Sept. 29, 1931. H. J. L. FRANK ET AL 1,825,267

SWITCHING DEVICE

Filed May 19, 1930 3 Sheets-Sheet 1

Fig. 1

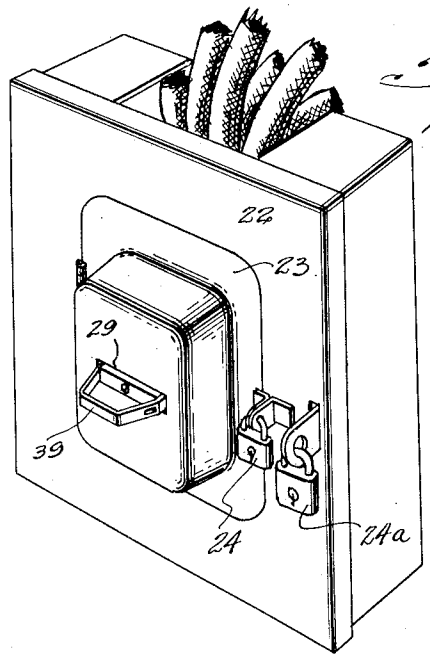


Fig. 2

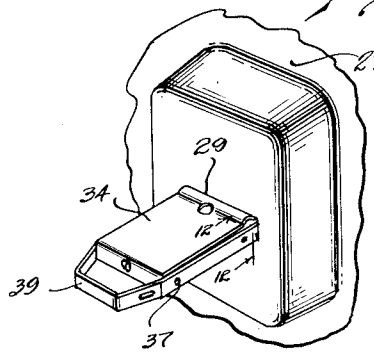


Fig. 3

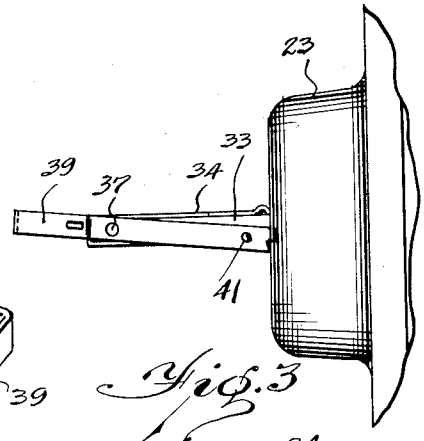


Fig. 4

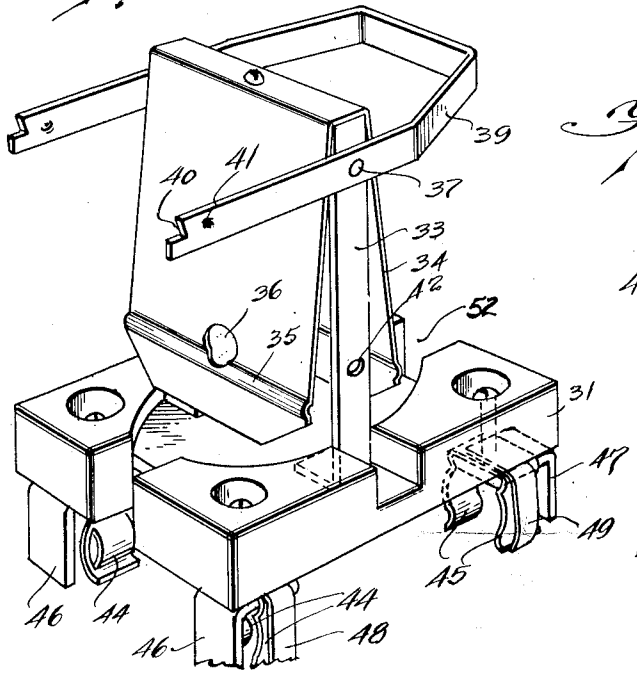
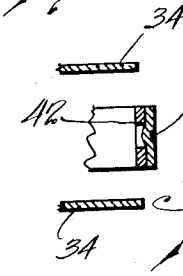


Fig. 12



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SWITCHING DEVICE

Filed May 19, 1930 3 Sheets-Sheet 2

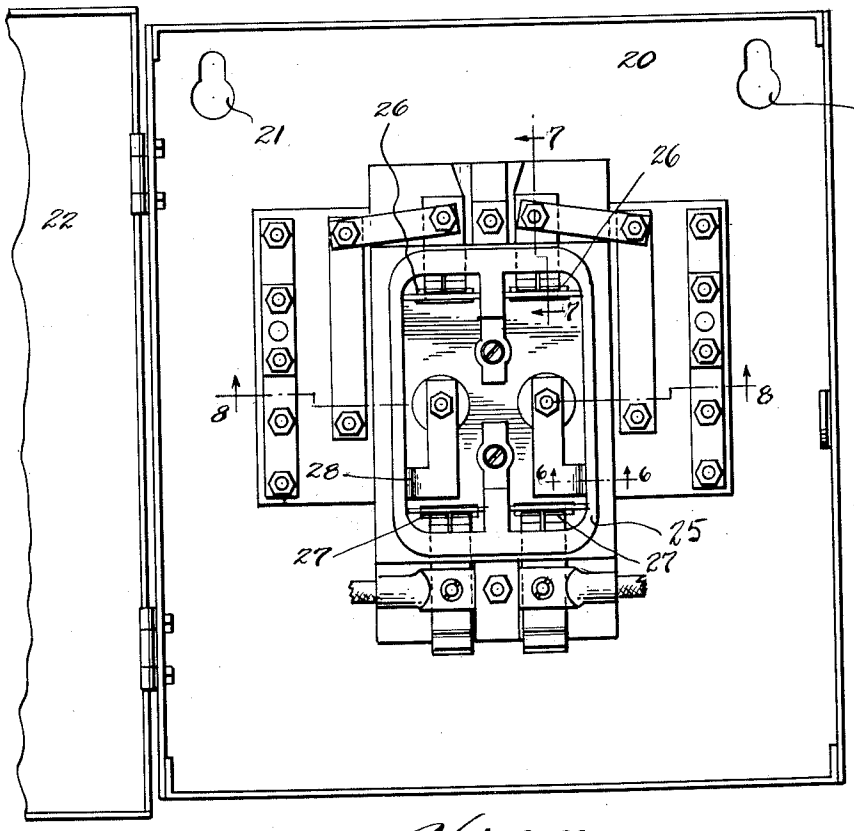


Fig. 5

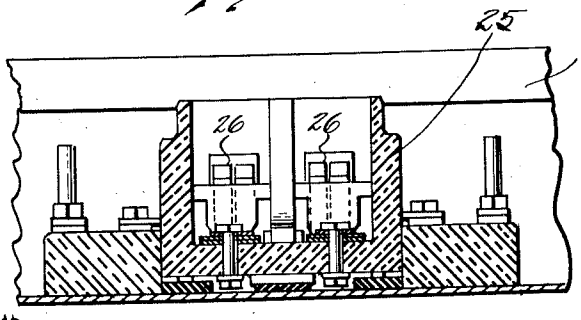


Fig. 8

Fig. 6

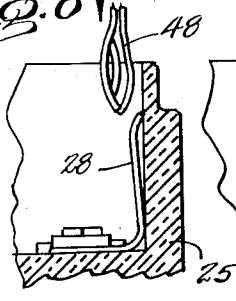
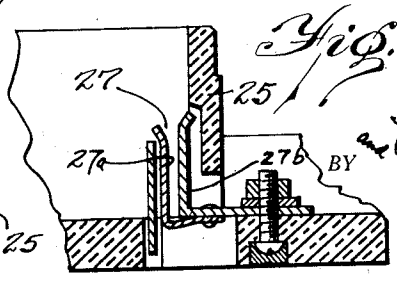


Fig. 7



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SWITCHING DEVICE

Filed May 19, 1930 3 Sheets-Sheet 3

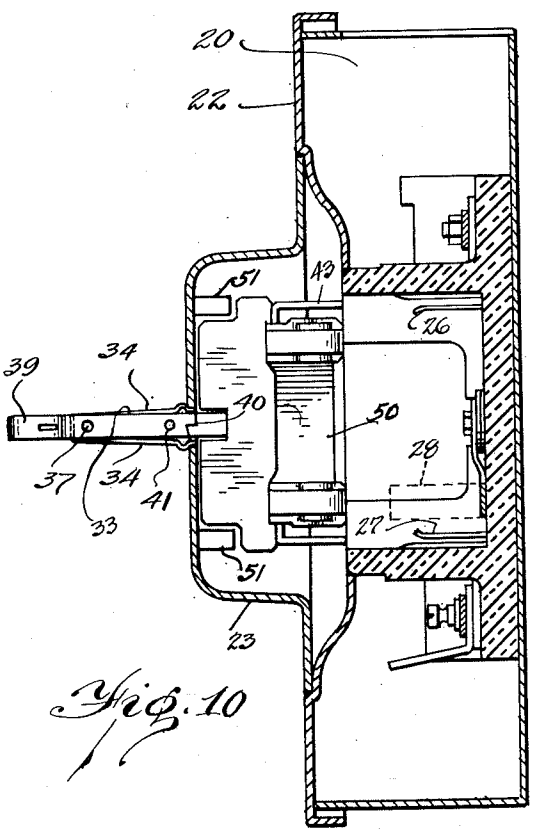


Fig. 10

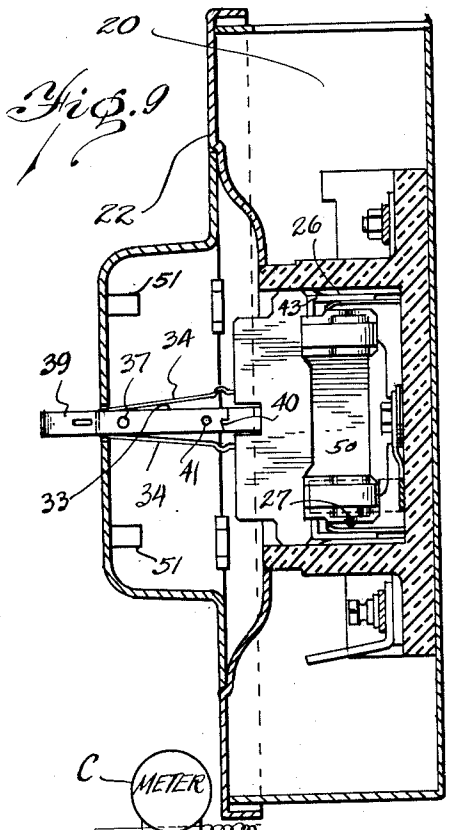


Fig. 9

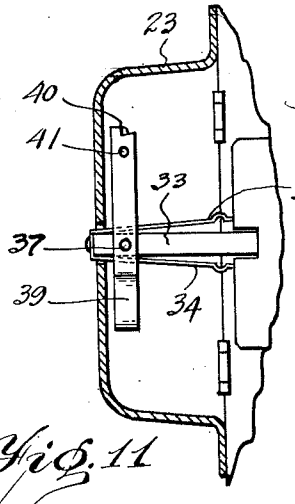


Fig. 11

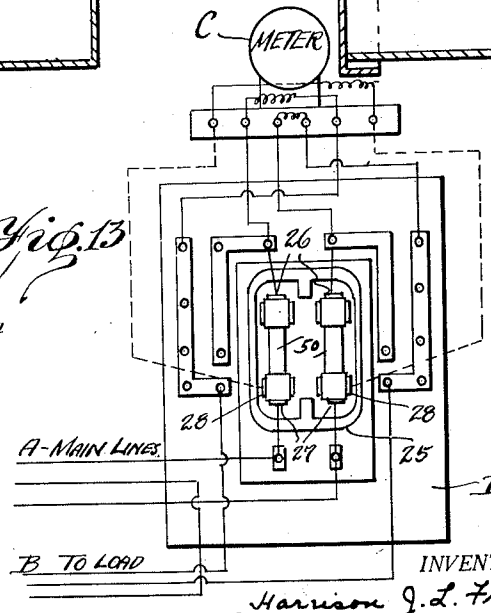


Fig. 13

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Patented Sept. 29, 1931 1,825,267

UNITED STATES PATENT OFFICE

HARRISON J. L. FRANK AND PAUL S. JENKINS, OF DETROIT, MICHIGAN, ASSIGNORS TO BULL DOG ELECTRIC PRODUCTS COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF WEST VIRGINIA

SWITCHING DEVICE

Application filed May 19, 1930. Serial No. 453,553.

This invention relates to switches and more particularly to meter and service entrance switches.

In the electrical industry, at present, it is the usual practice to provide a switch and fuse construction in circuit between the entrance power or lighting lines and the meter, and to lock or seal under cover, all parts of the switch except the switch handle or operating means, so that unauthorized access to the circuit terminals is prevented, while at the same time operation of the switch is permitted.

Constructions for performing the functions desired in a device of this character have generally been expensive, due to complicated linkages, large size of parts, etc., and there has been felt a need for a device of this character which is inexpensive and yet satisfactory.

An object of this invention, therefore, is a switch and fuse construction which may be readily and easily sealed off, and which has an exposed operating handle member.

A further object is a construction wherein a simple pull-switch of the type disclosed in the patent to Harrison J. L. Frank, No. 1,733,370, October 29, 1929, is utilized as the major portion of the switching and fusing members.

A still further object is a plug member having contacts each of which includes a fuse clip and two spaced contact making portions.

A further object is a switch wherein the receptacle is concealed by a locked cover having a slot therein, thru which projects the operating portion or handle of a plug switch adapted to cooperate with the receptacle.

A still further object is a guiding means for a plug and receptacle type switch, one which guides the plug into its seal in the receptacle, and which is flexible so as not to prevent the receptacle contact from guiding the plug contacts into proper engagement.

A further object is a plugging unit for masked receptacles, one which includes a guide and a plug secured to each other so as to form a unit which is separable from the mask and from the receptacle and which is interchangeable with other and similar plugging units, this feature being especially desirable from the view points of manufacturing convenience, installation convenience, and circuit change.

A still further object is a plug type switch for masked receptacles, including guides for facilitating rapid and non-arcing insertion and withdrawal of the plug switch.

An even further object is a plug type switch for receptacles provided with an apertured mask, the plug being provided with means to close the mask aperture at all times.

A still further object is a plug type switch for receptacles provided with hinged masks, there being means for guiding the plug into engagement with the receptacle, the means being such that they do not interfere with movements of the door in "switch in" or "switch out" position.

A still further object is a plug of the character described in the preceding paragraph having (*a*) means to cooperate with portions on the cover to guide the plug in its movement and to facilitate rapid switching movement thereof; (*b*) means to cooperate with a portion of the cover to restrain movement of the plug; and (*c*), means to permit locking of the plug to the cover, if desired.

A still further object is a fused switch wherein access to the fuses is prevented except when the switch is in its "off" or contact breaking portion.

A still further object is a switch of the character described, which is facile of operation, economical of manufacture, and compact and simple in construction, unlike switches previously provided to meet the requirements of a meter and service entrance switch.

Still other objects will readily occur to those skilled in the art upon reference to the following description and the accompanying drawings in which

Fig. 1 is a perspective view of the device ready for use.

Fig. 2 is a perspective view of a portion

of the device with a switch member shown in its circuit breaking position.

Fig. 3 is a side view of the portions shown in Fig. 2, certain parts being moved to another position.

Fig. 4 is a perspective view of parts of the switch member.

Fig. 5 is a plan view of the receptacle, parts being removed for clarity.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a section on the line 7—7 of Fig. 5.

Fig. 8 is a section on the line 8—8 of Fig. 5.

Fig. 9 is a section thru the device, parts being shown in contact making position.

Fig. 10 is a view resembling Fig. 9 but showing parts in contact breaking position.

Fig. 11 is a section like Fig. 9, but showing parts in a still further position.

Fig. 12 is a section on the line 12—12 of Fig. 2.

Fig. 13 is a circuit diagram of the device.

Referring to the drawings and more particularly to Fig. 13, there is indicated at A a plurality of main lines, connection of which to the load lines B thru a meter C and a fused switch D is desired. Circuits for making such connection are old and it is an object of this invention to provide a construction which enables such connections and circuits to be established in a manner previously stated.

The switch comprising the invention, includes a base member or conduit box 20 having the usual keyhole mounting slots 21 and hinged masking covers 22 and 23 adapted to be locked by locks such as are shown at 24 and 24*a*. Disposed within the box 20 is a receptacle 25 made of suitable insulating material, preferably porcelain, and constructed substantially in accordance with the teachings of Patent No. 1,733,370, previously mentioned.

The receptacle 25 includes a pair of contacts 26 and 27 for each line, and adjacent each contact 27 is an auxiliary contact 28, permanently connected to the meter as indicated in Fig. 13. The cover 22, when locked as indicated in Fig. 1, completely conceals all of the binding posts and testing blocks, not numbered, disposed in the box 20 around the receptacle 25 so that unauthorized access thereto is prevented. With cover 22 closed and cover 23 opened, however, the receptacle 25 is accessible and for reasons hereinafter stated cover 23 is provided with a slot 29 thru which is adapted to extend portions of the movable switch member, or block 31.

The construction of the latter, which is also partially illustrated in Patent No. 1,733,370, is of great importance and forms an essential part of this invention.

Referring to Fig. 4, it will be observed that switch member 31 includes a base having a bridge 33 extending upwardly therefrom, the latter supporting a U shaped spring leaf 34 having beads 35 on the free ends thereof, the bridge member 33 also supporting by means of pivots 37 a handle or bail member 39 having cut away portions 40. Spring member 34 also is provided with a pair of aligned holes 36 and handle member 39 is provided with a teat 41 which is adapted to engage the apertured portion 42 of the bridge member 43 to restrain the handle 39 from unwarranted movement with respect to the bridge member 33.

Switch member 31 is also provided in each line, with a pair of fuse holding clips 44 and 45 to which are connected contacts 46 and 47, and 48 and 49, respectively, a fuse 50 serving to connect fuse clips 44 and 45 to each other. It will be noted that parts 44, 46 and 48 are connected to each other at all times, so as to form a plugging unit, similar to the units disclosed in Patent No. 1,733,370.

It will also be noted that guides, such as those at 51 (Fig. 10) may be provided on the mask or cover 23 to cooperate with the portions of the plug adjacent the slots 52 (Fig. 4) and to guide the plug or switch member 31 into engagement with the receptacle, although it is to be understood that other guides may be considered their equivalents.

It will also be observed that the U shaped member 34 serves to close the slot 29 in the mask or cover 23 at all times, preventing the entrance of dirt, etc., and preventing theft of current from the receptacle, when locked.

Furthermore, guide leaf 34 is flexible so that after it has assisted in guiding plug member 31 into the receptacle, it will not prevent the receptacle contacts from guiding the plug contacts into intimate engagement. It will also be seen that guide 34 does not prevent opening of the door 23, regardless of the position of the plug 31.

By making the plug, guide, and handle in one unit, which is separable from the receptacle and box, the plugging unit can be readily removed from the box and interchanged with other similar units, as desired.

The various operations of the device will now be described. Switch member 31 is adapted to be plugged into and out of the receptacle 25 and when in engagement contacts 47 and 46 of the switch member engage contacts 26 and 27 of the receptacle to complete the circuit, 27 to 26, thru contact 46, fuse 50, and contact 47.

Spring finger 48 is adapted to engage contact 28 for circuit making purposes so that a line A, Fig. 13, will send current to the meter thru the fuse 50, and also thru contact 28 and thru the unfused meter connection for six-wire meter installations.

When it is desired to open the circuit, han-

dle member 39 is grasped and the switch 31 is quickly withdrawn from the receptacle 25 to break contact, and spring leaf 34 engages the sides of slot 29 to guide the switch member so that quick break is assured, thus preventing arcing. This same engagement also insures quick contact making since switch member 31 is thus guided into operative position.

When replacement of the fuses 50 is desired, switch member 31 is withdrawn, cover 23 is opened after unlocking padlock 24 and, with the switch in its circuit breaking position and only then, the fuses 50 can be replaced.

With cover 23 locked, with handle member 39 rotated to the position shown in Fig. 11, and with switch 31 in the receptacle 25, withdrawal of the plug from the receptacle is prevented, thereby preventing unauthorized circuit breaking.

When handle member 39 is rotated to the position shown in Fig. 3 so that cut away portions 40 engage portions of the cover 23, accidental or undesired circuit making is prevented since switch 31 cannot be reinserted into the receptacle.

If it is desired to lock the receptacle in circuit breaking position, a padlock or other fastening means can be passed thru holes 36 after the switch is withdrawn from the receptacle and cover 23 is locked, to thereby lock the switch against movement from its circuit breaking position.

Again, when access to the testing blocks and connections in the box 20 is desired, padlock 24*a* may be unlocked so that cover 22 may be opened.

Accordingly, it will be observed that there has been provided a switch which performs all the functions desired in switches of this character and which, however, is simple and compact in construction and economical of manufacture.

Now, having described the invention and the preferred embodiment thereof, it is to be understood that the invention is to be limited, not to the specific details herein set forth and illustrated, but only by the scope of the claims which follow.

I claim:—

1. In a meter and service entrance switch for a plurality of lines, a stationary block having, for each line, a meter contact and a pair of line contacts spaced from said meter contacts, one of said line contacts being adjacent said meter contact, and the other being remote therefrom, and a movable block adapted to cooperate with said stationary block, said movable block having a pair of contacts one of which is shaped to cooperate with the meter contact and the adjacent line contact, and the other of which is shaped to cooperate with the remote meter contact on the stationary block, and means on said movable block to electrically connect said movable block contacts to each other.

2. In a meter and service entrance switch for a plurality of lines, a stationary block having for each line, a meter contact and a pair of line contacts spaced from said meter contacts, one of said line contacts being adjacent said meter contact, and the other being remote therefrom, and a movable block adapted to cooperate with said stationary block, said movable block having a pair of contacts one of which is shaped to cooperate with the meter contact and the adjacent line contact, and the other of which is shaped to cooperate with the remote line contact on the stationary block, and a fuse on said movable block to electrically connect said movable block contacts to each other.

3. In a switch member including a body portion, a contact having a U shaped fuse clip portion, a blade portion transverse of said U shaped fuse clip portion, and a contact making finger portion adjacent and parallel to one leg of said U shaped clip portion.

4. In a switch member including a body portion, a contact having a U shaped fuse clip portion, a blade portion transverse of said U shaped fuse clip portion, and a contact making finger portion adjacent and parallel to one leg of said U shaped clip portion, the plane of the blade portion being at right angles to the plane of the contact making finger portion.

5. In a switch member, a body having an upwardly projecting handle portion and a spring leaf having one end free and having the other end attached to the upper end of said upwardly projecting handle portion.

6. In combination, a receptacle, a cover therefor having a slot, and a plug for said receptacle movable between the latter and said cover, said plug having a handle portion projecting thru said slot when said plug is in or out of engagement with said receptacle, and resilient means on said handle portion frictionally engaging the edges of said cover slot to provide a guide to enable quick connection or separation of said plug and said receptacle.

7. In combination, a receptacle, a cover therefor having a slot, and a plug for said receptacle movable between the latter and said cover, said plug having a handle portion projecting thru said slot when said plug is in or out of engagement with said receptacle, and resilient means on said handle portion frictionally engaging the edges of said cover slot to provide a guide to enable quick connection or separation of said plug and said receptacle, and an aperture in said portion providing a lock receiving means whereby said plug may be locked out of engagement with said receptacle.

8. In combination, a receptacle, a cover

therefor having a slot, and a plug for said receptacle movable between the latter and said cover, said plug having a portion projecting thru said slot when said plug is out of engagement with said receptacle, and means on said portion frictionally engaging said cover to provide a guide to enable quick connection or release of said plug and said receptacle, and means on said portion adapted to be moved out of line with respect to said slot to prevent movement of said plug with respect to said cover.

9. In a switch member, a body portion, fuse clips and contacts on one side thereof, and an operating handle on and projecting from the other side thereof and a leaf spring means on the sides of said handle.

10. In a switch member, a body portion, fuse clips and contacts on one side thereof, and an operating handle on the other side thereof, spring means on said handle, and a bail pivotally mounted on said handle to serve as a means to restrain switching movement of said member.

11. In combination, a receptacle, a mask therefor, and a plug for said receptacle having means cooperating with said mask to guide and lock said plug in place, said plug and means comprising a unit which is removable from said mask and interchangeable with other similar units, as desired.

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