

Aug. 19, 1947.

F. E. HARRIS ET AL

2,425,802

CONNECTOR

Filed April 26, 1944

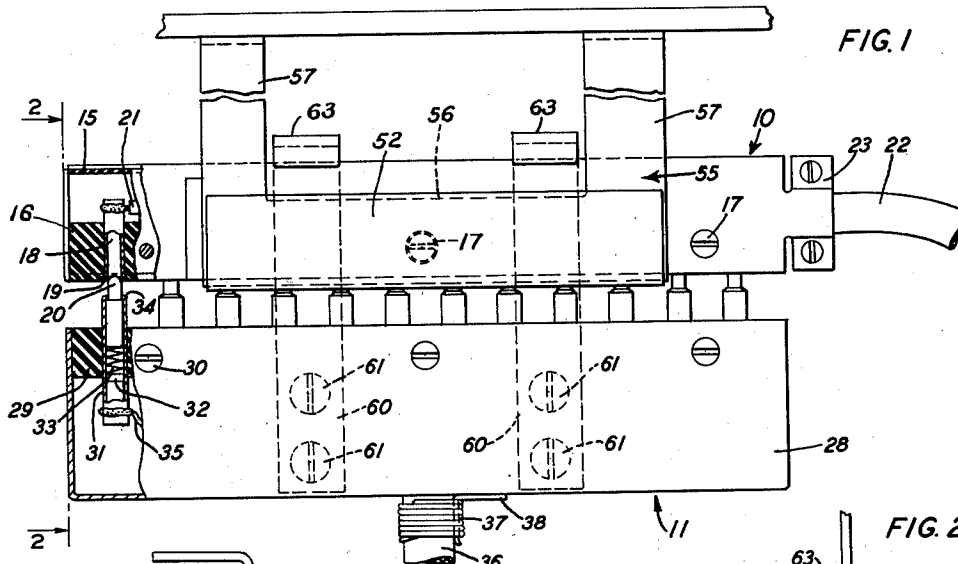


FIG. 1

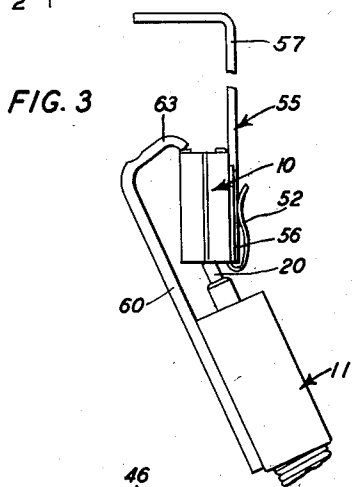


FIG. 3

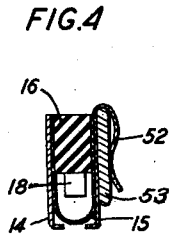


FIG. 4

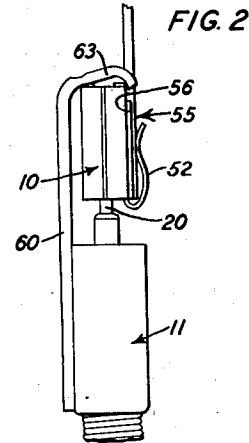


FIG. 2

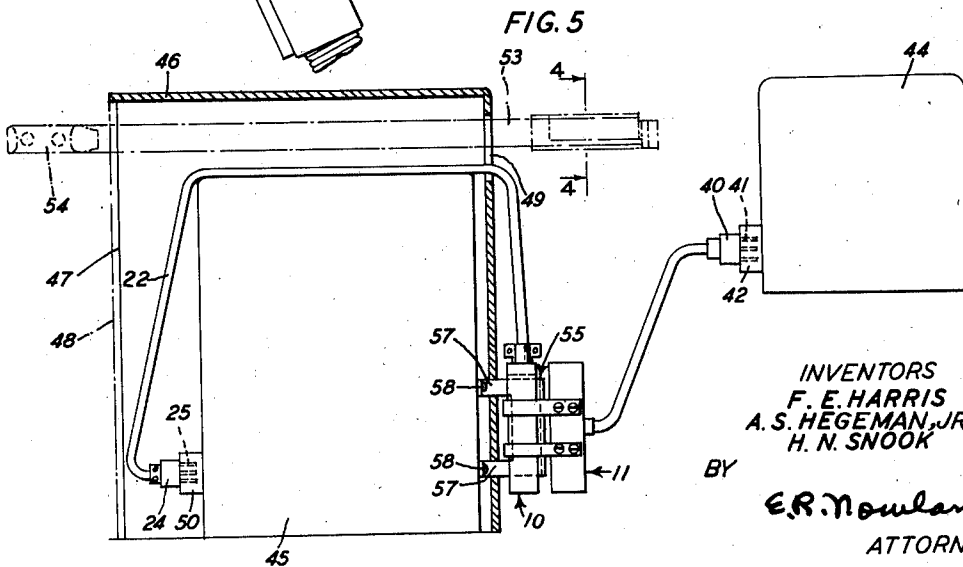


FIG. 5

INVENTORS
F. E. HARRIS
A. S. HEGEMAN, JR.
H. N. SNOOK

BY

E. R. Nowlan
ATTORNEY

UNITED STATES PATENT OFFICE

2,425,802

CONNECTOR

Fred E. Harris, Nutley, Andrew S. Hegeman, Jr.,
Glen Ridge, and Harry N. Snook, Maywood,
N. J., assignors to Western Electric Company,
Inc., New York, N. Y., a corporation of New
York

Application April 26, 1944, Serial No. 532,708

4 Claims. (Cl. 173—328)

1

This invention relates to connectors particularly adapted for connecting electrical units to test sets.

An object of the invention is to provide a simple, efficient and highly practical connector.

With this and other objects in view, the invention comprises a unit having aligned sockets therein, another unit having aligned plugs spaced for engagement with their respective sockets, and a connecting element carried by one of the units for removably receiving the other unit through a relative rocking movement of the sockets and their respective plugs in engagement with each other.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein

Fig. 1. is a front elevational view of the electrical connector, portions thereof being broken away;

Fig. 2 is an end elevational view taken along the line 2—2 of Fig. 1, showing the units in their connected positions;

Fig. 3 is an end elevational view of the electrical connector showing the relative positions of the units while being moved into or out of engagement with each other;

Fig. 4 is a vertical sectional view of one of the units, this view being taken along the line 4—4 of Fig. 5, and

Fig. 5 is a side elevational view of the electrical connector illustrated in conjunction with an electrical testing apparatus and an apparatus to be tested thereby.

Referring now to the drawing, attention is first directed to Figs. 1 to 4 inclusive, wherein the electrical connector is illustrated as being composed mainly of units indicated generally at 10 and 11. The unit 10 has an elongate hollow body or casing 14 in which there is disposed an insulating member 15 which is U-shaped in cross-section as illustrated in Fig. 4. A mounting strip 16, formed of a suitable insulating material, is disposed between the legs of the U-shaped member 15 in the casing 14 and is secured in place by suitable means such as screws 17. Sockets 18 are mounted in equally spaced apertures in the mounting strip 16, as illustrated in Fig. 1. The outer ends of the sockets, as indicated at 19, are flared outwardly to receive their respective plugs

2

20 of the unit 11. Electrical conductors 21 are connected, such as by soldering, to the inner ends of the sockets 18 and are housed in the hollow portion of the casing 14, particularly the insulating member 15 therein. The conductors 21 complete, or are parts of, a cable 22 which enters the casing 14 at one end thereof and is secured against displacement by a clamp 23 which is fixed to, or formed integral with, the casing 14. A plug 24 is fixed to the opposite end of the cable 22 and is provided with terminals 25 for electrical connection with their respective conductors 21.

The unit 11 has a hollow casing 28 with a mounting strip 29 of a suitable insulating material, closing the originally open end of the casing and secured in place by the aid of screws 30. Sleeves 31, having plugs 32 therein, are mounted in apertures in the mounting strip 29, as illustrated in Fig. 1, at positions adapted for alignment with their respective sockets 18 of the unit 10. The plugs 20, which are of the contour illustrated in Fig. 1, are movably disposed in the sleeves 31, and normally forced outwardly, through the aid of springs 33, and limited in their outward movement by inwardly turned edges 34 of their respective sleeves. Electrical conductors 35 are connected by suitable means, such as soldering, to their respective sleeves 31, these conductors extending into the casing 28 from a cable 36 held in place by suitable means, such as a winding 37 of wire about a bracket 38, the latter being fixed to the casing 28. The cable 36 is provided with a plug 40, terminals 41 of which are adapted, through the aid of a socket 42, to electrically connect the plugs 20 with predetermined circuits of a testing unit 44.

In the present embodiment the electrical connector provides the solution to a problem of including various portions of an electrical apparatus 45 in circuits to be tested selectively by the testing unit 44. The apparatus 45 is disposed in a housing 46 having an open front 47, to be closed by a cover 48, and an opening 49 in the rear wall thereof. In the present illustration it is necessary that the open front 47 of the housing be closed with the cover before the apparatus is tested. It is, therefore, necessary after connection is made through the aid of the plug 24 with a socket 50 of the apparatus, to move the unit 10 to a position outside the housing 46, so that accurate electrical connections may be made be-

3

tween the units of the apparatus and the various portions of the testing unit 44 after the cover 48 is secured in place, by any suitable means (not shown). The unit 10 is, therefore, provided with an integral clip 52, extending from one side of the casing 14, in the form shown particularly in Fig. 4, so that the unit 10 may be removably secured to the outer end of a tool or handle 53, provided with a gripping portion 54, which may be utilized in moving the unit 10 through the outlet 49 of the housing after the cable 22, particularly the plug 24 thereof, has been connected to the apparatus 45. A bracket 55, having a central portion 56 receivable by the clip 52, has leg portions 57 extending inwardly, through apertures in the housing 46, where they are secured, as at 58, to the apparatus 45.

The contours of the plugs 20 and their respective sockets 18 are such that the plugs will be permitted to enter the sockets given short distances, as illustrated in Fig. 1, sufficient for positive mechanical as well as electrical connections, these connections being limited, however, to permit relative movement of the units into and out of engagement with each other. Connecting elements 60 are mounted upon the casing 28 of the unit 11, as indicated at 61, the upper ends of the elements being hook-shaped, that is, bent, as illustrated in Figs. 2 and 3 and identified by reference numerals 63, to extend over and partially around the unit 10 when the units are connected. The elements 60 are spaced, as illustrated in Fig. 1, so that when the units are connected during the mounting of the unit 10 upon the bracket 55, the elements will cooperate with the bracket in holding the units against displacement with respect to each other and the bracket.

In connecting the units, attention is directed to Fig. 3, which illustrates the unit 10, connected, through its clip 52, with the bracket 55 and the plugs 20 positioned with their ends engaging their respective sockets 18. When in this position the plugs, that is, the springs 33 therefor, may be compressed to allow the ends 63 of the elements 60 to be positioned at the opposite side of the unit 10. The unit 11 may then be rocked about the connections of the plugs with their sockets, to move the elements 60, particularly the ends 63 thereof, from the position shown in Fig. 3 to the position shown in Fig. 2. When the units are connected, as shown in Fig. 2, the inwardly turned edges or ends of the elements 60 extend around the adjacent edge of the unit 10 and are disposed adjacent the central portion 56 of the bracket 55, to thus lock the units on the bracket against displacement. The units may be disconnected from each other and from the bracket 55 by reversing the movements described in connecting the units. In other words, suitable force may be applied to the unit 11 to move the overhanging ends of the elements 60 free of the adjacent edge of the unit 10, so that the rocking action of the unit 11, about the plug and socket connections, may be made to move the ends 63 of the elements 60 free of the unit 10. When the unit 11 has been removed from the unit 10, the latter is then free to be removed from the bracket 55.

Although a specific improvement of the invention has been shown and described, it will be understood that it is but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claims.

What is claimed is:

1. A connector comprising an elongate socket

4

unit with a casing having an open side, a U-shaped supporting bracket therefor having legs and a central portion, means carried by the casing for removably securing the casing to the central portion of the bracket, an insulating strip closing the open side of the casing and having spaced aligned apertures therein, sockets disposed in the apertures, an elongate plug unit having a casing with an open side, an insulating strip closing the open side of the last mentioned casing and having aligned apertures therein spaced comparable to the spacing of the sockets, spring-pressed contact plugs mounted in the last mentioned apertures, and a connecting element carried by the casing of the plug unit and formed to extend about the socket unit to secure the units together with their respective plugs and sockets interengaging.

2. A connector comprising an elongate socket unit with a casing having an open side, a U-shaped supporting bracket therefor having legs and a central portion, means carried by the casing for removably securing the casing to the central portion of the bracket, an insulating strip closing the open side of the casing and having spaced aligned apertures therein, sockets disposed in the apertures, an elongate plug unit having a casing with an open side, an insulating strip closing the open side of the last mentioned casing and having aligned apertures therein spaced comparable to the spacing of the sockets, spring-pressed contact plugs mounted in the last mentioned apertures, a connecting element carried by the casing of the plug unit and formed to extend about the socket unit and the central portion of the bracket to secure the units together with their respective plugs and sockets interengaging, and to secure the socket unit against removal from the bracket.

3. A connector comprising a unit having a plurality of aligned sockets therein, a U-shaped supporting bracket for the unit having legs and a central portion, a resilient clip fixed to one side of the unit for removably securing the unit to the central portion of the supporting bracket, a unit having a plurality of aligned spring-pressed plugs spaced for engagement with their respective sockets, and a connecting element mounted upon the plug unit and hook-shaped to extend partially around the socket unit through a relative rocking movement of the units during the compressing of the plugs and the relative rocking of the plugs and their sockets, to secure the units together.

4. A connector comprising a unit having a plurality of aligned sockets therein, a U-shaped supporting bracket for the unit having legs and a central portion, a resilient clip fixed to one side of the unit for removably securing the unit to the central portion of the supporting bracket, a unit having a plurality of aligned spring-pressed plugs spaced for engagement with their respective sockets, and a connecting element mounted upon the plug unit and hook-shaped to extend partially around the socket unit and the central bracket portion between the legs thereof through a relative rocking movement of the units during the compressing of the plugs and the relative rocking of the plugs and their sockets, to secure the units together, and to secure the socket unit against removal from the support.

FRED E. HARRIS.

ANDREW S. HEGEMAN, JR.

HARRY N. SNOOK.

(References on following page)

2,425,802

5

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,312,002	Schmitt -----	Feb. 23, 1943
468,654	Gibbs -----	Feb. 9, 1892
1,394,057	Woernley -----	Oct. 18, 1921
1,687,074	Wichert -----	Oct. 9, 1928
1,123,074	Bliss -----	Dec. 29, 1914

Number
2,217,219
2,145,949
2,258,269
2,265,341
2,271,463
2,354,598

5

Number
702,954
292,903

10

6

Name	Date
Field -----	Oct. 8, 1940
Obszarny -----	Feb. 7, 1939
Stoner et al. -----	Oct. 7, 1941
Borchert -----	Dec. 9, 1941
Reeves -----	Jan. 27, 1942
Janz -----	July 25, 1944

FOREIGN PATENTS

Country	Date
Germany -----	Feb. 20, 1941
Italy -----	1932