Feb. 1, 1966 R. G. KNOWLES 3,233,210

ELECTRICAL TERMINAL BLOCK ASSEMBLY

Filed Nov. 8, 1961 2 Sheets-Sheet 1

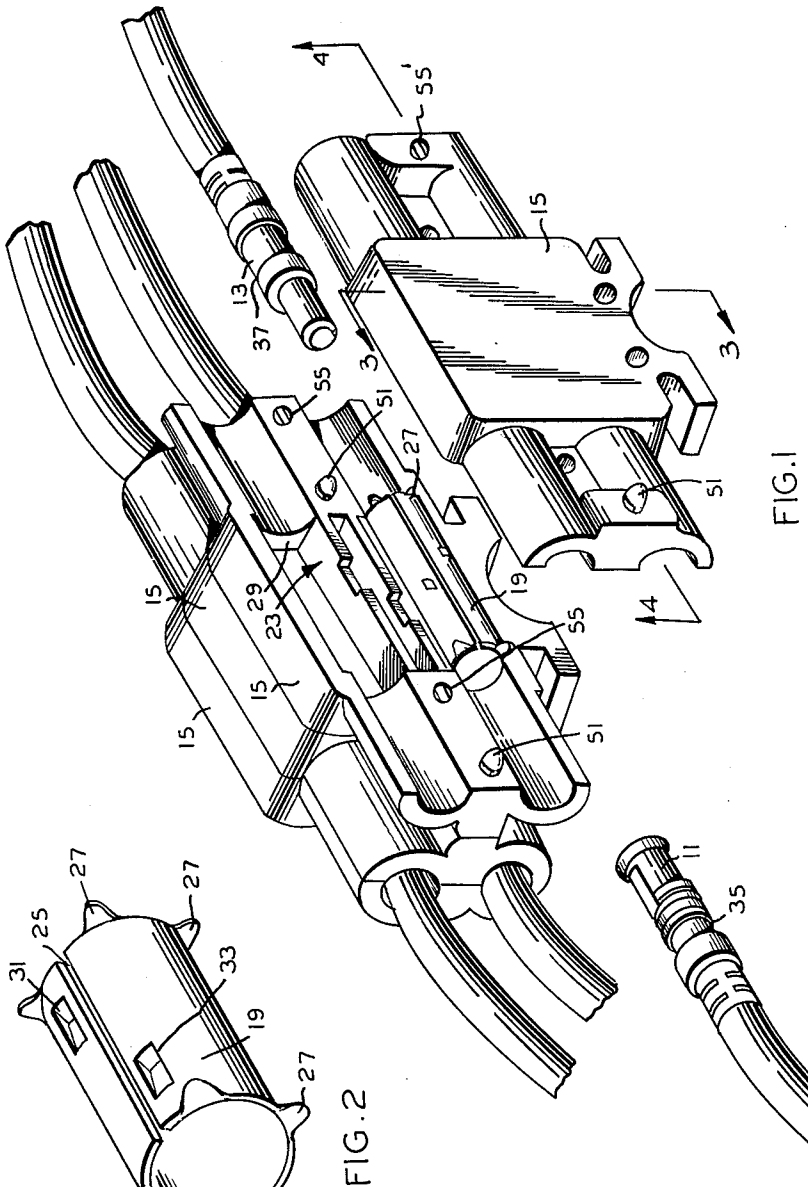


FIG. 1

FIG. 2

INVENTOR.
ROBERT GORDON KNOWLES

BY

ATTORNEY

Feb. 1, 1966 R. G. KNOWLES 3,233,210

ELECTRICAL TERMINAL BLOCK ASSEMBLY

Filed Nov. 8, 1961 2 Sheets-Sheet 2

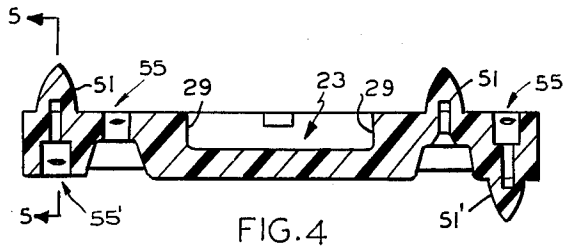


FIG.4

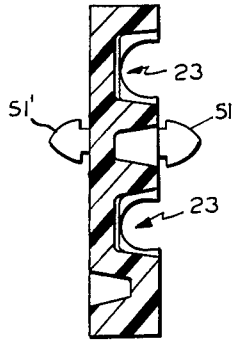


FIG.3

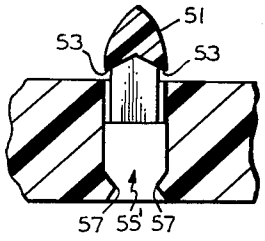


FIG.5

PRIOR ART

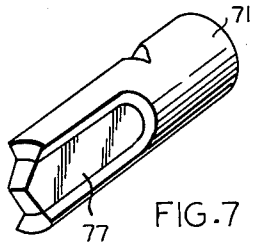


FIG.7

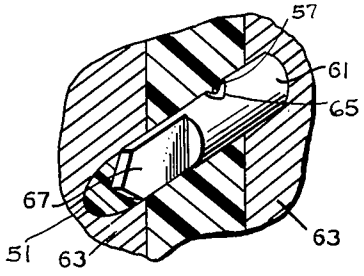


FIG. 6

PRIOR ART

INVENTOR.

ROBERT GORDON KNOWLES

BY

ATTORNEY

United States Patent Office 3,233,210 Patented Feb. 1, 1966

3,233,210

ELECTRICAL TERMINAL BLOCK ASSEMBLY

Robert G. Knowles, Norwalk, Conn., assignor to Burndy Corporation, a corporation of New York

Filed Nov. 8, 1961, Ser. No. 150,977
2 Claims. (Cl. 339—198)

This invention relates to connectors and, more particularly, to electrical terminal or connector block assemblies.

Terminal blocks are well known in the prior art for the purpose of removably interconnecting electrical conductors. It is now common to fabricate the long terminal block out of short modular blocks, each containing a group of connectors. A number of modular blocks are mechanically joined together, side-by-side, to form the desired length of terminal block containing the desired number of groups of connectors. These connectors may be designed to accommodate pairs of monoconductors, as shown in the Lazar and Knowles application, S.N. 73,013, filed December 1, 1960; or to accommodate pairs of coaxial conductors, as shown in the Salz and Sanislo application, S.N. 828,492, filed July 12, 1959, now abandoned.

While the Salz and Sanislo device admirably serves its purpose, it is constructed of a relatively large number of parts, i.e., seven, which makes it rather costly to produce.

An object, therefore, of this invention, is to provide a coaxial conductor connector block which is made of a minimum number of parts in toto, and a minimum number of different stock parts.

Another object is to provide a connector block which incorporates but one standard insulating part and one standard connecting retaining part.

Yet another object is to provide a standard insulating part which will releasably snap together with an identical part to provide a modulator block, and which modular block will releasably snap together with identical blocks to form a long terminal block.

Still another object is to provide a standard insulating part whereby the snapped-together modules may be more readily separated than the snapped-together parts which form a module.

These and other objects and features of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a terminal block embodying this invention, showing two modules, one of which is separated;

FIG. 2 is a perspective view of a retention spring used in the modules of FIG. 1;

FIG. 3 is an end view in cross section taken along line 3—3 in FIG. 1;

FIG. 4 is a bottom view in cross section taken along line 4—4 in FIG. 1;

FIG. 5 is a detail view in cross section taken along line 5—5 in FIG. 4;

FIG. 6 is a detail view in perspective section showing a method of molding fasteners as disclosed in the above-mentioned application Serial No. 73,013; and

FIG. 7 is a detail view in perspective showing an improved method of molding fasteners.

Referring to the drawings, it will be seen that the long terminal block is made up of a plurality of modules. Each module is here shown to connect two pairs of coaxial conductor cables although the same principles will permit a design for any number of pairs. Each of the pair of cables is fitted with a female coaxial connector **11** and a male coaxial connector **13**. Each module is made up from a pair of identical insulator halves **15**, which may be made of a suitable plastic such as nylon. Each module

includes two identical retention springs **19**. The connector pairs are adapted to be inserted into the springs and held therein while connected together.

Each insulator half **15** may be considered to consist of two semi-tubes, one on top of each other, on a base, which are divided by a plane which includes the axis of each semi-tube. Thus when two halves **15** are placed together, two tubes are formed. Each semi-tube has a medial recess **23** into which a tubular spring **19** is inserted.

Spring **19** is rolled up from a suitable resilient material, which is preferably also conductive, such as beryllium copper, into tubular form with a longitudinal gap **25**. End tabs **27** are bent up at each end of the tube to abut shoulders **29** formed by the medial recess end walls. A pair of detent dimples **31** and **33** are formed into the tube which are adapted to engage shoulders **35** and **37** on the coaxial connectors. The gap **25** provides the resiliency necessary for the coaxial connector shoulders to be snapped past the detent dimples. The dimples may be provided with a more gradual outer end and a more abrupt inner end to require connector insertion force of e.g. eight pounds and an extraction force of up to fourteen pounds.

The insulator parts are held together by a plurality of integral snap fasteners provided by identical plugs **51** on the inner surface thereof and **51'** on the outer surface with chord-like shoulders **53**, and identical sockets **55** on the inner surace and **55'** on the outer surface with chord-like detents or cross-ribs **57**. Each pair of halves, forming a module, is held together by four pairs of fasteners, each interior face of the part having two plugs and two sockets.

The exterior face of each part is provided with one plug **51'** and one socket **55'**. Since all the sets of fasteners are identical, and there ore four sets of fasteners between the pairs of parts forming a module, and only two sets of fasteners holding the adjacent modules together, it requires twice the force to separate the pair of inter modular parts than the adjacent modules.

These fasteners may be formed by the novel core-pin method disclosed in the previously mentioned S.N. 73,013. Briefly, as seen in FIG. 6, a method was provided wherein a pin with its chord-flats, and the axially aligned socket with its chord-ribs, as shown in FIG. 5, may be concurrently molded by use of a suitable core pin **61** in a mold **63**. The core pin is formed of rod stock. The rod forms the socket **55**, while two notches **65** cut into the rod form the two plastic ribs **57** in the socket **55**. The end of the pin **61** has two flats **67** milled therein perpendicular to the two notches **65**. The plastic is excluded from the volume occupied by the remaining section of the rod, and the absence of plastic resulting from the mating of the flatted pin and the mold forms the coid providing the chord flats with their shoulders **53**.

If it is desired to have but two sets of fasteners on each surface of parts, and still retain the differential separation force requirements, or to generally provide fasteners with different separation force requirements, then the core pin technique previously described can be improved as follows:

There is a limitation as to the height of the chord which can be molded by increasing the depth of notches **65** in the core pin. The withdrawal of the pin, despite the resiliency of the plastic, tends to rip away the chord material which is oversize, e.g., .01 inch in height. However, increasing the height of the shoulders **53** of the pin can be accomplished by reducing or scalloping the flats **77** on the core pin **71** as shown in FIG. 7. The resulting deeper void forms a higher and more abrupt shoulder, which provides a tighter interlocking.

The invention has thus been described but it is desired

to be understood that it is not confined to the particular forms or usages shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of the invention and, therefore, the right is broadly claimed to employ all equivalent instrumentalities coming within the scope of the appendent claims, and by means of which objects of this invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to obtain these objects and accomplish these results.

I claim:

1. A terminal block assembly comprising a plurality of modular terminal blocks disposed in side-by-side relationship; each said modular terminal block comprising a pair of identical insulating halves; each said half having first interlocking means comprising resilient snap-lock plugs and sockets to interlock one-half of a block to the other half, and having second interlocking means comprising resilient snap-lock plugs and sockets to interlock one-half of one block to a half of an adjacent block, each of said terminal blocks further including a recess formed in one of the insulating halves of said block and a cooperating recess formed in the other of said insulating halves, said recesses being disposed in opposed cooperating relationship so as to jointly define a contact receiving bore within said block; wherein said plugs have upstanding transverse shoulders thereon and said sockets have upstanding transverse ribs therein, the shoulders and ribs on mating pins and sockets being disposed to resiliently interlock, the force required to separate an interlocked pin and socket being a function of the contiguous heights of interlocked shoulder and rib.

2. A terminal block assembly according to claim 1 further including resilient means secured in said bore to engage and retain a cable connector inserted into said bore.

References Cited by the Examiner

UNITED STATES PATENTS

1,641,923	9/1927	Davis	264—276
2,225,632	12/1940	Herman	18—42
2,441,393	5/1948	Buchanan et al.	339—75
2,463,826	3/1949	Thacker	339—198
2,469,397	5/1949	Mezek	339—217
2,925,577	2/1960	Cetran et al.	339—198
2,928,066	3/1960	Gordon	339—198

FOREIGN PATENTS

462,763	4/1951	Italy.

JOSEPH D. SEERS, *Primary Examiner.*