July 22, 1952 E. F. MEKELBURG 2,604,504

PLUG IN CONTACT JAW

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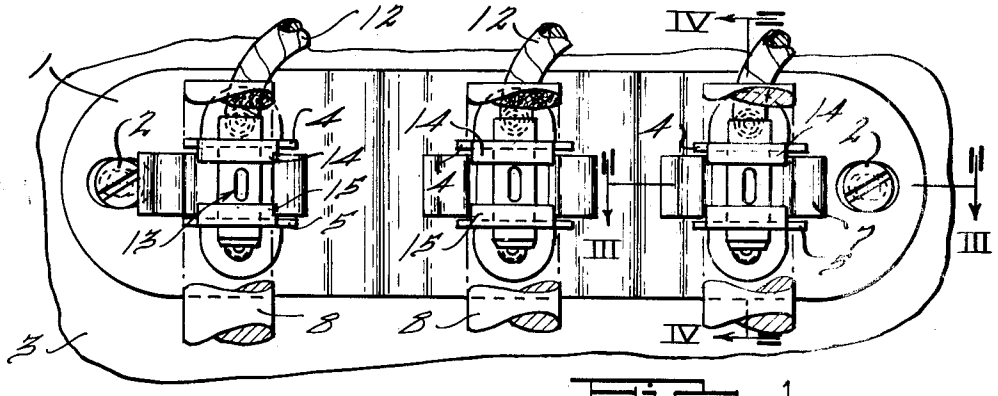


Fig. 1.

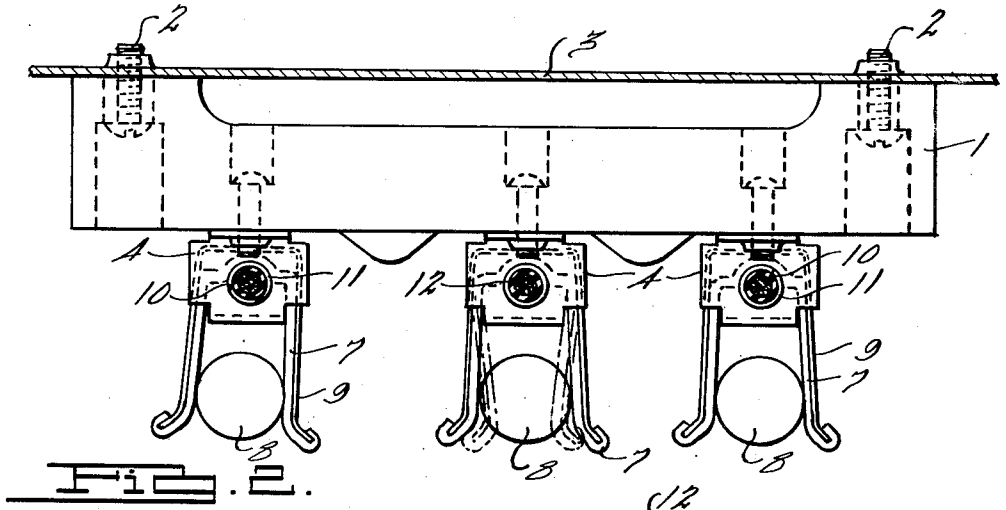


Fig. 2.

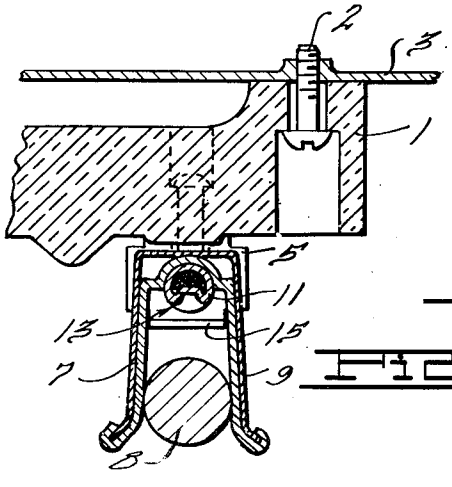


Fig. 3.

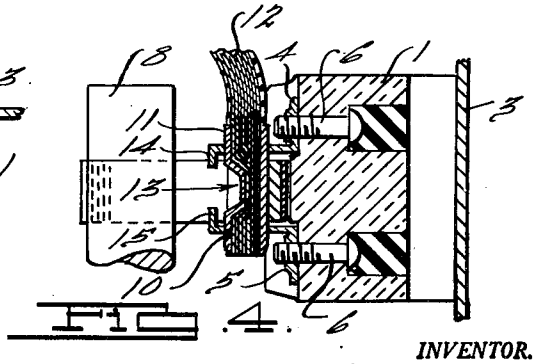


Fig. 4.

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PLUG-IN CONTACT JAW

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6 Claims. (Cl. 173—328)

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This invention relates to a device for making electrical connections to bus bars or the like.

It is frequently the practice in modern electrical installations to electrically connect the source of electrical energy to bus bars, and to effect connection of electrical instrumentalities, generally mounted in enclosing boxes, to these bus bars by means of resilient, generally U-shaped contact jaws so that the devices may be readily assembled and disassembled. Difficulties may arise from this arrangement when the electrical instrumentality, when moved into position, is so placed that the contact jaws do not exactly register with the bus bars. This is particularly true where the device is of large mass and is guided in its "plug-in" movement.

It is therefore one object of the present invention to provide a jaw type connector suitable for clamping on to bus bars or the like, in which the connectors are rotatable relative to their mounting.

Another object of the present invention is the provision of a device in accordance with the preceding object in which the connectors are swiveled relative to their mountings, whereby connection to current carrying bus bars or the like is facilitated.

Another object of the present invention is a device in accordance with the preceding objects in which the connector jaws are carried by tubular conductors rotatably mounted in supporting brackets and with the circuit leads electrically and mechanically connected within the tubular conductors.

Another object of the present invention is a device in accordance with the preceding objects in which generally U-shaped contact jaws are rigidly connected to tubular conductors rotatably mounted in supporting brackets to permit limited rotational movement of the jaws bodily relative to the mounting means whereby the attachment to bus bars, which are not exactly in axial alignment with the normal axis of the jaws, is facilitated, the circuit leads being electrically and mechanically mounted within the tubular conductors.

Other objects and features of the invention will be readily apparent to those skilled in the art from the specification and appended drawing illustrating certain preferred embodiments in which:

Figure 1 is a back elevational view of a device employing connector jaws according to the present invention.

Figure 2 is a plan view of the device of the present invention.

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Figure 3 is a view along the line III—III of Figure 1.

Figure 4 is a view along the line IV—IV of Figure 1.

The device of the present invention comprises an insulating block 1 of a material such as porcelain, which is mounted as by studs 2 to the rear wall 3 of an enclosing box for an electrical instrumentality, not shown.

Mounted on the back face of the insulating block 1 are brackets comprised of upper and lower members 4 and 5 mounted to the insulating block 1 by means of studs 6. The members 4 and 5 have inwardly projecting ledges 14 and 15 respectively for a purpose to be subsequently described.

Disposed within the members 4 and 5 are generally U-shaped connector jaws 7 of a material having good electrical conductivity, such as copper, and backed by U-shaped spring steel reinforcing strips 9 to maintain contact pressure. In Figure 2, in the middle illustration, there is shown in dotted lines the normal position of the connector 7, while in full lines there is shown the position of the connector 7 with a bus bar 8 inserted between the legs thereof. The outer ends of the connector 7 are spun over the edges of the spring strips so as to move therewith in both directions.

Fitting into an accommodating depression in the bight of the U-shaped connector jaw 7 is a tubular member 11 of conducting material of sufficient length to extend through suitable apertures 10 in bracket members 4 and 5, the apertures 10 loosely containing the member 11 so that it is pivotally mounted in the apertures. The member 11 and jaw 7 are brazed or otherwise connected together so that the jaw is supported by the member. An electrical circuit lead or conductor 12 is held in electrical and mechanical engagement within the member 11 by a crimped, inwardly pressed portion which then has the shape illustrated at 13 in Figure 4.

It should be noted, as will be seen from an inspection of Figure 3, that the ledges 14 and 15 do not completely bridge the gap between the legs of the connector 7, some space being left between the ledges and the legs so that the connector jaw may be pivoted about the loose mounting of member 11 within the brackets 4 and 5.

The operation of the device is readily apparent, and will be but briefly described. When the instrumentality carrying the insulating block 1 is moved into position, if the bus bars 8 which the connector jaws 7 are to engage are not exactly in alignment with the jaw centers, the bus bars

strike the outer portions of the legs of the jaws, rotating the jaws about the pivotal connection of the tubular members 11 within the apertures 10 in bracket members 4 and 5. A tight engagement of the legs of the U-shaped conducting jaws 7 with the bus bar is then effected due to the resilient bias of the spring strips 9. Electrical energy then readily passes from the bus bars through the legs of the jaws to the leads 12, through which it passes to the electrical instrumentality connected thereto.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto, as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims:

What is claimed is:

1. In a device adapted to engage rigid current carrying elements, a contact jaw of generally U shape, tubular conducting means electrically and mechanically connected to the bight of said U-shaped means, a flexible electrical conductor, means holding said flexible conductor in engagement with said tubular means, and a bracket, said bracket pivotally mounting said tubular means whereby said contact jaws may be rotated to engage said elements regardless of limited misalignment between said elements and said contact jaw.

2. In a device adapted to engage rigid current carrying elements, contact jaws of generally U-shape, tubular conducting means rigidly attached to the bight of said U-shaped means, flexible electrical conductors, means holding said flexible electrical conductors in electrical and mechanical engagement within said tubular means comprising inwardly pressed portions of said tubular means, and brackets pivotally mounting said tubular means whereby said contact jaws may be rotated to engage said elements regardless of limited misalignment between said elements and said jaws.

3. In a device adapted to engage rigid current carrying elements, contact jaws of generally U-shape having a transverse recess in the bight of said U, tubular conducting means rigidly mounted to said recess and projecting beyond both sides of said jaws, flexible electrical conductors, means holding said flexible electrical conductors in electrical and mechanical engagement with said tubular means comprising inwardly pressed portions of said tubular means, and brackets pivotally engaging the extending portions of said tubular means whereby said jaws may be rotated to engage said elements regardless of limited misalignment between said elements and said jaws, said brackets having means for limiting the amount of rotation of said engaging means.

4. In a device adapted to engage rigid current carrying elements, contact jaws of conducting material and of generally U-shape, tubular means of conducting material electrically and rigidly mechanically attached to the bights of said jaws and projecting beyond both sides thereof, flexible electrical conductors, means for holding said flexible electrical conductors in electrical and mechanical engagement within said tubular means comprising inwardly pressed portions of said tubular means, brackets having apertures therein in which said projecting portions of said tubular means are loosely fitted whereby said tubular means are pivotally mounted in said brackets to mount said jaws for rotation, and means integral with said bracket for limiting the amount of rotational movement of said engaging means.

5. In a device adapted to engage rigid current carrying elements, an insulating block, a bracket mounted to said insulating block, engaging means of electrically conductive material and of generally U-shape, a strip of resilient material extending about said engaging means to apply contacting pressure thereto, the ends of said engaging means having return bent portions interconnecting with the ends of said strip, a hollow connector of electrically conductive material rigidly mounted to the bight of said engaging means and having portions integral therewith extending outwardly from opposite sides of said engaging means, a flexible electrical conductor fastened within said connector, said bracket being formed of upper and lower spaced members each adjacent opposite sides of said engaging means, said members having circular apertures therein into which said extending portions are pivotally mounted, and an integral ledge extending from each member into the space between the legs of said engaging means for limiting the amount of rotational movement of said engaging means.

6. In a device adapted to engage rigid current carrying elements, a contact jaw of generally U shape, tubular conducting means electrically and mechanically connected to the bight of said U-shaped means, means integral with said tubular means for holding a flexible electrical conductor in engagement with said tubular means, and bracket means at opposite side of said jaw, said tubular means being rotatably mounted in said bracket means whereby said contact jaws may be rotated to engage said elements regardless of limited misalignment between said elements and said contact jaws.

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