

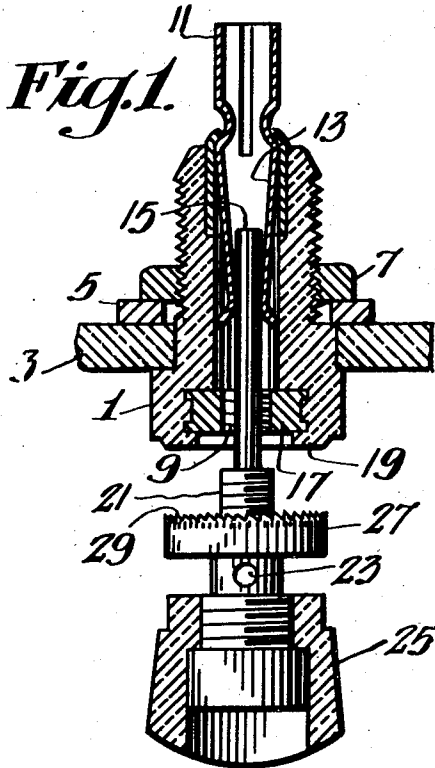
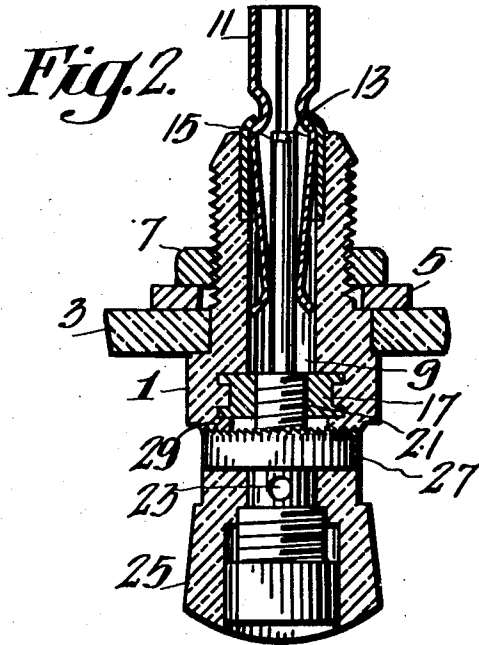
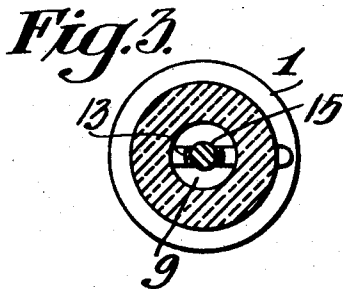
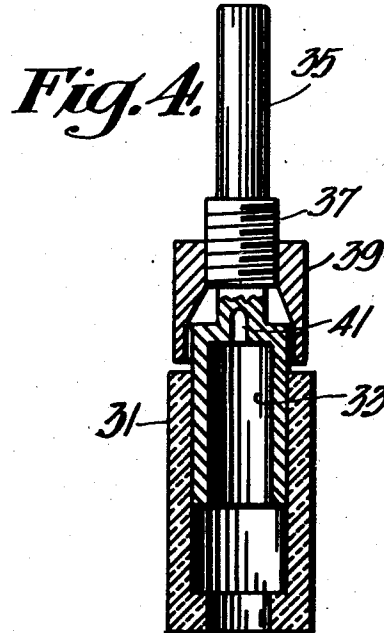
Oct. 14, 1947.

A. LIEBSCHER

2,429,026

JACK AND PLUG TYPE OF ELECTRICAL CONNECTOR

Filed Aug. 21, 1943



Inventor
Arthur Liebscher
31 *C. D. Muka*

Attorney

UNITED STATES PATENT OFFICE

2,429,026

JACK AND PLUG TYPE OF ELECTRICAL CONNECTOR

Arthur Liebscher, Philadelphia, Pa., assignor to
Radio Corporation of America, a corporation
of Delaware

Application August 21, 1943, Serial No. 499,521

1 Claim. (Cl. 173—363)

1
This invention relates to electrical connectors and particularly to improvements in connectors of the jack-and-plug (or "pin") type.

It is common practice to employ jack-and-plug type connectors in test equipment and other apparatus wherein the connections are subject to frequent change. Such connectors, however, are not always desirable since the cords to which the plugs are attached may introduce electrical losses which result in false readings. In such cases the preferred practice has been to provide auxiliary binding posts as connectors used for making measurements involving the resistive properties of the device under test. This duplication of both male and female connectors necessitates the use of additional internal wiring and therefore contributes materially to the complexity and cost of the equipment.

Accordingly, it is an object of the present invention to provide a combined binding post and pin jack connector.

Another and important object of the invention is to provide an improved jack adapted to receive either a plug (or "pin") or a binding post and one capable of retaining the said plug, pin or post either in locked or unlocked engagement.

A related object of the present invention is to provide an improved solderless plug type connector which is capable of being locked within the jack, and one nevertheless characterized by the simplicity and economy of its parts.

Other objects and advantages will be apparent and the invention itself will be best understood by reference to the following specification and to the accompanying drawing, wherein

Fig. 1 is a sectional elevation of a plug connector comprising a jack and a removable binding post, constructed in accordance with the principle of the invention and showing the binding post in its unlocked position within the jack,

Fig. 2 is a sectional elevation of the device of Fig. 1 showing the binding post in its locked position,

Fig. 3 is a cross-section view taken on the line 3—3 of Fig. 1, and

Fig. 4 is a sectional elevation of an alternative form of plug for use with the jack of Figs. 1 and 2.

In the jack and binding post assembly shown in Figs. 1 to 3, inclusive, the jack 1 comprises a molded tubular shell constituted of insulating material and is shown clamped to a panel 3 by means of a conventional lock washer 5 and nut 7. The bore of the jack is designated 9; it contains a tubular or equivalent type of conductor 11 hav-

2
ing spring metal jaws 13 which are biased to engage at least the leading portion of the rod, pin or plug 15 of the binding post or other connector which it is designed to serve.

This more or less standard jack 1 is provided, in accordance with the invention, with an internally threaded annulus or nut 17 which is immovably embedded in the head of the jack slightly beneath the plane of its outer face 19 and surrounding the axis of the bore 9. The internal diameter of this nut 17 is substantially greater than the diameter of the plug 15 so that the leading end of the plug may be readily passed through into and out of engagement with the jaws 13 of the spring metal connector 11. As will hereinafter more fully appear, this internally threaded insert 17 cooperates with a complementarily threaded fixture 21 on the plug 15 whenever it is desired to "lock" the plug within the jack.

As in standard practice, the binding post portion of the plug shown of Figs. 1 and 2 is provided with a hole 23 for receiving a wire or other external lead, not shown. A captive head or knob 25 on one side of the hole 23 and an immovable flange or rim 27 on the plug side of the hole comprise opposing surfaces between which the said external lead is clamped when the head 25 is screwed down on the post. The externally threaded part 21 which engages the internally-threaded embedded nut 17 (when the plug is inserted sufficiently far into the bore of the jack) is on the plug side of the flange 27 and, like the said flange, is secured against rotation on and with respect to the plug. It will be observed that flange 27 is knurled as indicated at 29 on the side which faces the jack and this knurled or roughened face 29 is brought into positive frictional engagement with the non-metallic surface 19 of the jack when the fixture or sleeve 21 on the trailing end of the prong 15 is screwed up on the nut 17 by turning the knob 25 as far as it will go in the clockwise direction. When the knob or head 25 is turned in the counter-clockwise direction the knurled face 29 of the flange 27 remains in engagement with the face 19 of the jack until the hole 23 in the binding post is exposed. This permits the connector in the said hole to be changed without removing the plug from the jack. The application of a slightly greater torque to the knob 25 than is required to expose the aperture 23 causes the plug 15 and the threaded sleeve 21 thereon to be turned within the jack and with respect to the embedded nut

17 so that, when the said sleeve is unscrewed, the plug can be pulled out of the jack.

Fig. 4 shows a standard cord-type connector which has been modified in accordance with the invention to provide means for locking it within the bore of the jack of Figs. 1 and 2. The connector here illustrated comprises an outer insulating cylinder 31 and an inner hollow metal cylinder 33 which extends beyond the end of the insulating cylinder 31 and terminates in a solid rod-like plug 35, which is provided adjacent to its trailing end with an integral externally threaded fixture 37 upon which a hollow cap 39 having complementary internal threads is mounted. To apply this plug to a cord or wire (not shown), the end of the cord is entered into the open ends of the cylinders 31 and 33 and passed through an aperture 41 in the exposed end of the inner cylinder 33, whereupon the cap 39 is screwed down on the threaded portion 37 of the plug to cover the said connection. In accordance with the present invention, the fixture 37 on the plug of this otherwise standard connector is made sufficiently long to permit it to be entered into the threaded nut 17 which is embedded in the jack 1 (Figs. 1 and 2) and its diameter and threads are so dimensioned that the said fixture cooperates with said nut to secure the plug within the bore of the jack in the manner previously described.

From the foregoing it will be apparent that the present invention provides an improved jack-and-plug type connector wherein the jack is adapted to receive either a plug, or pin, or binding post and is capable of retaining the said plug, pin or post either in locked or unlocked engagement.

What is claimed is:

In combination, a jack comprising a body portion constituted of insulating material and having a bore adapted to receive a plug, a conductive connector for said plug mounted within said bore, an annulus having an internally threaded surface of a diameter greater than that of said plug embedded beneath the face of said insulating material adjacent to the entrance of said bore, a plug having a captive head on its trailing end and a leading rod-like portion adapted to be thrust into said bore through said annulus into engagement with said connector, a threaded projection on the outer end of said rod-like portion for engagement with said internally threaded annulus, and a flange intermediate said threaded projection and said captive head, said flange having a knurled surface on the side facing said jack and adapted to be brought into frictional engagement with the said insulating face of said jack when said plug is rotated to bring its said threaded projection into engagement with said internally threaded annulus.

ARTHUR LIEBSCHER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,253,223	Blake	Aug. 19, 1941
1,168,019	Liversidge	Jan. 11, 1916
2,049,749	Roth	Aug. 4, 1936
2,253,223	Blake	Aug. 19, 1941
1,653,029	Yaxley	Dec. 20, 1927