This invention relates to meter receptacles and more particularly to receptacles having by-pass mechanisms to afford continued operation when said meter is removed. These mechanisms are generally divided into two types, automatic and manual. This invention relates particularly to the latter type wherein a separate operation is required to engage the by-pass circuit.

Meter receptacles having manual by-pass mechanisms have exterior actuating means commonly mounted on the cover of the receptacle with a mechanical connection to the interior mechanism. This connection is easily releasable upon removal of the cover, however, replacement of the cover requires that the components of the connection be properly aligned to prevent damage to the components. It is therefore an object of this invention to provide an instrument receptacle of the aforementioned type wherein the cover may be removed and replaced without particular regard to the position of the actuating means of the by-pass mechanism.

It is another object of this invention to provide a mechanism of the aforementioned type wherein the components of the mechanism are easily manufactured and assembled.

Other objects and advantages of the invention will become apparent in the following description and claims when read in conjunction with the drawings, wherein:

FIGURE 1 is a side elevational view of a meter mounted in a receptacle incorporating the invention with portions of the enclosure broken away;
FIG. 2 is a front elevational view of the receptacle and enclosure of FIG. 1 with the meter removed;
FIG. 3 is a bottom elevational view of FIG. 2 with part of the enclosure broken away;
FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 2;
FIG. 5 is a fragmentary sectional view taken along line 5—5 of FIG. 4; and
FIGS. 6a and 6b are exploded isometric views of components of the invention.

With reference to FIGS. 1 and 2 there is shown an enclosure 4 having therein a meter 2 mounted thereon by screws 6 which pass through clearance holes in tabs 4a secured to the underside of the cover 4 and take into threaded openings in tabs 2a of enclosure 2. Cover 4 has a circular flanged opening 4b extending outwardly thereof and it can be seen in FIG. 2 that tabs 4a and 2a extend into the openings 4b so that the screws 6 are accessible only through the opening 4b.

Mounted in the enclosure 2 and directly behind the opening 4b are a pair of support blocks 8 and 10 made of an electrical insulating material. Blocks 8 and 10 support a neutral bus bar 12 at their centers and a pair of entrance bus bars 14 and 16 at their ends. A spring clip terminal 18 is mounted on the upper surface of the left-hand side of block 8 and its strap 28 has connection with a bus bar 39 which leads to the customer's load. Likewise, a spring clip terminal 32 is mounted on the upper surface at the right-hand side of block 10 and its strap 34 is connected to a second bus bar 36 which leads to the customer's load.

A meter 38 having a base 38a and four blade terminals 38b is attached to the receptacle formed by the above described components by inserting its blade terminals into the spring clip terminals 18, 22, 26 and 32 until the base 38a rests upon the outwardly extending flanged portion of the cover 4. With the meter so attached it completes and "reads" two circuits, one through bus bar 14, strap 20, terminal 18, terminals 38b of the left-hand side of the meter, terminal 26, strap 28 and bus bar 30 and the other through bus bar 16, strap 24, terminal 22, terminals 38b of the right-hand side of the meter, terminal 32, strap 34, and bus bar 36. The meter 38 is held in place on the receptacle by a retaining ring 40 which has a U-shaped cross section and surrounds the outer surface of the base 38a and the flange of the cover 4.

Retaining ring 40 is drawn secure and sealed by a representative of the service company to thereby prevent unauthorized removal of the meter.

The device of the following description comprises the invention of this disclosure and permits authorized personnel to effect continued service to the customer upon removal of the meter.

A pair of spring contact members 42 and 44, shown individually in FIG. 6b, are placed upon bus bars 14 and 16, respectively, as shown in FIGS. 1-4. A pair of U-shaped clamps 46 and 48 are placed over the springs 42 and 44, respectively, in such a manner that the leg portions of the respective clamps surround the contacts and the bus bars 14 and 16, respectively. A pair of screws 50 and 52 pass through clearance openings in the respective bus bars and contacts and take into threaded openings in clamps 46 and 48, respectively, to secure the contacts to the bus bars.

A pair of helical compression springs 54 and 56 are placed over a pair of hollow sleeve members 58 and 60, respectively, having outwardly flanged head portions 58a and 60a, respectively. The springs 54 and 56 and sleeves 58 and 60 are then placed over the outwardly extending ends of screws 50 and 52, respectively, so that the upper side of the head portions 58a and 62a bear against the underside of an upper leg portion of the contacts 42 and 44, respectively.

The opposite ends of helical springs 54 and 56 bear against the upper side of clamps 46 and 48 and the under side of the head portions 58a and 60a, respectively, to bias the sleeves and hence the respective upper leg portions of the contacts 42 and 44 outwardly of the bus bars 14 and 16. The upper leg portions of contacts 42 and 44 bear against the underside of a horizontal portion of connector straps 28 and 34, respectively, which serve as outer limits to the spring contacts and their auxiliary bias springs 54 and 56.

A contact carrier 62 made of insulating material has slots 62a at each end that fit into corresponding notches 42a and 44a of spring contact members 42 and 44. Member 62 also has a depressed portion 62b intermediate its ends.

With reference particularly to FIG. 6a, there is shown a formed metal support member 64 having a base portion 64a, a pair of upstanding wall portions 64b disposed on opposite sides of base 64a, and a third upstanding wall portion 64c disposed along a third edge of base 64a. Wall portions 64b each have a circular opening 64d formed therein which is open to one side of member 64b by a slot 64e which is narrower than the diameter of the opening 64d. The lower edge of slot 64e extends horizontally to become the upper edge of projection 64f.
which has a hole 64g. Each wall 64b also has a tab 64h extending from it at right angles and each tab has a hole 64l formed therein.

An actuator 66 (FIG. 6) has a tongue portion 66a and an actuating cam surface 66d extending in opposite directions. A stop portion 66c also extends outwardly in a direction approximately normal to the portions 66a and 66b.

Member 66 also has semi-circular bearing projections 66d extending outwardly at its opposite sides. Projections 66d have flat areas 66e formed thereon so that the width of the projections across the flats is slightly less than the height of the slots 64e of member 64, while the diameter of the projections is slightly less than that of the openings 64f.

Member 66 is assembled to member 64 by tipping the member 66 so that its tongue portion 66a is pointing downward and the stop portion 66c is pointing toward the upstanding wall 64c, and sliding the flats 66e of bearing projections 66d through the slots 64e. When the semi-circular portions of projections 66d are in the circular openings 64d of walls 64b, member 66 is rotated so that the stop 66c is inserted toward the base of member 64 and the flats 66e of member 66 are approximately at right angles to the slots 64e.

A pressure plate 68, having a pair of slots 68a at its opposite sides, is then placed on member 64 with the slots 68a loosely surrounding the projections 66f. It will be seen in the side profile of plate 68 that it is bent to a slight "V" shape. A pin 70 is then placed in the holes 64g of projections 64f and its ends are upset slightly to maintain the pin within this position. With pin 70 in place the plate 68 cannot be removed.

A guide member 72 has a horizontally extending leg 72a and a vertically extending leg 72b. A pair of holes 72c are formed in leg 72b in alignment with holes 64j of member 64, and a slot 72d is formed in leg 72a. A lever member 74 has an outwardly extending leg 74a to which is secured a member 76 having a depending leg portion 76a. The upper end of lever 74 is bent at a slight angle and also has an opening 74b. The lower end of member 74 is provided with openings to receive a standard sealing member.

Cover member 4 is provided at its lower end just below the opening 4b with a pair of holes in alignment with holes 64j of member 64 and 72c of member 72. The horizontal portion of the flanged extension of cover 4 has an opening 4c (FIG. 3) in this area to provide clearance for member 74 and its attached member 76 and likewise a small portion of the flange of this extension is bent outwardly at 4d to provide clearance for the member 76.

Assembly of the various parts is made to the cover by placing the tabs 64h of member 64 against the inner surface of the cover 4 with the holes 64i in alignment with the corresponding holes in the cover. The members 66, 68 and 78 above described as being assembled to member 64 remain in this assembled relationship.

Though the opening 4c in cover 4 and opening 74b is fitted around tongue 66a of member 66. The lower end of member 74 is inserted through slot 72d of member 72 and the latter is placed against the front surface of cover 4 so that holes 72c are in alignment with the holes formed in the cover. The member 74 is then secured to the cover by rivets 78 which pass through holes 64i, 72c and the holes in the cover. This provides an inexpensive assembly of loosely held interfitting parts which are non-removable.

It can be seen in FIG. 1 that stop portion 66c abuts against the inner surface of cover 4 to engage the counterclockwise rotation of member 66. In FIG. 4 it can be seen that the lower surface of tongue 66a abuts one edge of the opening 4c to limit the counterclockwise rotation of member 66.

When the cover 4 is placed upon the enclosure 2 the plate 68 engages the surface 62b of contact carrier 62. It is to be pointed out at this time that assembly of the cover 4 to the enclosure 2 can be made without reference to the particular position of the actuator members and without damage to any of the parts thereof as will be more fully apparent in the following description.

FIG. 1 shows the meter 38 assembled to the receptacle with the actuator member in its normal inoperative position. The lever 74 is pushed upwardly to rotate member 66 clockwise. Cam surface 66b bears against pressure plate 68 to pivot the plate clockwise about the leg 64c. Plate 65 in turn bears against surface 62o of contact carrier 62 to move the member inwardly. The ends of contact carrier 62 thus carry the legs of contacts 42 and 44 away from the straps 28 and 34 and allow the meter to complete the circuit. It can be seen also that projection 76c is under the retaining ring 40 when the ring is installed so that it is impossible for unauthorized persons to pull lever 74 downward without damaging the ring or its seal.

When the seal, ring and meter are removed by an authorized person and it is desired to maintain service to the customer, the lever 74 is pulled downward which rotates member 66 counterclockwise as shown in FIG. 4. The cam surface 66b releases the plate 68 which in turn releases contact carrier 62. The bias of the spring contacts 42 and 44 and their auxiliary springs 54 and 56 force the contacts 42 and 44 into engagement with the underside of straps 28 and 34. Circuits are then complete through bus bar 14, spring contact 42, strap 28 and bus bar 30 to the customer's load and through bus bar 16, spring contact 44, strap 34 and bus bar 36 to the customer's load.

As pointed out earlier, when the cover 4 is secured to enclosure 2 with the actuator assembly in the position shown in FIG. 4, no pressure is applied to any of the members. If, however, the cover is assembled with the actuator in the position shown in FIG. 1, the plate 68 will merely move the contact carrier 62 inwardly and hence the spring contacts 42 and 44 will be moved away from the straps 28 and 34 with no damage to any of the parts.

We claim:

1. In a receptacle for receiving an electrical meter having a flanged base portion, a pair of electrical conducting members, means for securing the said conducting members to said meter, a spring contact member disposed between said pair of conducting members and secured to one end thereof to one of said conducting members and having a portion engageable with the other of said pair of conducting members in its normal condition, a contact carrier member connected to said portion of said spring contact member, a pressure plate member overlying said contact carrier, a rotatable actuating member having a cam surface on one end thereof and an outwardly extending tongue portion at its opposite end, a slidable lever member having connection at one end with said tongue portion of said actuating member and disposed within a receptacle supported guide means at its other end, said lever member being slidable in one direction to rotate said actuating member in a direction causing said cam surface to act upon said contact carrier through said pressure plate to move said contact carrier, and hence said contact member out of engagement with said other electrical conducting member, and said lever member being slidable in the opposite direction to rotate said actuator member in another direction causing said cam surface to release said pressure plate so that said contact carrier is moved by the natural resilient bias of said spring contact member to permit said portion of the latter to engage the other of said pair of electrical conducting members.

2. The combination according to claim 1, wherein said receptacle has an outwardly extending flanged portion to receive said flanged base portion of said meter, a retaining
ring surrounds and envelops both of said flanged portions to secure said meter to said receptacle, and wherein said lever member extends through an opening in said flanged portion of said receptacle and a portion of said lever members is also enveloped by said retaining ring when said lever member is in its one extreme position to prevent said lever from being moved to its other position.

3. The combination according to claim 2, wherein said lever member has an outwardly extending portion at its midportion, said outwardly extending portion formed normal to said lever and having a second portion formed at its outer end substantially normal to said outwardly extending portion, and wherein said second portion is enveloped by said retaining ring when said lever is in its one extreme position to prevent said lever from being moved to its other position.

4. The combination according to claim 1, together with an auxiliary spring member disposed between the ends of said spring contact member, wherein one end of said auxiliary spring acts upon said one end of said spring contact member and the other end of said auxiliary spring acts upon said engageable portion of said spring contact member to provide additional bias of the latter toward engagement with said other electrical conducting member.

5. In a receptacle for receiving an electrical meter having a flanged base portion, two pairs of electrical conducting members, means connecting said electrical conducting members to said meter, a spring contact member disposed between each pair of conducting members, said spring contacts being secured at one end to corresponding ones of said conducting members of each pair and having a portion engageable with the other of each pair of conducting members in the normal condition of said spring contact members, a contact carrier connected to said portions of said spring contacts, a pressure plate member pivotally mounted within said receptacle and overlying said contact carrier, a rotatable actuating member having a cam surface on one end thereof and an outwardly extending tongue portion at its opposite end, a slidable lever member having connection at one end with said tongue portion and disposed within a receptacle supported guide means at its other end, said lever member being slidable in one direction to rotate said actuating member in a direction causing said cam surface to act upon said contact carrier through said pressure plate to move said contact carrier, and hence said spring contact members out of engagement with said other electrical conducting member, and said lever member being slidable in an opposite direction to rotate said actuator member in another direction causing said cam surface to release said pressure plate so that said contact carrier is moved by the natural resilient bias of said spring contacts to permit said portions of the latter to engage the other of said pairs of electrical conducting members.

6. The combination according to claim 5, wherein said receptacle has an outwardly extending flanged portion to receive said flanged base portion of said meter, a retaining ring surrounds and envelops both of said flanged portions to secure said meter to said receptacle, and wherein said lever member extends through an opening in said flanged portions of said receptacle, said lever member having an outwardly extending portion at its midportion, said outwardly extending portion formed normal to said lever and having a second portion formed at its outer end substantially normal to said outwardly extending portion at its midportion, said outwardly extending portion formed normal to said lever and having a second portion formed at its outer end substantially normal to said outwardly extending portion, said second portion being enveloped by said retaining ring when said lever is in its one extreme position to prevent the lever from being moved to its other position.

7. The combination according to claim 5, together with a pair of auxiliary spring members, one of said auxiliary spring members disposed between the ends of each of said spring contact members, wherein one end of said auxiliary springs act upon said one end of said spring contact members and the other end of said auxiliary springs act upon said engageable portions of said spring contact members to provide additional bias of the latter toward engagement with said other electrical conducting members.

8. A receptacle for receiving an electrical meter having a flanged base portion, said receptacle comprising an enclosure member and a cover member to overlie said enclosure member, said cover member having an outwardly flanged portion to receive said flanged base portion of said instrument, an opening in said outwardly flanged portion, a lever member extending through said opening, an opening in one end of said lever member, an actuating member mounted for rotation on the inner side of said cover member, means extending from said rotatable actuating member through said opening in said lever member to form a driving connection between said members, a pressure plate member pivotally mounted upon the inner side of said cover whereby a second means extending from said actuating member acts upon said pressure plate member upon rotation of said actuating member to pivot said pressure plate member, and said enclosure member having electrical conducting members, movable contact means disposed between said electrical conducting members to effect a change of circuit between said conducting members, and a contact carrying member connected to said movable contact means, said pressure plate member abutting said contact carrying member when said cover is placed on said enclosure to form a driving relationship between the members.

No references cited.

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