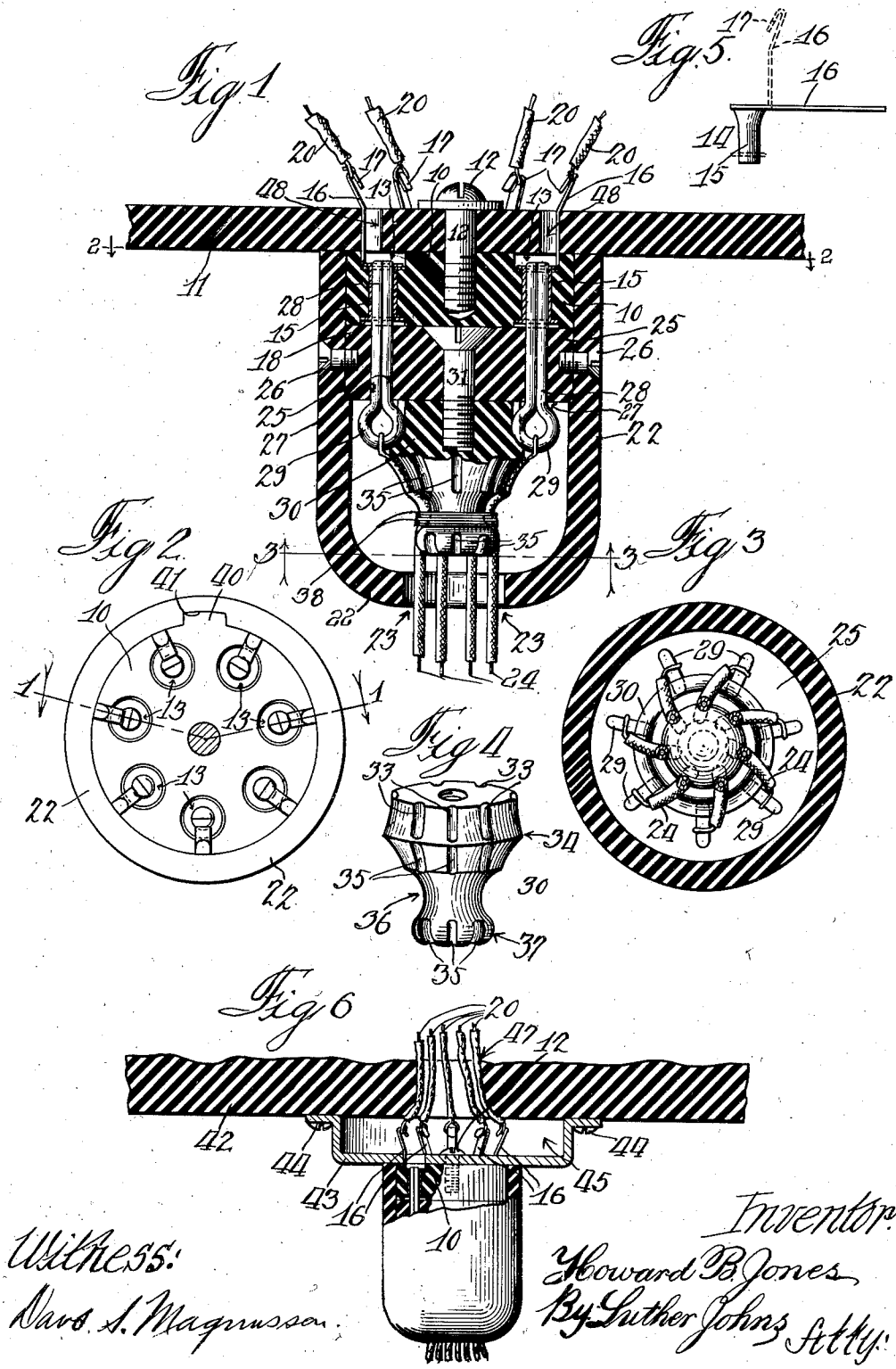
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H. B. JONES

ELECTRICAL CONNECTION DEVICE

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UNITED STATES PATENT OFFICE.

HOWARD B. JONES, OF EVANSTON, ILLINOIS.

ELECTRICAL CONNECTION DEVICE.

Application filed August 28, 1922. Serial No. 584,901.

To all whom it may concern:

Be it known that I, HOWARD B. JONES, a citizen of the United States, residing in Evanston, Cook County, Illinois, have invented certain new and useful Improvements in Electrical Connection Devices, of which the following is a specification.

These improvements relate to electrical connection devices of the plug-and-socket type according to which the desired contacts are made and broken by push and pull movements of the operator. Such devices broadly are well known and the present advance is largely in features of construction and arrangement of parts. From the construction herein illustrated as a preferred embodiment of the improvements such objects and advantages are had as a notably low cost, simplicity of parts, ease in assemblage, permanency and security of connections, and the important fact that a materially large number of contact elements may be assembled in relatively small space for simultaneous use.

Figure 1 of the drawings is a sectional view as on the broken line 1—1 of Fig. 2; Fig. 2 is an end view as on the line 2—2 of Fig. 1; Fig. 3 is a transverse sectional view as on the line 3—3 of Fig. 1; Fig. 4 is a perspective of what I term a pin-holding member which is shown partly in section in Fig. 1; Fig. 5 is a side view of a well-known form of eyelet used by me in the device as a socket element; and Fig. 6 is a view partly in medial vertical section showing an auxiliary mounting useful in certain kinds of work.

The device comprises two principal parts—a socket member and a plug member. The socket member is shown as a circular disc 10 of insulating material held upon the board, instrument panel or other structure 11 by the screw 12, the screw terminating short of the inner surface of the disc 10 whereby the insulation there is maintained. The disc 10 is bored with a plurality of parallel holes 13 arranged substantially in a circle, as well shown in Fig. 2, the holes being enlarged at the ends respectively and each being adapted to receive one of the eyelets 14 shown in Fig. 5. These eyelets respectively have a body part 15 and an integral stem 16, and in my use of them the stem is bent in line with the body part and formed at the end with the hook 17. They are made of brass and can be purchased at small cost in the open market. After being positioned in the holes 13 respectively their end portions are swaged outward by an ordinary riveting operation and these socket elements 14 are thus securely held in place. Conduit wires 20 may be secured to the hooks 17 by looping the wires around the hooks and applying solder.

The plug member includes first a housing 22, shown as cylindrical and having one end open adjacent to the panel or other structure 11, the open end encompassing the disc 10 with a snug fit for ready application to and withdrawal therefrom. The outer end of the housing may be rounded for appearance as shown and is provided with an aperture 23 for conduit wires 24. A supporting member 25 in the form of a disc of insulating material is positioned so as substantially to come against the socket member 10 when the parts are operatively assembled as in Fig. 1. Screws 26 hold the supporting member 25 rigidly yet in readily removable relation to the housing. This supporting member 25 is bored or otherwise formed with a plurality of holes 27 directed toward the open end of the housing, substantially parallel with each other and circularly arranged, these holes 27 being so positioned as to be directly opposite the socket elements 14 respectively. A plurality of contact stems or plug elements 28, each having a head 29, extend through these holes 27 with the heads 29 on the side of the supporting member 25 which is farthest from the open end of the housing, and with the free ends of the stems projecting into the socket elements respectively when operatively connected as in Fig. 1. In my practice these plug elements 28 are ordinary brass cotter pins, and the tendency of their free ends to spread provides for a snug fit at all times between the pins and the socket elements with which they interfit for sliding movement. Such cotter pins are very cheap and to be had in the open market.

Means for holding the plug elements 28 for ready removability are shown as a locking member 30, Fig. 4, which is rigidly held for ready removability by the screw 31, Fig. 1, to the pin-holding member 25. This member 30 has a plurality of recesses 33 adapted to receive the heads of the cotter pins respectively and prevent their turning. The member 30 has also an enlarged part at 34 which overhangs the heads of the pins and holds the pins against longitudinal movement out of the holes 27. Recesses 35 between the lines extended of the recesses 33 are also formed in the holding member 30,

and these recesses 35 are adapted to receive the conduit wires 24. The holding member 30 has a reduced or neck portion at 36 resulting in a head 37 at the end of the member 30. When the wires 24 are connected to the heads as 29 of the plug elements a winding of cord 38 binds the wires tightly in the neck portion 36 whereby pulls upon the wires intended to separate the contact elements will be communicated to the strongly-secured parts and not to the soldered connections between these wires 24 and the heads as 29 respectively.

From Fig. 2 it will be noted that the socket member 10 is provided with a projection 40 on its periphery and that the housing 22 has an interfitting recess 41, this provision insuring that the plug member may never be so applied to the socket member as to make a wrong connection.

In Fig. 6 the structure 42 may be considered a wall, a base board, a switchboard or a panel of an electrical instrument. The departure in this figure from what has already been described is in the provision of the auxiliary support 43, which is shown as a cup-shaped element readily secured by screws 44 to the structure 42. A space 45 is thus provided for the ends of the wires 20 and the ends of the connection strips or terminals 16. The member 43 may be of hard rubber or other insulating material. The screw 12 secures the parts 10 and 43 readily separably together. This construction is highly advantageous where it is feasible or desirable to bore only one hole as 47 in the structure as 42.

In view of this description some more specific advantages and objects of these improvements may be pointed out. The present form illustrated is designed more particularly for use in radio telephone receiving set panel construction, and provides for seven contacts which may be made or broken simultaneously by a single simple movement of the hand. The likelihood of getting the connections mixed is entirely overcome and means are thus afforded for easily and quickly doing what is ordinarily a tedious operation. Furthermore, the person setting up such an instrument is ordinarily not equipped for boring relatively large holes in the panel, such as ordinarily are required, and according to these improvements he may bore only relatively small holes such as seven holes 48, Fig. 1 and for the screw 12. An important feature of the construction is its relatively small size. According to my practice the outside diameter of the housing 22 is only one and one-quarter inches. This makes for an unusually neat appearance of the switchboard or panel and saves much space thereon. Numerous advantages arise in installation of the device. The terminal members 16 and their hooks 17 are substantially widely spaced apart and can be bent down flat against the panel, and thus sufficient space is provided between them for soldering operations for connecting the wires to them respectively. The socket member 10 occupies but little space on the board and presents a neat appearance when the plug member is disconnected from it. The housing of the plug member protects the ends of the pins 28 so that contact by the pins with some other object to produce a short circuit is not likely to occur. Importantly, the soldering of the wires 24 to the heads of the pins may be done before the parts are assembled, the connections cleaned of all substances likely to produce corrosion, and the heads may then be brought very close together and yet be held apart by the locking member 30. Repairs may readily be made through disconnecting the several parts.

Reference should be had to the appended claims to determine the scope of the improvements herein set forth.

I claim:

1. In an electrical connection plug of the character described, the combination of a disc-like supporting member of insulating material having apertures therethrough substantially parallel with the axis thereof for accommodating contact stems, a headed contact stem in the form of a cotter pin loosely positioned in each of said apertures with the heads of said stems on the inner side of the supporting member, a housing of insulating material including a tubular part having an open end adapted to receive a socket member encompassing said supporting member and stems with the supporting member intermediate the ends of the housing and held readily removably therein, said stems terminating short of but close to the open end of the housing while extending materially beyond the outer surface of the supporting member, means for holding said stems against inward movement, and means carried by the supporting member for binding wires thereagainst, the end of the housing opposite said open end having an aperture for wires.

2. In an electrical connection plug of the character described, the combination of an open-ended housing, a supporting member readily removably carried within said housing and having a plurality of substantially parallel apertures therein for contact stems, the open-end portion of said housing extending materially beyond said supporting member to form a pocket adapted to receive a cooperating socket member, a plurality of contact stems, one thereof being in each of said apertures, said contact stems extending close to the plane of the open end of said housing member, means for holding said contact stems readily removably in said

apertures respectively, and means within the housing for holding wires leading to the contact stems to communicate pull strains upon the wires to the device as a whole.

3. In an electrical connection device of the character described, the combination of an open-ended substantially cylindrical housing, a supporting member readily removably and rigidly secured within said housing, said member having a plurality of substantially parallel apertures substantially circularly arranged and directed longitudinally of the housing, a plurality of headed pins directed toward the open end of the housing and extending through said apertures, there being one pin in each aperture, the heads of the pins being on the inner side of said supporting member, a member readily removably mounted on said supporting member for holding said pins readily removably in said apertures respectively, the housing having an aperture for conduit wires adjacent to said pin-holding member, and means for holding such wires firmly to said pin-holding member to communicate pulling strains thereon to said housing and associated parts, said housing having an open end formed to receive a socket member adapted to interfit slidingly with said housing at the open end thereof.

4. In an electrical connection plug of the character described, the combination of an open-ended housing, a supporting member rigidly positioned within and intermediate the ends of the housing, said member having a plurality of substantially parallel apertures directed longitudinally of the housing, a plurality of headed contact stems extending readily removably through said apertures, there being one stem in each of said apertures, said stems extending toward the open end of the housing with the heads of the stems on the side of the supporting member which is farthest from the open end of the housing, and means carried by said supporting member for holding said stems readily removably in said apertures respectively.

5. In an electrical connection plug of the character described, the combination of an open-ended housing, a supporting member rigidly positioned within and intermediate the ends of the housing, said member having a plurality of substantially parallel apertures directed longitudinally of the housing, a headed contact stem in and extending through each of said apertures, a clamping member for contacting the heads of said stems to hold the stems in said apertures respectively, said clamping member being formed with a portion against which conduit wires leading to said heads respectively may be tightly bound.

6. In an electrical connection plug of the character described, the combination of a substantially cylindrical open-ended housing, a supporting member readily removably positioned rigidly within and intermediate the ends of the housing, said member having a plurality of substantially parallel apertures substantially in circular arrangement and directed longitudinally of the housing, a plurality of headed contact stems extending through said apertures, one stem being in each aperture, with the heads of the stems on the inner side of the supporting member, a substantially-centrally-arranged clamping member carried rigidly and readily removably by said supporting member on the inner side thereof, said clamping member being adapted to engage the heads of the stems to hold them in position for use, said clamping member also being formed to have conduit wires secured thereto.

7. In an electrical connection device of the character described, the combination of an open-ended substantially cylindrical housing, a supporting member readily removably and rigidly carried within and intermediate the ends of the housing, a plurality of cotter pins extending through said apertures, one pin being in each aperture, the pins being directed toward the open end of the housing and being substantially parallel with each other, and means on the inner surface of said supporting member for engaging the heads of the pins and holding them against retraction in said apertures.

HOWARD B. JONES.