April 25, 1933. J. SACHS 1,905,003

ELECTRIC METER SERVICE APPLIANCE

Filed April 2, 1932

Fig. 1

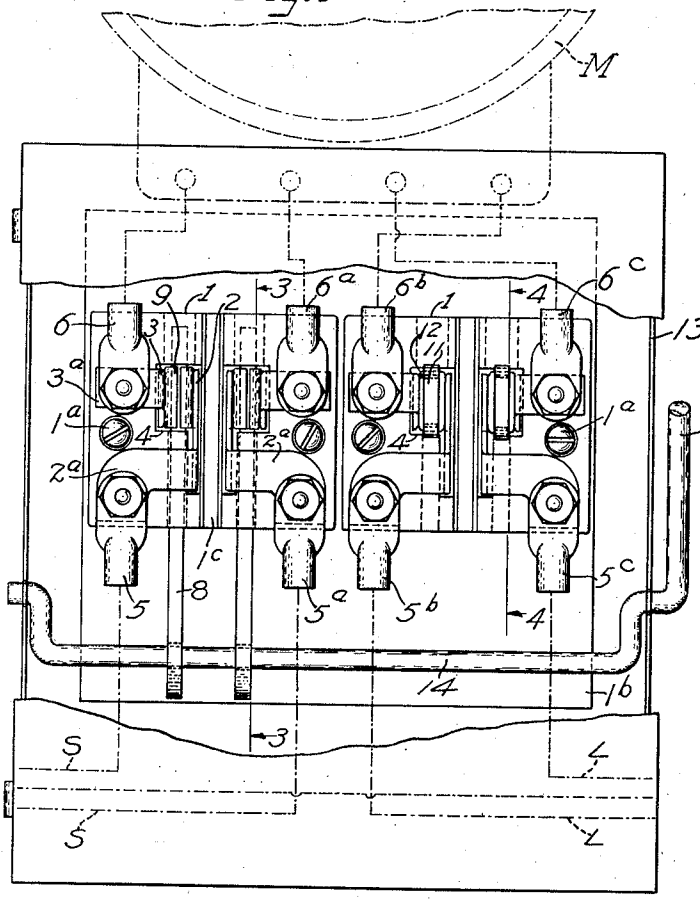



Fig. 3

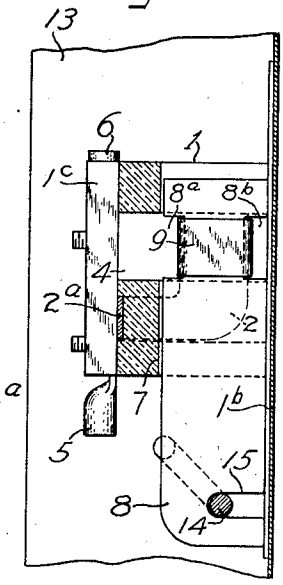



Fig. 2

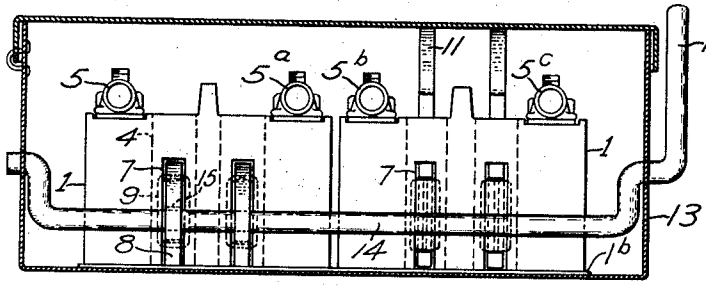
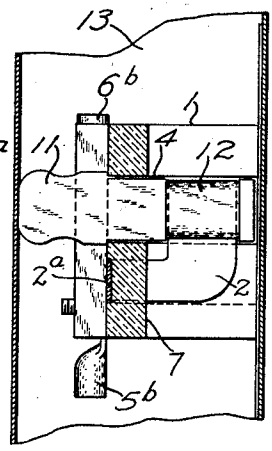



Fig. 4




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# UNITED STATES PATENT OFFICE

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## ELECTRIC METER SERVICE APPLIANCE

Application filed April 2, 1932. Serial No. 602,861.

The present invention relates particularly to a meter service appliance having switching connectors or members and meter testing connectors or members, which connectors or members are adapted to be connected in the several circuit wires leading to and from the meter. While not necessarily so limited the present invention is particularly applicable to a meter service appliance wherein the fuses are either omitted entirely or are mounted entirely independently of the switching and testing connectors or members.

One of the objects of the invention is to provide an appliance of this type which permits the switching and testing members to be interchangeably assembled with the base structure so as to permit different electrical connections with minimum structural changes in the appliance.

A further object of the invention is to provide a device of the class described wherein the base structure or unit is so constructed that without any changes whatsoever therein it can be used with a switching member movable in one direction or in one path, or with a testing member movable in another direction or in another path.

A still further object of the invention is to provide certain improved details of construction for the switching members so as to facilitate manufacture and reduce costs.

Still further objects of the invention will be apparent from the following specification and claims.

In the accompanying drawing I have shown one embodiment of the invention which I have found to be satisfactory, but it will be understood that the drawing 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 a meter service appliance embodying the invention, the front cover of the enclosing box being broken away in part.

Fig. 2 is a bottom view, the enclosing box being shown in section.

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

Fig. 4 is a vertical sectional view taken along the line 4—4 of Fig. 1.

In the drawing I have shown an insulating base structure which may conveniently comprise two separate bases 1, 1. The base structure, whether consisting of two separate bases or otherwise constructed, has two portions of substantially identical construction. When there are two separate bases each of the said bases constitutes one of the said portions. The base structure is held in place by screws $1^a$, $1^a$, and when the said base structure is secured to the rear wall of an enclosing box, there may be provided an interposed sheet of insulating material $1^b$.

Mounted on each portion or base 1 there is at least one pair and if necessary two pairs of stationary switch contacts 2 and 3. Preferably and as shown the base is provided with an opening 4 extending from front to rear and the two contacts extend from the front of the base rearward into the said opening. Formed integrally with the contacts are extensions $2^a$ and $3^a$ mounted on the front of the base and connected respectively with wire terminals 5 and 6. When there are two pairs of contacts on each portion or base 1 they are of similar construction except that they are preferably reversed in positions as indicated in the drawing. A barrier $1^c$ may be provided between the two pairs of contacts. Each portion or base 1 with the contacts and connections thereon will be referred to as a contact holding unit.

In association with each pair of contacts each base is provided with two differently positioned means thereon respectively adapted for controlling the movement of two different optionally usable circuit making and breaking members. These controlling means may be varied, but preferably they consist of guideways formed directly on or in the base itself. Formed in the base at the rear thereof is a groove 7 which intersects the corresponding opening 4 and this groove is adapted to receive and guide a vertically movable switching member which comprises an insulating plate 8 with a conducting element 9

thereon. The switching member is guided at the rear by the rear wall of the enclosing box or by the interposed insulating sheet $1^b$. When the switching member 8—9 is in its lower position as shown in Figs. 1 and 3, electrical connection is established between the two contacts 2 and 3. When the switching member is moved upward from the position shown the electrical connection is broken.

The walls of the before-mentioned opening 4 preferably constitute the second guideway. A manually movable circuit making and breaking member is provided adapted to enter this guideway, the said member comprising an insulating plate 11 with a conducting element 12 thereon. The plate 11 is so shaped at the front as to be adapted to be conveniently moved manually. When the member 11—12 is in its rearmost position as shown in Fig. 4, electrical connection is established between the corresponding stationary contacts. The member 11—12 may be entirely removed in the forward direction and when so removed the connection between the said contacts is broken.

Insofar as concerns certain phases of my invention the details of the circuit making and breaking members 8—9 and 11—12 may be widely varied. However, another phase of the invention relates specifically to the said details which will now be more particularly described.

Referring to Fig. 3 it will be observed that the insulating plate 8 is provided with two opposite notches $8^a$ and $8^b$ formed respectively in the front and rear edges thereof. The conducting element 9 consists of a strip of sheet metal bent to form a substantially closed loop which extends into or through the notches $8^a$ and $8^b$ and which encloses that portion of the plate 8 which is positioned between the said notches. The loop formation of the conducting element 9 is more clearly shown by dotted lines in Fig. 2.

It will be observed that with this construction the manufacture and assembly of the circuit making and breaking member is simple and inexpensive. The insulating plate can be easily punched with the notches $8^a$ and $8^b$ therein and the conducting element 9 can be initially formed with the loop sufficiently open to permit it to be slipped into position on the insulating plate. Then by means of a suitable press the conducting element can be bent to its final shape, thus locking itself in position on the insulating plate.

The circuit making and breaking member 11—12 is or may be similar in construction to the member 8—9 and repetition of the detailed description is unnecessary.

An operating member is provided and when the base structure is mounted in an enclosing box such as 13 the operating member is preferably in the form of a cranked spindle 14 pivotally mounted in the side walls of the box. The operating member 14 includes a handle $14^a$ on the exterior of the box. The insulating plate 8 of each switching member is provided with a slot 15 through which extends the cranked portion of the operating member 14. It will be evident that the operating member is thus adapted to move the switching members. When the handle $14^a$ is in its uppermost position as shown the switching members are in their circuit closing positions. When the handle is moved downward the switching members are moved upward to their open-circuit positions.

The upper end wall of the box 13 is preferably adapted for protective cooperation with a portion of an electric meter M, the construction being such that the said portion of the meter can project into the box with a relatively close fit so as to prevent theft of current. The meter service appliance which is shown in the drawing may be variously connected with the meter and with the circuit wires and one arrangement of connections is shown in the drawing. Two of the service wires S are connected with the terminals 5 and $5^a$ and the terminals 6 and $6^a$ are connected with wires leading to the meter. The terminals $6^b$ and $6^c$ are connected with wires leading from the meter, and the load wires L are connected with the terminals $5^b$ and $5^c$.

With the particular arrangement of electrical connections which is shown the two switching members 8—9 are connected on the service side of the meter and are therefore adapted to connect and disconnect the meter with the service wires when the handle is operated. The two testing members 11—12 are interposed between the meter and the load wires and it will be evident that either or both load wires may be readily disconnected from the meter by manually removing one or both of the test members. If service to the customer is to be discontinued, the members 11—12 may be removed and the box then closed and locked. This provides an additional safeguard against any unauthorized restoration of the circuit connections.

It will be observed that the several screws which hold the wire terminals in place are much longer than would otherwise be necessary, these screws being thus adapted for use as test contacts for the attachment of bypass connections or of leads connected with various meter testing instrumentalities.

I have already explained that the two portions of the base structure, that is, the two bases 1, 1 are of identical construction and that there are provided two guideways adjacent each pair of switch contacts. It will therefore be evident that various arrangements of switching and testing members can be provided. Fig. 1 shows one such arrangement, but it will be observed that if preferred the two switching members 8—9 could

be at the right instead of at the left and that the two testing members 11—12 could be at the left instead of at the right. As shown the switching members are connected ahead of the meter and the testing members are connected after the meter, but if the said members were reversed as above suggested the testing members would be ahead of the meter and the switching members would be after the meter. The switching members may be at the center and the testing members may be at the sides. Other possible rearrangements of the switching and testing members are obviously possible.

When the two bases 1, 1 are entirely separate as shown and as is preferred considerable economy of manufacture is obtained. The two bases and also all of the electrical parts permanently mounted thereon are identical in construction and can thus be manufactured with a minimum of expense for molds and tools, and there is also less expense for storing, handling and the like. It will further be apparent that the unit structure is also available for use in other devices which might require only the switching function or only the meter testing function.

What I claim is:

1. A contact holding unit for an electric circuit making and breaking device, comprising in combination, two stationary contacts, and a base supporting the contacts and having two separate differently positioned means thereon respectively adapted for controlling the movement of two different optionally usable circuit making and breaking members into and out of circuit making position between the said contacts.

2. A contact holding unit for an electric circuit making and breaking device, comprising in combination, two opposed stationary contacts, and a base supporting the contacts and having two separate guideways thereon at substantial angles to each other and each adapted for guiding a circuit making and breaking member into and out of circuit making position between the said contacts.

3. A contact holding unit for an electric circuit making and breaking device, comprising in combination, two opposed stationary contacts, and a base supporting the contacts and having two separate guideways thereon at substantial angles to each other and adapted respectively for guiding two different optionally usable circuit making and breaking members into and out of circuit making positions between the said contacts.

4. A contact holding unit for an electric circuit making and breaking device, comprising in combination, two opposed stationary contacts, and a base supporting the contacts adjacent the rear thereof and having a groove at the rear thereof constituting a guideway adapted for guiding a circuit making and breaking member into and out of circuit making position between the said contacts, the said base also having an opening from front to rear thereof constituting a guideway adapted for guiding a different circuit making and breaking member into and out of circuit making position between the said contacts.

5. A meter service appliance comprising in combination, an insulating base structure having two portions of substantially identical construction, each portion having two separate differently positioned means thereon respectively adapted for controlling the movement of two different optionally usable circuit making and breaking members, two pairs of opposed contacts mounted in identical positions on the respective portions of the base structure, an operating member supported separately from the base structure, a switching member engaging one controlling means on one portion of the base structure and connected with the operating member to be moved into and out of circuit making position between the corresponding contacts, and a circuit making and breaking member engaging the other controlling means on the other portion of the base structure and manually movable independently of the operating member into and out of circuit making position between the corresponding contacts.

6. A meter service appliance comprising in combination, an insulating base structure having two portions of substantially identical construction, each portion having two separate guideways thereon at substantial angles to each other, two pairs of opposed contacts on the respective portions of the base structure adjacent both of the said guideways, an operating member supported separately from the base structure, a switching member engaging one guideway of one portion of the base structure and connected with the operating member to be moved thereby into and out of circuit making position between the corresponding contacts, and a circuit making and breaking member engaging the other guideway of the other portion of the base structure and manually movable independently of the operating member into and out of circuit making position between the corresponding contacts.

7. A meter service appliance comprising in combination, two separate bases of identical construction and each having two separate guideways thereon at substantial angles to each other, two pairs of opposed contacts on the respective bases adjacent both of the said guideways, an operating member supported separately from the bases, a switching member engaging one guideway of one base and connected with the operating member to be moved thereby into and out of circuit making position between the corresponding contacts, and a circuit making and breaking member engaging the other guide-

way of the other base and manually movable independently of the operating member into and out of circuit making position between the corresponding contacts.

8. A meter service appliance comprising in combination, two separate bases of identical construction and each having a groove at the rear constituting a guideway and each having an opening from front to rear intersecting the said groove and constituting a second guideway, two pairs of opposed contacts on the respective bases adjacent both of the said guideways, an operating member supported separately from the bases, a switching member engaging the first guideway of one base and connected with the operating member to be moved thereby parallelly with the rear of the base into and out of circuit making position between the corresponding contacts, and a circuit making and breaking member entering the said opening and guided therein for manual movement backward and forward independently of the operating member into and out of circuit making position between the corresponding contacts.

9. A meter service appliance comprising in combination, a movable operating member, a base structure comprising two portions of substantially identical construction located in similar relationship to the operating member, each portion having two separate differently positioned means thereon respectively adapted for controlling the movement of two different circuit making and breaking members, two pairs of opposed contacts mounted in identical positions on the respective portions of the base structure, and two different interchangeable circuit making and breaking members, one interchangeable member being adapted to engage one controlling means on either portion of the base structure and being connectible with the operating member to be moved thereby into and out of circuit making position between the corresponding contacts, and the other interchangeable member being adapted to engage the other controlling means on either portion of the base structure and to be manually moved independently of the operating member into and out of circuit making position between the corresponding contacts.

10. A meter service appliance comprising in combination, a movable operating member, a base structure comprising two portions of substantially identical construction located in similar relationship to the operating member, each portion having two separate guideways thereon at substantial angles to each other, two pairs of opposed contacts mounted in identical positions on the respective portions of the base structure and adjacent both guideways, and two different interchangeable circuit making and breaking members, one interchangeable member being adapted to engage one guideway on either portion of the base structure and being connectible with the operating member to be moved thereby into and out of circuit making position between the corresponding contacts, and the other interchangeable member being adapted to engage the other guideway on either portion of the base structure and to be manually moved independently of the operating member into and out of circuit making position between the corresponding contacts.

11. A meter service appliance comprising in combination, a movable operating member, a base structure comprising two portions of substantially identical construction located in similar relationship to the operating member, each portion having a groove at the rear constituting a guideway and each having an opening from front to rear intersecting the said groove and constituting a second guideway, two pairs of opposed contacts mounted in identical positions on the respective portions of the base structure and adjacent both guideways, and two different interchangeable circuit making and breaking members, one interchangeable member being adapted to enter the rear groove in either portion of the base structure and being connectible with the operating member to be moved thereby parallelly with the rear of the base structure into and out of circuit making position between the corresponding contacts, and the other interchangeable member being adapted to enter the said opening in either portion of the base structure and to be guided therein for manual movement backward and forward independently of the operating member into and out of circuit making position between the corresponding contacts.

12. A meter service appliance comprising in combination, a movable operating member, two separate bases of identical construction located in similar relationship to the operating member, each base having two separate guideways thereon at substantial angles to each other, two pairs of opposed contacts mounted in identical positions on the respective bases and adjacent both guideways, and two different interchangeable circuit making and breaking members, one interchangeable member being adapted to engage one guideway on either base and being connectible with the operating member to be moved thereby into and out of circuit making position between the corresponding contacts, and the other interchangeable member being adapted to engage the other guideway on either base and to be manually moved independently of the operating member into and out of circuit making position between the corresponding contacts.

13. A meter service appliance comprising in combination, a movable operating member, two separate bases of identical construction located in similar relationship to the

operating member, each base having a groove at the rear constituting a guideway and each having an opening from front to rear intersecting the said groove and constituting a second guideway, two pairs of opposed contacts mounted in identical positions on the respective bases and adjacent both guideways, and two different interchangeable circuit making and breaking members, one interchangeable member being adapted to enter the rear groove in either base and being connectible with the operating member to be moved thereby parallelly with the rear of the base into and out of circuit making position between the corresponding contacts, and the other interchangeable member being adapted to enter the said opening in either base and to be guided therein for manual movement backward and forward independently of the operating member into and out of circuit making position between the corresponding contacts.

14. As an article of manufacture, a longitudinally movable circuit making and breaking member comprising in combination a relatively thin flat plate of insulating material having opposite parallel guiding edges with two opposite notches formed respectively therein, and a contact element comprising a strip of sheet metal bent to form a substantially closed loop and positioned in the notches and substantially enclosing that portion of the plate between the notches.

In testimony whereof I have hereunto set my hand this 28th day of March, 1932.

JOSEPH SACHS.