

ELECTRICAL INTERLOCK SWITCH

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Fig. 1.

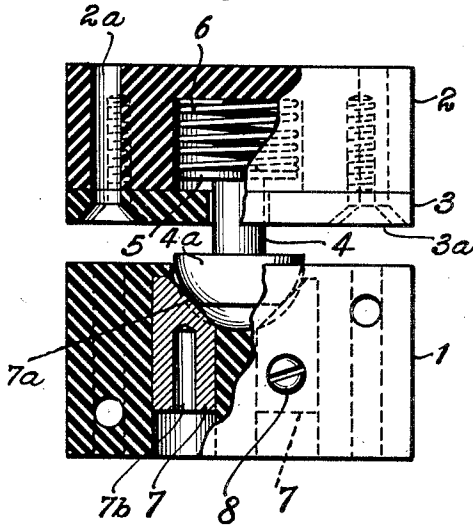


Fig. 2.

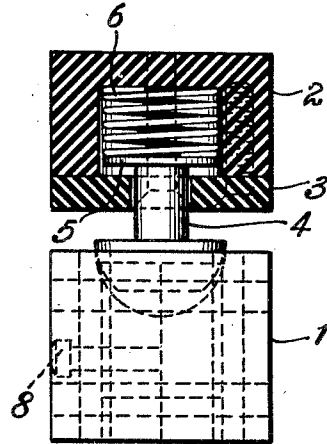


Fig. 3.

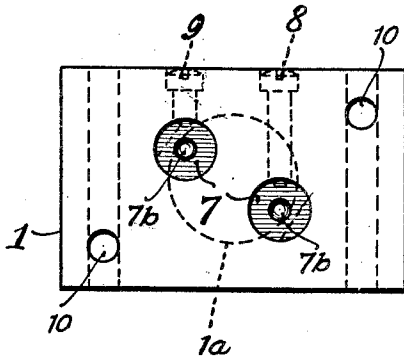
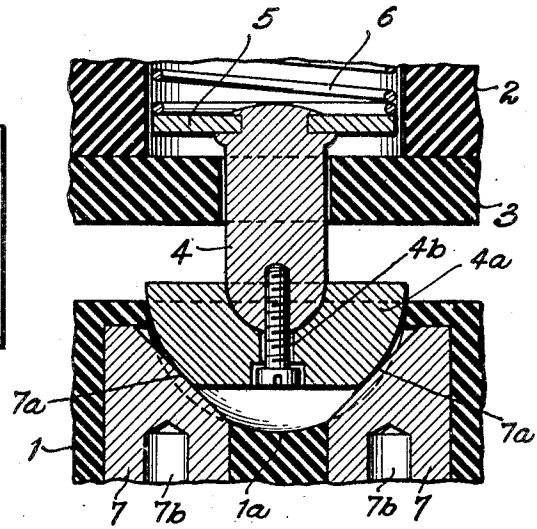


Fig. 4.



Inventor
Oswin Voigt,

H. S. Swann

Attorney

UNITED STATES PATENT OFFICE

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ELECTRICAL INTERLOCK SWITCH

Oswin Voigt, Port Jefferson, N. Y., assignor to
Radio Corporation of America, a corporation
of Delaware

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6 Claims. (Cl. 200—54)

This invention relates to a new and useful interlock switch.

An object of this invention is to simplify and improve interlock switches generally.

Another object of this invention is to provide an improved interlock switch which has provisions for the wiping of the contacts to prevent poor contact due to dirt and corrosion.

A feature of this invention is the novel arrangement of a separate fixed and movable insulating portion, the separate fixed portion having contained therein two fixed contact members, the separate movable insulating portion having located therein a plunger-like metallic member which, when mounted on a door or similar member the switch is moved to the closed position, short-circuits the contacts of the fixed portion.

Although interlock switches are old in the art, the switch of this invention greatly improves the reliability of the contacting operation, particularly when such interlocks are used for the purpose of forming a door interlock for use with radio transmitters and other electrical equipment where interlocks are required for protection of the operating personnel. The contacts of the interlock switch of this invention are so arranged to prevent poor contact due to dirt and corrosion by providing a metallic plunger which has a ball and socket joint, thus ensuring a positive wipe of the contacts.

This invention will best be understood by referring to the accompanying drawing, in which:

Fig. 1 is a side elevation, partly in section, showing the interlock switch of this invention;

Fig. 2 is an end view of Fig. 1;

Fig. 3 is a plan view of Fig. 1; and

Fig. 4 is an enlarged detail section, showing the arrangement of the fixed and movable contacts.

Referring now in detail to the drawing, an insulating block member 1 forms the separate fixed portion of the interlock switch and is generally arranged to be secured to the door casing or enclosure of a radio transmitter or other electrical equipment. Block 2 is an insulating member which forms the movable portion and is arranged to be secured to the door which is hinged to the casing of the transmitter. An insulating plate 3 retains a plunger rod 4 which is loosely secured to a semi-spherical metallic plunger 4a, a washer 5 and spring tension member 6 in operative engagement within the insulating member 2. Insulating plate 3 is secured to member 2 by means of a plurality of screws 3a. For fastening block 2 to the door of the

transmitter, members 2 and 3 are provided with apertures 2a for receiving suitable binding means (not shown) such as, for example, a flat head screw. Fixed insulating member 1 is provided with a semi-spherical or concaved aperture 1a, located in the central upper portion thereof. The radius of aperture 1a is struck around the same center as the end of plunger 4a. The curvature of aperture 1a acts to guide in plunger 4a and offsets for any misalignment of parts. Two metallic fixed contact members 7 are arranged opposite each other and extend part way up through the concaved aperture in insulating block 1, so that a beveled portion 7a projects slightly above the normal inner surface of aperture 1a. Contact members 7 are secured in place by means of screws 8 and 9 which lock the contacts in operative engagement. Each rod-like fixed contact member has an aperture 7b located in the lower portion to receive suitable connection leads. The fixed insulating block 1 is secured to the fixed portion of the radio transmitter by suitable binding means (not shown) passing through apertures 10.

The operation of this device will be more clearly explained by referring to the enlarged detail (Fig. 4) wherein it is seen that when insulating members 2 and 3 are moved near insulating block 1, the flattened semi-circular contact member 4a having the same radius as aperture 1a, is thereby guided so as to short circuit the two fixed contact rods 7. In order that there might be a positive wiping action, member 4a is secured to plunger rod 4 by means of a ball and socket joint arrangement, the connection between the two parts being secured by means of a fillister head screw 4b, which has its head loosely fitted in member 4a, and its threaded body portion secured to member 4. The upper portion of member 4 has secured thereto a disc-like or washer member 5, which is arranged to pass freely in the counterbored aperture of member 2. A helical extension spring member 6 is located within the central aperture of block 2 and is arranged so that plunger 4 is always pressed outward. When the door of the radio transmitter is closed and member 4a contacts the fixed contact members 7, spring 6 will then be slightly compressed. It will be seen by this novel switch that the danger to the operator is minimized by the fact that the actual live metallic contacting surfaces lie beneath the outer surface of insulating block 1. Short-circuiting caused by means of unauthorized metallic members being placed across contacts 7 is impossible. Also, plunger rod 4, which

is secured to block 2, carries no live contacts, and the operative engagement of plunger 4 only takes place when it enters the semi-spherical aperture in block 1.

Although only one form of this invention is shown, it should not be limited precisely thereto.

What is claimed is:

1. An electrical interlock switch comprising an insulating member, a second insulating member located above said first insulating member, each insulating member having adjacent flat surfaces, said first insulating member having a concaved portion, a pair of rod-like fixed contact members located below the flat surface of said insulating member and on opposite sides of the concaved portion of said first insulating member, and a movable metallic plunger member having a convexed surface which is arranged on said second insulating member to connect both rod-like contact members together to complete an external electrical circuit which is connected to said fixed contacts.

2. An electrical interlock switch comprising a first insulating member, a second insulating member, said first insulating member having a flat surface and a concaved portion, a pair of fixed metallic members located in said concaved portion and on opposite ends of said first insulating member, and a movable metallic plunger member having a ball and socket joint, said plunger member arranged to enter the concaved portion of said first insulating member and to connect both contacts together to complete an external electrical circuit which is connected to said fixed contacts.

3. An electrical interlock switch comprising a first and a second insulating member, said first insulating member having a flat surface and a concaved portion, a pair of fixed metallic members located below the flat surface but slightly above the concaved portion and on opposite ends of said first insulating member, a movable metallic member secured to the second insulating member and arranged to connect both of said fixed contact members together to complete an electrical circuit which is connected to said fixed contacts, and means located in the lower portion

of said first insulating member for making connection from said fixed contacts to said external electrical circuit.

4. An electrical interlock switch comprising a first separate block-like insulating portion having at least one flat surface and a concaved portion therein, a pair of fixed metallic members located below the flat surface of said insulating portion and located on opposite sides of said concaved portion, a second separate insulating portion, a movable metallic member arranged on said second separate insulating portion to be guided into the concaved portion of said first insulation portion and arranged to connect both of said fixed contact members together to complete an electrical circuit which is connected to said first fixed contacts.

5. An electrical interlock switch comprising a first separate insulating portion having at least one flat surface and a concaved portion therein, a second separate insulation portion located above said first insulation portion, a pair of rod-like fixed contact members located below the flat surface of said insulating portion and on opposite sides thereof, and a movable metallic member arranged to be guided into the concaved portion of said second insulating portion to connect both rod-like contact members together to complete an external electrical circuit which is connected to said fixed contacts.

6. An electrical interlock switch comprising a first separate insulating portion, a second separate insulating portion located adjacent said first insulating portion, said first insulating portion having a flat surface and a concaved portion, a pair of fixed contact members located below the flat surface and on opposite sides of said first insulating portion, a semi-spherical metallic plunger located within said second insulating portion and having spring tension means whereby said semi-spherical metallic plunger is guided into the concaved portion of said first insulating portion and arranged to connect both contacts to complete an electrical circuit which is connected to said first contacts.

OSWIN VOIGT.