

Dec. 6, 1938.

L. E. FISHER ET AL

2,139,072

ELECTRIC SWITCH

Filed Aug. 22, 1935

3 Sheets-Sheet 1

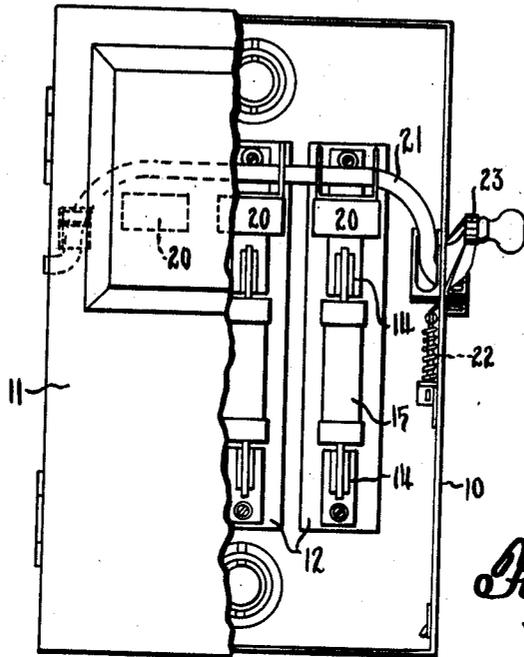


Fig. 1

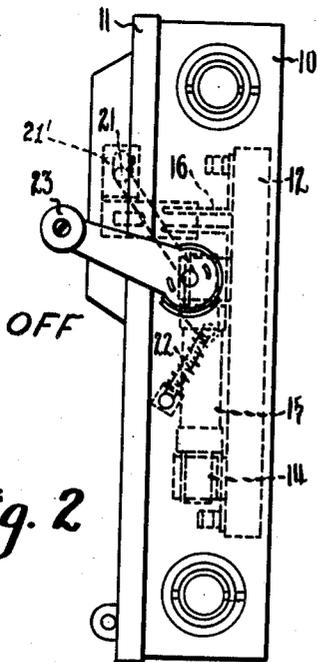


Fig. 2

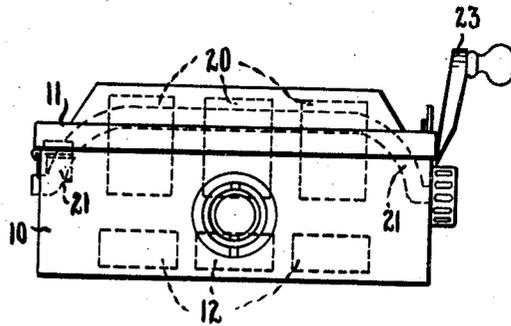


Fig. 3

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3 Sheets-Sheet 3

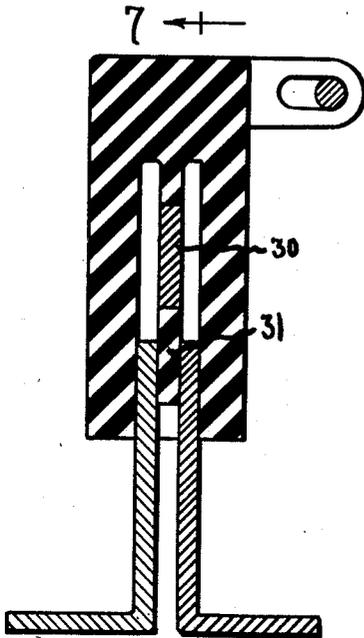


Fig. 6

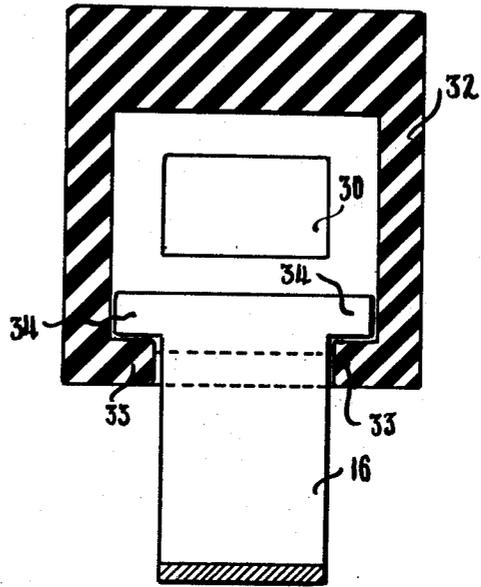


Fig. 7

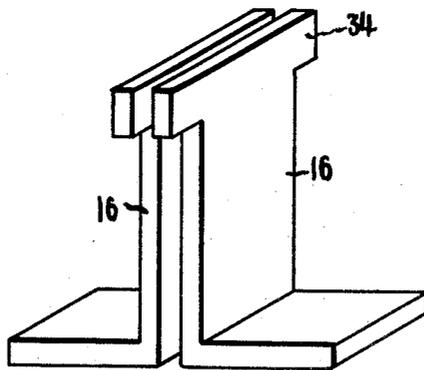


Fig. 8

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UNITED STATES PATENT OFFICE

2,139,072

ELECTRIC SWITCH

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Detroit, Mich.

Application August 22, 1935, Serial No. 37,291

9 Claims. (Cl. 200-163)

This application relates to electric switches.

The switch here shown is generally of the type disclosed in the patent to H. J. L. Frank, No. 1,731,489, of October 15, 1929, and represents an improvement over the switch of that patent. The switch here shown, as well as the switch of the patent, includes a sheet metal box having an open front closed by a hinged cover and contains an insulation base upon which are mounted fuses and stationary contacts, and for connecting the fuses into the switch controlled lines there are provided movable contacts operatively associated with an operating bail journaled in opposite sides of the sheet metal switch box and manipulated, through a quick make and break mechanism, by means of a crank handle outside of the box. In the switch of the patent the movable contacts are in the nature of pivotally mounted knife blades of the lever type and the connections between the blades and the bail are remote from the knife blade pivots so that the knife blades swing into and out of engagement with the stationary contacts. In the switch here shown the movable contacts are of the reciprocating type, as illustrated by the switch of a copending application in the name of Lawrence E. Fisher and William H. Frank, Serial No. 35,732, filed Aug. 12, 1935, and these movable contacts are operatively associated with and insulatedly supported by the bail of the switch.

The switch of the present invention differs from the switch of the patent in still another respect. In the switch of the present invention the base is removably secured to the box and the stationary contacts are inseparably coupled to the insulation formation that supports the movable contact from the operating bail. Consequently, for facilitating pulling of wires into and through the switch box, and for enabling the switch box to be used as a pull box, and for facilitating wiring up of the switch, the base may be swung out of the box and pivotally supported on the operating bail in a manner that will readily be obvious so as to clear the entire interior of the switch box, all without requiring or permitting the base to be detached entirely and completely from the remainder of the switch.

Still further objects and advantages of the switch here disclosed will be readily understandable upon reference to the specification and drawings of this application.

In these drawings,

Fig. 1 is a front view of the switch with the box cover partially cut away to expose the interior, the switch being shown in off position.

Fig. 2 is a right side view of Fig. 1.

Fig. 3 is a bottom end view of Fig. 1.

Fig. 4 is a view similar to Fig. 2 but with the switch in the on position and with the conductors shown in place.

Fig. 5 shows the switch base swung out of the switch box to clear the interior of the box.

Figs. 6, 7, and 8 show contact details and illustrate the manner of interlocking the stationary and the movable contacts so they may not be detached completely from one another.

Referring to the drawings it will be seen that the switch here shown, like the switch of Patent No. 1,731,489, includes a sheet metal box 10 having a hingedly mounted front cover 11. Within the box and secured to the rear wall thereof as by means of suitable mounting screws (not shown), is a three part base 12 of insulation and mounted on the parts of such base are fuse clips 14 between which are supported suitable fuses 15. Also mounted on the base parts are stationary contacts 16 which when bridged by the movable contacts to be described connect through the fuses the switch controlled lines represented by the line and load conductors 17, encased in conduits 18.

For bridging the stationary contacts there are provided movable contacts supported in insulation formations referenced generally 20 and these are provided with lugs 21' through whose slots pass the bight of an operating bail 21 journaled in opposite sides of switch box 10 and operated, through a quick make and break mechanism 22, by an exposed handle 23.

As has previously been stated the contact details are generally of the type shown in application, Serial No. 35,732, filed August 12, 1935, and they are here illustrated in detail. The stationary contacts 16 are in the nature of angle clips of conducting material fixedly mounted on the base parts 12. The movable contacts are in the nature of slugs 30 of conducting material carried by the central portions 31 of box-like insulation structures 32 which reciprocate over the stationary contacts and which are provided with the slotted lugs 21 previously mentioned by means of which the box-like structures 32 and the movable contacts 30 formed as parts thereof are suspended from the operating bail.

In order to prevent complete detachment of the movable contact structures from the stationary contacts, the box-like structures 32 are provided with inwardly projecting portions 33 which interlock with outward projections 34 on the stationary contacts 16 and it will thus be seen that while

reciprocation of the movable contacts is permitted without interference, nevertheless complete detachment of the movable contacts from the stationary contacts is prevented.

5 It will be seen that when crank handle 23 is oscillated the bail 21 will correspondingly oscillate with the result that the movable contacts will reciprocate to and from their contact making and breaking positions with a quick make and break action provided by mechanism 22.

10 It will also be observed that if the mounting screws which secure the base parts 12 to the back of the box 10 are removed, that the base parts as a whole may be swung out from the interior of the box to clear such interior and facilitate wire pulling and wiring of the switch. When the base is so swung out the engagement or interlock provided by the portions 33 and 34 of the contact sets prevents detachment of the base from the movable contacts and therefore the base may be considered as pivotally supported by the operating bail when it is in its swung-out position; the group of parts comprising the base, the contacts, and the operating bail may be considered as a unitary assembly pivotally supported on box 10, and particularly on the sides thereof, when such assembly is swung out to clear the interior of the box for wire pulling and wire connecting purposes.

30 We claim:

1. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact from the bail and handle means, the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion in a manner to have a full floating movement with respect thereto, and means interlocking the insulation structure to the stationary contact whereby complete disassociation of the movable parts from the stationary parts is prevented.

55 2. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, the insulation structure comprising a housing containing the movable contact and completely closed except at one open end thereof which opens towards the base and telescoping over the stationary contact which closes the open end of the housing at all times and which has its free end constantly within the housing.

3. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact from the bail and handle means, the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion in a manner to have a full floating movement with respect thereto, and means interlocking the insulation structure to the stationary contact whereby complete disassociation of the movable parts from the stationary parts is prevented, the constant engagement of the insulation structure and the stationary contact insuring rectilinear movement only of the movable contact.

4. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact from the bail and handle means, the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion in a manner to have a full floating movement with respect thereto, and means interlocking the insulation structure to the stationary contact whereby complete disassociation of the movable parts from the stationary parts is prevented, the constant engagement of the insulation structure and the stationary contact insuring rectilinear movement only of the movable contact, the insulation structure comprising a cup shaped housing containing the movable contact and opening towards the base and telescoping over the stationary contact which closes the open side of the housing at all times and which has its free end constantly within the housing.

5. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, the

the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion, the insulation structure comprising a housing containing the movable contact and completely closed except at one open end thereof which opens towards the base and telescoping over the stationary contact which closes the open end of the housing at all times and which has its free end constantly within the housing.

6. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion, and means interlocking the insulation structure to the stationary contact whereby complete disassociation of the movable parts from the stationary parts is prevented.

7. In a box contained switch, a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, and means interlocking the insulation structure to the stationary contact whereby complete dis-

association of the movable parts from the stationary parts is prevented.

8. In a box contained switch, a stationary contact, a movable contact mounted to reciprocate with a substantially rectilinear motion, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, and means interlocking the insulation structure to the stationary contact whereby complete disassociation of the movable parts from the stationary parts is prevented, the stationary parts being hingedly interlocked to the movable parts whereby they may be swung out of the switch containing box to clear the interior of the latter.

9. In a box contained switch a box, an openable front cover therefor, a stationary contact mounted on the back of the box and projecting forwardly, a movable contact mounted to reciprocate with a substantially rectilinear motion towards and away from the back of the box, and quick acting mechanical motion means of the bail and handle type for reciprocating said movable contact into and out of contact making position with a rectilinear motion, the movable contact being formed as part of an insulation structure which supports and guides the movable contact in its movement and insulates the movable contact from the bail and handle means, the means including a rod portion in front of, spaced from, and parallel to the box back and mounted to move towards and away from the box back without losing its parallel relation thereto, the insulation structure being mounted on the rod portion in a manner to have a full floating movement with respect thereto, the insulation structure comprising a housing containing the movable contact and completely closed except at one open end thereof which opens towards the base and telescoping over the stationary contact which closes the open end of the housing at all times and which has its free end constantly within the housing.

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