

- [54] **SOCKET TERMINAL**
- [75] Inventors: **Wladimiro Teagno; Luigi Campari**,
both of Turin, Italy
- [73] Assignee: **AMP Incorporated, Harrisburg, Pa.**
- [22] Filed: **Apr. 17, 1972**
- [21] Appl. No.: **244,744**
- [30] **Foreign Application Priority Data**
Apr. 27, 1971 Italy 23731 A/71
- [52] **U.S. Cl.**..... **339/256 R, 339/65, 339/217 S**
- [51] **Int. Cl.**..... **H01r 11/22**
- [58] **Field of Search** **339/19, 217, 276 F,**
339/192, 18 C, 65, 66, 219, 256, 258

- [56] **References Cited**
- UNITED STATES PATENTS**
- 3,553,635 1/1971 Lundergan et al. 339/258 P
- 3,202,959 8/1965 Keller 339/217 S
- 3,336,567 8/1967 Coldren 339/192 R
- 3,271,729 9/1966 Bakker et al. 339/217 S

- FOREIGN PATENTS OR APPLICATIONS**
- 93,843 4/1969 France 339/217 S

- OTHER PUBLICATIONS**
- Mele et al., "Straight-Through Connector" IBM Tech.
Disclosure, 4-1971.

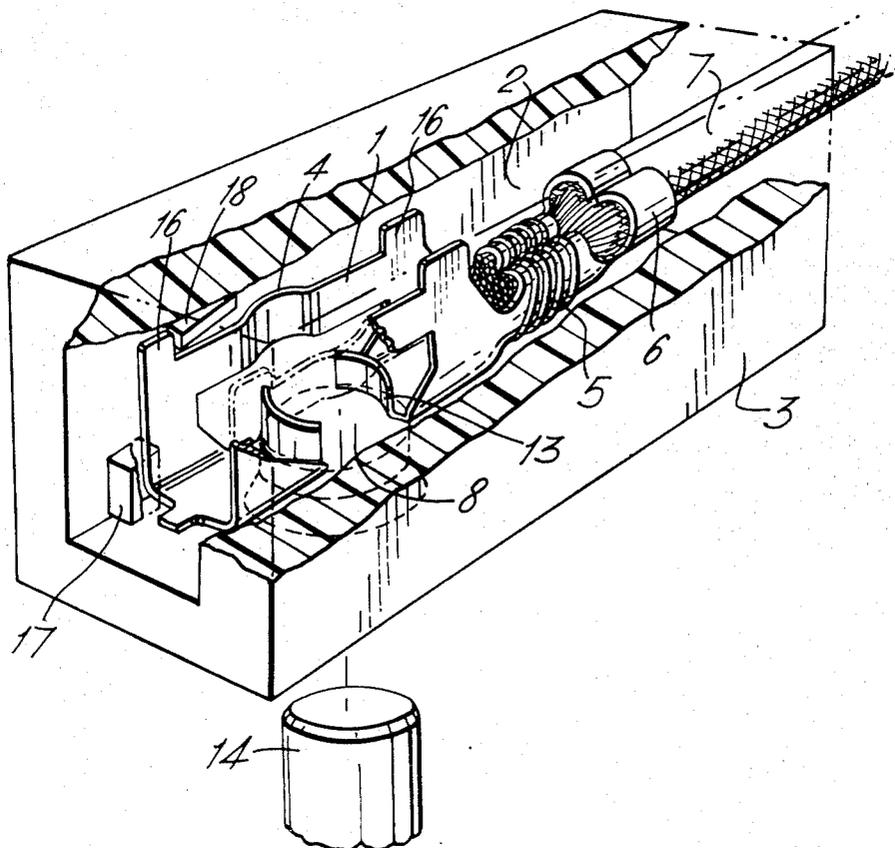
Primary Examiner—Marvin A. Champion
Assistant Examiner—Robert A. Hafer
Attorney—William J. Keating, Jay L. Seitchik et al.

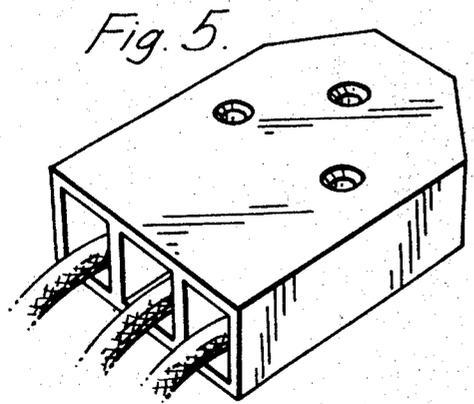
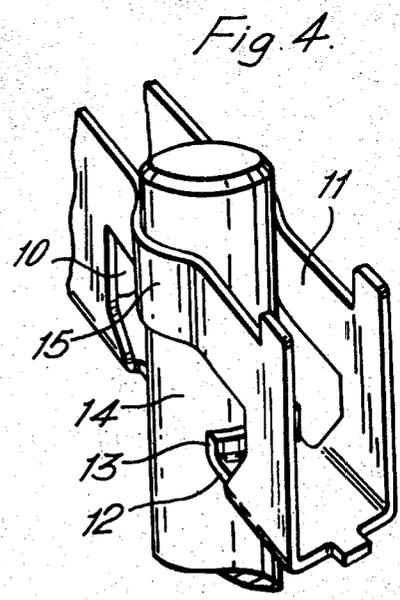
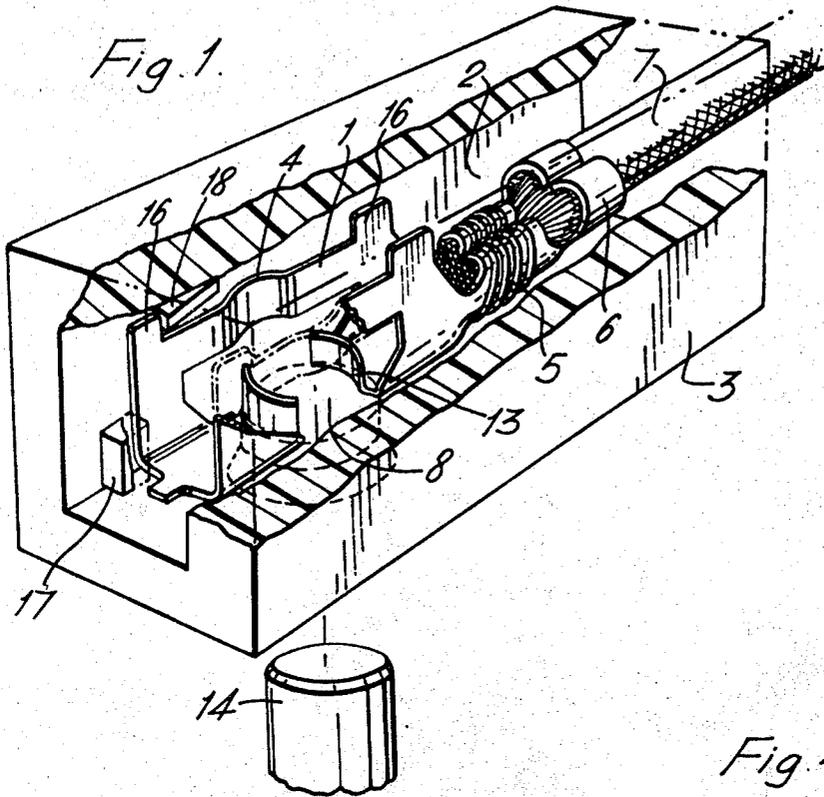
[57] **ABSTRACT**

A socket terminal for releasably receiving a pin and comprising a channel-shaped contact portion for receiving the pin between the channel sides and normally through an aperture in the channel base, the aperture extending throughout the channel width and being elongated lengthwise of the channel; a wire connecting section being formed at an end of the channel-shaped portion, tongues extending integrally from opposite ends of the aperture for engaging diametrically opposite first side portions of the pin, side portions of the channel being arranged to engage diametrically opposite second side portions of the pin orthogonally arranged with respect to the first side portions.

The socket terminals are particularly useful when assembled in cluster blocks of the kind used in connecting through the hermetically sealed enclosures of refrigerator motors where they may be subject to vibration and adverse atmospheric environment but must satisfy stringent reliability requirements.

3 Claims, 5 Drawing Figures





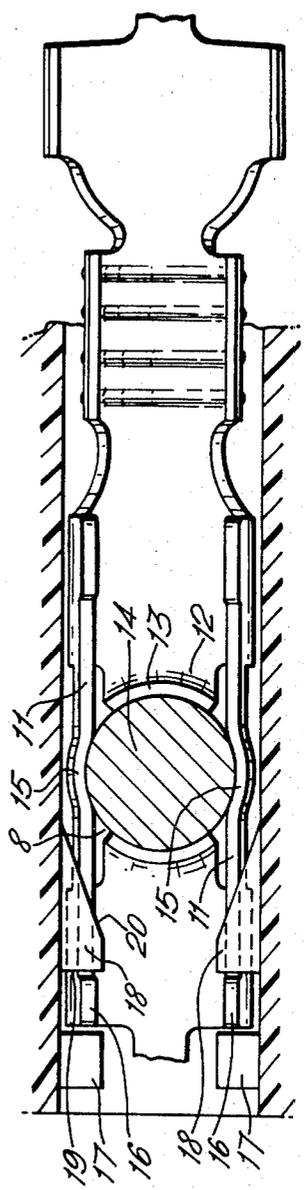
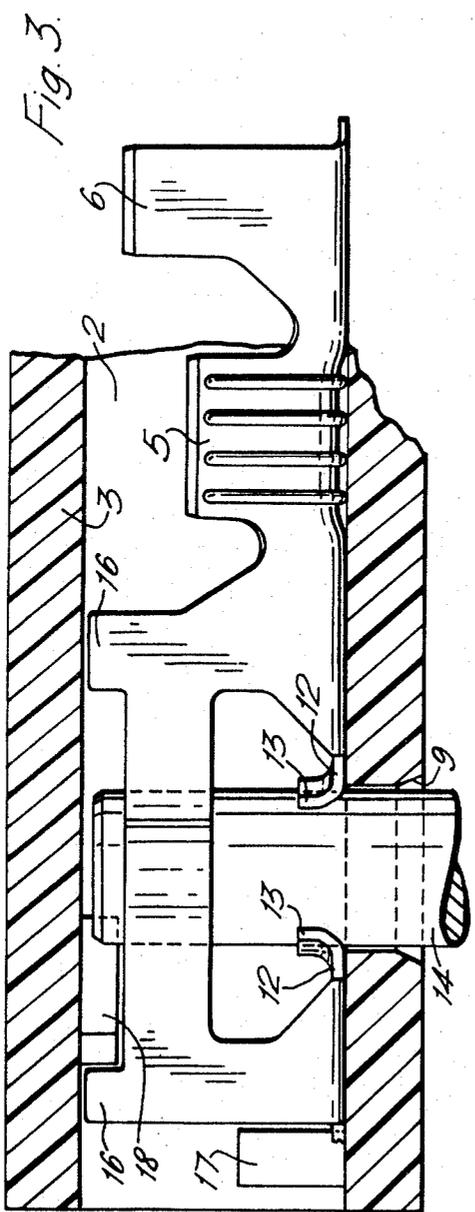


Fig. 2.

SOCKET TERMINAL

This invention relates to socket terminals and is particularly concerned with a receptacle for use in a cluster block of the kind used in connecting through the hermetically sealed enclosures of refrigerator motors. A connector of this type has been fully described in U.S. Pat. No. 3,271,729.

In use such receptacles are subject to vibration and, often, to adverse atmospheric environment. There are stringent reliability requirements and difficulty has been experienced in meeting these requirements in practice. It is important that the receptacles are securely retained within their housings, and yet can readily be removed for inspection or replacement. It is important that a connector is securely retained on its complementary pins in use to avoid inadvertent removal under vibration or other operating conditions and also that it can readily be engaged with its complementary pins.

There have been numerous improvements in contact receptacles and housings in an attempt to meet the stringent requirements and it is an object of this invention to present a further improved socket terminal.

A socket terminal for releasably receiving a pin according to the present invention comprises a channel-shaped contact portion for receiving the pin between the channel sides and normally through an aperture in the channel base, the aperture extending throughout the channel width and being elongated lengthwise of the channel; a wire connecting section being formed at an end of the channel-shaped portion, tongues extending integrally from opposite ends of the aperture for engaging diametrically opposite first side portions of the pin, side portions of the channel being arranged to engage diametrically opposite second side portions of the pin orthogonally arranged with respect to the first side portions.

The invention will now be described, by way of example, with reference to the accompanying partly diagrammatic drawings, in which:

FIG. 1 is a fragmentary partly sectional exploded perspective view of a pin and socket assembly;

FIG. 2 is a fragmentary plan view of the FIG. 1 assembly with the housing in section;

FIG. 3 is a fragmentary side elevation of the FIG. 1 assembly with the housing in section;

FIG. 4 is a fragmentary perspective view of a socket terminal of the FIG. 1 assembly in engagement with a pin; and

FIG. 5 is a perspective view of a complete connector assembly according to the invention.

The assembly of FIG. 5 comprises a unitary plastics moulding of slab-like form having three parallel passageways communicating with respective pin apertures. The pin apertures are disposed at one side of the block in triangular array. Each passageway contains a contact socket for engaging a pin received through the aperture, the contact being secured to a conductor wire and the wires of all of the contacts extending from a common end of the housing.

FIG. 1 shows one of the socket terminals 1 of the FIG. 5 assembly in its passageway 2 of the housing 3. The socket terminal 1 comprises a channel-shaped contact portion 4 integrally formed at one end with wire crimp and insulation support sections 5 and 6 secured respectively to the stripped end and insulation of a con-

ductor wire 7. The channel base is formed with an aperture 8 registering with a pin aperture 9, FIG. 3, formed in the housing wall, the aperture 8 extending from side to side of the channel and being elongated lengthwise of the channel. The aperture 8 extends into the channel sides at side apertures 10 which have forward and rearward sides converging towards the ends of aperture 8. The side apertures 10 are bridged by channel side portions 11, distal from the base, and longer than the base aperture 8.

Integral tongues 12 project inwardly from opposite ends of the apertures and at their free ends have lips 13 turned up between the channel sides. As seen in plan view in FIG. 2, the lips 13 are arcuately formed for embracing a circular section pin 14 and define parts of circular profile axially aligned with and of lesser diameter than pin aperture 9.

The channel side portions 11 bridging the side apertures 10 are each formed centrally with arcuate inwardly facing concavities 15, as seen in plan view, for embracing the pin 14 in resilient manner. The concavities 15 thus define in relaxed condition parts of a circle of lesser diameter than that of pin 14 and axially aligned with the pin aperture 9. The concavities 15 are disposed on a side of the channel base remote from the housing aperture for the pin 14 and are spaced from the lips 12 axially of the pin 14. Also the concavities 15 are arranged to engage diametrically opposite portions of the pin 8 orthogonal to diametrically opposite pin portions engaged by the lips 13.

The tongues 12 define short cantilever springs compared with longer beams defined by the side portions 11 so that the tongues 12 are stiffer and may exert substantially greater contact pressure. They are also, by virtue of the turned up lips, more resistant to withdrawal than to insertion of the pin 14.

The channel sides at their free edges remote from the base, are each provided with a pair of ears 16, one at each end of the channel section and projecting away from the base. The ears 16 serve to guide the contact within the housing passageway 2 by slidably engaging the wall opposite that formed with pin aperture 9. They also serve to stand the channel side portions 11 away from the wall.

The ears 16 at the channel end distal from the wire connecting section 5,6 serve to latch the socket within the housing. The housing is formed at the forward end of the passageway adjacent the wall formed with the pin aperture 9, with a pair of stops 17 which limit forward insertion of the socket into the passageway. Rearwardly of stops 17, and at the opposite wall is a pair of further stops 18 one at each side of the passageway 2. The stops 18 are formed with forward shoulder surfaces 19 facing the forward stops 17, and rear ramplike surfaces 20 inclined rearwardly and outwardly.

On insertion of the socket contact into a passageway, from the right, as seen in FIGS. 2 and 3, the leading ears 16 engage the ramp surfaces 20 and are cammed inwards by flexure of the channel sides. When the leading ears 16 pass the shoulder surfaces 19 they spring outwards to engage the shoulders 19 to resist contact withdrawal. Forward ends of the channel sides engage the stops 17 to resist further forward movement.

We claim:

1. A socket terminal for releasably receiving a pin and comprising a channel-shaped contact portion for receiving the pin between the channel sides and nor-

3

mally through an aperture in the chanel base, the aperture extending throughout the channel width and into the channel side portions, a wire connecting section being formed at an end of the channel-shaped portion, tongues extending integrally from opposite sides of the aperture for engaging diametrically opposite first side portions of the pin, side portions of the channel being arranged to engage diametrically opposite second side portions of the pin orthogonally arranged with respect to the first side portions, the channel side portions being spaced axially of the pin from the tongues of the channel base, said tongues arranged to exert a relatively high contact pressure on the pin and said side

4

portions being arranged to exert a generally low contact pressure on the pin.

2. A socket terminal as claimed in claim 1, in which free ends of the tongues are turned up between the channel sides and are arcuately formed for embracing a circular section pin.

3. A socket terminal as claimed in claim 1, in which free edges of the channel sides remote from the channel base are each formed with a pair of ears, one ear on each side of the aperture and projecting away from the base.

* * * * *

15

20

25

30

35

40

45

50

55

60

65