Nov. 15, 1927. 1,649,694

J. H. HEWITT

ELECTRIC SWITCH

Filed March 5, 1926 2 Sheets-Sheet 1

FIG. 1.

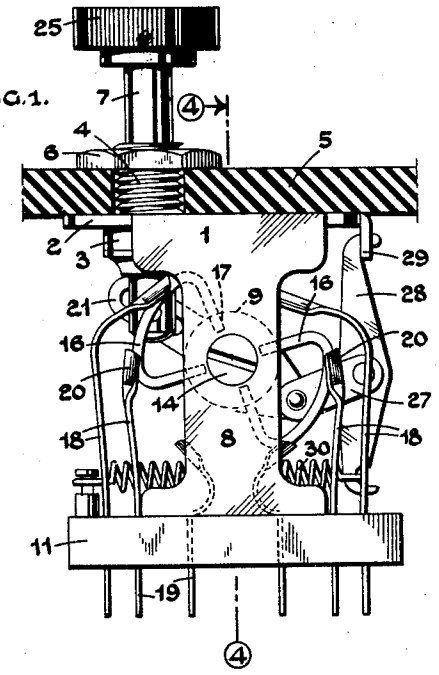


FIG. 2.

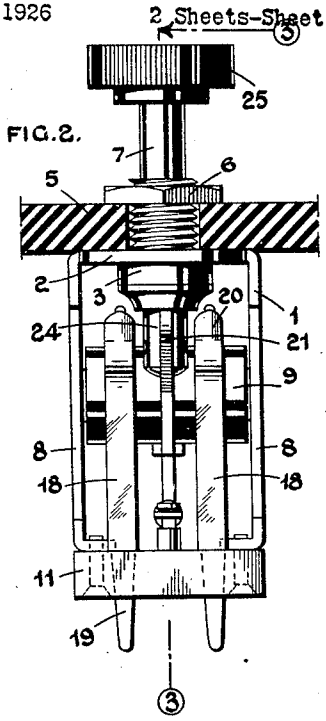


FIG. 3.

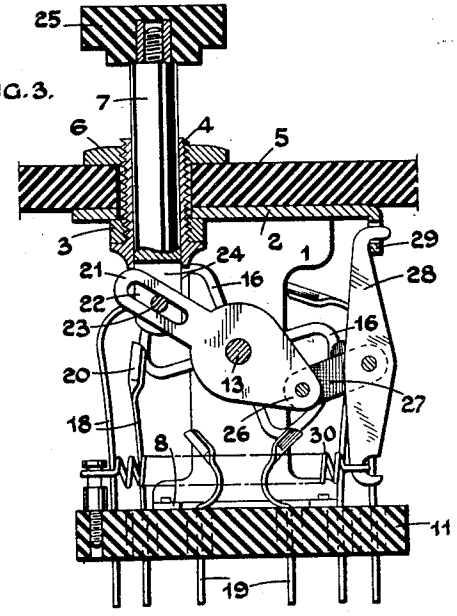
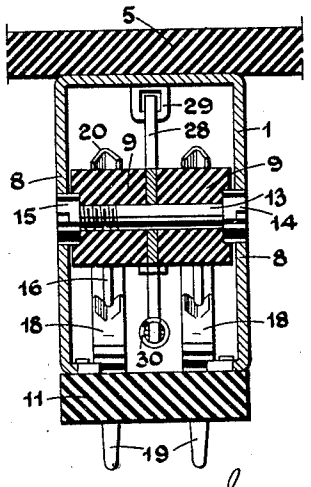


FIG. 4.



Inventor
John Hulbert Hewitt
By
V. B. Lingen, Atty.

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J. H. HEWITT

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FIG.5.

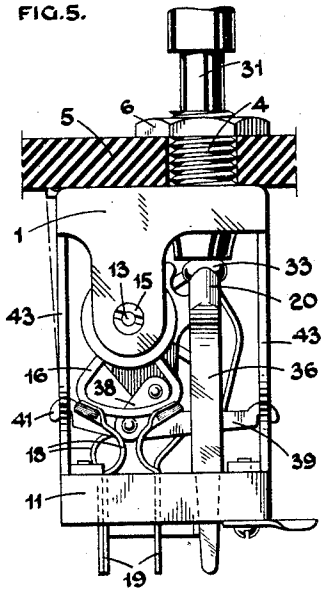


FIG.6.

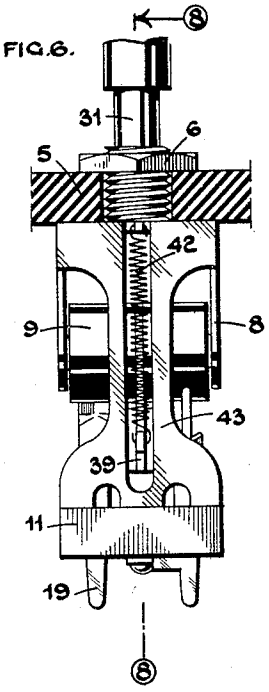


FIG.7.

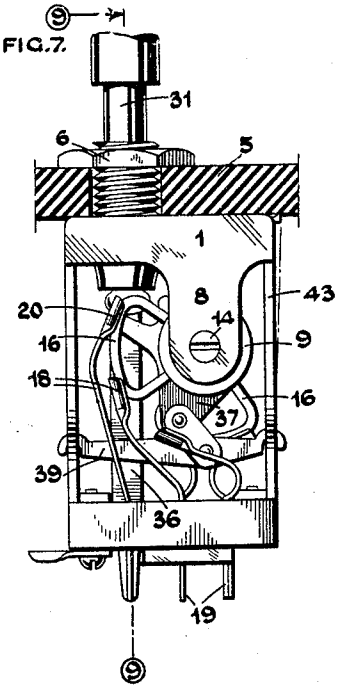


FIG.8.

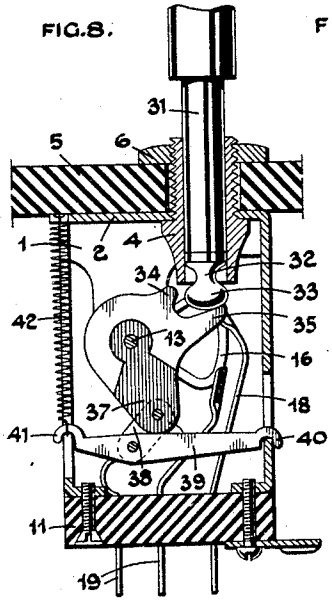


FIG.9.

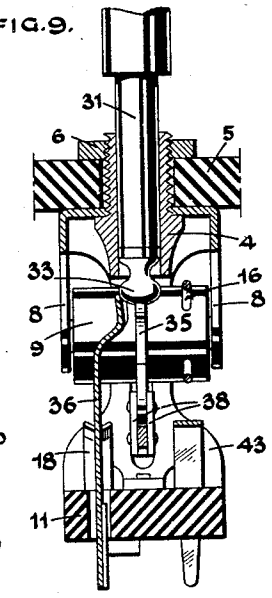
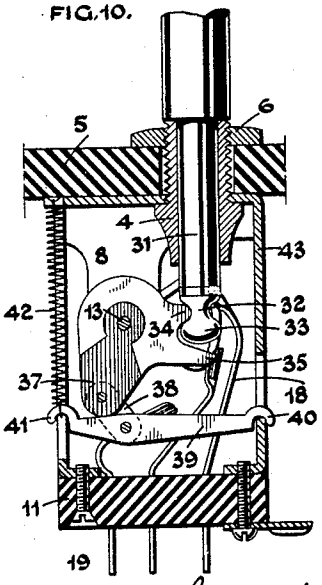


FIG.10.



Inventor
John Herbert Hewitt
By
J. B. Kluger, Atty

Patented Nov. 15, 1927. 1,649,694

UNITED STATES PATENT OFFICE.

JOHN HERBERT HEWITT, OF BIRMINGHAM, ENGLAND.

ELECTRIC SWITCH.

Application filed March 5, 1926, Serial No. 92,595, and in Great Britain February 2, 1926.

This invention relates to electric switches and is intended primarily for use with wireless apparatus wherein it is desirable that the switch shall include as small a volume of metal as possible and wherein the various conducting parts shall be well separated to minimize capacity effects.

One of the objects of the present invention is to construct an improved switch of the kind in which the moving contacts are mounted on a rotary drum or hub and are preferably of skeleton form and adapted to engage with stationary contacts formed of strips of metal separately mounted in an insulator.

When used in wireless apparatus such switches commonly have to be mounted on a panel, and a further object of the present invention is to construct the switch so that its surface area when projected on to the panel is as small as possible, the construction being much more compact than the various arrangements described in my prior U. S. A. Patent No. 1,554,090.

A further important object of the invention is to provide a switch operating on the "jack" principle by means of which an extraneous circuit is interposed in any desirable portion of a circuit, merely by inserting a plug or "jack" which constitutes the two ends of the extraneous circuit, said plug or "jack" consisting of two insulated members.

A further object of the present invention is to provide a switch wherein the terminals associated with the contacts are easily accessible for wiring.

A further object of the present invention is to construct a switch of the kind referred to wherein the cost of manufacture is kept as low as possible and wherein the arrangement is such that the switch can be mounted on the panel by providing a single hole in the panel.

A further object of the present invention is to provide a switch of the kind referred to which can be operated by a member which is detachable from the switch, the switch being constructed so that a member of a particular shape must be used for its operation whereby the said operating member can be used as a key, preventing the unauthorized operation of the switch.

One of the features of the present invention is to provide a bracket or frame having a portion or portions which rotatably support the drum or hub carrying the moving contact, the said bracket or frame having an attachment portion by which it is adapted to be secured to the panel, the said attachment portion being parallel to the axis of the drum or hub, and the attachment portion being provided with a hollow boss which receives or is adapted to receive an operating member formed as a push rod having an endwise movement, means being provided associated with the hub whereby the said rod can turn the hub.

The push rod which constitutes the operating member may have a pin and slot connection with a crank or its equivalent associated with the hub, or the hub may be provided with a recess or fork adapted to be engaged by an enlarged head upon the operating push rod so that the push rod can be entirely detached from the switch.

If the fork or recess associated with the hub is made of a particular shape, then a special shape of head and neck may be necessary on the operating push rod, in which case the operating push rod will serve as a key to prevent unauthorized operation of the switch.

The bracket or frame of the switch may be made from a single sheet metal blank having a portion for attachment to the underside of the usual insulating panel and having integral ears which are bent at right angles to the attachment portion and which serve to carry the drum or hub between them.

The said ears may be extended so that they may also carry an insulating plate which receives the stationary contacts, or a separate pair of ears may be provided integrally on the said sheet metal blank for carrying the said insulating panel.

Suitable means, such as a spring pressed lever connected to a crank on the drum may be provided for retaining the drum in either of its two alternative positions.

Referring to the drawings:—

Figure 1 is a side view of one form of the switch showing the panel in section.

Figure 2 is a front view thereof showing the panel in section.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 1.

Figure 5 is a view in side elevation show-

ing another form of switch constructed in accordance with my invention, the panel being shown in section.

Figure 6 is a front view of Figure 5.

Figure 7 is a view looking from the rear of Figure 5.

Figure 8 is a section on line 8—8 of Figure 6.

Figure 9 is a section on line 9—9 of Figure 7.

Figure 10 is a view similar to Figure 8 but showing the switch after it has been operated.

In the construction shown in Figures 1 to 4, the bracket member 1 is made of a sheet metal blank of inverted U shape having an attachment portion 2 provided with a boss 3 in which is inserted a sleeve 4 which is adapted to extend through the hole in the panel 5, the switch being thus secured to the panel by a nut 6 on the outer side of the panel which screws on to the said sleeve. This sleeve 4 forms a bearing for the operating push rod 7.

The plate forming the bracket 1 is provided with a pair of intergral ears 8 which are bent at right angles to the attachment portion 2 and which carry between them the hub 9, and which are also extended and have their ends 10 bent towards each other to carry an insulating plate 11 for receiving the stationary contacts 12.

The insulating hub 9 may be constructed of any suitable insulating material and is mounted on a central screw 13 having a round head 14 and round nut 15 which are rotatably carried in the ears 8 of the bracket 1.

This hub 9 is provided with any suitable number of moving contact members 16 which are of sector like form constructed of round or other section wire, the ends 17 of the wire being inserted in radial or substantially radial holes in the hub.

The stationary contacts 18 are formed of strips of metal or other conducting material having shouldered shanks 19 which are driven into round or other holes in the insulating plate carried by the bracket.

The stationary contact strips 18 have their end portions 20 bent into channel or V form so as partially to embrace the transverse section of the wire or material forming the moving contacts.

The insulating hub 9 is formed in two parts between which at the centre is mounted a metal crank 21, and this crank is provided with a slot 22 through which passes a pin 23 connecting the inner slotted end 24 of the operating push rod 7. The push rod extends through the sleeve 4 and is provided with an insulating handle 25.

The hub 9 is preferably provided with a second crank 26 which may be diametrically opposite to and formed as an extension of the crank 21 which is connected with the push rod, and this second crank 26 is connected by a pair of links 27 to about the centre of the lever 28 which is pivotally mounted or hooked on to an integral lug 29 on the bracket 1 and which is acted upon at its opposite end by a coiled tension spring 30. The arrangement is such that in moving from one terminal position to the other, the hub 9 moves the crank 26 past a dead centre position so that the spring pressed lever 28 operates to retain the hub in either terminal position.

In the construction shown in Figures 5 to 10 the operating push rod, instead of being permanently secured to the crank associated with the hub, is formed as a separate member or "jack" 31 and is provided with a reduced neck 32 near its end beyond which is an enlarged and rounded head 33.

In this construction the end of the crank on the hub 9 is formed as a fork having prongs 34 and 35 of unequal length, the arrangement being such that when the push rod 31 is pushed into the switch, the end of its head 33 pushes against the longer prong 35 of the fork and rotates the hub 9. On pulling the operating rod 31 out of the sleeve 4 its enlarged head 33 engages the shorter prong 34 of the fork and moves the hub 9 back into its original position.

In either construction the bracket may be provided with a second pair of ears at its ends, the first pair of ears which carry the hub being at its sides. The arrangement is shown in Figures 5 to 10 wherein the pair of ears 35 which are disposed at the ends of the bracket are bent at right angles to the attachment portion of the bracket and serve to carry the insulating plate 11 which receives the stationary contacts 18.

The operating push rod or "jack" 31 used is made in two conducting parts insulated from each other, one part forming the head and reduced neck 33 and 32 and the other part forming the shank 31 of the rod.

In this construction, the insulating plate 11 is provided with a contact 36 which, when the operating rod 31 is pushed into the switch, is adapted to bridge the two conducting parts 33 and 31 of the operating rod so as to close a circuit containing these two conducting parts, this circuit being closed simultaneously with the operation of the switch, or the contact 36 may be arranged to engage the head 33 while the shank 31 is earthed by its engagement with the sleeve 4.

The switch may be provided with any suitable number of moving and stationary contacts 16 and 18, and the bracket may be used as an earth return.

All the forms of the switch are preferably provided with a spring pressed lever having a link connection to the crank associated with the hub, and the said lever may either

be arranged parallel with the operating member of the switch but at the opposite side of the hub, or it may be arranged at right angles to the operating member and be disposed between the hub and the insulating plate which carries the stationary contacts.

In the construction shown in Figures 5 to 10 it is necessary for the forked crank 34, 35 on the hub 9 to be insulated from the other metal parts of the switch and accordingly it is mounted upon or associated with an insulating member 37 which forms a second crank and is connected by links 38 with the lever 39, one end 40 of which is hooked over a portion of the bracket and the other end 41 of which is connected by a coiled spring 42 to the bracket, the arrangement being such that the operation of the switch causes the crank to throw over a dead centre position so that the coiled spring 42 retains the switch in either terminal position.

In all the arrangements described, the stationary contacts or the shanks thereof are substantially parallel with the operating member although the effective ends of the stationary contacts are bent into suitable positions to co-operate with the moving contacts.

What I claim then is:—

1. An electric switch comprising a bracket having an attachment portion and having means for carrying a hub; an insulating hub mounted in said hub carrying means for rocking movement; movable contact members on said hub; stationary contact members; means for carrying said stationary contact members; a crank associated with said hub; a hollow boss in said bracket adapted to receive a sliding member for operating said crank; a lever pivotally associated with said bracket; a spring acting on said lever, and a link connection between said lever and said hub.

2. An electric switch comprising a bracket having an attachment portion and having means for carrying a hub; an insulating hub mounted in said hub carrying means for rocking movement; said hub comprising a pair of insulating discs held in concentric relationship by a screw; a head and nut at the ends of the screw; said head and nut forming trunnions engaging in said hub carrying means; movable contact members on said hub; stationary contact members; means for carrying said stationary contact members; a crank associated with said hub, and a hollow boss in said bracket adapted to receive a sliding member for operating said crank.

3. An electric switch comprising a bracket having an attachment portion and having means for carrying a hub; an insulating hub mounted in said hub carrying means for rocking movement; said hub comprising a pair of insulating discs held in concentric relationship by a screw; a head and nut at the ends of the screw; said head and nut forming trunnions engaging in said hub carrying means; movable contact members on said hub; stationary contact members; means for carrying said stationary contact members; a crank associated with said hub; said crank being mounted on said screw between said discs, and a hollow boss in said bracket adapted to receive a sliding member for operating said crank.

In witness whereof I affix my signature.

JOHN HERBERT HEWITT.