May 6, 1930. J. SACHS 1,757,742

ELECTRIC CIRCUIT CONTROLLING APPLIANCE

Original Filed July 12, 1927 2 Sheets-Sheet 1

Fig. 1

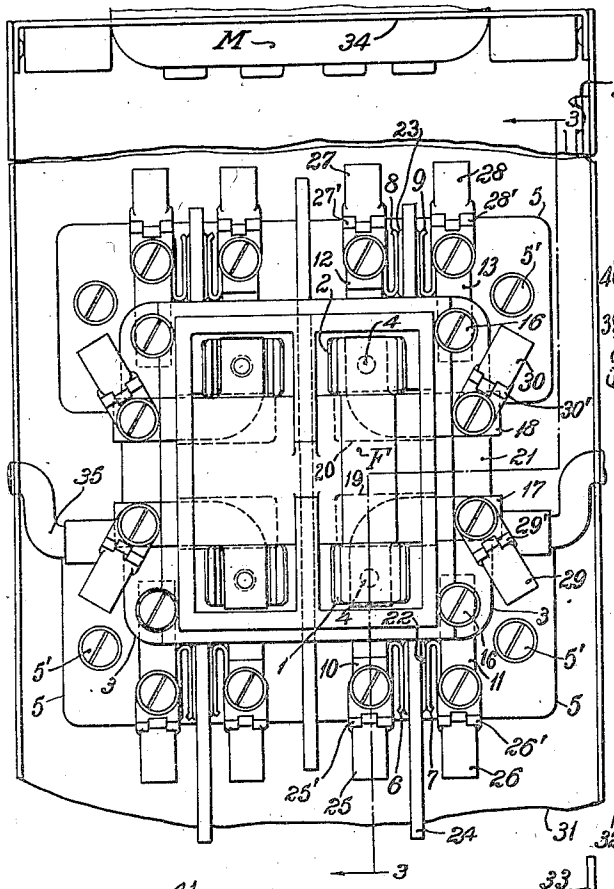


Fig. 3

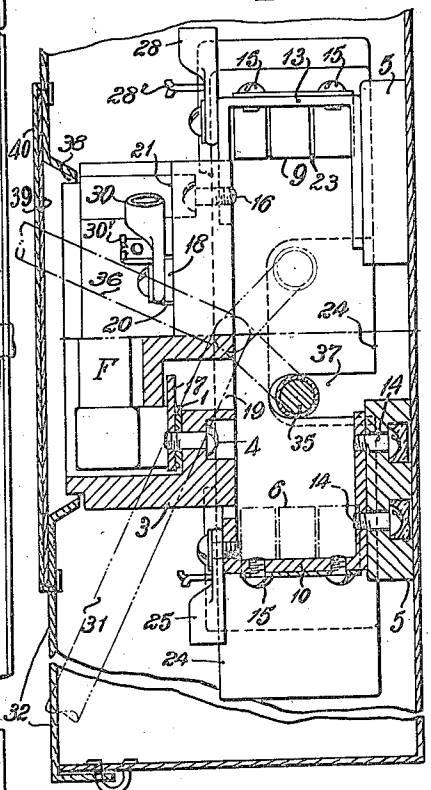
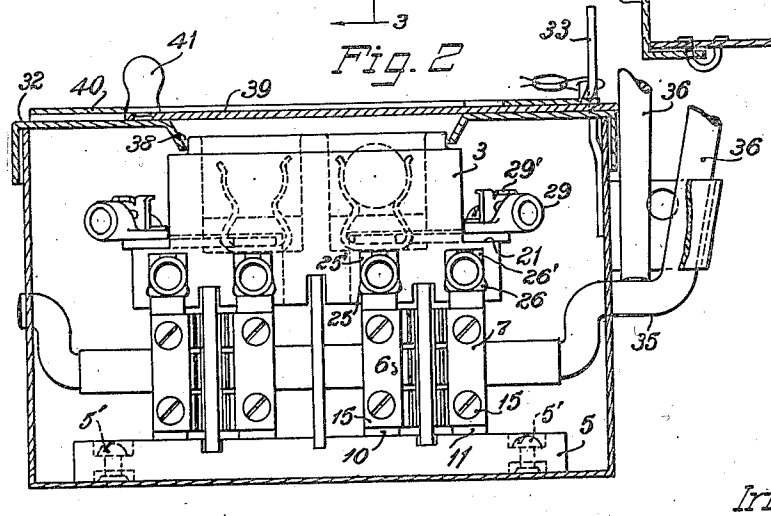


Fig. 2



Inventor
Joseph Sachs
By S. Jay Teller
Attorney

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Fig. 4

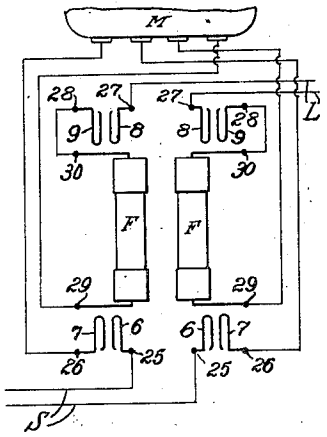


Fig. 5

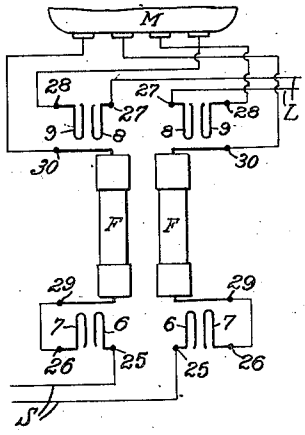


Fig. 6

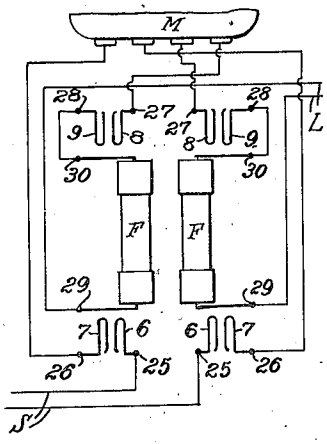


Fig. 7

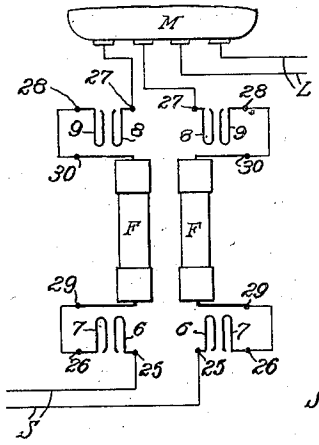
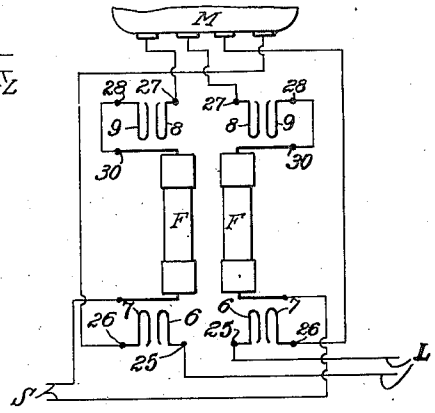


Fig. 8



Inventor
Joseph Sachs
By S. Jay Teller
Attorney

Patented May 6, 1930 1,757,742

UNITED STATES PATENT OFFICE

JOSEPH SACHS, OF WEST HARTFORD, CONNECTICUT

ELECTRIC-CIRCUIT-CONTROLLING APPLIANCE

Application filed July 12, 1927, Serial No. 205,207. Renewed December 7, 1929.

This invention relates to fused electric switch appliances and particularly to such appliances of the type wherein there are two switching devices for each pair of fuse contacts the said two switching devices being arranged to be manually operated substantially simultaneously.

In my copending application for Electric meter service appliance, Serial No. 188,793, filed May 4th, 1927, I have disclosed a fused switch appliance of this general type particularly intended and adapted for direct association with an electric meter. The appliance as shown in the said application has means serving to directly and relatively permanently connect one fuse contact with one stationary switch contact of one switching device, and it has four wire receiving terminals, one connected with the remaining fuse contact, one connected with the remaining switch contact of the said switching device, and two connected respectively with the stationary switch contacts of the other switching device.

One of the objects of the present invention is to provide a fused switch appliance of the type described having all of the fuse contacts arranged so as to be initially free from electrical connection with any of the switch contacts, the said appliance having six separate wire receiving terminals instead of four, these six terminals being connected respectively with the said two fuse contacts and with the four stationary switch contacts of the two said switching devices. It will be obvious that with six independent wire receiving terminals it is possible to conveniently connect the said two switching devices and the fuse contacts in any desired electrical sequence and it is also possible to include in this sequence at any desired point some other electrical appliance such as an electric meter.

In my copending application for Electric circuit controlling appliance, Serial No. 218,279, filed Sept. 8, 1927, I have disclosed and claimed an appliance of the general type disclosed in my patents for Electric circuit controlling appliances, No. 1,754,433 and No. 1,754,445, both issued April 15, 1930, but having four wire receiving terminals connected and arranged as already described instead of only two terminals as disclosed in the said patents. A further feature of the present invention resides in the structural arrangement incident to the provision of six separate wire receiving terminals connected respectively with the two fuse contacts and the four stationary switch contacts of a fused switch of the type shown in the patents last above referred to.

In the accompanying drawings I have shown one embodiment of the invention but it will be understood that the drawings are for illustrative purposes only and that the invention may be otherwise embodied particularly by the use of the variations in the fused switch structure such as set forth in the aforesaid patents and in the applications referred to therein.

Of the drawings:

Figure 1 is a front view of an appliance embodying the invention the cover of the enclosure cabinet being omitted.

Fig. 2 is a bottom view of the appliance shown in Fig. 1 the cabinet being shown in section.

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

Figs. 4 to 8 inclusive are diagrams of possible electrical connections.

As already stated an appliance embodying the invention comprises a pair of fuse contacts and two switch devices. As concerns the broader aspects of the invention these fuse and switch parts may be variously constructed and arranged, but in order that the invention may be clearly understood I have shown in Figs. 1 to 3 an embodiment thereof similar in many respects to the construction disclosed in my said Patent No. 1,754,445.

The construction as illustrated includes two pairs of fuse contacts and two pairs of switching devices associated respectively with each pair of fuse contacts. The fuse and switch parts as illustrated are arranged in a unit and they are symmetrically disposed with respect to the vertical central plane of the unit. For the sake of convenience and simplicity of description I will describe in detail only those parts on one side of the

said plane, it being understood that the parts on the other side are or may be the same in construction except for reversal of position.

As illustrated the fused switch unit includes at each side two fuse receiving contacts 1 and 2. These are shown as being adapted for receiving a cartridge enclosed fuse F but it will be understood that I do not so limit myself. Suitable means is provided for supporting the fuse contacts and for this purpose I have shown an insulating base 3 mounted in fixed spaced relationship with the rear supporting wall which may be the rear wall of an enclosing cabinet. The fuse contacts are mounted directly on the base, being held by screws 4, 4. Preferably the fused switch unit also includes a second insulating means 5, 5 which serves as a supporting device and is secured directly to the said supporting wall by suitable devices such as screws 5', 5'. This second insulating means may comprise two separate members as shown but this is not essential. All of the various conducting parts of the fused switch unit are connected with the insulating members 3 and 5, 5. Located at least in part in the space behind the plane of the rear face of the base 3 are switch devices, each comprising two stationary switch contacts and a rectilinearly movable switch contact adapted to engage or disengage both of the stationary contacts to make or break the electrical connections between them.

The stationary contacts for one switch device are represented at 6 and 7 and the stationary switch contacts for the other switch device are indicated at 8 and 9. The several stationary switch contacts are carried respectively by supporting elements 10, 11, 12 and 13 which project forward from the supporting devices 5, 5 and which may be secured thereto by screws 14, 14. Each of the switch contacts is preferably of a general U-shape and is provided with a laterally extending flange which engages the corresponding supporting element. Screws 15, 15 extend through the flange and into the supporting element to detachably hold the switch contacts in place.

The supporting elements 11 and 13 are extended upward and downward respectively and serve as means for supporting the base 3. Screws 16, 16 extend through the base and into the said supporting elements as illustrated.

As already stated the fuse contacts 1 and 2 are held in place on the base 3 by screws 4, 4. These screws also engage conducting straps 17 and 18 which extend upward and downward respectively and also laterally from the fuse contacts. The straps 17 and 18 are thus electrically connected respectively with the fuse contacts 1 and 2. These straps 17 and 18 are positioned in part in open sided recesses 19 and 20 which extend forward from the back face of the base. The end portions of the straps 17 and 18 extend laterally through the open sides of the recesses and in front of a ledge 21 formed on the base at the side thereof.

For making and breaking electrical connection between the stationary switch contacts of the two pairs there are provided two rectilinearly movable switch contacts which are preferably carried by a single flat insulating element as described in detail in my aforesaid patent No. 1,754,443. The two movable switch contacts are shown at 22 and 23 respectively and the flat insulating element is shown at 24, the said insulating element with the movable switch contacts thereon constituting a switching member. The said switching member is guided between the insulating members 3 and 5, 5. It will be understood that when the member 24 is moved the two contacts 22 and 23 are moved to simultaneously engage and disengage the respective pairs of switch contacts 6 and 7, and 8 and 9. It will be further understood that the switching members move upward from the positions shown to break the circuit.

Connected respectively with the supporting elements 10, 11, 12 and 13 and with the ends of the straps 17 and 18 are wire connecting terminals 25, 26, 27, 28, 29 and 30. I have shown terminals of the solder lug type but I do not so limit myself. It will be obvious that the said terminals 25, 26, 27, 28, 29 and 30 are electrically connected respectively with the stationary switch contacts 6, 7, 8 and 9 and the fuse contacts 1 and 2. It will be observed that the terminals 29 and 30 connected with the fuse contacts are at the side of the base and therefore well separated from the other terminals which are at the ends of the base.

As already described the base 3 is held in place by the screws 16, 16. By removing the said screws the base with the fuse contacts thereon may be removed thus exposing all of the switch parts for inspection, cleaning or adjustment. Inasmuch as the base 3 serves as the means for retaining and guiding the movable switching members at the front edges thereof, it will be obvious that when the base is removed as described, the switching members can be also removed.

Ordinarily and preferably the fused switch unit as described is enclosed within a suitable cabinet or casing such as the cabinet 31 shown in the drawings. This cabinet is of the usual rectangular form and the supporting members 5, 5 are secured to the rear wall of the cabinet by means of screws 5', 5' as already stated. The cabinet is shown as being provided with a pivoted front cover 32 which is hinged to one wall as for instance the bottom wall, so as to be openable to permit access to the switch and fuse parts. The cover

may be locked in closed position by means of a latch 33 and if desired a seal may be inserted through the latch in the usual way to definitely prevent the opening of the cabinet except by breaking the seal.

If desired the cabinet may be adapted to be protectively associated with an electric meter, but it will be understood that the invention is not so limited. When so adapted the upper wall 34 of the cabinet preferably has an opening therein of such size and shape as to substantially fit the terminal chamber portion of an electric meter such as indicated at M, the said terminal chamber portion of the meter projecting for a short distance into the cabinet and substantially closing the said opening in the end wall 34. Inasmuch as the meter M projects into the cabinet the cabinet serves as a means not only for protectively enclosing the connections between the switch and fuse parts and the meter.

I provide a suitable means for operating the switching devices from the exterior of the cabinet when the cover is closed and as shown this means comprises an operating spindle 35 which extends through bearing apertures in the side walls of the cabinet and which is provided with an operating handle 36 on the exterior of the cabinet. Within the cabinet the operating spindle 35 is provided with a cranked portion which extends through slots 37 in the respective insulating elements 24 of the switch members. By moving the handle 36 the switch members may be moved upward or downward as required to disengage the movable switch contacts from the stationary switch contacts or to reengage them therewith.

The cover 32 of the cabinet may be provided with an opening 38 through which the fuse contacts and the fuses are accessible when the cover is closed. The base 3 is so formed and so positioned as to substantially close the opening 38 when the cover is closed. As the result of this construction it is impossible to get access to the interior of the cabinet or to any of the live electrical parts therein except the fuse contacts after the cover has been closed and sealed.

If desired there may be provided an auxiliary cover for the opening in the main cover 32, this auxiliary cover being interlocked with the switch mechanism so that the auxiliary cover cannot be opened when the switches are closed and so that the switches cannot be closed when the auxiliary cover is open. I have shown a transversely slidable auxiliary cover 39 which is held and guided by means of a member 40. The cover 39 is provided with a knob 41 by means of which it may be moved laterally. With the parts in the positions shown the cover 39 is obstructed by the handle 36 so that the cover cannot be opened to expose the fuses so long as the handle 36 remains in the switch closing position. However, when the handle is moved downward to the lower position shown in Fig. 3 so as to move the switching members 24, 24 upward to open the circuit the cover 39 is then free to be moved laterally toward the right to permit access to the fuse contacts and the fuses; but with the cover thus moved laterally it is impossible to move the handle 36 to close the circuit. The interlocked cover and handle construction as disclosed constitutes no part of the present invention, being set forth in my patents for Enclosed fused switches, Nos. 1,721,493, 1,721,494 and 1,721,495 all issued July 16, 1929.

When an appliance embodying the invention is intended to be used in association with an electric meter it is preferable to provide auxiliary contacts in association with the several wire receiving terminals these contacts serving for the attachment of suitable by-pass connections and for the attachment of the usual meter testing appliances. I have shown test contacts 25′, 26′, 27′, 28′, 29′, and 30′ associated respectively with the wire receiving terminals 25, 26, 27, 28, 29 and 30.

Figs. 4 to 8 are electrical diagrams showing various electrical connections which may be used with a fused switch embodying the invention. In these diagrams I have illustrated the switch as associated with an electric meter but it will be understood that the invention is not so limited and that the switch may be used in associaton with other electrical appliances as may be desired or without immediate association with any other appliance.

In each of the figures the incoming service wires are indicated by S and the outgoing load wires are indicated by L. Fig. 4 shows an electrical sequence of service wires—switch—meter—fuse—switch—load wires. Fig. 5 shows an electrical sequence of service wires—switch—fuse—meter—switch—load wires. Fig. 6 shows an electrical sequence of service wires—switch—meter—switch—fuse—load wires. Fig. 7 shows an electrical sequence of service wires—switch—fuse—switch—meter—load wires. Fig. 8 shows an electrical sequence of service wires—fuse—switch—meter—switch—load wires. It will be understood that the electrical connections shown in these figures have been selected merely for the purpose of illustrating the invention and that numerous other arrangements may be used as required to meet different conditions.

What I claim is:

1. In a fused switch appliance, the combination of a base, two fuse receiving contacts connected with the base, two switch devices each comprising two stationary switch contacts associated with the base and a movable switching member comprising a conducting element normally engaging the said stationary switch contacts to establish electrical

connection between them, the said switch contacts being initially free from electrical connection with the said fuse contacts, manually operable means for moving the movable members of the two switching devices to open or close the circuit through both of the said devices substantially simultaneously, and six wire receiving terminals connected respectively with the two fuse contacts and with the four stationary switch contacts of the two switch devices.

2. In a fused switch appliance the combination of two fuse receiving contacts, means for supporting the fuse receiving contacts in normally fixed relationship with a rear supporting wall, two pairs of opposed stationary switch contacts in normally fixed relation to the fuse contacts, the said switch contacts being initially free from electrical connection with the said fuse contacts, a rectilinearly movable switching member comprising two conducting elements insulated from each other and normally engaging the said stationary switch contacts of the corresponding pairs to establish electrical connections between them, means for moving the said switching member to disengage the conducting elements thereof from or to re-engage them with the said stationary switch contacts, and six wire receiving terminals connected respectively with the two fuse contacts and with the four stationary switch contacts of the switch devices.

3. In a fused switch appliance, the combination of two fuse receiving contacts, means including an insulating base for supporting the fuse receiving contacts in normally fixed relationship with a rear supporting wall, two pairs of opposed stationary switch contacts in normally fixed relation to the fuse contacts and located at least in part behind a transverse plane through the rear parts of the fuse contacts, the said switch contacts being initially free from electrical connection with the said fuse contacts, a rectilinearly movable switching member located at least in part behind the said base and comprising two conducting elements insulated from each other and normally engaging the said stationary switch contacts of the corresponding pairs to establish electrical connection between them, means for moving the said switching member to disengage the conducting elements thereof from or to re-engage them with the said stationary switch contacts, and six wire receiving terminals connected respectively with the two fuse contacts and with the four stationary switch contacts of the two switch devices.

4. In a fused switch appliance the combination of two fuse receiving contacts, means including an insulating base for supporting the fuse receiving contacts in normally fixed relationship with a rear supporting wall, two pairs of opposed stationary switch contacts in normally fixed relation to the fuse contacts and located at least in part behind a transverse plane through the rear parts of the fuse contacts, the said switch contacts being initially free from electrical connection with the said fuse contacts, a rectilinearly movable switching member located at least in part behind the said base and comprising two conducting elements insulated from each other and normally engaging the said stationary switch contacts of the corresponding pairs to establish electrical connections between them, means for moving the said switching member to disengage the conducting elements thereof from or to re-engage them with the said stationary switch contacts, two wire receiving terminals at one end of the base connected respectively with the stationary switch contacts of one pair, two wire receiving terminals at the opposite end of the base connected respectively with the stationary switch contacts of the other pair, and two wire receiving terminals at one side of the base connected respectively with the two fuse contacts.

5. In a fused switch appliance, the combination of two fuse receiving contacts, means including an insulating base for supporting the fuse receiving contacts in normally fixed relationship with a rear supporting wall, the said base having two open-side recesses adjacent the respective fuse contacts, two pairs of opposed stationary switch contacts in normally fixed relation to the fuse contacts and located at least in part behind a transverse plane through the rear parts of the fuse contacts, the said switch contacts being initially free from electrical connection with the said fuse contacts, a rectilinearly movable switching member located at least in part behind the said base and comprising two conducting elements insulated from each other and normally engaging the said stationary switch contacts of the corresponding pairs to establish electrical connections between them, meanes for moving the said switching member to disengage the conducting elements thereof from or to re-engage them with the said stationary switch contacts, two pairs of wire receiving terminals at opposite ends of the base, the terminals of one pair being connected respectively with the stationary switch contacts of one pair and the terminals of the other pair being connected respectively with the stationary switch contacts of the other pair, two conducting straps located in the said recesses in the base and electrically connected with the respectively adjacent fuse contacts, and two other wire receiving terminals located at one side of the base and connected respectively with the said straps.

In testimony whereof I have hereunto set my hand this 30th day of June, 1927.

JOSEPH SACHS.