Jan. 18, 1955 W. H. FLANAGAN, JR 2,700,144

ELECTRICAL SOCKET ASSEMBLY

Filed Aug. 30, 1952

FIG. 1.

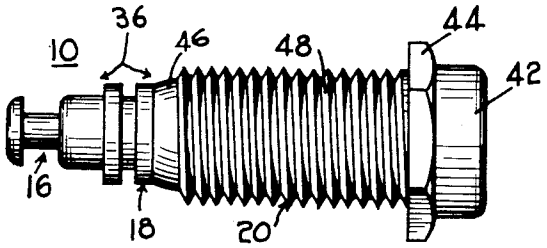


FIG. 2.

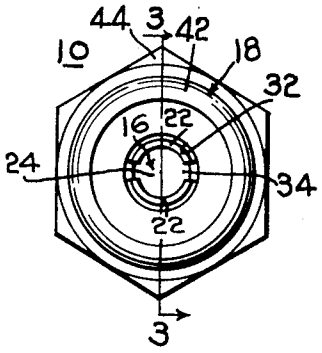


FIG. 3.

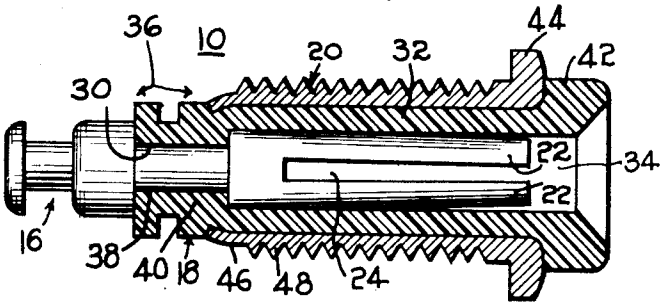
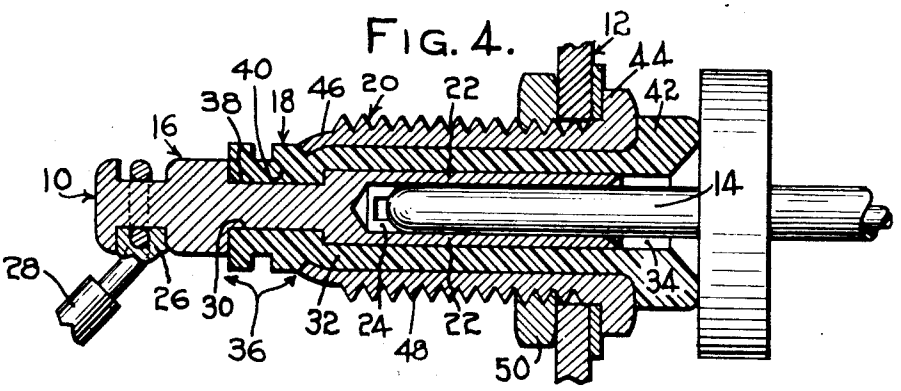


FIG. 4.



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ELECTRICAL SOCKET ASSEMBLY

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5 Claims. (Cl. 339—217)

This invention relates generally to electrical sockets, and has particular reference to a socket adapted to receive and make electrical contact to a test probe or the like.

The object of the invention is to provide a socket of this general type which is economical to assemble and is readily adapted for mounting onto a test panel or the like.

A further object of the invention is to provide a socket in which inner and outer conductors are separated by a resilient insulating member and are self-retained thereon.

A still further object of the invention is to provide a socket assembly having a center conductor and an enclosing insulating member which has interlocking means to prevent relative axial movement therebetween, with an outer conducting shell disposed about the insulating member with means thereon retaining the interlocking means in engagement.

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 elevation of a socket member embodying the features of the invention;

Fig. 2 is a view of the socket member of Fig. 1 as seen from the right end;

Fig. 3 is a view in section taken on line 3—3 of Fig. 2; and

Fig. 4 is a view in section similar to Fig. 3 in which the socket is assembled onto a test panel, with a lead wire connected thereto and a test probe inserted therein.

Referring to the drawing, there is illustrated socket **10**, which is adapted for assembly into a test panel **12** or the like, to receive and make electrical contact to an inserted test probe **14**.

The socket **10** comprises generally a center conductor **16**, an insulating member **18** disposed about the center conductor, and an outer conducting shell **20** disposed about the insulating member.

The center conductor **16** comprises a series of longitudinally extending resilient arms **22** at one end, forming a central aperture **24** to receive the test probe **14**, and a terminal portion **26** at the other end to receive an electrical lead wire **28**. Intermediate the arms and the terminal portion, a peripheral recess **30** is provided in the center conductor, which extends an appreciable distance longitudinally thereon.

The insulating member **18** is preferably formed of a resilient organic plastic such as nylon, polyethylene, polytetrafluoroethylene, or the like, which is sufficiently resilient to permit assembly thereof, but has sufficient strength to retain the parts in assembly as will appear hereinafter.

The insulating member comprises generally a cylindrical arm-enclosing portion **32** having an internal cavity **34** receiving the arms **22**, and an end portion **36** disposed about the portion of the center conductor having the recess **30**. The end portion **36** is provided with a restricted opening **38** extending from the end of the insulating member to the central cavity, thereby forming an internal peripheral flange-like portion **40** seated in the recess **30** of the center conductor. At the opposite end of the insulating member, a radially extending flange **42** is provided for a purpose to appear hereinafter.

The outer shell **20** is disposed about the cylindrical arm-enclosing portion **32**, and has a radially extending flange portion **44** at one end disposed against the flange **42** of the insulating member. The other end of the outer shell terminates about the end portion **36** of the insulating member, and is provided with an inwardly crimped portion **46**, which protrudes into the end portion about the recess **30** in the insulating member. The outer surface of the outer shell is preferably provided with threads **48**, to permit a nut **50** to be assembled thereon.

In the illustrated construction, the interlocking flange-like portion **40** of the insulating member and the recess **30** of the center conductor prevent longitudinal movement therebetween, and the inwardly crimped end **46** of the outer shell both retains the flange-like portion in the recess and retains the outer shell in assembly thereon.

The various parts of illustrated socket assembly are easily assembled, since the resiliency of the plastic insulating member permits the flange-like portion of the insulator to be snapped over an end of the center conductor to seat in the recess, and thereafter, the assembly of the outer shell and the crimping of the end thereof about the flange-like portion retains the parts in secure assembly, with no additional retaining rings or collars being necessary.

As illustrated in Fig. 4, the socket is easily assembled into a test panel opening by means of the nut **50**, so that the panel is gripped between the nut and the flange **44** on the end of the outer shell. The radial flange **42** on the insulating member prevents accidental shorting between the outer shell and the inner conductor by an inserted test probe, and also cooperates with the crimped end **46** in preventing axial movement between the insulating member and the outer shell.

Since certain obvious modifications 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. An electrical connector, comprising a center conductor having longitudinally extending resilient arms at one end and terminal means at the other end for receiving an electrical lead wire, an insulating housing formed of resilient organic plastic and having a radial flange at one end disposed about the center conductor, and an outer conducting shell having external threads disposed about the insulating member, said center conductor and said insulating member having peripheral interlocking portions to prevent axial movement therebetween, said outer shell having a radial flange seated against the flange of the resilient member and peripheral means projecting into said resilient insulating member about said interlocking means to cooperate with said flanges in retaining the shell in assembly thereon and retaining said interlocking means in engagement.

2. An electrical connector, comprising a center conductor having resilient arms at one end to receive and resiliently engage a male connector, means at the other end for connecting an electrical lead wire thereto, and peripheral recess disposed thereabout intermediate the resilient arms and said other end, an insulating member disposed about said center conductor, said insulating member enclosing said resilient arms and having a radial flange at the end adjacent said arms, a portion seated in said peripheral recess to prevent longitudinal movement of the insulating member relative to the center conductor, and an outer conducting shell having external threads disposed about the insulating member, said shell having a radial flange seated against the flange of the resilient member and means protruding into the periphery of the insulating member about the portion disposed in the recess to cooperate with said flanges in retaining the shell in assembly thereon and retaining said portion in the recess.

3. An electrical connector, comprising a center conductor having resilient arms at one end to receive and resiliently engage a male connector, means at the other end for connecting an electrical lead wire thereto, and a peripheral recess disposed thereabout intermediate the resilient arms and said other end, an insulating member formed of a resilient organic thermoplastic disposed about the center conductor, said insulating member encircling the resilient arms and having a portion circumferentially disposed in said recess to prevent longitudinal movement of the insulating member relative to the center conductor,

and an outer conducting shell having external threads disposed about the insulating member, said shell having a peripheral portion protruding into the resilient insulating member about the portion disposed in the recess retaining the shell in assembly thereon and retaining said portion in the recess, and said shell and said insulating member having radially extending flange portions disposed at the end thereof adjacent the resilient arms.

4. An electrical connector, comprising a center conductor having longitudinally extending resilient arms at one end to receive and resiliently engage a male connector, means at the other end for connecting an electrical lead wire, and a peripheral recess disposed about the center conductor and extending an appreciable distance longitudinally between the arms and said other end, an insulating member formed of resilient organic plastic disposed about the center conductor, said insulating member having a radially extending flange at one end, an internal opening extending longitudinally therethrough, said opening receiving the resilient arms, and having a restricted portion adjacent the portion receiving the arms forming an internal flange-like member seated in the recess in the center conductor preventing axial movement of the insulating member relative to the center conductor, and an external shell having external threads disposed about the insulating member, said shell having a radially extending flange at one end seated against the flange on the insulating member and an inwardly crimped portion at the other end, said inwardly crimped portion being disposed about and protruding into the portion of the insulating member disposed about the recess in the center conductor retaining the shell in assembly thereon and retaining said flange-like portion seated in the recess.

5. An electrical connector, comprising a center conductor having longitudinally extending resilient arms at one end and terminal means at the other end for receiving an electrical lead wire, an insulating housing formed of resilient organic plastic disposed about the center conductor, and an outer conducting shell having external threads disposed about the insulating housing, said center conductor having a peripheral recess, and said insulating member having an internal flange-like member seated in said recess interlocking the insulating member and the center conductor against axial movement relative to each other, said outer shell having a radially extending flange at one end and an inwardly crimped peripheral portion at the other end, said inwardly crimped peripheral portion being disposed about the portion of the insulating member disposed in the recess, one end of said insulating member extending beyond the end of the shell having the radially extending flange, said end of the insulating member having a radially extending flange bearing against the radially extending flange on the outer shell.

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