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W. H. FLANAGAN, JR

2,877,437

CONNECTOR

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FIG. 1.

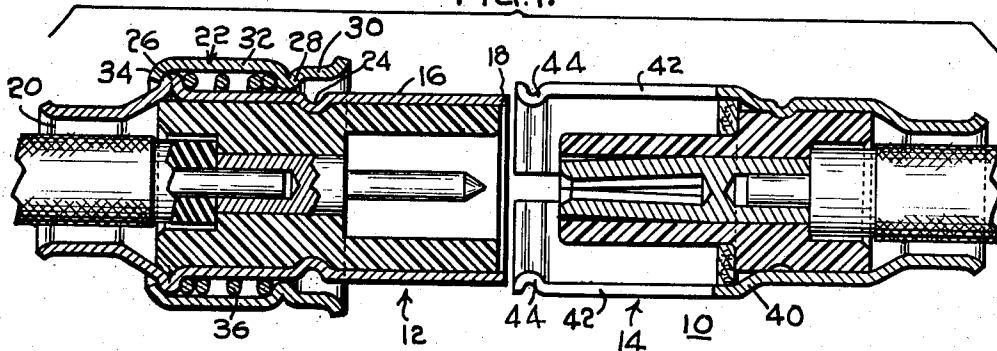


FIG. 2.

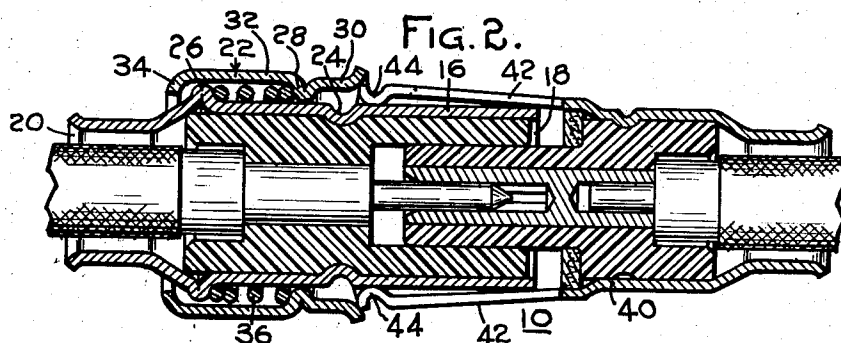


FIG. 3.

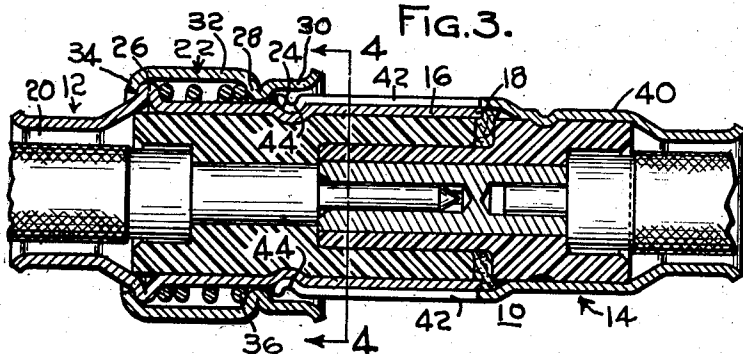


FIG. 4.

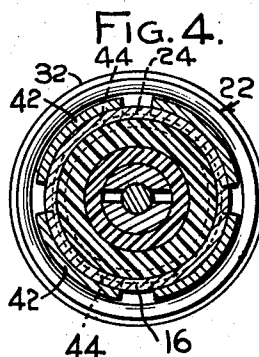
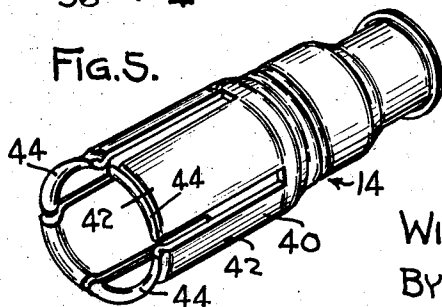


FIG. 5.



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2,877,437

CONNECTOR

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2 Claims. (Cl. 339—91)

This invention relates generally to connectors and has particular reference to an electrical connector designed for use with coaxial cable.

The object of the invention is to provide a connector in which cooperating connector members are adapted for engagement by simply pushing together, but can be separated only after manually releasing a locking mechanism.

Another object of the invention is to provide a connector having portions adapted to snap into engagement in which means are provided on one portion normally preventing flexing of the other portion necessary for disengagement until manually released.

A further object of the invention is to provide a connector having portions which may be joined by a simple axial push yet cannot be accidentally or unintentionally disconnected.

A further object of the invention is to provide a connector as described above which is adapted for rapid and economical manufacture.

Other objects of the invention will, in part, be obvious, and will, in part, appear hereinafter.

In the drawing:

Fig. 1 is a view in section of a connector embodying the features of the invention in which the connector portions are in position for assembly;

Fig. 2 is a view of the connector portions during assembly illustrating the action of the spring arms and the locking mechanism;

Fig. 3 is a view of the connector portions after completion of the assembly;

Fig. 4 is a view in section taken on line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of one portion of the connector.

Referring to the drawing there is illustrated a connector 10 comprising a pair of cooperating portions 12 and 14 adapted for engagement and having an internal structure adapted to complete an electric circuit.

The connector portion 12 comprises generally a cylindrical body shell 16 having an open forward end 18, an apertured rear end 20 for receiving a lead wire, and a locking ring 22 disposed thereabout. The shell 16 is provided with an inwardly embossed peripheral groove 24 disposed thereabout and a crimped rim 26 disposed rearwardly of the groove and extending radially outwardly about the circumference of the shell.

The locking ring 22 is provided with a crimped rim 28 projecting radially inwardly forming a forward portion 30 and a rear portion 32 spaced radially from the shell. The rear end 34 of the ring is crimped inwardly on the rear side of the rim 26 to bias the ring into a predetermined forward position so that the forward portion 30 is disposed about the groove, a spring 36 is disposed about the shell and maintained in a flexed condition between the rims 26 and 28.

The connector portion 14 comprises generally a body portion 40 having a circumferential series of forwardly

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extending spring fingers 42 with inwardly rounded shoulders 42 formed therein adjacent the ends. The spring fingers 42 are adapted to snap into and out of engagement with the shell 16, and to this end the inside diameter of the body 40 at the spring fingers is substantially the same as the outside diameter of the shell 16, and the inside diameter within the shoulders 44 is less than the outside diameter of the shell 16, and substantially the same as the outside diameter of the shell in the groove 24.

Hence during the assembly of the two parts of the connector, as the spring fingers pass over the end 18 of the shell 16 they are flexed outwardly, thereby increasing the diameter of the end of the spring fingers. The inside diameter of the forward portion 30 of the locking ring is less than the diameter of the spring fingers in the above-mentioned outwardly flexed condition, hence as the connectors move together, the ends of the spring fingers contact the end of the forward portion 30 of the locking ring and forces it rearwardly compressing the spring 36 until the shoulders on the spring fingers snap into the groove 24. The diameter of the spring fingers is thereby decreased to an amount less than the inside diameter of the forward portions of the ring so that the ring is permitted to move forward to its original position with the forward portion thereafter being disposed about the shouldered ends of the spring fingers.

The connector portions are thereby prevented from being separated by an axial pull, since to separate, the shoulders must unsnap from the groove which necessitates outward flexing of the arms. However, since the inside diameter of the forward portion is substantially the same as the outside diameter of the spring fingers, the outward flexing required for disengagement is prevented.

Disengagement is, however, easily accomplished by manually moving the locking ring rearwardly to uncover the ends of the spring fingers after which the connector portions may be separated by an axial pull.

The connector portions may also be disengaged in situations where they are under tension since outward forces by the spring fingers against the locking ring under such conditions are not great enough to prevent easy axial movement thereof.

The forward ends of the locking ring and the forward ends of spring fingers are inclined outwardly to facilitate engagement of the members.

The connector is particularly adapted for use with electronic apparatus where connections must be rapidly and easily made, yet must be secure against accidental disengagement due to shock or vibration, and must be readily disengaged when desired.

Since certain obvious changes may be made in the device without departing from the scope of the invention, it is intended that all matter contained herein be interpreted in an illustrative and not in a limiting sense.

I claim:

1. A connector comprising a first portion cylindrical body shell formed of a single piece of sheet metal and having a peripheral groove formed in spaced relation to the forward end and a peripheral rim disposed rearwardly of the groove and projecting radially outwardly, a locking ring disposed about the body, said locking ring having a forward portion spaced radially from the body shell, a peripheral rim projecting radially inwardly at the rear of the forward portion, and a rear end portion curled inwardly over the rear of the peripheral rim on the shell, and a spring member disposed about the shell between the peripheral rims and biasing the locking ring forwardly into a position such that the forward portion is disposed about the groove, and a second connector portion comprising a body having a circumferential series

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of forwardly extending spring fingers having inwardly extending rounded shoulders adjacent the ends, said fingers being dimensioned to pass over the forward end of the first connector portion and snap into and out of engagement with the peripheral groove by radial flexing of the arms in response to relative axial movement of the parts, said forward portion of the locking ring being dimensioned to prevent outward flexing of the fingers necessary to permit disengagement of the fingers from the groove, said spring fingers having a portion on the forward end positioned to engage the forward portion of the locking shell when the connector portions are moved together and move the locking shell rearwardly into a non-locking position and dimensioned to permit the locking shell to return to a locking position after the spring fingers have snapped into the groove.

2. A connector comprising cooperating conductor portions adapted to snap into and out of engagement by radial flexing of resilient portions, a first portion comprising a cylindrical body with an external circumferential groove spaced from the end, a second portion hav-

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ing a plurality of forwardly extending spring arms adapted for telescopic engagement with said body, shoulders formed adjacent the terminal ends of said spring arms for snapping engagement with said groove by radial flexing in response to relative axial movement, a locking shell positioned at one end of said body being normally spring biased in the direction of the free end of said body, said shell having a flared lip portion adapted for cooperative engagement with the distal ends of said spring arms enabling said arms to move the shell axially into non-locking position and allowing locking action when the shoulder of said spring arm enters the corresponding groove.

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