

[54] ELECTRICAL CONNECTOR
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SC, 167, 213 R, 213 B, 214

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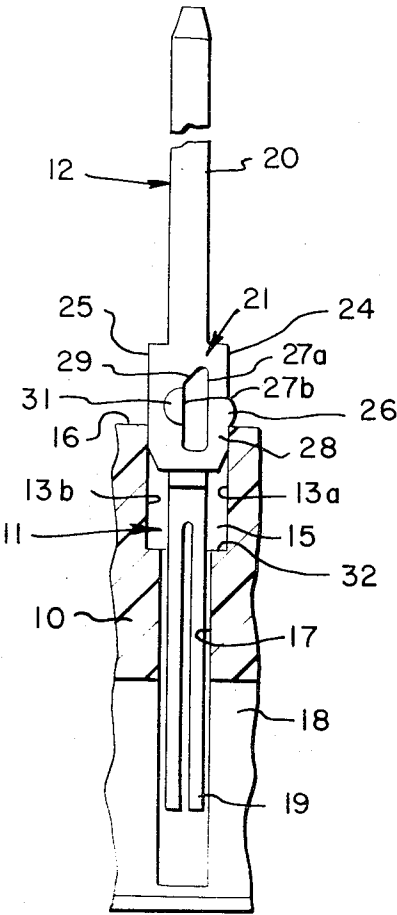
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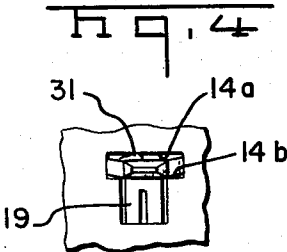
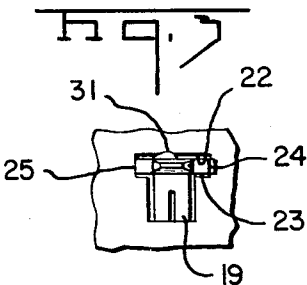
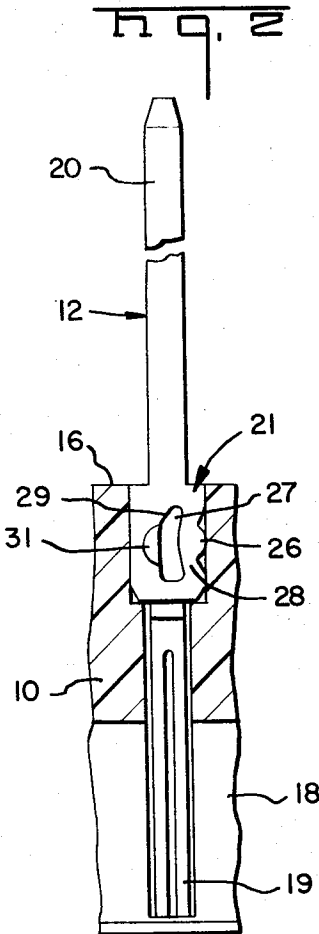
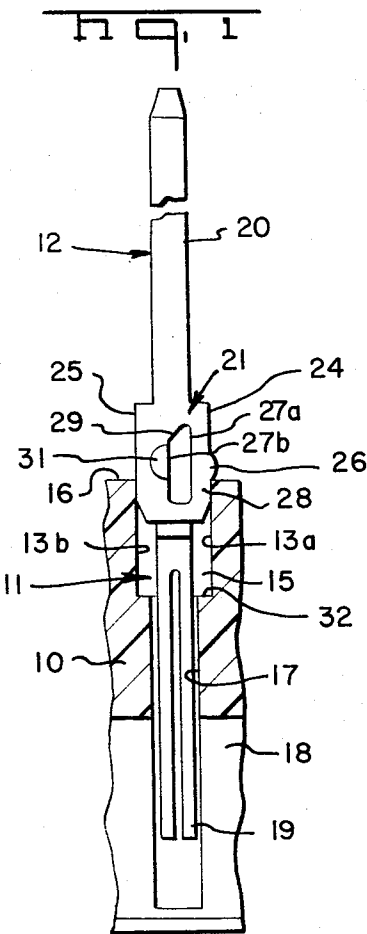
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Assistant Examiner—Robert A. Hafer
Attorney—William J. Keating et al.

[57] ABSTRACT
An electrical contact has a portion for securing the contact in a rectangular aperture in a housing, the contact securing portion being a flat flexible plate slotted to define a spring arm and having a projection on a flat side of the plate such that when the contact is inserted into the associated aperture the spring arm and the projection engage two adjacent walls and force the contact securing portion into engagement with a second two adjacent walls thus positioning the contact accurately in the housing.

3 Claims, 4 Drawing Figures





ELECTRICAL CONNECTOR

This invention relates to a contact for an electrical connector and to the connector itself, which comprises a housing made of insulating material and carrying a plurality of contacts.

An electrical connector usually comprises a block of insulating material formed as a housing and having apertures each for receiving an electrical contact. Each contact may comprise a first contact portion arranged to mate with a complementary contact portion in an external circuit and a second contact portion for connection to a lead.

It is important in some applications, for example printed circuit board edge connectors or any other connectors having a large number of contacts, to ensure extremely accurate positioning of each contact in its aperture.

According to one aspect of the present invention, an elongate contact for an electrical connector comprises a contact portion, a wire connecting portion and a contact securing portion, the contact securing portion being a generally rectangular cross-section flexible flat plate having a through slot extending generally in the axial direction of the contact to define with an edge of the securing portion a spring arm, the spring arm projecting laterally of the contact and being flexible in the plane of the securing portion, and a projection being located on a flat side of the securing portion.

According to another aspect of the present invention, an electrical connector comprises a housing made of insulating material and having a plurality of generally rectangular apertures each of which removably receives a contact as specified in the preceding paragraph, the spring arm engaging a first wall of the respective aperture and the projection on the flat side of the securing portion engaging an adjacent second wall of the respective aperture to urge the securing portion against adjacent third and fourth walls of the respective aperture.

The present invention as embodied in a printed circuit board edge connector will now be described, by way of example, with reference to the accompanying drawings in which:

FIG. 1 is a fragmentary sectional view taken through an aperture of printed circuit board edge connector housing showing a partially inserted contact;

FIG. 2 is a view similar to FIG. 1 but showing the contact fully inserted in the housing;

FIG. 3 is a diagrammatic fragmentary plan view of the contact of FIGS. 1 and 2 just before insertion in the housing; and

FIG. 4 is a diagrammatic fragmentary plan view of the printed circuit board edge connector with the contact fully inserted.

A printed circuit board edge connector comprises an insulating housing 10 made of a rigid plastics material and having a plurality of through apertures 11 (only one of which is shown) each for receiving an electrical contact 12. Each aperture is of rectangular cross-section having two pairs of opposed walls 13a, 13b, and 14a, 14b respectively. The walls 13a and 13b are stepped at a shoulder 32 to form a relatively wide portion 15 communicating with an end 16 of the housing 10 and a relatively narrow portion 17 communicating with a channel 18 adapted to receive an edge of a printed circuit board.

Each contact 12 is stamped from sheet metal and comprises; a contact portion formed as a contact spring 19 arranged resiliently to engage a conductive strip on the printed circuit board, and a wire connecting portion in the form of a post 20 to which an electrical lead may be connected, e.g. by soldering or wrapping the lead about the post. Intermediate the post 20 and the contact spring 19 is a contact securing and positioning portion 21, which is a generally rectangular plate having two opposed sides 22 and 23 coplanar with the opposed faces of the post 20, and two opposed edges 24 and 25 disposed outwardly of and extending parallel with the opposed edges of the post 20. The edges 24 and 25 are chamfered adjacent the contact spring 19. A lateral projection 26 is provided mid-way along the edge 24 of the portion 21. An elongate slot 27, disposed between the edges 24 and 25 of the securing portion 21 and slightly nearer the edge 24, extends generally in the axial direction of the post 20 to define a spring arm 28 containing the lateral projection 26. The slot 27 has smoothly rounded corners; the top left-hand (as seen in FIGS. 1 and 2) corner 29 of the slot 27 is more gently curved than the other corners to define a relatively long side 27a extending adjacent the spring arm 28 parallel to the longitudinal axis of the securing portion 21 and an opposed parallel relatively short side 27b to assist in maintaining the edge 25 rigid.

To assist in positioning the contact 12 in its aperture 11 a dimple 31, disposed adjacent the slot 27 and projecting outwardly from the side 22 of the portion 21, is provided.

The contact 12 is assembled in the housing 10 by inserting the contact spring 19 via the wide portion 15 into the narrow portion 17 of the aperture 11 as seen in FIG. 1. As the edges 24 and 25 of the portion 20 come into engagement with the side walls 13a and 13b of the wide portion 15 the contact securing portion 21 is allowed to slide partially into the wide portion 15 until the lateral projection 26 engages the end 16 of the housing 10. Upon further insertion of the contact 12 the spring arm 28 is resiliently deflected towards the post axis, the slot 27 taking up deformation of the spring arm 28.

The effect of the spring arm 28 being biased against the wall 13a of the aperture 11 is to urge the edge 25 of the portion 21 against the wall 13b of the aperture 11.

At the same time as the projection 26 enters the aperture the dimple 31 comes into engagement with the wall 14a. This causes the portion 21 to deflect as shown in FIG. 4 to urge the side 23 of the portion 21 against the wall 14b of the aperture 11. The combined effect of the projection 26 and the dimple 31 is, therefore, that the portion 21 is positively positioned against two adjacent mutually perpendicular walls 13b and 14b of the aperture 11.

Insertion of the contact 12 is complete when the portion 21 abuts the shoulder 32 in the aperture 11 (see FIG. 2).

What is claimed is:

1. An elongate contact for an electrical connector comprising a contact portion, a wire connecting portion and a contact securing portion, the contact securing portion being a generally rectangular cross-section flexible flat plate having a through slot extending generally in the axial direction of the contact to define with an edge of the securing portion a spring arm, the spring

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arm having a projection extending laterally of the contact, said spring arm being flexible in the plane of the securing portion, and a dimple being located on a flat side of the securing portion, said projection and dimple extending in mutually perpendicular directions, said slot being disposed nearer one edge than the other edge of the securing portion and said dimple disposed adjacent to the slot and nearer the other edge than the one edge of the securing portion.

2. An electrical connector comprising a housing made of insulating material and having a plurality of generally rectangular apertures each of which removably receives a contact as claimed in claim 1, the spring arm engaging a first wall of the respective aperture and the dimple on the flat side of the securing portion engaging an adjacent second wall of the respective aperture to urge the securing portion against adjacent third and fourth walls of the respective aperture.

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3. An elongate contact for an electrical connector comprising a contact portion, a wire connecting portion and a contact securing portion, the contact securing portion being a generally rectangular cross-section flexible flat plate having a through slot extending generally in the axial direction of the contact to define with an edge of the securing portion a spring arm, said slot having a relatively long side extending adjacent the spring arm parallel to the longitudinal axis of the contact securing portion and an opposed parallel relatively short side to assist in maintaining the other edge of the securing portion rigid, the spring arm having a projection extending laterally of the contact, said spring arm being flexible in the plane of the securing portion, and a dimple being located on a flat side of the securing portion, said projection and dimple extending in mutually perpendicular directions.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,761,871

Dated September 25, 1973

Inventor(s) Lucas Gerardus Christianus Teurlings

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the title page in the heading, the Assignor was left out and it should read as follows:

"Lucas Gerardus Christianus Teurlings, Frederik
Hendriklaan 120, 's-Hertogenbosch,
Netherlands;

Assignor to AMP Incorporated, Harrisburg, Pa."

Signed and sealed this 15th day of January 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents