April 15, 1930. J. SACHS 1,754,441

ELECTRIC CIRCUIT CONTROLLING APPLIANCE

Filed Aug. 23, 1926

Fig. 1

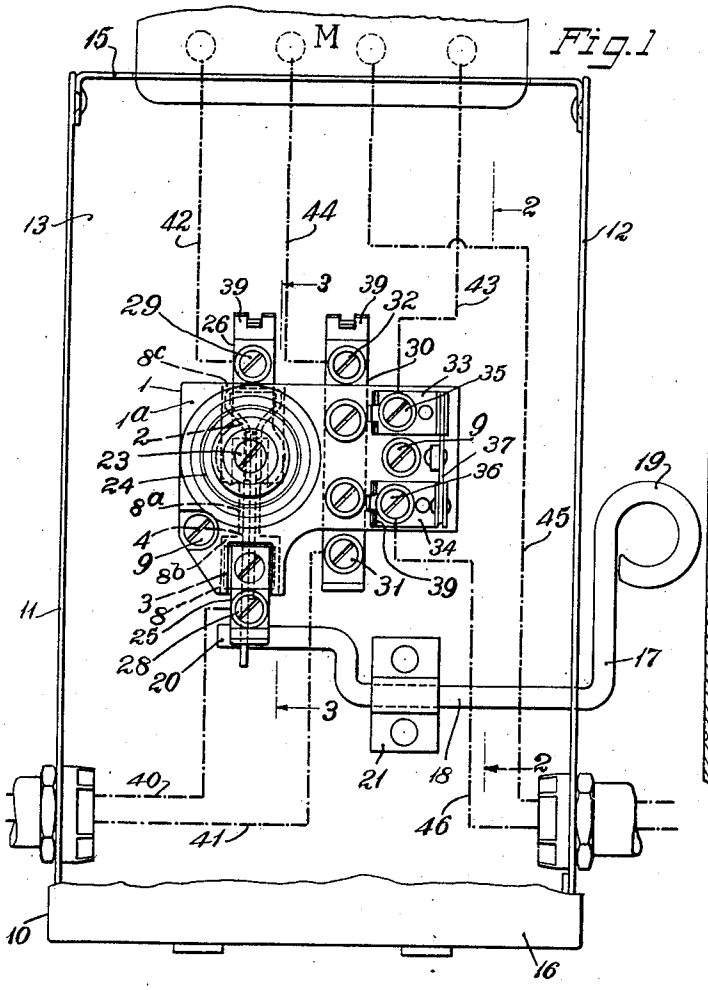


Fig. 2

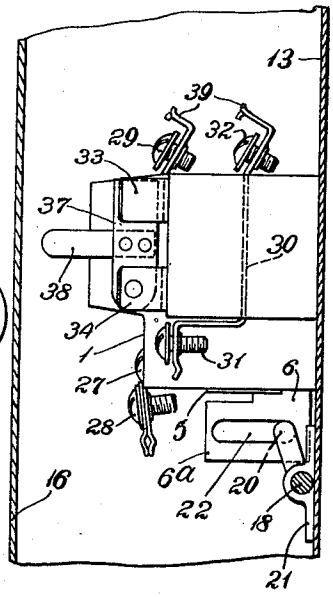


Fig. 3

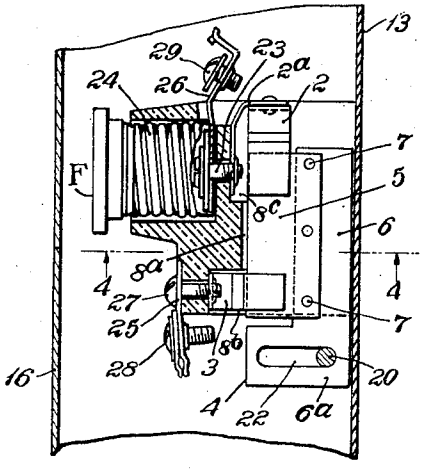
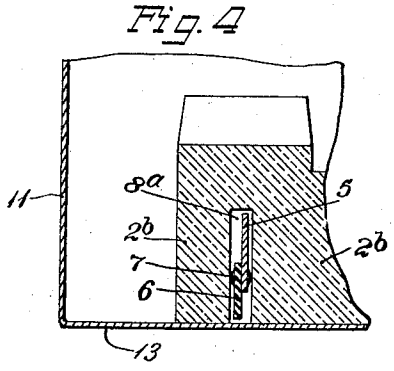


Fig. 4



INVENTOR.
Joseph Sachs
BY
S. Jay Teller
ATTORNEY.

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UNITED STATES PATENT OFFICE

JOSEPH SACHS, OF WEST HARTFORD, CONNECTICUT

ELECTRIC-CIRCUIT-CONTROLLING APPLIANCE

Application filed August 23, 1926. Serial No. 131,043.

This invention is particularly applicable to electric appliances which have circuit controlling means, preferably including switching and fusing elements, enclosed within a protecting cabinet which can be sealed so as to render the live parts inaccessible; but the invention is not so limited. A construction embodying the present invention is in many respects similar to that disclosed in my copending application for Electric circuit controlling appliances, Serial Number 746,911, filed October 30, 1924.

One of the objects of the present invention is to provide in an appliance of the type referred to a sliding switch member having an improved construction and having an improved cooperative relationship with the other parts of the appliance.

Another object of the invention is to provide an improved operating mechanism for an appliance of the general character referred to. As shown, the operating mechanism includes a member pivoted on the enclosing cabinet and having the spindle portion thereof closely adjacent the back wall of the cabinet whereby obstruction of the space within the cabinet is reduced to a minimum.

In the accompanying drawing I have shown one embodiment of the invention, but it will be understood that the drawing is intended for illustrative purposes only and is not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

Fig. 1 is a front view of an appliance embodying the invention, the front cover being broken away to show the parts inside of the cabinet.

Fig. 2 is a fragmentary vertical sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view taken along the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary horizontal sectional view taken along the line 4—4 of Fig. 3.

In accordance with the invention I provide an insulating base 1 which is so constructed and arranged that the main body portion thereof is spaced from the means or wall upon which the base is mounted. The supporting means or wall may be the back wall of an enclosing cabinet, as will presently appear, but I do not necessarily so limit myself. The insulating base 1 is relatively small in size and shallow in depth and the main body portion 1^a of the base is separated from the back wall of the cabinet so as to provide a space in which a switching mechanism may be located.

As shown and as preferred there is a stationary switch contact or clip 2 carried by or connected with the base adjacent the back thereof, and preferably there is also a second stationary contact or clip 3 also carried by or connected with the base adjacent the back thereof. For normally establishing an electrical connection through the switch, there is provided a movable switching member 4 which includes a conducting element 5 normally engaging both of the clips 2 and 3. The contact element 5 has oppositely facing contact faces opposite each other, these faces being adapted to engage the two contact faces of each of the clips 2 and 3. The switching member 4 also includes an insulating element 6 operatively connected with the conducting element. The details of connection may be varied, but as illustrated, two elements are rigidly connected together by means of rivets 7, 7. The switching member 4 is rectilinearly movable parallelly with the supporting wall. Upon movement in one direction the conducting element 5 of the said member is disengaged from at least one of the switch contacts or clips as, for instance, the clip 2. Upon movement in the other direction the clip is reengaged to reestablish the electrical connection.

As clearly shown in the drawing the insulating element 6 of the switching member is located in the space between the conducting element 5 and the supporting wall, and it is so constructed and arranged that its rear edge is in close proximity to the said supporting wall. The insulating element, therefore, serves, in conjunction with the said supporting wall, to guide the said switching member in its rectilinear movement parallel with the wall. It will be observed that the said in-

sulating element 6 of the switching member is flat and relatively thin and that it is arranged perpendicularly to the supporting means or wall with its rear edge positioned to be guided thereby. The front edge of the switching member is in close proximity to the main body of the base, which therefore serves as a front guide for the said member.

As already stated, the body portion 1^a of the base is spaced from the supporting wall and as shown and as preferred this spacing is effected by means of pedestal or supporting portions 2^b, 2^b formed as integral parts of the base. These pedestal portions extend backward so as to engage the supporting wall and they are spaced apart so as to form a slot or passage 8 between them. Suitable means such as screws 9, 9 are provided for clamping the base to the supporting wall. The slot or passage 8 is so located as to contain a part of the movable switching member 4, and the portion 8^a of the slot or passage which contains the conducting element 5 of the switching member is of such size that a restricted passageway is provided for the said element. The slot 8 is preferably also formed with wider portions 8^b, and 8^c for containing the switch contacts 2 and 3 respectively. It will be observed that when the conducting elements 5 is moved to break the electrical connection, the movement is in the inward direction into the portion 8^a of the slot with the result that there is a tendency to break or rupture the arc, the reason being that the arc will not follow into the slot but on the contrary tends to move outward from the slot.

Preferably and ordinarily the base 1 and the parts connected thereto are mounted within an enclosing cabinet 10. The cabinet is ordinarily formed of sheet metal and it includes side walls 11 and 12, a back wall 13, end walls 15 and a movable front cover 16. As shown, the cover 16 is hinged to the bottom end wall. The top end wall is provided with an opening to receive and protectively enclose the terminal chamber of a meter M. The base 1 is secured to the back wall 13, this back wall constituting the supporting means or wall which has been already referred to.

In accordance with the invention I provide an improved switch operating mechanism, and as concerns this phase of the invention I do not necessarily limit myself to a switch of the form which has been described. As shown and as preferred the operating mechanism comprises an operating spindle which includes a pivot section extending through a wall of the cabinet, a manually operable handle connected with the pivot section and located on the exterior of the cabinet and an element inside of the cabinet also connected with the pivot section and operatively engaging the switching member to move it. Preferably the operating spindle comprises a single rod 17 which is bent to form a pivot section 18, a handle 19 and a crank section 20 adapted to operatively engage the switching member. In accordance with one phase of the invention, the pivot section 18 is located in contact with or at least very closely adjacent the back wall of the cabinet so as to reduce to a minimum any obstruction of the space within the cabinet and so as to provide the maximum of unobstructed space within the cabinet for the location of connecting wires. As illustrated the pivot section is held in place partly by reason of its engagement with the edges of the bearing aperture in the side wall 12 of the cabinet and partly by means of a bearing clip 21 which is secured directly to the back wall 13 of the cabinet. The bearing clip 21 is located in close proximity to the end of the crank section 20 so as to prevent or limit any movement of the operating member toward the right.

The details of the connection between the crank section 20 and the switching member may be varied. I prefer, however, to utilize the insulating element 6 of the switching member for the purpose of moving the said member. The said insulating element is therefore provided with a transverse slot 22 into which the crank section 20 of the operating member extends. The slot 22 is shown as being in an extension 6^a of the insulating element but I do not so limit myself. With the parts in the position shown in the drawing, the switching member is held in its upper or closed position and serves to establish an electrical connection between the contacts 2 and 3. However, when the handle 19 is swung forward and downward the crank section 20 moving in the slot 22 serves to draw the switch member downward and thus break the electrical connection between the conducting element 5 and the contact 2. When the handle 19 is returned in the upward and backward direction the switching member is returned to the position illustrated.

As already stated the base 1 is held in place by screws 9, 9, being therefore readily detachable from its supporting means. It will be observed from an inspection of the drawing that upon removal of the base the switching member is freely separable from the base either rearwardly or longitudinally. It will further be observed from an inspection of the drawing that the slotted element 6 and the cranked portion 20 of the operating member are so related as to be engageable with and disengageable from each other while the said member remains in pivotal connection with the cabinet. This permits the switching member to be freely assembled with or removed from the cabinet and operating member in conjunction with the attachment or detachment of the base.

I preferably provide in addition to the switch and its associated parts as already de-

scribed a pair of fuse contacts so mounted on the base as to be accessible from the front thereof. Preferably the fuse contacts are on the front face of the base and may be adapted for the reception of a fuse F of the screw plug type. These contacts are shown at 23 and 24 respectively. An electrical connection is provided between one of the switch contacts and one of the fuse contacts. Preferably the central fuse receiving contact 23 is in the form of a screw which extends directly through the base and which engages an intermediate conductor 2^a connected with the switch clip 2.

In order to establish a circuit through the device there are provided two wire receiving terminals 25 and 26, one connected with the remaining switch contacts 3 and the other connected with the remaining fuse contact 24. The clip 3 is connected by means of a screw 27 to the downward extending terminal 25 which has a binding screw 28. The outer or threaded fuse receiving contact 24 is connected with the upward extending terminal 26 which is provided with a binding screw 29. A vertically extending neutral conductor 30 is located in a groove in the back of the base and is provided with binding screws 31 and 32.

When the appliance is to be used for meter testing purposes I may provide, in addition to the parts already described, a test switch which may be connected into the circuit and which may be manually opened when it is desired to test the meter with which the appliance may be associated. Preferably and as shown the test switch is located on the front of the base and adjacent the end thereof which is opposite the switch mechanism. As shown the test switch is arranged with its movable switching member located in a plane perpendicular to the direction of movement of the main switching member. In the construction as shown the front face of the base is provided with recesses in which are set forward extending contact plates 33 and 34 provided with binding screws 35 and 36. A switch member 37 is pivoted to one of these plates and is adapted to be swung into and out of engagement with the other plate, a handle 38 of insulation being provided for the purpose of moving it. The terminal lug 26, the neutral conductor 30 and the plates 33 and 34 may have their ends 39 shaped for the ready attachment of testing clips as well understood in the art.

As already stated the appliance embodying the invention is adapted to be arranged with the cabinet thereof protectively associated with the terminal chamber of a meter M. One of the service mains 40 is connected by the screw 28 to the lug 25, and the other service main 41 is connected by the screw 31 to the neutral conductor 30. One meter current-coil terminal is connected by a lead 42 with the lug 26 by means of the screw 29, and the other meter current-coil terminal is connected by a lead 43 with the plate 33 by means of the screw 35. In the form of meter illustrated the potential terminals are bridged and one is connected by a lead 44 with the neutral conductor 30 by means of the screw 32, and the other is directly connected with a load wire 45. The other load wire 46 is connected with the plate 34 by means of the binding screw 36.

When the switch member 4 is drawn away from the clip 2 by the forward and downward movement of the handle 19, as already described, the circuit is opened on the service side of the meter. When the handle is moved upward and backward the switch member is pushed into the clip and the circuit is closed. The circuit is protected on the service side of the meter by the fuse F. When desired for testing purposes, the test switch member 37 on the load side of the meter may be manipulated as necessary.

What I claim is:

1. In an electric switch, the combination of a rear supporting means having a forward facing surface, a switching member positioned at the front of the supporting means and movable rectilinearly in either direction parallelly with the said forward facing surface, the said member comprising a relatively thin flat insulating plate arranged perpendicularly to the said surface with its rear edge positioned to be guided thereby and also comprising a conducting element carried by the insulating plate and held thereby in spaced relationship with the said surface, a normally stationary switch contact positioned to be engaged and disengaged by the conducting element of the movable switching member to make and break electrical connection through the switch, and a means additional to the said supporting means and the said switch contact carried by the said supporting means in normally fixed relation thereto and constituting a front guide for the switching member.

2. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, a switching member in the cabinet adjacent the said rear wall and movable rectilinearly in either direction parallelly therewith, the said member comprising a relatively thin flat insulating plate arranged perpendicularly to the said rear wall with its rear edge positioned to be guided thereby and also comprising a conducting element carried by the insulating plate and held thereby in spaced relationship with the said rear wall, a normally stationary switch contact in the cabinet positioned to be engaged and disengaged by the conducting element of the movable switching member to make and break electrical connection through the switch, and manually operable means accessible from the exterior of the cabinet for

moving the switching member rectilinearly as aforesaid.

3. As an article of manufacture, a rectilinearly movable switching member comprising in combination a relatively thin flat plate of insulating material having a guiding edge parallel with its direction of rectilinear movement and also having a crank receiving slot therein extending transversely with respect to the said edge, and a contact element carried by the said plate and spaced from the said guiding edge thereof, the said contact element being longitudinally spaced from the said slot and having two oppositely facing contact faces opposite each other.

4. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base, means for holding the base with its main body in normally fixed spaced relation to the supporting means and with the back of the base facing the said forward facing surface, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said forward facing surface, and a switching member located and guided between the supporting means and the main body of the base for movement rectilinearly in either direction parallelly with the said forward facing surface of the former, the said member comprising a relatively thin flat insulating plate arranged perpendicularly to the said forward facing surface with its rear edge positioned to be guided thereby and also comprising a conducting element carried by the insulating plate and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts.

5. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base having a narrow longitudinal passage formed therein perpendicular to the back and extending parallelly thereof, means for holding the base in normally fixed relation to the supporting means with the back of the base facing the said forward facing surface, two stationary switch contacts mounted in normally fixed positions adjacent the said passage and spaced from the said forward facing surface, and a flat switching member located in the said passage and guided for movement rectilinearly in either direction parallelly with the said forward facing surface of the supporting means, the said member comprising a relatively thin flat insulating plate having its rear edge positioned to be guided by the said surface and also comprising a conducting element carried by the insulating plate with its opposite faces closely adjacent the opposed walls of the passage and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts.

6. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base, means for holding the base with its main body in normally fixed spaced relation to the supporting means and with the back of the base facing the said forward facing surface, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said forward facing surface, a relatively thin flat insulating plate located between the supporting means and the main body of the base for movement rectilinearly in either direction parallelly with the said forward facing surface of the former and arranged perpendicularly to the said forward facing surface with its rear edge positioned to be guided thereby, and a thin flat conducting element carried by the insulating plate and extending forward therefrom, the said conducting element upon being moved as aforesaid remaining in engagement with one switch contact and serving to make and break electrical connection with the other switch contact.

7. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, an insulating base in the cabinet, means for holding the base with its main body in normally fixed spaced relation to the said rear wall of the cabinet, two stationary switch contacts mounted in normally fixed positions in the cabinet adjacent the back of the base and spaced from the said rear wall, and a switching member located and guided between the rear wall and the main body of the base for movement rectilinearly in either direction parallelly with the said rear wall, the said member comprising a relatively thin flat insulating plate arranged perpendicularly to the said rear wall with its rear edge positioned to be guided thereby and also comprising a conducting element carried by the insulating plate and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts.

8. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base, means for holding the base with its main body in normally fixed spaced relation to the supporting means and with the back of the base facing the said forward facing surface thereof, a pair of fuse receiving contacts carried by the base at the front thereof, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said forward facing surface, means electrically connecting one fuse contact with one switch contact, two wire receiving terminals electrically connectible re-

spectively with the remaining fuse contact and the remaining switch contact, and a switching member located between and guided by the supporting means and the main body of the base and movable rectilinearly in either direction parallelly with the said forward facing surface of the former, the said member comprising an insulating element located adjacent the said forward facing surface so as to be guided thereby and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts.

9. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, an insulating base in the cabinet, means for holding the base with its main body in normally fixed spaced relation to the said rear wall of the cabinet, a pair of fuse receiving contacts carried by the base at the front thereof, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said rear wall, means electrically connecting one fuse contact with one switch contact, two wire receiving terminals electrically connectible respectively with the remaining fuse contact and the remaining switch contact, and a switching member located and guided between the rear wall and the main body of the base and movable rectilinearly in either direction parallelly with the said rear wall, the said member comprising an insulating element located adjacent the said rear wall so as to be guided thereby and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts.

10. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base, means for detachably holding the base with its main body in normally fixed spaced relation to the supporting means and with the back of the base facing the said forward facing surface thereof, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the forward facing surface of the supporting means, and a switching member located between the supporting means and the main body of the base and movable rectilinearly in either direction parallelly with the said forward facing surface of the former, the said member comprising an insulating element located adjacent the said forward facing surface so as to be guided thereby and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts and the said member being freely separable rearwardly from the base when the latter is detached from the supporting means.

11. In an electric switch, the combination of a rear supporting means having a forward facing surface, an insulating base, means for detachably holding the base with its main body in normally fixed spaced relation to the supporting means and with the back of the base facing the said forward facing surface thereof, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the forward facing surface of the supporting means, and a switching member located between the supporting means and the main body of the base and movable rectilinearly in either direction parallelly with the said forward facing surface of the former, the said member comprising a relatively thin flat insulating plate arranged perpendicularly to the said forward facing surface with its rear edge positioned to be guided thereby and also comprising a conducting element carried by the insulating plate and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts and the said member being freely separable rearwardly from the base when the latter is detached from the supporting means.

12. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, an insulating base in the cabinet, means for detachably holding the base with its main body in normally fixed spaced relation to the said rear wall of the cabinet, two stationary switch contacts mounted in normally fixed positions in the cabinet adjacent the back of the base and spaced from the said rear wall, and a switching member located and guided between the rear wall and the main body of the base for movement rectilinearly in either direction parallelly with the said rear wall, the said member comprising an insulating element located adjacent the said rear wall so as to be guided thereby and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts and the said member being freely separable rearwardly from the base when the latter is detached from the cabinet.

13. In an electric switch, the combination of an insulating base having a passage extending therethrough from one face to an opposite face, two stationary switch contacts mounted in normally fixed positions on the base adjacent the said passage therethrough, a switching member located in part within the said passage and guided for rectilinear movement longitudinally thereof, the said

member comprising an element having a transverse slot therein and also comprising a conducting element carried by the slotted element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts, and a pivoted operating member having a cranked portion entering the transverse slot and serving upon being pivotally moved to move the switching member rectilinearly in the passage as aforesaid.

14. In an electric switch, the combination of a rear supporting means having a forward facing surface, a switching member positioned at the front of the supporting means and movable rectilinearly in either direction parallelly with the said forward facing surface, the said member comprising a transversely slotted insulating element and also comprising a conducting element carried by the insulating element, a normally stationary switch contact adapted to be engaged and disengaged by the conducting element of the movable switching member to make and break electrical connection through the switch, and a pivoted operating member having a cranked portion entering the transverse slot in the insulating element, the said member upon being pivotally moved serving to move the switching member rectilinearly as aforesaid.

15. In an electric switch, the combination of a rear supporting means having a forward facing surface, a switching member positioned at the front of the supporting means and movable rectilinearly in either direction parallelly with the said forward facing surface, the said member comprising a relatively thin flat insulating plate transversely slotted and arranged perpendicularly to the said forward facing surface so as to be guided thereby and also comprising a conducting element carried by the insulating plate and held thereby in spaced relationship with the said surface, a normally stationary switch contact adapted to be engaged and disengaged by the conducting element of the movable switching member to make and break electrical connection through the switch, and a pivoted operating member having a cranked portion entering the transverse slot in the insulating plate, the said member upon being pivotally moved serving to move the switching member rectilinearly as aforesaid.

16. In an electric switch, the combination of a rear supporting means having a forward facing surface, a switching member positioned at the front of the supporting means and movable rectilinearly in either direction parallelly with the said forward facing surface, the said member comprising a relatively thin flat insulating plate transversely slotted near one end and arranged perpendicularly to the said forward facing surface and also comprising a conducting element carried by the insulating plate at a longitudinal distance from the said slot and held in spaced relationship with the said surface, a normally stationary switch contact adapted to be engaged and disengaged by the conducting element of the movable switching member to make and break electrical connection through the switch, and a pivoted operating member having a cranked portion entering the transverse slot in the insulating plate, the said member upon being pivotally moved serving to move the switching member rectilinearly as aforesaid.

17. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, an insulating base in the cabinet, means for holding the base with its main body in normally fixed spaced relation to the said rear wall of the cabinet, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said rear wall, a switching member located between the said rear wall and the main body of the base and guided in part by the base for movement rectilinearly in either direction parallelly with the said rear wall, the said member comprising a transversely slotted insulated element and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts and an operating member pivotally mounted on the cabinet and comprising an externally accessible handle and an internally located cranked portion entering the transverse slot in the insulating element and serving upon movement of the handle to move the switching member rectilinearly as aforesaid.

18. In an electric switch, the combination of an insulating base having a passage extending therethrough from one face to an opposite face, means for detachably holding the base in normally fixed relation to a rear support, two stationary switch contacts mounted in normally fixed positions on the base adjacent the said passage therethrough, a pivoted operating member supported independently of the base and having a cranked portion, a switching member located in part within the said passage in the base and guided for rectilinear movement longitudinally thereof and comprising an element having a transverse slot therein to receive the cranked portion of the operating member so as to be moved thereby and also comprising a conducting element carried by the slotted element and adapted upon longitudinal movement of the switching member by the operating member to make and break electrical connection between the said stationary switch contacts, the said switching member being normally limited as to longitudinal movement by reason of its engagement with the operating

member and being freely removable from the base by longitudinal movement when the base is moved relatively to its support so as to permit disengagement of the switch member from the operating member.

19. In an electric switch, the combination of an enclosing cabinet having a rear wall and an openable front cover, an insulating base in the cabinet, means for detachably holding the base with its main body in normally fixed spaced relation to the said rear wall of the cabinet, two stationary switch contacts mounted in normally fixed positions adjacent the back of the base and spaced from the said rear wall, a switching member located between the said rear wall and the main body of the base and guided in part by the base for movement rectilinearly in either direction parallelly with the said rear wall, the said member comprising an insulating element having a slot arranged at an angle to the said rear wall and also comprising a conducting element carried by the insulating element and adapted upon being moved as aforesaid to make and break electrical connection between the said stationary switch contacts, and an operating member pivotally mounted on the cabinet for movement about an axis parallel with the rear wall and comprising an externally accessible handle and an internally located cranked portion entering the said slot in the insulating element and serving upon movement of the handle to move the switching member rectilinearly as aforesaid, the said insulating element and cranked portion being engageable with and disengageable from each other while the operating member remains in pivotal connection with the cabinet thus permitting the switching member to be freely assembled with or removed from the cabinet and operating member in conjunction with the attachment or detachment of the base.

20. In an electric switch, the combination of an enclosing cabinet including an openable cover, an insulating base held in normally fixed position in the cabinet, a switch connected with the base comprising two contacts and a movable switching member, an operating spindle comprising a pivot section extending through a bearing aperture in a side wall thereof and a manually operable handle outside of the cabinet, the said spindle also comprising a crank section inside of the cabinet and operatively connected with the switch member, and an auxiliary bearing member engaging the said pivot section, the said bearing member being structurally separate from and additional to the base and the cabinet walls and secured to the cabinet rear wall.

21. In an electric switch, the combination of an enclosing cabinet including an openable cover, an insulating base held in fixed position in the cabinet, a switch associated with the base comprising two contacts and a movable switching member, an operating spindle comprising a rod including a pivot section positioned closely adjacent the back wall of the cabinet and extending through a bearing aperture in a side wall thereof, the rod being bent to form a manually operable handle outside of the cabinet and also to form a crank section inside of the cabinet and operatively connected with the switch member, and a bearing clip engaging the said pivot section and secured to the back wall of the cabinet.

22. In an electric switch, the combination of an enclosing cabinet including an openable cover, an insulating base in the cabinet, means for holding the said base in fixed position in the cabinet with the back thereof facing the back wall of the cabinet, a stationary switch contact connected with the base adjacent the back thereof, a movable switching member located between the main body of the base and the back wall of the cabinet and normally engaging the said contact to establish an electrical connection through the switch, the said switch member being rectilinearly movable in either direction parallelly with the back wall of the cabinet to be disengaged from or reengaged with the said contact, and an operating member pivoted on the cabinet for movement about an axis closely adjacent the back wall of the said cabinet and perpendicular to the direction of movement of the switching member, the said member comprising a manually operable handle outside of the cabinet and an element inside of the cabinet operatively connected with the switch member to move it rectilinearly as aforesaid.

23. In an electric switch, the combination of an enclosing cabinet including an openable cover, an insulating base in the cabinet, means for holding the said base in fixed position in the cabinet with the back thereof facing the back wall of the cabinet, a stationary switch contact connected with the base adjacent the back thereof, a movable switching member located between the main body of the base and the back wall of the cabinet and normally engaging the said contact to establish an electrical connection through the switch, the said switch member being rectilinearly movable in either direction parallelly with the back wall of the cabinet to be disengaged from or reengaged with the said contact, an operating spindle comprising a rod including a pivot section positioned closely adjacent the back wall of the cabinet and extending through a bearing aperture in a side wall thereof, the rod being bent to form a manually operable handle outside of the cabinet and also to form a crank section inside of the cabinet and operatively connected with the switch member, and a bearing clip engaging the said pivot section and secured to the back wall of the cabinet.

24. In an electric switch, the combination of an enclosing cabinet including an openable cover, an insulating base in the cabinet, means for holding the said base in fixed position in the cabinet with the back thereof facing the back wall of the cabinet, a stationary switch contact connected with the base adjacent the back thereof, a movable switching member located between the main body of the base and the back wall of the cabinet, the said member including a conducting element normally engaging the said contact to establish an electrical connection through the switch and also including an insulating element movable with the conducting element and positioned between it and the said supporting surface, the said insulating element having a transversely extending slot formed therein and the said switch member as a whole being rectilinearly movable in either direction parallelly with the back wall of the cabinet to disengage the conducting element thereof from or reengage it with the said contact, an operating spindle comprising a rod including a pivot section positioned closely adjacent the back wall of the cabinet and extending through a bearing aperture in a side wall thereof, the rod being bent to form a manually operable handle outside of the cabinet and also to form a crank section inside of the cabinet and extending into the slot in the insulating element of the switching member, and a bearing clip engaging the said pivot section and secured to the back wall of the cabinet.

JOSEPH SACHS.