April 14, 1942. L. M. KEEFE 2,279,824

CONNECTOR DEVICE

Filed Dec. 11, 1940

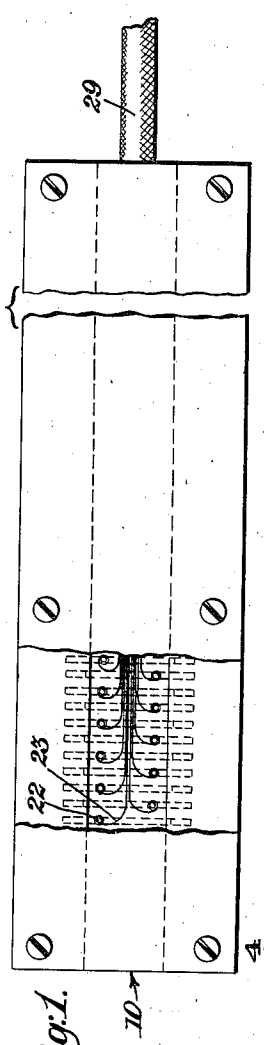


Fig. 1.

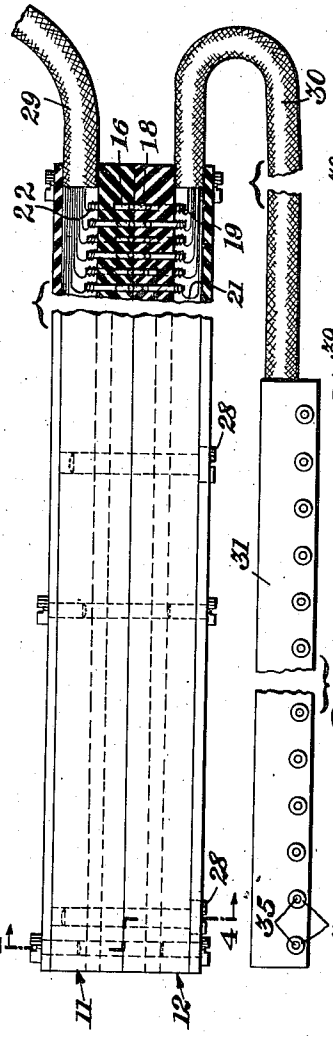


Fig. 2.

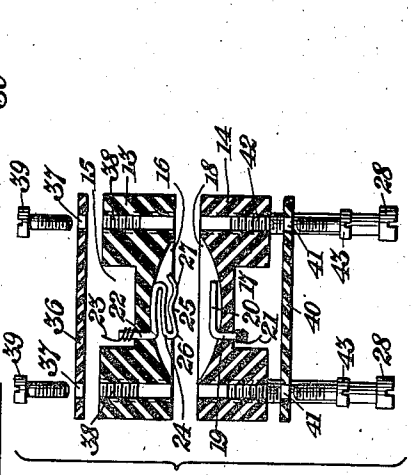


Fig. 3.

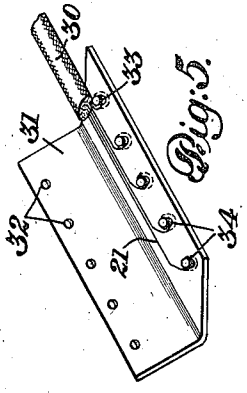


Fig. 5.

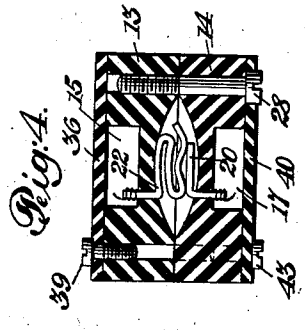


Fig. 4.

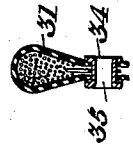


Fig. 6.

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Patented Apr. 14, 1942 2,279,824

UNITED STATES PATENT OFFICE

2,279,824

CONNECTOR DEVICE

Lincoln M. Keefe, Springfield, Mass.

Application December 11, 1940, Serial No. 369,568

6 Claims. (Cl. 173—328)

This invention relates to improvements in connector devices, and has for an object, the provision of a pair of cooperative connector blocks each forming the terminus of a plurality of cables and including isolated contact members so formed that the contact resistance therebetween is so low as to be negligible.

Another object of the invention is the provision in a connector device of a pair of similar rectangular insulation blocks each having a plurality of isolated cavities formed therein in spaced relation to each other in cooperating faces of the device and each having, on their opposite faces, channels for the cables leading to or from the devices.

A further object of the invention is the provision of, in cooperative connector blocks, like isolated cavities, whereby the cavities in one block coincide with the cavities in the other block, and conductors in said cavities almost as thick as the width of the cavities, the conductors in one block extending from the face of the block, and the conductors in the other block being below the surface thereof a distance less than the distance which the conductors extend from the other block.

Other objects will be obvious to those skilled in the art as set forth in the drawing and specification.

In the drawing:

Figure 1 is a plan view of one embodiment of the invention showing the connector device with a portion of the cover broken away to show connections to some of the contact members therein;

Figure 2 is an elevation of the connector device in Figure 1;

Figure 3 is an exploded sectional view of the device showing the relative positions of the members thereof;

Figure 4 is a sectional view taken along the lines 4—4 of Figure 2 showing the relation of the contact members when the blocks are secured together;

Figure 5 is a perspective view of a device cabled to said connector device in the manner shown in Figure 2; and

Figure 6 is a cross-sectional view of the device shown in Figure 5 after the same has been eyeletted together.

The new and improved connector device 10 consists of two cooperative members 11 and 12 which consist of similar blocks of insulation 13 and 14 (see Figure 3). The block 13 has a longitudinal channel 15 formed therein accessible from one face thereof and a plurality of arcuate slots 16 terminating in the opposite face thereof, said slots extending laterally in said last surface, that is to say, at right angles to the longitudinal slot 15 in the opposite face. The member 14 has a like longitudinal slot 17 and a plurality of like lateral arcuate slots in its opposite face, one of which is shown designated by the numeral 18. The elements mounted in each slot 18 are alike and the description will be given in connection with one slot 18, it being understood that the other slots 18 contain like members.

A hole is formed in the wall between a slot 18 and the longitudinal slot 17 and has forced therein one leg 19 of an L-shaped spring contact member 20. The leg 19 extends through into the slot 19 a distance sufficient to enable a wire or cable 21 to have its end twisted about the end of the leg 19 and soldered thereto.

The slots 16 formed in block 13 each have a hole extending through and communicating with the longitudinal slot 15. One of the slots 16 is shown in Figure 3 and contains a contact member, one leg 22 of which extends through the aforesaid hole and projects upwardly in the slot or channel 15 a distance sufficient for a wire or cable 23 to be twisted thereabout and soldered to the leg 22.

Formed integral with the leg 22 is a double loop of spring material 24, the bottom terminus 25 of which extends horizontally as shown in Figure 3 and has formed therein a plurality of contact points designated by the numerals 26 and 27. The terminus extends out of the slot 16 and consequently beyond the surface of the block 13, the object being that the spring material should extend from the surface of the block a sufficient distance to establish a contact between the member 22, 24, 25 and the member 19, 20, which is so formed that the contact resistance between the members is negligible.

The slots 16 and 18 are a few thousandths wider than the thickness of the contact members, therefore when the blocks 13 and 14 are firmly secured together in a manner to be presently described, the slots 18 guide the contact members in the block 13 and insure the maintenance of these contact members in intimate contact with the contact members in the block 14. In order to quickly secure the blocks 13 and 14 together, and at the same time be enabled to quickly disassemble them, a plurality of like holes are formed in the blocks and the holes in the block 13 are threaded so as to accommodate screws 28.

As shown in Figures 1 and 2, the cables or conductors leading to the upper block and from the

lower block may be surrounded with a suitable casing 29 which may be circular loom, spaghetii tubing, or the like, or it may be braided directly upon the group of cables. One of the cables is designated by the numeral 23 and is shown connected to leg 22 and soldered. The cables connected to the lower block are designated by the numeral 21 and they likewise may be surrounded by some protective member similar to the one shown in 29 and designated by the numeral 30. The other ends of the cables 21 may be connected to any means in accordance with what it is associated with; by way of example, the other ends of the cables 21 are shown in Figure 2 as extending into a casing 31. This type of casing for a cable terminal is shown, described and claimed in co-pending application Serial No. 369,569, filed December 11, 1940. The casing 31 as shown in Figure 5 may consist of a sheet of insulation having formed therein a plurality of holes 32 along one edge thereof and 33 along the other edge thereof, said holes being so positioned in the member 31 that when the same is folded together, the holes 32 and 33 are in alignment with each other. Eyelets, designated by the numeral 34, are positioned in the holes 33 after which the bare ends of the cables 21 are individually wrapped about said eyelets and soldered thereto. After a row of eyelets 34 have the cables 21 secured and soldered thereto, the member 31 is folded so that the cables lie within the fold as shown in Figure 6, and the end of the loom or protective member 30 extends within the folded member 31. After the member 31 has been folded together, the eyelets 34 are riveted so as to permanently secure the member 31 in its folded position, thereby forming a terminal block adapted to be electrically connected to a desired device by having screws pass through the holes 35 formed in the eyelets 34.

After the cables 23 are connected to the outstanding legs 22 in the channel 15, the cables and the connections may be protected by means of a plate of insulation 36. This plate has holes 37 formed therein which are adapted to be aligned with threaded holes 38 formed in the block 13 and secured thereto by means of screws 39. A plate of insulation 40 is provided for covering the slot 17 and has formed therein holes 41 adapted to be aligned with threaded holes 42 in the block 14 and secured thereto by means of screws 43.

Connector devices of the character described herein are of great importance in connection with electrical tabulating machines and other machines of similar character because their use enables an assembler of the machine to quickly interconnect various elements which go to make up the machine and also enable the repair man to quickly disconnect and remove from such machines those elements which need repair.

It is obvious that if the repair man can remove an element of the machine needing repair to a table or bench he can more expeditiously make repairs without having the other elements of the machine in the way.

What is claimed is:

1. In a connector device for electrical cables, a pair of cooperative blocks of insulation material, a plurality of isolated cavities formed in at least one surface of one of said blocks, a plurality of isolated cavities formed in the other of said blocks, means for detachably securing said blocks together with their corresponding isolated cavities in registration, a conductor in each cavity of said second mentioned block, each conductor being substantially L shaped with one leg lying on the bottom of its cavity and the other leg extending through the block for connection to a cable, a conductor in each cavity of said first mentioned block, said last conductors each being formed of spring material with a straight portion extending through its block for connection to a cable and a portion of zigzag form extending from its cavity a distance greater than the depth of the corresponding cavity in said second block minus the thickness of the first mentioned leg of said L shaped conductor, thereby insuring intimate contact between corresponding conductors when said blocks are secured together.

2. In a connector device for electrical cables, a pair of cooperative blocks of insulation material, a plurality of isolated cavities formed in at least one surface of one of said blocks, a plurality of isolated cavities formed in the other of said blocks, means for detachably securing said blocks together with their corresponding isolated cavities in registration, a conductor in each cavity of said second mentioned block, each conductor being of sufficient width to form a working fit with the edges of its cavity and being substantially L shaped in form with one leg lying along and adjacent to the bottom of its cavity and the other leg extending through the block for connection to a cable, a conductor in each cavity of said first mentioned block of sufficient width to form a fit in its cavity, said last conductors each being formed of spring material with a straight portion extending through its block for connection to a cable and a portion of zigzag form extending from its cavity a distance greater than the depth of the corresponding cavity in said second block minus the thickness of the first mentioned leg of said L shaped conductor, and the clearance between said leg and the bottom of the cavity, thereby insuring and maintaining resilient intimate contact between corresponding conductors when said blocks are secured together.

3. In a connector device for electrical cables, a pair of cooperative blocks of insulation material, a plurality of isolated cavities formed in at least one surface of one of said blocks, a longitudinal channel formed in the opposite surface of said last block, a plurality of isolated cavities formed in the other of said blocks, a longitudinal channel formed in the opposite surface of said last block, means for detachably securing said blocks together with their corresponding isolated cavities in registration, a conductor in each cavity of said second mentioned block, each conductor being substantially L shaped with one leg lying on the bottom of its cavity and the other leg extending through the block into said second channel for connection to a cable, a conductor in each cavity of said first mentioned block, said last conductors each being formed of spring material with a straight portion extending through its block into said first channel for connection to a cable and a portion of zigzag form extending from its cavity a distance greater than the depth of the corresponding cavity in said second block minus the thickness of the first mentioned leg of said L shaped conductor, thereby insuring intimate contact between corresponding conductors when said blocks are secured together.

4. In a connector device for electrical cables, a pair of cooperative blocks of insulation material, a plurality of isolated cavities formed in at least one surface of one of said blocks with

webs of said material therebetween, a plurality of isolated cavities formed in the other of said blocks with webs of said material therebetween, means for detachably securing said blocks together with their corresponding isolated cavities in registration and with the webs in one block contacting the webs in the other, a conductor in each cavity of said second mentioned block, each conductor being formed of spring wire of a diameter to form a working fit with the edges of its cavity and being substantially L shaped in form with one leg lying along and adjacent to the bottom of its cavity and the other leg extending through the block for connection to a cable, a conductor in each cavity of said first mentioned block, said last conductors each being formed of spring wire of a diameter sufficient to form a working fit with the edges of its cavity and having a straight portion extending through its block for connection to a cable and a portion of zigzag form extending from its cavity a distance greater than the depth of the corresponding cavity in said second block minus the thickness of the first mentioned leg of said L shaped conductor and the clearance between said leg and the bottom of the cavity, thereby insuring and maintaining resilient intimate contact between corresponding conductors when said blocks are secured together.

5. The invention according to claim 3 in which the legs of said L shaped conductors project into said second channel along a substantially straight longitudinal line therein and in which said legs of the conductors in said first mentioned block extend into said first channel along a substantially straight longitudinal line.

6. A connector device according to claim 3 in which cover plates are provided for enclosing said channels and for protecting said conductor legs after the same have had cables connected thereto.

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