

Jan. 12, 1943.

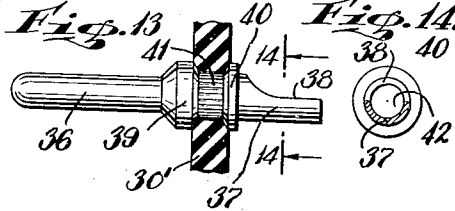
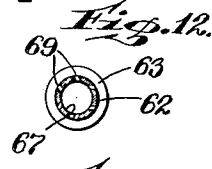
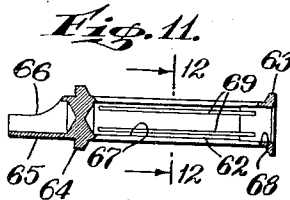
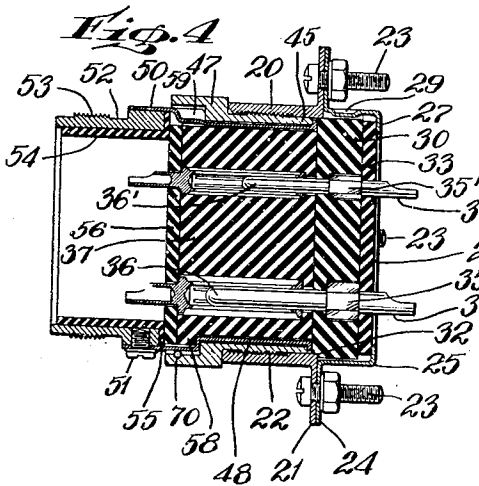
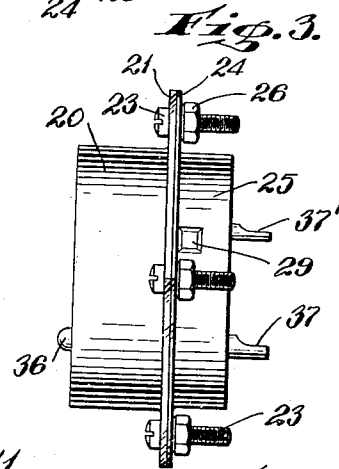
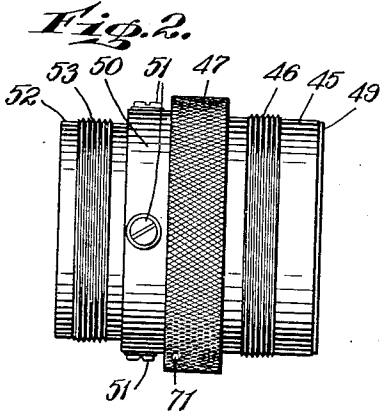
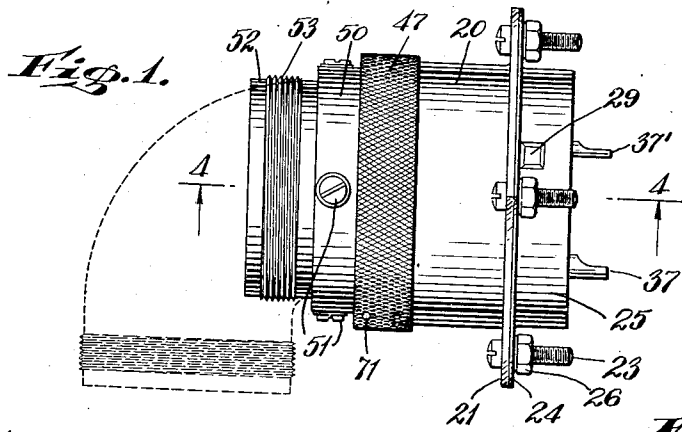
K. G. STRUNK

2,307,972

ELECTRICAL CONNECTOR

Filed Dec. 22, 1941

2 Sheets-Sheet 1



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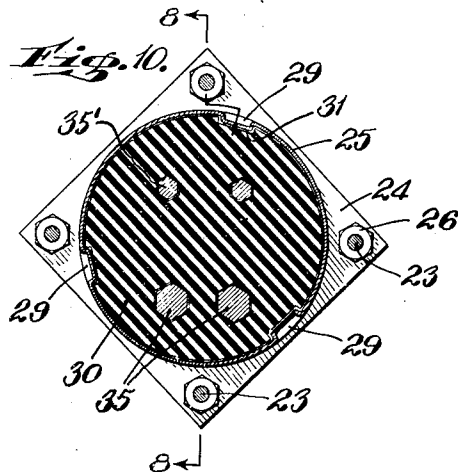
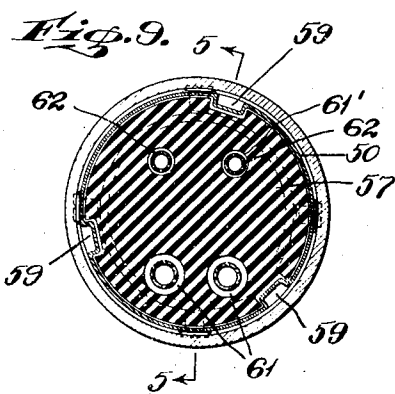
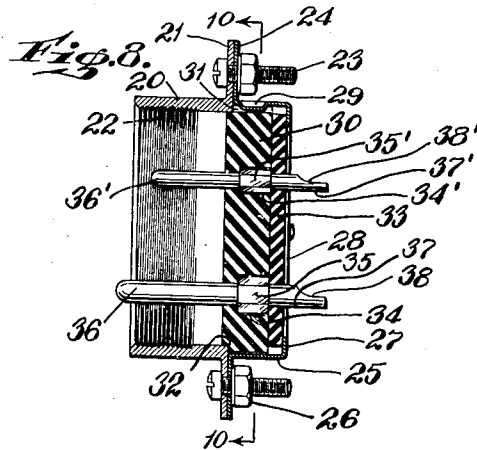
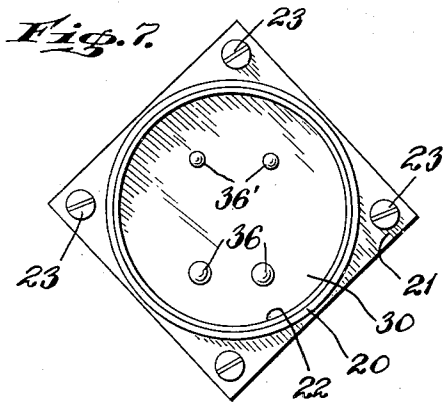
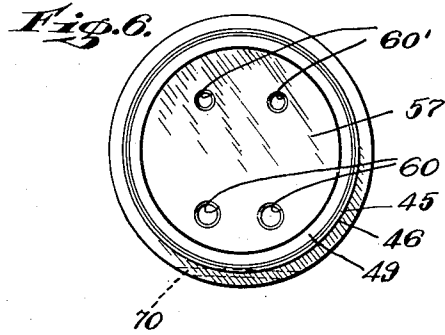
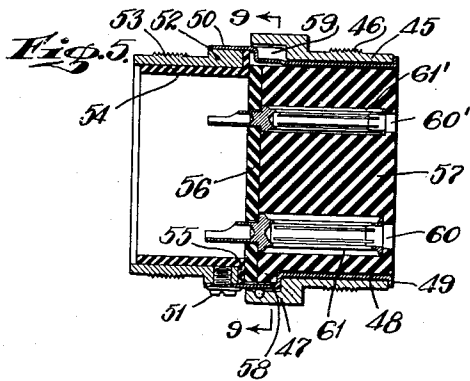
K. G. STRUNK

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ELECTRICAL CONNECTOR

Filed Dec. 22, 1941

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,307,972

ELECTRICAL CONNECTOR

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poration of New Jersey

Application December 22, 1941, Serial No. 424,027

6 Claims. (Cl. 173—328)

This invention relates to electrical connectors, particularly to a type adapted for use where a plurality of wires are contained in a single, radio shielded conduit.

An object of the invention is to provide an electrical connector for two or more pairs of cable ends, in which each pair may vary in amperage from the others.

A further object is to provide a connector which will continue and complete the radio shielding between two sections of cable which the connector joins.

A further feature is in the provision of a connector, capable of rapidly joining or disjoining an electrical cable in an easy and efficient manner, by manual operation only, no tools being required.

Another object is to produce a compact, light weight, junction box composed of two main, manually separable parts, each containing portions of the elements required.

These and other advantageous aims are accomplished by the novel and practical construction, combination and arrangement of the few and simple parts hereinafter described and illustrated in the accompanying drawings, constituting a graphical component of this disclosure, and in which:

Figure 1 is a side elevational view of a complete embodiment of the invention.

Figure 2 is a side elevational view of one of the separable elements.

Figure 3 is a similar view of the coaxing element.

Figure 4 is a longitudinal sectional view taken on line 4—4 of Figure 1.

Figure 5 is a longitudinal sectional view taken substantially on line 5—5 of Figure 9.

Figure 6 is a front elevational view of the parts shown in Figure 5.

Figure 7 is an end view of the parts shown in Figure 8.

Figure 8 is a longitudinal sectional view taken on line 8—8 of Figure 10.

Figure 9 is a transverse sectional view taken on line 9—9 of Figure 5.

Figure 10 is a similar sectional view taken on line 10—10 of Figure 8.

Figure 11 is a longitudinal sectional view showing the form of socket used in the device.

Figure 12 is a transverse sectional view taken on line 12—12 of Figure 11.

Figure 13 is a side view of a modified form of plug engageable in the socket.

Figure 14 is a transverse sectional view taken on line 14—14 of Figure 13.

Referring in greater detail to the drawings, the numeral 20 designates a metal sleeve having a rectangular base flange 21, and is provided with an internal screw thread 22 in its end opposite the flange.

Passing through openings in the corners of the flange, are screws 23 by which the device may be secured in location; the screws also pass through similar flanges 24, formed in a relatively thin, sheet metal housing 25, which is firmly connected to the flange 21 by nuts 26 adjustable on the screws 23. The outer intumed flange element 27 of the housing contains a circular opening 28, and in the cylindrical wall of the housing are formed, at equally-spaced intervals, three in-reaching nodes 29.

A molded base block 30 is disposed in the housing, the block being substantially a disc of insulative material, having in its periphery a series of notches 31 interchangeably engageable with the nodes 29. This base block is further provided with an annular, corner recess 32 to engage the corresponding inner corner of the sleeve 20, and is held firmly in adjusted position thereto by the block 30; a non-conductive washer 33 is held against the block 30 by reason of the intumed flange 27 of the housing 25.

The base block 30 has formed in its face, opposite the shoulder recess 32, two or more pairs of recesses 34—34' of hexagonal cross section, adapted to loosely receive the large collar portions 35—35' of connector plugs 36—36' which are held in the recesses by the washer 33.

The plugs 36—36', which are integral with the collars, extend through the block into the chamber within the sleeve 20; these plugs may be of different diameters in order to accommodate currents of different amperage. Extending opposite to the plugs are hollow terminal stems 37—37' adapted to receive the entering end of cables and are cut away, as at 38—38', in order to facilitate soldering the ends of the cables therein.

In the modification shown in Figures 13 and 14, the plugs are formed with collars 39 and 40, having bevelled shoulders, respectively front and rear, while therebetween are reduced connecting elements 41, coarsely knurled longitudinally to have molded upon them a base block 30', similar to that before described.

The cut-away portion 38 extends from the end towards the enlarged portion to substantially half the diameter of the stem.

The opposite, main element, shown best in Fig-

ures 2, 5 and 6, comprises a metallic sleeve 45, provided with external threads 46 midway its length adapted to engage the threads 22 of the mating element. This sleeve has its inner end 47 enlarged and provided with a knurled surface by which it may be conveniently adjusted by hand.

Inside the sleeve 45 is a sheet metal lining 48 having an annular outturned flange 49 at its outer end, while its opposite inner end is expanded in diameter and extended in length forming a thimble 50, held by screws 51 to an outer sleeve 52 provided midway in its length with screw threads 53.

This sleeve contains an insulating bushing 54 having an outstanding flange 55, abutting the inner, larger end of the outer sleeve 52.

Adjacent the flange 55 is an insulating washer 56, having peripheral notches held from rotation by inreaching nodes formed with the lining 50.

Juxtaposed against the washer 56 is a circular dielectric block 57 having an enlarged collar 58 contacting the washer, and recessed at intervals in its periphery to engage the nodes 59 of the lining 48, in which it is snugly surrounded.

In the block 57 are pairs of bores 60—60', counter-bored as at 61—61', in their ends adjacent the washer 56, while the washer 56 is similarly bored in alignment with the openings 60—60'.

Disposed in these openings are sockets, shown in detail in Figures 11 and 12, which consist of a conductive tube 62, its inner end 63 enlarged to fit the counter-bores 61—61', and closed at their opposite outer end 64, also enlarged to fit the bore and provided with bored extension 65 cut away upon one side, as at 66, similar to the stems 37, to receive cable terminals, which are soldered therein.

The thin walled main central section of the socket 62 has a longitudinal bore 67, enlarged at its outer open end, as at 68; the entire tube, between its enlarged ends is provided with a plurality of slots 69, preferably arranged obliquely or tangentially to the axis of the socket. The bore 67 of the socket is slightly less in diameter than the diameter of the plug 36 which, however, freely enters the portion 68 of the socket and then comes in frictional, resilient contact with the main bore, which, as will be seen, is in the form of longitudinal strips of metal which cooperate in providing a maximum contact area between the plug and socket.

A small hole 70 passes tangentially through the knurled sleeve 47 by which a wire 71 may be passed to impinge upon the periphery of the lining thimble 50 preventing relative rotary movement.

From the foregoing, it will be obvious that the plugs are readily removable, making the placement easy and are so arranged as to prevent the heat of soldering from damaging the insulating material.

The block 57 and washer 56, containing the sockets may be rotated within the sleeve 45 in order to obtain alignment with the matching plugs in the block 30, and it is to be noted that the sockets are as readily removable as the plugs.

The adapter or junction box need not necessarily be straight, but may be constructed with an angle elbow to provide an angular take-off for the cable as indicated in Figure 1.

When a right angular adapter is employed, the two holes in the base housing flange 24 permit four positions of take-off for the cable, and by shifting the position of the molded block 57 from

one to another of its four detent positions, at least twelve take-off directions are possible.

Having thus fully described the invention, and set forth the manner of its construction and application, together with its manifest advantages, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. An electric connector comprising a pair of sleeves threadedly connected, a flange on one of said sleeves having locating means adjustable into a plurality of different axial positions, a housing in the last named sleeve, a dielectric block rotatively adjustable in said housing, one or more pairs of conductor plugs extending through said block, each having means for connection with the end of an electric conductor, a dielectric block rotatively adjustable in the first named sleeve, a lining intervening therebetween, pairs of conductive sockets set in the last named block in register with said plugs, each socket having means for connection with the opposite end of an electric conductor, means to prevent short circuiting conductors connecting with said sockets, and means to retain said lining and block in adjusted position therein, relative to its enclosing sleeve.

2. An electric connector comprising a pair of sleeves threadedly connected, a flange on one of said sleeves having locating means adjustable into a plurality of different axial positions, a housing fixed in the last named sleeve and having a plurality of inreaching nodes, a dielectric block in said housing, said block having peripheral recesses to receive said nodes in selectively adjustable positions, solid conductive plugs arranged in pairs in said block, a lining in the other of said sleeves, said lining provided with inreaching nodes, a dielectric block in said lining having peripheral recesses adjustably engageable with said nodes, an extension on said second sleeve beyond said block having an insulating bushing therein, tubular sockets in said second block receptive of said plugs, the wall of said sockets being truly cylindrical and latticed to elastically bind on entered plugs, and semicircular hollow outer ends on said plugs and sockets adapted to facilitate securing cable terminals therein.

3. In an electric connector, the combination with a pair of casing sleeves having means for connection and a dielectric block rotatively adjustable in each sleeve, one or more solid cylindrical conductor plugs loosely engaged in one of said blocks directed towards the other block and having oppositely disposed hollow stems in which to secure the terminals of electric conductors, hollow thin walled straight tubular conductor sockets set in the mating block in register with said plugs, said sockets having an internal diameter slightly less than the diameter of the plugs, the ends of said sockets being increased in diameter over the main tubular portion therebetween, a plurality of spaced, longitudinal kerfs in said main portion, the intermediate portion of the wall constituting resilient bars to tenaciously engage an entered plug, and hollow stems on said sockets opposed to the tubular portions in which to secure the opposed ends of entering cables.

4. In an electric connector, the combination with a pair of casing sleeves having means for axial engagement and a dielectric block rotatively adjustable in each sleeve, one or more solid cylindrical conductor plugs loosely engaged in one of said blocks, a dielectric washer to retain said plugs in the block, conductor sockets set in the other of said blocks in register with said plugs, said sockets having end portions to fit openings

in said second block and thin walled connections therebetween, the bore of said sockets being of lesser diameter than that of the plugs, said bore enlarged at the entrance end, said connections being formed to present a plurality of longitudinal slots thereby to produce resilient strips to tightly embrace a plug entered therein, and means on the outer ends of said plugs and sockets to facilitate secure entered cables therein.

5. In an electric connector, a solid cylindrical conductive plug having means for engagement with an end of a conductor, and a conductive socket having means for engagement with the end of a matched conductor, said socket having a bore less in diameter than that of said plug, its ends rigid and its intermediate length longitudinally incised tangentially of its bore to present resilient striations to bind on an entered plug.

6. In an electrical connector, a plug having a cylindrical main enterable portion and a diametrical enlargement opposite thereto containing a conductor receiving axial bore, said enlargement being open on one side to half its diameter throughout the greater portion of its length, means intermediate said main portion and enlargement to retain the plug immobile when assembled, a socket having rigid end portions, a thin walled cylinder intervening of slightly lesser internal diameter than the plug, the bore of said cylinder being of increased diameter at its entrance end, a plurality of narrow slots in the wall of said cylinder disposed longitudinally thereof and tangential to the bore, and a conductor receiving member on said socket corresponding to that of said plug.

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