May 24, 1938. H. M. JOHNSON 2,118,607

ELECTRICAL CONNECTER DEVICE

Filed Sept. 15, 1936 2 Sheets-Sheet 1

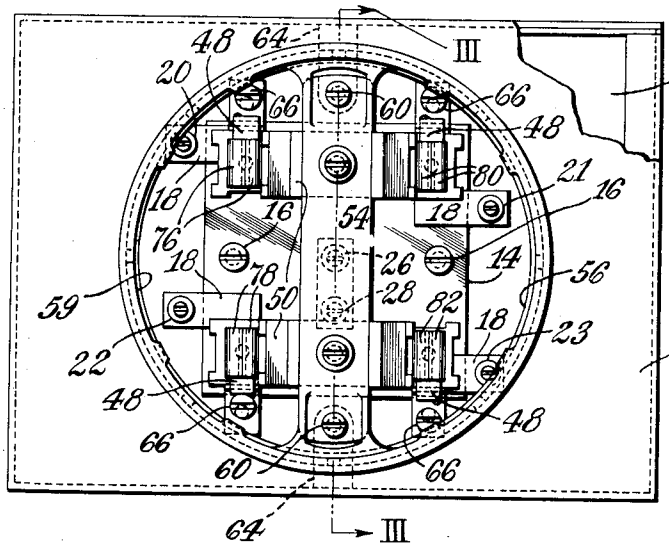


Fig. 1

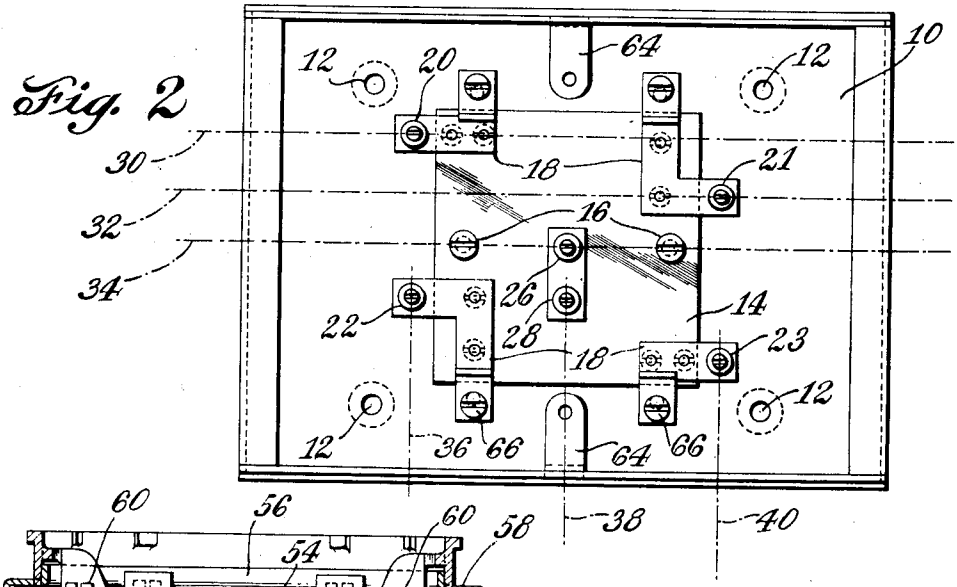


Fig. 2

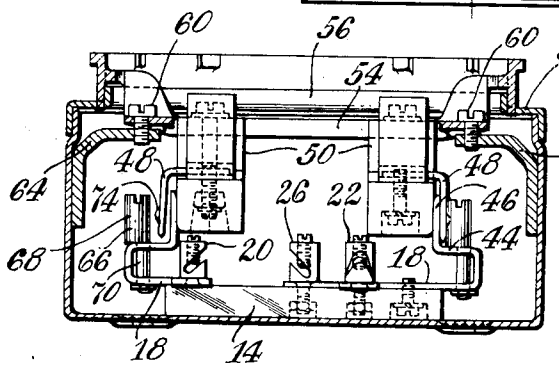


Fig. 3

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ELECTRICAL CONNECTER DEVICE

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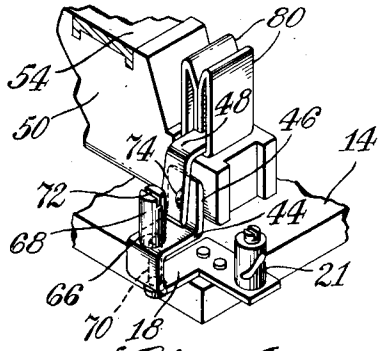


Fig. 4

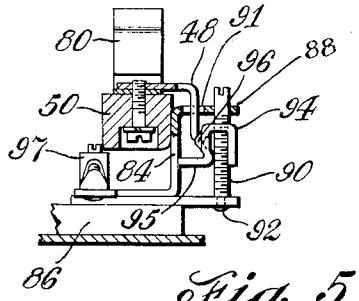


Fig. 5

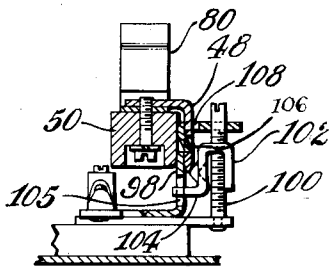


Fig. 6

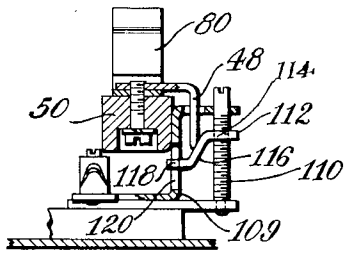


Fig. 7

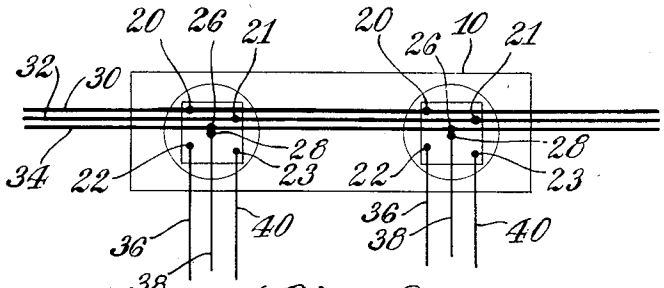


Fig. 8

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UNITED STATES PATENT OFFICE

2,118,607

ELECTRICAL CONNECTER DEVICE

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Application September 15, 1936, Serial No. 100,840

7 Claims. (Cl. 247—2)

This invention relates to electrical apparatus and is herein illustrated as embodied in an electrical connection system.

In electrical power circuits, use is commonly made of a meter for measuring the amount of electricity supplied to individual smaller circuits, such as the circuits in dwelling houses. In view of the very large number of meter installations in all parts of the country, it is desirable that the various apparatus used be standardized as far as possible and that the apparatus be susceptible to convenient installation. With this end in view, it is an object of the present invention to provide electrical connection apparatus of the type referred to which can be readily and economically assembled and which at the same time will be comparatively simple in construction. To this end and as illustrated, I have provided apparatus for forming the connections between the power line and individual circuit-control devices in which there are fixed contacts adapted to engage the power wires and a removable member carrying contacts for engaging terminals of a meter or other instrument, together with connecters for engaging the first-mentioned terminals as well as movable members for applying pressure to the two sets of terminals to make electrical contact. Preferably and as shown, each power wire extends through a trough or panel box and is secured to a fixed terminal having associated therewith an upstanding bracket, and there is a detachable member in the form of a cover carrying terminals adapted to engage a portion of an electrical instrument, such as a meter, and having a depending member movable heightwise of the bracket, there being a cam associated with the bracket for forcing together the depending terminals and the bracket. Preferably, the cam is arranged for operation by means of a rotatable shank or screw which is readily accessible when the cover and meter terminal device are in place.

An advantage of the construction above outlined is that the power wires can be secured to the terminals in one or several installations as a preliminary step and then, when it is desired to install an instrument such as a meter, the meter support is slid into position with the depending members located adjacent to the brackets and the cams are then operated to make the electrical contacts. This greatly simplifies the assembly of the apparatus. Furthermore, the cams and associated elements facilitate the making of the electrical contacts, something which has been more or less difficult to do heretofore because of the comparative inaccessibility of the several parts to be connected. It is to be further noted that in the use of the present apparatus for meter installations the use of loose screws in making connections is avoided. The present apparatus also provides a junction between movable and fixed parts requiring no close mechanical tolerance and also provides a positive disconnection feature to permit discontinuance of electric service with a meter replaced in normal position.

These and other features of the invention are disclosed in the accompanying drawings, and in the following detailed specification, and will be pointed out in the claims.

In the drawings,

Fig. 1 illustrates a top-plan view of a trough or panel box and cover constructed in accordance with my invention;

Fig. 2 is a top-plan view of the trough or panel box with the cover removed;

Fig. 3 is a transverse vertical cross-section through the trough or panel box and cover;

Fig. 4 is a perspective view of the connecter device shown in Figs. 1, 2 and 3;

Figs. 5, 6 and 7 are side elevations of modified forms of connecting devices; and

Fig. 8 is a diagrammatic view illustrating the manner of connecting the apparatus in circuit.

As shown in Figs. 1, 2 and 3, the panel box embodying the invention comprises a sheet-metal housing in the form of a trough 10 having openings 12 in the bottom thereof through which the trough may be secured to a wall or other surface by means of screws (not shown). In the central portion of the box is secured an insulating block 14 held by screws 16. Upon the block 14 are mounted four terminal brackets 18 which carry binding posts 20, 21, 22 and 23. In the central portion of the block is mounted a bracket 24 carrying binding posts 26 and 28. Bus wires 30, 32 and 34 extend longitudinally of the box through openings in side walls therein and are respectively connected to the binding posts 20, 21 and 26. Wires 36, 38 and 40 leading to circuit-control devices are respectively connected to binding posts 22, 28 and 23. Each of the brackets 18 is provided with an upwardly extending portion 42 which is bent inwardly as shown at 44 and then again upwardly as shown at 46. The portions 46 are adapted to engage depending contact members 48 carried by blocks 50 of insulating material secured by screws 52 to a cross-bar 54 mounted in a circular opening 56 in a cover or instrument panel 58. This panel has a socket 59 for the reception of a meter or other instrument. The panel 58 is adapted to be secured to the panel

box 10 by screws 60 extending through openings in lateral flanges 64 extending inwardly from the upper portion of the trough 10.

Means is provided for insuring close contact between the members 48 and the upstanding portions of the brackets 46. This means comprises a cam 66 (Figs. 3 and 4) in the form of a stud having a cylindrical head 68 and a shank portion 70 extending through the bracket 18 and having its lower end upset to prevent removal of the stud from the bracket. The upper end of the cylindrical portion 68 has a slot 72 adapted to receive the end of a screw-driver so that the cam can be rotated readily about the axis of the shank 70 into engagement with the depending member 48, thereby to force the members 46 and 48 into close engagement and to retain them in that position.

The member 48 is provided with a nib 74 to act as a stop to prevent the rotation of the cam beyond its maximum throw. The depending members 48 are respectively connected to spring contacts 76, 78, 80 and 82 secured to the insulating blocks 50. These spring contacts are adapted to receive the four terminals of a meter or other instrument which is to be inserted in position within the opening 56 in the socket 59 of the cover 58. This construction is such that when the instrument is in position and the cams 68 are rotated to force the contacts 46 and 48 together that the current will pass from the wire 30 through the terminal 20 to contact 76 to contact 78 to terminal 22 into the wire 36. Similarly the current will pass through the wire 32 to terminal 21 through the contact members 80 and the instrument to contact members 82 and terminal 23 to the wire 40. Thus it will be apparent that after the trough 10 and the block 14 have been installed the cover 58 and its instrument contacts can be readily secured in position on the panel box 10 and the electrical connections can be completed by adjustment of the cams 70, after which the instrument, such as a meter, can be positioned in engagement with the contact members 76, 78, 80 and 82.

Another form of connecting device is illustrated in Fig. 5 which discloses an upstanding bracket 84 connected to an insulating block 86 in a manner similar to the bracket 18 previously described. The upper end 88 of the bracket is bent outwardly and has extending through it a screw 90, the lower portion 92 of which is upset to prevent heightwise movement of the screw relatively to the bracket. The upper portion of the bracket has an opening 91, adapted to receive the depending member 48. To engage the member 48 there is provided a cam or wedge member 94, substantially U-shaped, and mounted upon the screw 90. The member has a projection 96 adapted to contact with the member 48 upon rotating the screw in a direction to raise the member 94. A laterally projecting portion 95 abuts the bracket thereby preventing rotation of the wedge. This provides a simple means for forming an electrical connection between the member 48 and the terminal 97 to which the brackets 84 are connected.

Fig. 6 discloses another modification of connecting devices in which there is a bracket 98 similar to the bracket 84 of Fig. 5 and a screw 100 extending through the bracket in a heightwise direction, said screw carrying a wedge member 102, a leg portion 104 of which extends through a guide slot 105 in the bracket 98. The bracket has a lateral projection 106 adapted to enter an opening 108 in the depending contact portion 48 when the latter is moved down into position adjacent to the bracket through the opening 108 therein. The projection 106 and the walls of the opening 108 constitute a locking device which operates to prevent relative heightwise movement of the contacting parts.

Fig. 7 shows a still further modification of connecting devices in which there is a bracket 109 and screw 110 similar to those shown in Figs. 6 and 7 and a contacting member 112 having a laterally extending portion 114 embracing the screw and an offset portion 116 extending downwardly and then inwardly toward the bracket 109 and having a nib 118 positioned in a vertically extending slot 120 in the bracket 109. The member 116 is adapted to engage the depending member 48 in a manner similar to the other modification of connecting devices as above set forth. The nib 118 prevents rotation of the member 116 about the axis of the screw 110.

As shown diagrammatically in Fig. 8, two or more connecter devices in a trough 10 of the type above set forth can be connected in a series to the bus lines 30, 32 and 34, each of them being wired in a manner similar to that illustrated in Fig. 2. Thus, when it is desired to install meters or other instruments subsequent to wiring one or more of the panel boxes, it is only necessary to insert the cover and instrument socket 58 with the depending contact member 48 extending downwardly into juxtaposition with the upper portions 46 of the bracket 42 and rotate the cams 68 to cause close contact between the members 46 and 48, after which the meter or other instrument is positioned with its contacts engaging the spring members 76, 78, 80, and 82. Thus it will be seen that I have provided a comparatively simple construction for facilitating the assembling and installation of meters or other instruments in electric circuits.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. An electrical connecter device comprising a housing, a separable instrument support mounted upon the housing, an electrical contact element carried by the support, an electric terminal carried by the housing, means for insuring electrical contact between the contact element and the terminal comprising a bracket secured to the terminal and having a portion thereof extending adjacent to the contact element, and a cam mounted upon the bracket operable to force said portion thereof into engagement with the contact element.

2. An electrical connecter device comprising a housing, an instrument support mounted upon the housing, an electrical contact element carried by the support, an electric terminal carried by the housing, means for insuring electrical contact between the contact element and the terminal comprising a bracket secured to the terminal and having a portion thereof extending adjacent to the contact element, a screw carried by the bracket, a wedge member mounted upon the screw for movement into engagement with the contact member and means to prevent rotation of the wedge relatively to the bracket during such movement.

3. An electrical circuit connecter comprising two separable electrical contact element supports, a contact element carried by one of the supports and having a depending portion, a bracket carried by the other of the supports and having an upstanding portion extending adjacent to the said depending portion, a rotatable

screw carried by the bracket, and a cam engaged by the screw and operable upon rotation of the screw to engage the said depending portion.

4. An electrical connecter device comprising a housing, an instrument support mounted upon the housing, a terminal plate mounted upon the housing, a contact element depending from the instrument support, interlocking means upon the terminal plate and contact element to lock the same against relative heightwise movement, and means for applying pressure to the plate and element to insure electrical contact between them.

5. In an electric meter installation including a receptacle having terminal clamps mounted therein and a meter support mounted thereon including terminal jaws for making connection with the terminals of a meter; a releasable connecting device for electrically connecting a terminal clamp with a terminal jaw comprising conducting members secured at one end to said clamp and jaw, respectively, and having the free ends thereof extending adjacent to but spaced from each other, at least one of said members being resiliently movable toward the other, and means carried by one of said members for exerting a wedging action on the other member to clamp the free ends of the members together.

6. In an electric meter installation including a receptacle having terminal clamps mounted therein and a meter support mounted thereon including terminal jaws for making connection with the terminals of a meter; a releasable connecting device for electrically connecting a terminal clamp with a terminal jaw comprising conducting members secured at one end to said clamp and jaw, respectively, and having the free ends thereof extending adjacent to but spaced from each other, at least one of said members being resiliently movable toward the other, and means carried by one of said members for exerting a wedging action on the other member to clamp the free ends of the members together, said means including a wedge actuating device fixed to said one of said members.

7. In an electric meter installation including a receptacle having terminal clamps mounted therein and a meter support mounted thereon including terminal jaws for making connection with the terminals of a meter; a releasable connecting device for electrically connecting a terminal clamp with a terminal jaw comprising conducting members secured at one end to said clamp and jaw, respectively, and having the free ends thereof extending adjacent to each other, and manually operable means carried by one of said members operable in one direction to positively connect said free ends and operable in the opposite direction to break such connection.

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