft being journalled in a bushing carried by one wall of the casing and having its inner end within the casing provided with an enlarged polygonal head whereby axial movement of the shaft in one direction is limited by the engagement of the shoulder at the juncture of the polygonal head and the remainder of the shaft with the inner wall of the casing, a driving member for the rotary switch instrumentalities having a non-rotatable connection with the polygonal head, a pair of stationary contacts within the casing adjacent the inner end of the polygonal head, a contact member to bridge said stationary contacts mounted in a recess formed directly in the end of the polygonal head, and spring means engaging the contact member to yieldably urge it and the shaft away from said stationary contacts whereby engagement of the contact member with the stationary contacts requires axial shifting of the shaft inwardly against the action of said yieldable means.

4. In a switch of the character described, a cup shaped casing, a terminal head closing the casing, a plurality of stationary contacts carried by the terminal head and exposed on the inner face thereof, a rotary switch member engageable with certain of the stationary contacts, an axially shiftable contact member adapted to electrically bridge other of said contacts, an actuating shaft slidably journalled in a bushing carried by the bottom wall of the casing, an actuating member carried directly by the outer end of the shaft, the inner end of the shaft disposed within the casing being of enlarged polygonal cross section, a drive member having an opening to receive the polygonal inner end of the shaft to transmit rotary motion of the shaft to the rotary contact member, spring means encircling the polygonal end of the shaft and confined between the inner wall of the casing and said driving member to yieldably urge the same and the rotary contact member toward the stationary contacts engageable thereby, said polygonal end of the shaft having an axial recess opening to its end to receive the axially shiftable contact member, means to insulate said axially shiftable contact member from the shaft and facilitate relative rotation of the shaft with respect to said axially shiftable contact member, whereby the shaft and the rotary contact member are freely rotatable with the shaft shifted inwardly to engage the axially shiftable contact member with its stationary contacts, and spring means to move the axially shiftable contact member and the shaft away from the terminal head to a position defined by the engagement of the juncture between the polygonal portion and the round portion of the shaft with the inner wall of the casing.

5. In a switch of the character described, a cup shaped casing, a terminal head closing the casing, a pair of fixed contacts carried by the terminal head adjacent its central portion, a journal bearing carried by the wall of the casing opposite the terminal head, an actuating shaft slidably journalled in said bearing, a polygonal head formed integral with the shaft and disposed within the casing with the juncture between the polygonal head and the shaft engageable with the wall of said casing to limit outward movement of the shaft, said polygonal head having an axial recess, a cup shaped contact member mounted in said recess, a flange on the cup shaped contact member limiting the inward movement of the cup shaped member into the recess and engageable with the spaced stationary contacts upon axial shifting of the shaft toward the terminal head, an expansive spring seated within the cup shaped contact

member and engaging the terminal head to yieldably urge the shaft and cup shaped contact member away from the terminal head, an insulating lining between the cup shaped contact member and the recess to electrically insulate the cup shaped contact member from the shaft and provide for free rotation of the shaft with respect to the cup shaped contact member when the same is engaged with the stationary contacts, and rotary switch instrumentalities within the casing and operable upon rotation of the shaft.

In testimony whereof, I hereunto affix my signature.

EDGAR M. SORENG.