Nov. 20, 1962 R. F. FIEBERG 3,065,450

SEPARABLE CONNECTOR

Filed Aug. 3, 1959

FIG. 1

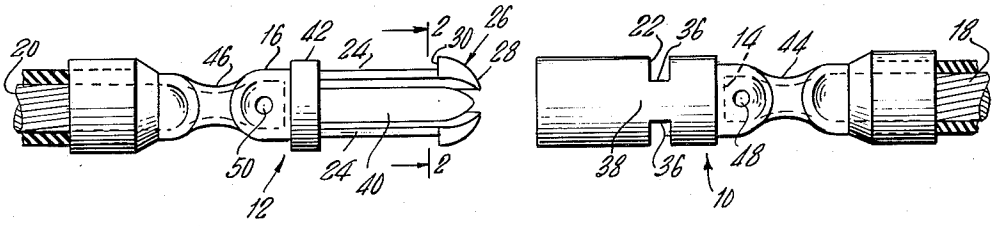
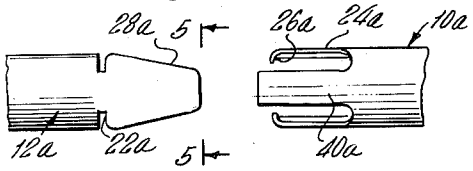



FIG. 4



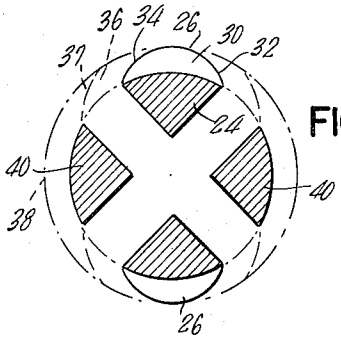




FIG. 2

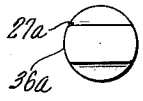



FIG. 5

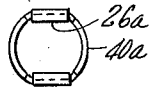



FIG. 6

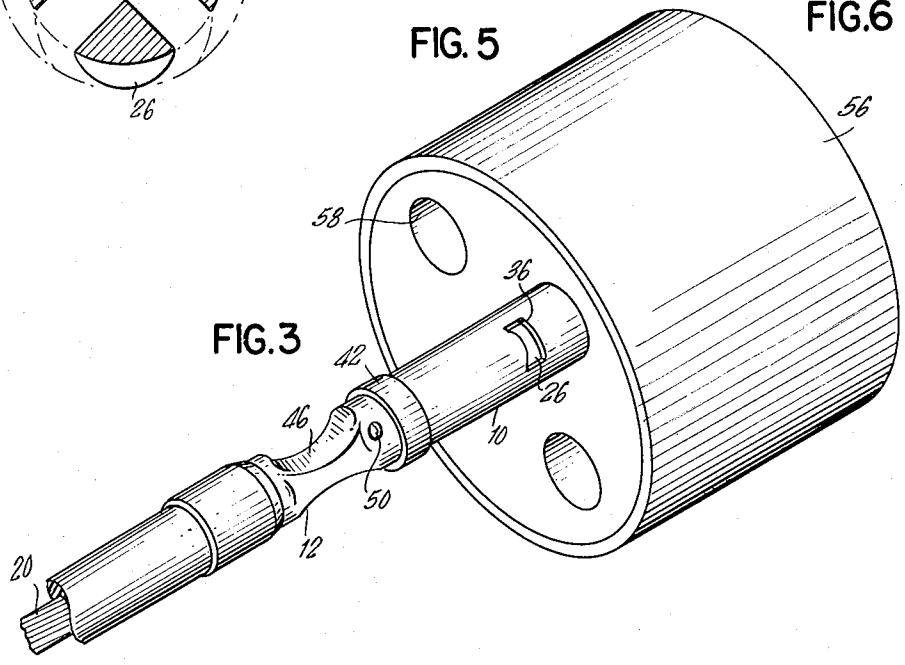



FIG. 3

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3,065,450

# SEPARABLE CONNECTOR

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3 Claims. (Cl. 339—253)

My invention relates to an electrical connector and more particularly to a coupling connector that may be readily separated when desired.

The general object of the invention is to provide a coupling connector that can be locked and separated without the use of tools and which does not require additional parts.

Other objects are to provide such a connector which does not require externally extending parts; which may be completely enclosed with insulation; and which may be inexpensively made on high-speed production equipment.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing in which:

FIGURE 1 is an exploded view of a preferred form of the invention shown in side elevation.

FIGURE 2 is a sectional view taken in the plane 2—2 of FIGURE 1.

FIGURE 3 is a perspective view of the final connection mounted to a supporting panel.

FIGURE 4 is an exploded side elevation of a modification shown partially.

FIGURE 5 is a cross-sectional view taken in the plane 5—5 of FIGURE 4.

FIGURE 6 is an end view of the spring member in FIGURE 4.

The invention generally comprises pin and socket connector parts one of which has been provided with a spring detent, and the other with an engaging side camming groove. Mating the two parts will cause the detent to snap into the groove and lock the parts. To unlock the connector, one of the parts may be rotated with respect to the other sufficiently to cause the detent to raise the cam out of the groove. A longitudinal pull of one part with respect to the other will then uncouple the connector.

Specifically the coupling connector illustrated in FIGURES 1–3 comprises a socket member 10 and a pin member 12, each provided with a hollow end 14 and 16 respectively for crimping a conductor such as 18 and 20, therein.

The socket member 10 may be provided with a transverse catch or slot 22 in the wall thereof. The pin member 12, is longitudinally slotted to form the spring contact 24 having an upstanding detent 26 for engagement with the slot 22. The detent is rounded at its interior portion 28 and sharply shouldered at its posterior edge 30. Thus the detent will be cammed radially and inwardly when entering the socket, and will spring into the slot 22 when fully inserted. The posterior shoulder 30 will engage the transverse edge of the slot 22 when a longitudinal pull is attempted to separate the parts.

The detent is laterally rounded as at 32 and 34 to cam over either of the lateral edges 36, of the slot when either the socket member or the pin member is rotated one with respect to the other. As a result the detent is radially and inwardly moved until it clears the slot and reaches a position under the unslotted portion 38 of the socket member. At this point, the pin member may be easily withdrawn from the socket member. To facilitate the camming action the lateral edges 36 of slot 22 may be



bevelled or tapered as shown in the dot dash lines 37 in FIGURE 2 for easy entry of the rounded detent.

The pin may be cross-slotted as shown in FIGURE 2 to provide two oppositely positioned contacts with locking detents and two plain contacts 40. The plain contacts are intended to provide a continuous springy electrical contact with the walls of the socket member regardless of the position of the detent 26.

The pin member may be shaped with a peripheral shoulder 42 forming a positioning stop when the parts are coupled.

A portion of the hollow conductor receiving ends 14 and 16 of the numbers may be crimped as at 44 and 46 to the conductors, to secure the electrical connections. Any well-known method of securing the conductors may be employed. Peepholes 48 and 50 may be formed in the connector walls to enable the conductors to be visually examined in the inserted position.

The connector parts may be supported by a panel 56 made of insulating material, provided with recesses 58 for receiving and supporting one set of the connector parts therein. The parts may be molded in or otherwise secured to the panel.

Each of the connector parts may be made of a single piece of metal. If made of pure copper work hardening the contacts during manufacture will provide for sufficient spring for general use. Otherwise more springy materials may be employed.

The relative position of the parts containing the detent and the slot may be reversed. In FIGURE 4 for example, the detents 26*a* on spring contacts 24*a* form part of the wall of the socket member 10*a*. Extending spring contact 40*a* form the remainder of the socket.

The pin member 12*a* is provided with a transversely positioned catch or groove 22*a* having a cam 27*a* for camming the detent 26*a* to the surface 36*a* of the pin when it is desired to unlock the detent from the groove. The anterior portion of the pin may be tapered as at 28*a*, for easy entrance under detent 26*a*. The spring contacts 40*a* may extend beyond the ends of the detents to provide electrical contacts with the pin during the movement of the detents.

In the connector described in FIGURES 1–3 the connector may be more or less tightly enclosed with insulation without interferring with the action of the detents.

In both modifications a lock is provided which eliminates the need for extra parts, tools or keys. The parts may be polarized to insure locking when coupled. No extra dimensions need be provided over the conventional pin and socket numbers, thus ensuring compactness when multi-units are needed.

I have thus described the invention, but I desire it understood that it is not confined to the particular forms or uses shown or described, the same being merely illustrative, and that the invention may be carried out in other ways without the parting from the spirit of the invention, and therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of the invention are obtained and new results accomplished, as is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

I claim:

1. An electrical connector assembly comprising: a socket member and a pin member; a transverse recess in the inner surface of said socket providing a locking shoulder; at least two pairs of resilient fingers formed in said pin member; said pin including a rounded nose formed at its end to cam said fingers toward each other

during insertion of said pin into said socket member; one pair of said opposed resilient fingers having an electrical contact surface thereon in surface contact with said socket and thereby providing substantial electrical interconnection between said pin and said socket; another pair of said opposed resilient fingers having a mechanical detent thereon engaging said locking shoulder and thereby mechanically locking together said pin and said socket; and a camming surface on each side of each of said detents, for causing said detent to be cammed out of said recess and away from said shoulder when said pin and said socket are rotated in either direction one with respect to the other.

2. An electrical connector assembly according to claim 1 wherein said transverse recess is provided by a slot cutting through the wall of said socket.



3. An electrical connector assembly according to claim 1 wherein said pin and said socket are substantially circular in cross-section.


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