

[54] ELECTRICAL TERMINAL

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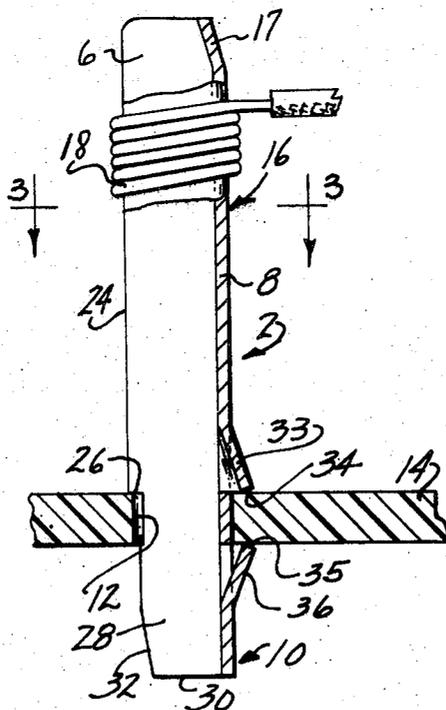
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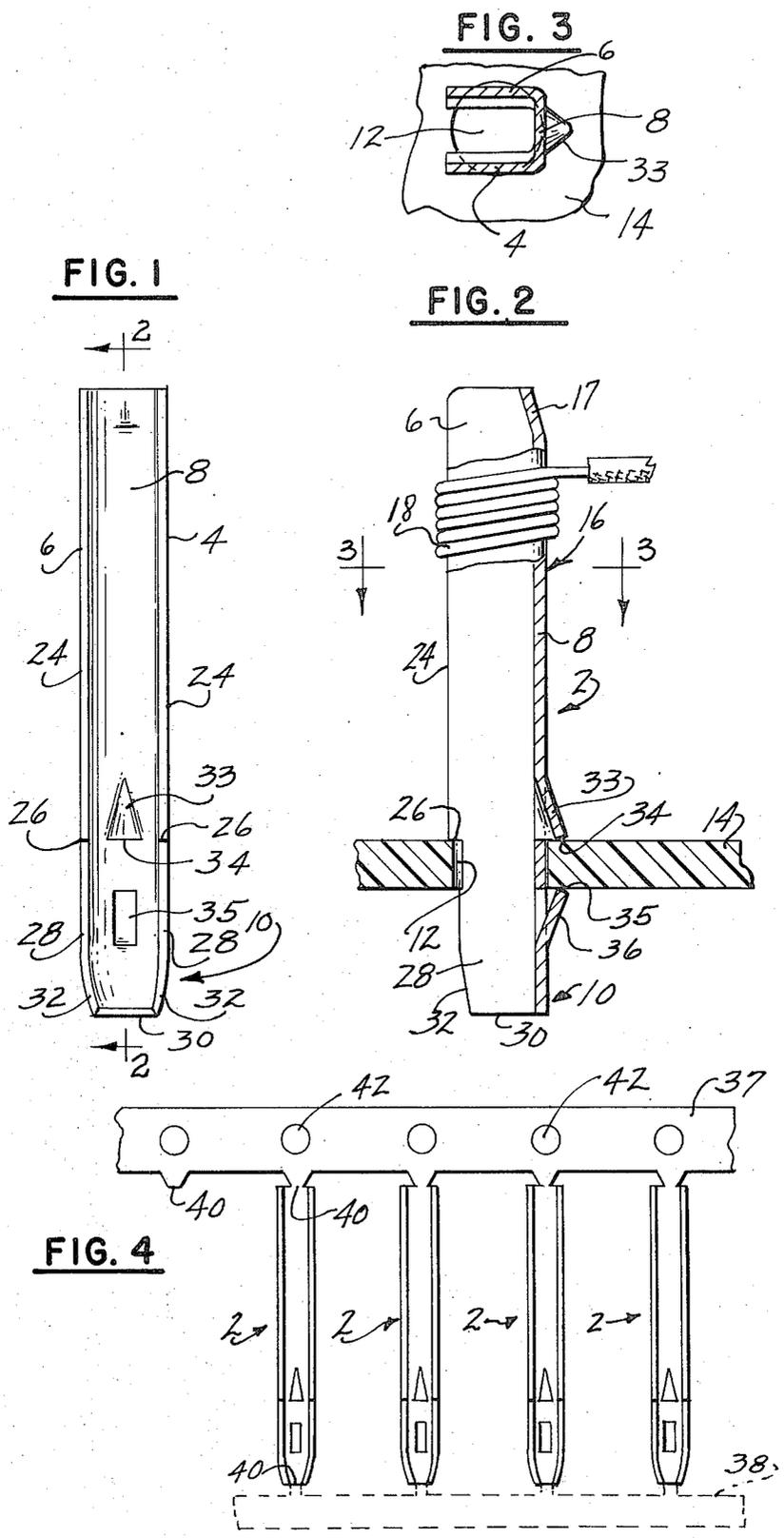
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[57] ABSTRACT

An electrical terminal comprises a U-shaped sheet metal body with the legs of the body being cut away to define shoulders for abutting the top surface of a printed circuit board. The bight of the U-shaped body also has an outwardly struck projection that engages the top surface of the printed circuit board to enhance stability of the terminal thereon. Below the detent the bight has a spring tongue for snap-locking against the bottom or printed wire side of the board. The trailing end of the body has a tapered free end and can be used as a wire wrapped terminal or may be inserted into a connector.

4 Claims, 4 Drawing Figures





## ELECTRICAL TERMINAL

## BACKGROUND OF THE INVENTION

This invention relates to improvements in electrical terminals. More particularly, the invention relates to terminals of the type for mounting on a printed circuit board. In addition the terminal has a trailing end for receiving a wrap of wire or for insertion into a socket connector. The terminal is of a type that is of U-shaped configuration with means for retaining the terminal on the circuit board upon insertion into the board.

## OBJECTS AND SUMMARY OF THE INVENTION

It is an object of this invention to provide a U-shaped electrical terminal that snaps into and positively locks to a printed circuit board, the snap lock being effected by means including a spring tongue on the backbone or bight.

It is a further object of this invention to provide a terminal of the type stated in which the upper end of the terminal is tapered to receive a wire wrap or to facilitate entrance into a socket connector having a socket opening with a cross section that is compatible with the cross section of the trailing end of the terminal.

In accordance with the forgoing objects the terminal of the present invention comprises a one-piece elongated sheet metal body that defines a U-shaped channel with spaced apart legs that are joined by a bight. The channel is open at its opposite ends and also open opposite to the bight. The channel shaped body has an entrance portion for insertion into a hole in a printed circuit board and a trailing portion for connection to an electrical component, such as a connector or a wrap of wire. The entrance portion further includes shoulders that are formed by cutting away portions of the legs and which abut the printed circuit board. The bight has an outwardly struck detent that cooperates with shoulders to provide a support for the terminal at three spaced regions. The bight also has a spring tongue that snaps into locking position on the printed wiring side of the circuit board.

## BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a front elevational view of a terminal constructed in accordance with and embodying the present invention;

FIG. 2 is a sectional view of the terminal taken along line 2—2 of FIG. 1 and shown in position on a printed circuit board;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2; and

FIG. 4 is an elevational view of a series of terminals joined together by carrier strips.

## DETAILED DESCRIPTION

Referring now in more detail to the drawing, there is shown a terminal comprising a one-piece, elongated sheet metal body 2 of brass or other suitable resilient conductive material. The body 2 defines a U-shaped channel having longitudinally extending parallel legs 4, 6 that are joined by a generally flat bight 8. The body 2 may be considered as having an entrance portion 10 for insertion into a hole 12 in a printed circuit board 14, and a trailing portion 16 for connection to a wire wrap 18, or alternatively for insertion into a socket-

type connector for receiving so called square pin male terminals.

As best seen in FIG. 2 the upper end of the trailing portion 16 is tapered by the provision of an angularly bent bight section 17 that extends to the free end of the trailing portion. This allows the preformed wire wrap 18 to be telescoped freely over the upper end of the trailing portion 16 and then pressed downwardly into firm engagement with the middle part of the trailing portion whereby the free edges 24, 24 of the legs 4, 6 bite into the wire of the wrap.

The free edges 24, 24 extend downwardly and in parallel relation to transverse shoulders 26, 26 that are adapted to engage the top surface of the circuit board 14. Below the shoulders 26, 26, the legs 4, 6 are of reduced width sufficient for passage into the hole 12 on opposite sides of the diameter line thereof as is seen from FIG. 3. Furthermore, these lower reduced-width sections 28, 28 of the legs 4, 6 curve toward each other near the tip 30, as shown at 32 in FIG. 1, while the free edges of those sections 28, 28 taper toward the tip, all for purposes of facilitating easy entry of the body. Except for the curved portions 32, the portions of each leg 4 or 6 above and below its shoulder 26 are in the same plane.

The bight 8 is centrally formed with an outwardly struck detent 33, the lower edge 34 of which is substantially in the same plane as the shoulders 26, 26 and is also adapted to engage the upper surface of the printed board 14. Below the edge 34, the bight 8 is also struck outwardly to provide a spring tongue 35 having an upper edge 36 for engagement with the underside (i.e., the printed wiring side) of the board 14. The edges 34, 36 are normally spaced apart a distance less than the thickness of the board 14.

Upon insertion of the entrance portion 10 of the terminal into the hole 12, the edge of the hole 12 urges the spring tongue 35 toward the bight 8 until the tongue passes through the hole 12. At that time the tongue 35 will spring outwardly and underlie the printed circuit board 14 and with the edge 35 in firm locking engagement therewith. At the same time the shoulders 26, 26 and the edge 34 of the detent 33 will engage the top side of the printed circuit board. A positive lock of the terminal onto the circuit board is, therefore, provided. The shoulders 26, 26 cooperate with the detent 33 to support the terminal at three locations and thereby stabilize the terminal in position on the board 14.

As best seen in FIG. 4, the terminals are produced in chain form, namely by being formed with conventional mechanism that leaves two carrier strips 37, 38 that are parallel and which are joined respectively to the corresponding entrance and trailing ends of the bodies 2 at frangible lines of weakness 40 at which the carrier strips may ultimately be separated from the terminals. The carrier strips 36, 38 have holes 42 by which the strips and the being-formed terminals may be advanced through the forming machinery. Carrier strip 38 is identical to carrier strip 37 and is thus shown diagrammatically in dotted lines. Upon completion of the formation of the terminals, a number of them, together with the carrier strips 37, 38, may be wound into a supply roll for subsequent use. In such use, however, a desired number of terminals are withdrawn from the supply and both carrier strips are transversely severed to leave a group of parallel terminals with two integral carrier strips. The lower carrier strip 38 may then be

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removed leaving the upper carrier strip 37 in place whereby the latter may be used to position all of the terminals simultaneously into a series of properly spaced holes in the printed circuit board. After the terminals are snapped into their respective holes, as previously described, the terminals along with other components of the circuit board may be soldered in accordance with known techniques. Before or after the soldering, the upper carrier strip 37 may be separated from the terminals. Both carrier strips are discarded as scrap.

The trailing end 16 may be used with a wire wrap 18 or it may be inserted into a compatible connector socket having a socket opening for receiving so called square pin terminals.

The invention is claimed as follows:

1. An electrical terminal comprising a one-piece elongated sheet metal body that defines a U-shaped channel with spaced apart legs that are joined by a bight, said channel-body having an entrance portion for insertion into a hole in a printed circuit board and a trailing portion for connection to an electrical component, said entrance portion having a shoulder on each said legs for abutment against the surface of the printed

circuit board, an outwardly struck detent on said bight that forms an edge in substantially planar alignment with said shoulders whereby the shoulders and the detent form three regions of support for the body on a surface of said printed circuit board, and an outwardly struck spring tongue on said bight, said spring tongue being distended toward the bight upon passage into said hole and springing outwardly upon passage therepast to engage the opposite surface of said printed circuit board.

2. An electrical terminal according to claim 1 in which the trailing portion has a free end section that is tapered.

3. An electrical terminal according to claim 1 in which said legs in the regions between said shoulders and the tip of the entrance portion are each of a width that is less than the regions of the legs between said shoulders and the free end of the trailing portion.

4. An electrical terminal according to claim 1 in which the spacing of said legs above said shoulders is no greater than the spacing of the legs below said shoulders.

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