CONNECTION BLOCK RETAINERS FOR PANEL BOARD HOLDERS


3 Claims. (Cl. 317—39)

This invention relates to circuit panel holders, and more particularly to means by which a connection block, used in such holders, is securely yet removably held in proper position in the holder.

Circuit panel holders as presently known, usually consist of a frame in which the panels bearing printed or otherwise-produced electrical circuits, are mounted in a manner providing for their easy access and change when desired. Included in the holder is a connection block usually composed of insulating material such as a ceramic, and bearing a substantial number of metallic connection clips for the reception of electrical contacts. The connection block is generally mounted at the required position within the holder by means of bolts, screws or fittings so that when it requires removal or replacement, the use of tools, such as a screwdriver and a screwdriver plug, is required to remove the hardware holding the block in place. It is also often necessary, when removing one of the connection blocks mounted in the known manner, to be required to reach down inside of a complicated electron nest to reach the block, with the possibility of disturbing or damaging some of the electronic components.

It is therefore an object of the present invention to provide a connection block mounting which will securely hold the block at the required position in the holder yet permit its ready removal whenever required without the use of tools.

It is an object of the invention to provide a connection block mounting by which the assembly of a module will be speeded up since no additional or added hardware is required for the mounting of the block.

It is an object of the invention to provide means for mounting the connection block in a position in the holder where it is rendered accessible and can be readily reached for removal and replacement when desired.

More particularly, the invention contemplates the provision of a circuit panel-holding frame including cross rails on the one of which a connection block is seated, and a pair of wire loops secured to other cross rods, which loops straddle or embrace opposite end portions of the connection block thereby holding the same immovably in place. The inherent flexibility of the wire loops is sufficient to enable them to be sprung apart by manual force imposed on them to enable the connection block to be quickly released and removed whenever required.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawing in which an illustrative embodiment of the invention is disclosed,

FIG. 1 is a perspective view of a circuit panel holder provided with the improved means for holding a connection block in position;

FIG. 2 is a side elevational view of the connection block;

FIG. 3 is an end view of the circuit panel holder as seen from the right of FIG. 1 and FIG. 4 is a transverse sectional view, taken substantially on the line 4—4 of FIG. 3, looking in the direction of the arrows.

Referring to the drawing, 1 and 2 respectively designate end panels of the circuit panel holder. Such panels, as shown, are held in their required spaced relation by means of spaced parallel rods 3 and 4 and the nuts 7 and 8 threadably mounted thereon. Means is provided on these rods for securely mounting a number of the circuit panels, which means are not shown herein in detail, but one of the panel-holding devices is designated generally by the dotted line representation 9. The end panels 1 and 2 are not essential to the present invention since the frame which supports the circuit panels might be wholly composed of metallic rods or other means might be used for holding parts of the frame together.

At each end of the holder is provided a U-shaped wire frame generally indicated at 10, and said frame includes a pair of spaced legs 11 and 12 connected at one end by angular parts 14. The legs 11 and 12 are welded to the rods 3 and 4 and the frame 10 is braced by cross rods 15 and 16 welded to the legs 11 and 12. The cross rod 15 is shown as being welded to the outside of the legs 11 and 12 and the cross rod 16 is welded to the inside thereof. The cross rod 15 might, if desired, be welded to the inside of the legs 11 and 12.

The connection block 21, provided with a substantial number of the connection elements or clips 22, is shown in FIG. 2, and the same consists of an elongated strip of insulating material, such as a ceramic, provided with reduced-thickness ends 23, and spaced inwardly of said end are shoulders 24. The seated or mounted position of the connection block is shown in FIGS. 1 and 3 wherein it will be seen to rest on the cross rods 13 and be maintained from longitudinal shift relatively thereto by means of the shoulders 24 which abut against said cross rods.

The means for holding the connection block seated firmly on the cross rods 13, consists of a pair of similar wire loops, each of which is generally indicated at 17. Each of the loops is provided with a pair of parallel legs shown at 18 and 19 connected at one end by a cross member 20. The cross member 20, by its junction with the legs 18 and 19, forms a bight which straddles or embraces the end parts 23 of the connection block, and holds the same firmly in position between the cross rods 13 and prevented from both longitudinal and lateral shifting movement. The upper surface of the block 21 may, if desired, be provided with transverse grooves 26 in which the cross members 20 of the loops 17 are fitted.

The ends of the loops 18 and 19 are welded to the rod 16 and which are the only points at which the loops 17 are attached to the frames 10, the length of the loops from such points of attachment to their cross members 20 being sufficient to allow the loops under manual pressure to be sprung apart sufficiently, as shown in dotted lines in FIG. 4, to free the connection block and enable it to be lifted away. It will be noted that the loops 17 are bent angularly and inwardly at about the point where they pass on the outside of the cross bars 4 and when the connection block is not fitted in position, these angular portions rest against the cross rods 13.

The described arrangement is such that the connection block is securely yet removably held in place. It can be easily removed from its seat against the cross rods 13 by springing the loops 17 apart. It positions the connection block at the required place to enable the circuit boards to be plugged in, and the wire construction around the connection block enables the block to be cooled more effectively than is the case where a solid notched-out stamping is employed for the retention of the connection block.

Having thus described a single embodiment of the invention, it is obvious that the same is not to be restricted
thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A connection block retainer for circuit board holders comprising, a circuit board holder having ends connected by a plurality of rods, means on the rods for engaging and holding panel boards, a pair of stationary U-shaped loops extending across the tops of the rods at the opposite ends of the holder and fixedly attached at their open ends remotely from their bights to some of the rods, whereby the bight portions of the loops are capable of flexure in a direction away from one another without bodily shift of said loops, a connection block extending between a rod at one side of the holder and a rod at the opposite side and resting against the said rods, the connection block having means abutting against the rods on which it is seated to hold the block against longitudinal shift and having its opposite end portions extending through the loops whereby said loops will springably retain the connection block securely against the tops of the rods between which it extends.

2. A connection block retainer for circuit board holders comprising, a holder including a pair of spaced apart connection block supporting rods, a connection block extending between said rods and resting directly upon the same, the connection block having shoulders located adjacent to its opposite ends, said shoulders defining a part of the connection block which fits between the rods, the shoulders engaging against the rods and holding the connection block against longitudinal shift, a pair of U-shaped springy loops having leg portions rigidly fastened to parts of the holder, each loop having a bight portion constantly maintained in position over the tops of the end portions of the connection block to thereby firmly bias the connection block against the rods, the bight portions of the loops having sufficient resilience to enable the loops to be flexed in opposition to the springy bias to enable the connection block to be inserted under the bights without requiring pivotal bodily displacement of the loops.

3. A connection block retainer for circuit board holders comprising, a holder including a pair of spaced-apart parallel connection block supporting rods, a connection block resting directly upon top of said rods and bridging the space between them, the connection block having a shoulder at each end, each shoulder resting against one of the rods to hold the block against longitudinal displacement, a pair of U-shaped springy loops rigidly and stationarily attached at one end to stationary parts of the holder, the loops having angularly-disposed bight portions resiliently biased to constantly maintain them over the tops of the opposite end portions of the connection block to thereby springably hold the connection block down upon the top portions of the rods, the bight portions of the loops having sufficient springiness to enable them to be flexed without bodily displacing the loops, to permit the connection block to be inserted under the loops or to be removed therefrom.

References Cited in the file of this patent

UNITED STATES PATENTS

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