

(21) Application No 9211273.9

(22) Date of filing 28.05.1992

(30) Priority data

(31) 9111471

(32) 28.05.1991

(33) GB

(51) INT CL<sup>5</sup>  
H01R 4/48 // H01R 9/24(52) UK CL (Edition K)  
H2E EDCU EEGK(56) Documents cited  
GB 2251738 A GB 2127627 A GB 2095925 A  
GB 1447935 A GB 1434965 A(58) Field of search  
UK CL (Edition K) H2E  
INT CL<sup>5</sup> H01R(71) Applicant  
Harwin PLC

(Incorporated in the United Kingdom)

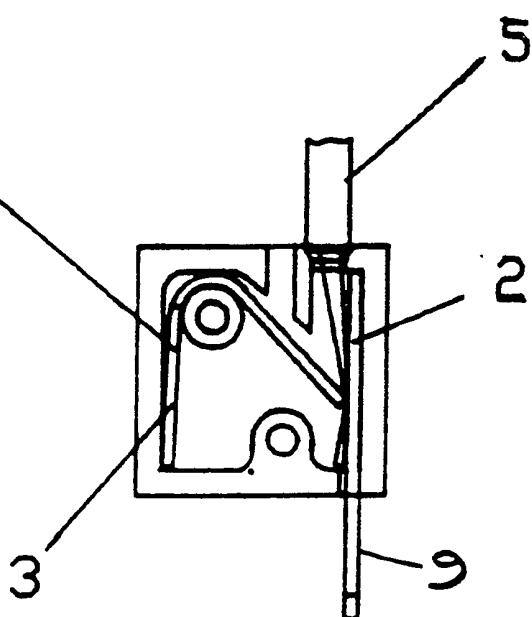
Fitzherbert Road, Farlington, Portsmouth, Hampshire,  
PO6 1RT, United Kingdom(72) Inventor  
Michael Allen Todd(74) Agent and/or Address for Service  
A A Thornton & Co  
Northumberland House, 303-306 High Holborn,  
London, WC1V 7LE, United Kingdom

## (54) Screwless terminal block

(57) A screwless terminal block consists of a housing having an opening through which an end of a wire may be inserted. As the end of the conductor is inserted into the housing it pushes past one end of a leaf spring (3) which is provided in the housing bent around a pivot. The pivotted end of the leaf spring (3) biasses the wire against a contact member (2). When the wire is pulled outwards from the terminal this draws up the spring member (3) which is wedged into the corner of the housing (1) thus preventing the wire being withdrawn. The wire may be released by moving the pivotted end of the leaf spring away from the contact member (2). This may be done by providing another opening in the housing through which a screwdriver or the like may be inserted. Preferably the two ends of the leaf spring have different widths so as to make one end stronger than the other. This spring construction allows the wire to enter the housing easily but prevents the wire from being pulled out. Studs and holes on respective housings enable ganging of like terminal blocks.

**SPRING**  
**MATERIAL- SPRING STEEL**

FIG. 3



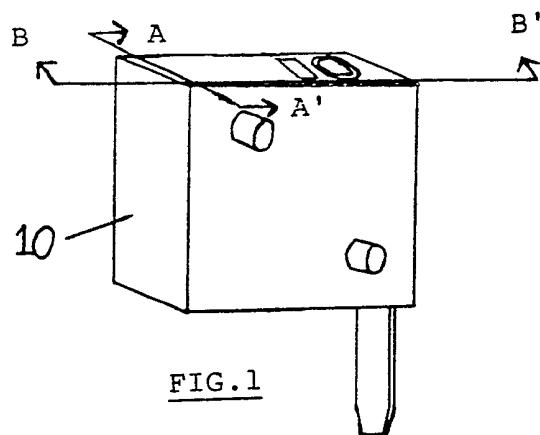


FIG. 1

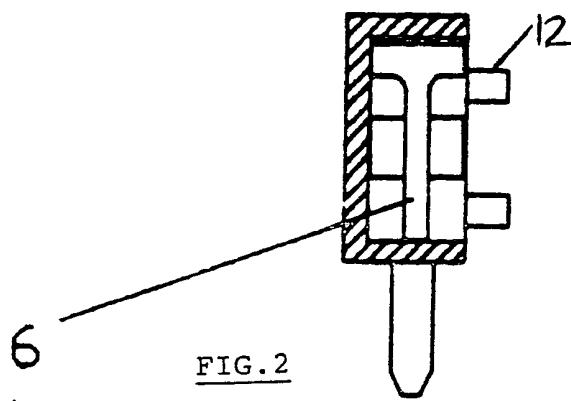


FIG. 2

SPRING  
MATERIAL:- SPRING STEEL

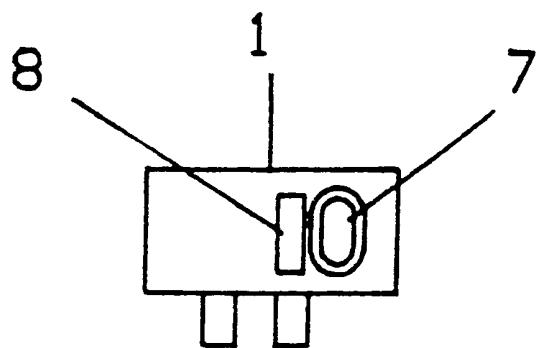


FIG. 4

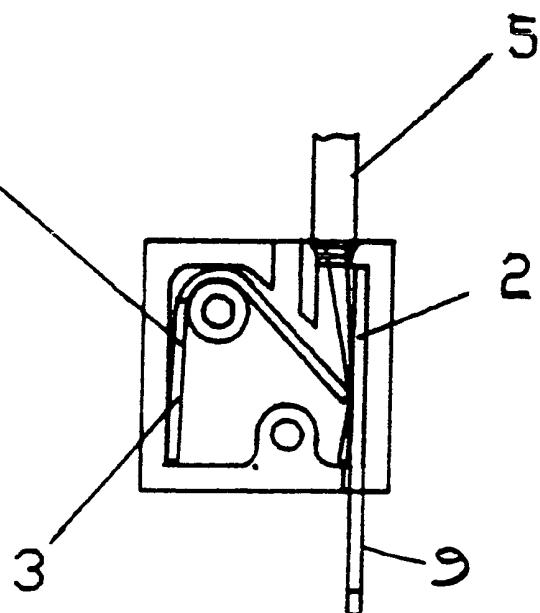


FIG. 3

SCREWLESS TERMINAL BLOCK

The present invention relates to the field of electrical terminations and more particularly to an electrical terminal block to which a conductor may be connected by simple insertion alone.

Various types of electrical terminal block are known for use in simplifying the connection of conductors to one another, for example to facilitate connection of a wire to a circuit board. With the prior art terminal blocks it is often necessary after a wire has been inserted for some measure to be taken so as to anchor the wire in the terminal block, for example by tightening a screw.

The present invention provides a terminal block comprising:

a housing having an opening for receiving an end of an electrical conductor;

an electrical contact having an inner portion disposed in said housing so as to be contactable in use by the inserted end of the electrical conductor; and

biassing means for biassing, in use, the inserted end of the electrical conductor against the inner portion of the contact;

wherein the biassing means is adapted in use to permit the end of the conductor to be inserted through the opening but to hinder the withdrawal of the end of the conductor through said opening, and wherein the biassing means is releasable in response to the application of an external force so as to permit the withdrawal of the end of the conductor through the opening.

The advantage of electrical terminal blocks according to the present invention is that their design facilitates easy admission of a wire into the termination and secures the wire in the block

automatically, i.e. without the need for further action on the part of the user.

In preferred embodiments of the invention the biassing means takes the form of a leaf spring bent around a pivot in the housing. It is further preferred that the two ends of the leaf spring should be made different from one another so that one end is weaker than the other. With this spring construction insertion of a wire into the terminal block is facilitated whereas removal of the wire from the terminal block is relatively difficult.

Further features and advantages of the present invention will become clear from the following description of an embodiment thereof, given by way of example, with reference to the accompanying drawings, in which:

Fig.1 shows a perspective view of an electrical terminal block according to the preferred embodiment of the invention;

Fig.2 shows a section through the terminal block of Fig.1 taken along the lines A-A';

Fig.3 shows a section through the terminal block of Fig.1 taken along the line B-B'; and

Fig. 4 shows a top plan view of the terminal block of Fig.1.

Figures 1 to 4 illustrate a preferred embodiment of electrical terminal block according to the present invention.

The terminal block (10) consists of a housing (1) a contact member (2) for enabling the terminated wire to be connected to other circuitry, and a spring member (3) for holding the terminated wire in place once it has been inserted into the block.

The spring member (3) is adapted and/or arranged in the housing so as to present little resistance when a wire is inserted into the terminal

block and to offer substantial resistance when an inserted wire is sought to be pulled out of the block. In the preferred embodiment shown in the drawings, the spring member is a leaf spring having portions of different widths, therefore one half of the spring member is weak and the other half of the spring member is strong. This makes for easy insertion of the wire into the termination and substantial retention of the wire when it is subject to a pull-out force.

The functioning of an electrical terminal block according to the preferred embodiment will now be described.

A conductor wire (5) is inserted into the housing (1) through the hole (7) and moves past spring member (3) which, because of the reduced width of its tail section (6), moves away easily. When the wire (5) is fully inserted the spring member (3) forces it against the contact (2).

When the wire is pulled outwards from the terminal, it draws up the spring member (3) which is wedged into the corner of housing (1) thus preventing the wire from being withdrawn.

In order to remove the wire, a device such as a small screwdriver is inserted into a slot (8) provided in the housing (1), forcing down the spring member (3) until the wire is released.

It is not essential that the releasing of the spring (3) should be achieved by the insertion of a screwdriver or the like through the opening (8) so as to directly contact the pivotted end of the spring (3). The important factor is that the pivotted end of the spring should be caused to move away from the inner portion of the contact member (2) in response to an external force. However, provision of the slot (8) has the advantage of great simplicity.

An extended portion (9) of the contact (2) serves to provide the desired electrical connection of

the terminated wire to other circuitry. This extended portion (9) may be adapted (as shown in the drawings) for connection to a printed circuit board.

Alternatively, a wire-to-wire connecting terminal may be made by connecting one terminal block according to the invention with its mirror image. Studs (12) and holes (13), or a functional equivalent thereof, may be provided on the housing (1) of the terminal block so as to enable a plurality of blocks according to the invention to be ganged together.

The housing (1) may be a moulded body made on conventional moulding machinery from a thermoplastic material such as glass-filled polyester. The contact member (2) is preferably made from a good conductive material, such as a copper alloy, so as to enable current from the terminated wire to be conducted to the rest of the circuitry. The contact member (2) and the spring member (3) may be formed as a single, stamped part.

CLAIMS:

1. A terminal block (10) comprising:  
a housing (1) having an opening (7) for receiving an end of an electrical conductor (5);  
an electrical contact having an inner portion (2) disposed in said housing (1) so as to be contactable in use by the inserted end of the electrical conductor (5); and  
biassing means (3) for biassing, in use, the inserted end of the electrical conductor (5) against the inner portion (2) of the contact;  
wherein the biassing means (3) is adapted in use to permit the end of the conductor to be inserted through the opening (7) but to hinder the withdrawal of the end of the conductor through said opening, and wherein the biassing means (3) is releasable in response to the application of an external force so as to permit the withdrawal of the end of the conductor through the opening (7).
2. A terminal block according to claim 1, wherein the biassing means (3) comprises a pivotted element having an end biassed towards the inner portion of the contact and arranged so that, in use, the inserted end of a conductor (5) is trapped between the end of the pivotted element and the contact (2), and wherein the biassing means (3) is adapted to be released by causing the end of the pivotted element to be moved away from the inner portion (2) of the contact.
3. A terminal block according to claim 2, wherein the biassing means (3) is a leaf spring bent around a pivot provided in the housing, the end of the leaf spring remote from the pivotted end being arranged to bear against a surface of the housing.

4. A terminal block according to claim 3, wherein the dimensions of the pivotted end of the leaf spring are greater than those of the end (6) of the leaf spring remote therefrom.
5. A terminal block according to claim 3, wherein means (12) are provided on the housing to enable the terminal block to be located in abutment with another terminal block, said locating means (12) comprising an element which also forms the pivot around which the leaf spring is bent.
6. A terminal block according to any previous claim wherein the housing (1) includes a further opening (8) arranged to enable an element to be inserted therethrough into the housing (1) so as to apply an external force directly to the biassing means (3).
7. A terminal block substantially as hereinbefore described with reference to the accompanying drawings.

Relevant Technical fields

(i) UK CI (Edition K ) H2E

Search Examiner

MRS J BANNISTER

(ii) Int CI (Edition 5 ) H01R

Databases (see over)

(i) UK Patent Office

Date of Search

(ii)

25 AUGUST 1992

Documents considered relevant following a search in respect of claims

ALL

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	The following are examples only	
X, E	GB 2251738 A (AMP) See Figures 7-9	1-3
X	GB 2127627 A (LUCAS) See Figure 1	1-3, 6
X	GB 2095925 A (AAG STUCCHI) See Figure 4 and page 1 line 129 - page 2 line 1	1, 2, 6
X	GB 1447935 (ALMA) See Figure 5	1, 2, 4, 6
X	GB 1434965 (WAGO) See Figure 2	1, 2, 6

Category	Identity of document and relevant passages	Relevant to claim(s)

#### Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).