

March 19, 1968

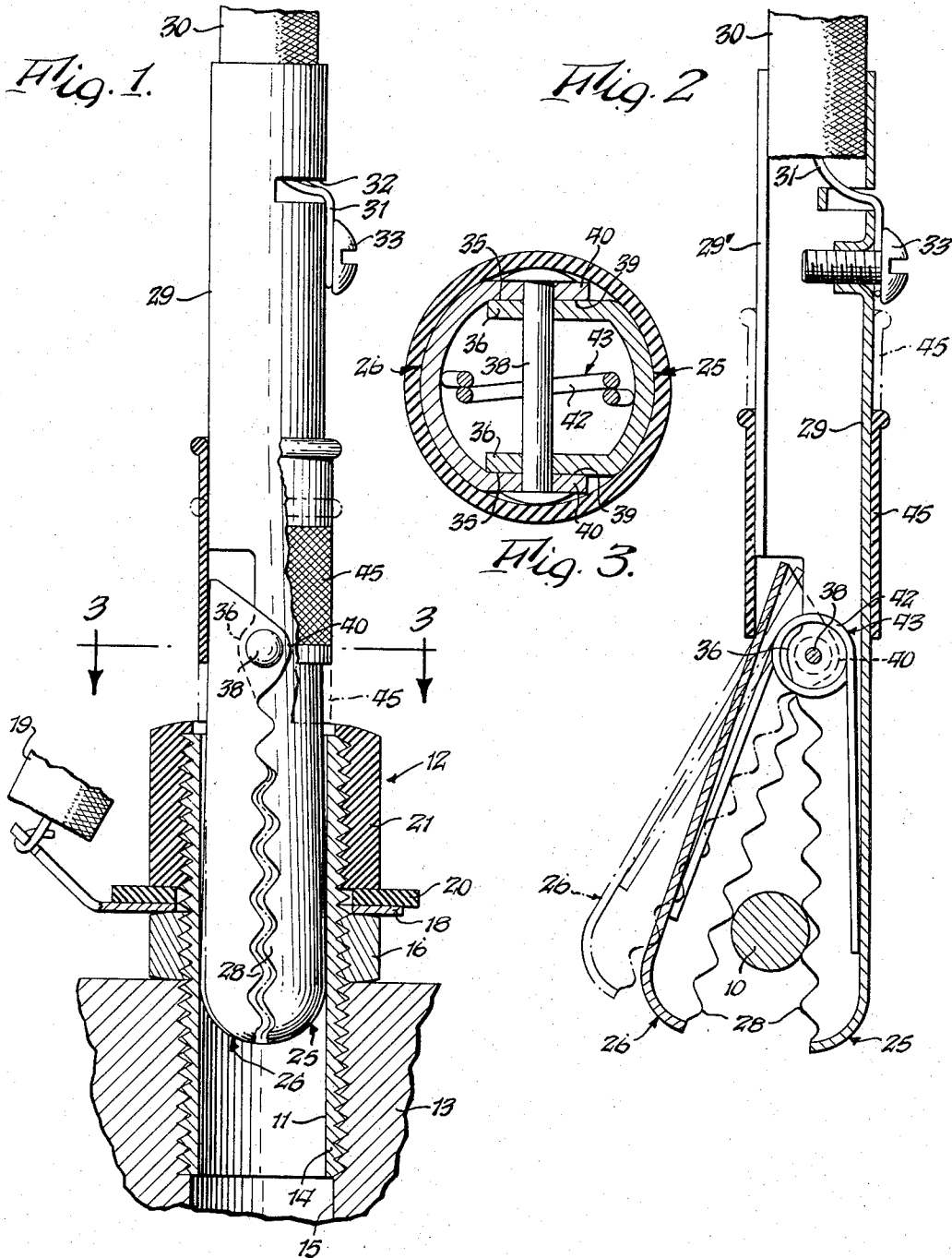
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3,374,455

ELECTRICAL CONNECTOR

Filed Oct. 21, 1965

2 Sheets-Sheet 1



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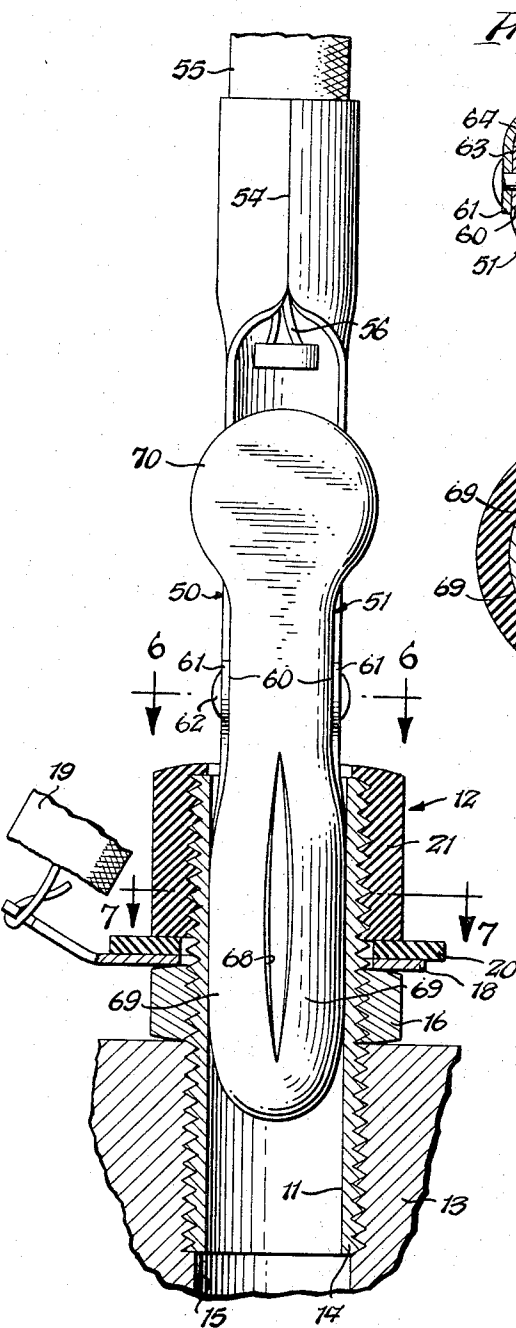


Fig. 4.

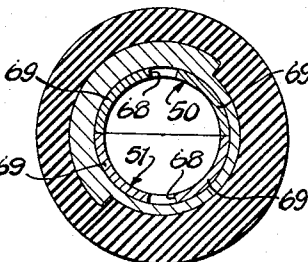
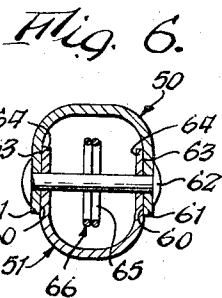


Fig. 7.

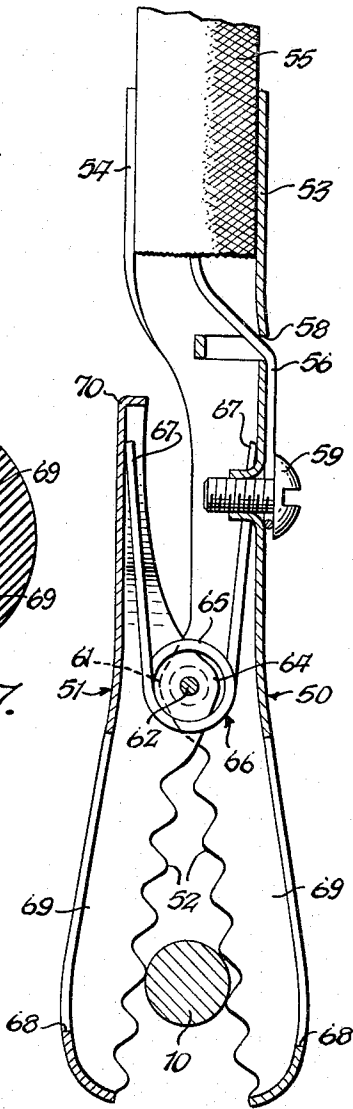


Fig. 5.

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ELECTRICAL CONNECTOR

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2 Claims. (Cl. 339—31)

ABSTRACT OF THE DISCLOSURE

The test connector is adapted for both male and female electrical parts and has a tubular metal body adapted to be connected to an electrical test line and with one end extended along one side of its axis to provide an integral channel-shaped fixed jaw with its concavity facing this axis and its edges provided with teeth to engage a male electrical part. A movable channel-shaped jaw has its inner end pivoted to the base of the fixed jaw to swing on an axis perpendicular to the said first axis and has teeth mating with the teeth of the fixed jaw. The jaws, when closed, jointly are of cylindrical form to fit into the female part. The jaws are biased to their open position and manually operable means are provided for moving them toward each other. These manually operable means can be in the form of a sleeve slidable on the body portion over the exterior movable jaw or can be an extended finger piece at the base of the movable jaw.

This invention relates to a readily attachable and detachable electrical connector, and the principal object is to provide such a connector which can be attached to the exterior of a male electrical part and can also be inserted in the bore of a female electrical part and in either case obtain and maintain good electrical contact therewith.

Other objects are to provide such a connector which in either case can be readily applied, which is low in cost and which will stand up under conditions of severe and constant use without getting out of order.

In the drawings, FIG. 1 is an enlarged side elevational view of one form of connector embodying the invention, showing the same inserted in and in electrical contact with the bore of an electrical socket. FIG. 2 is a similar view showing the same connected with the exterior surfaces of a wire. FIG. 3 is a transverse section taken on line 3—3, FIG. 1. FIGS. 4 and 5 are views similar to FIGS. 1 and 2, respectively, and illustrating a modified form of the invention. FIGS. 6 and 7 are transverse sections taken on the correspondingly numbered lines of FIG. 4.

Both forms of the invention include a pair of connected jaws having opposing surfaces adapted to engage the exterior of a male electrical part, such as a bare part of an electrical wire 10, FIGS. 2 and 5, and having opposite external surfaces adapted to engage the bore 11 of a female electrical part such as a terminal socket 12 mounted on a dielectric base 13. The socket 12 shown is conventional, comprising an external threaded metal sleeve 14 screwed into a bore 15 in the base 13 and held therein by a lock nut 16 against which a ring-shaped terminal 18 of an electrical wire 19 is held by a dielectric washer 20 and nut 21.

The form of the invention illustrated in FIGS. 1—3 comprises a pair of elongated sheet metal, channel-shaped alligator jaws 25 and 26, the opposing surfaces of which are in the form of interfitting rounding teeth 28 along the opposing edges of the jaws. The inboard ends of the jaw 25 is in the form of a cylindrical split sleeve 29, the split or seam of which is indicated at 29'. The insulation 30 of an electrical wire 31 is shown as snugly fitted in the bore of the sleeve 29 and as extending through an

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opening 32 to the exterior thereof and electrically connected thereto by a screw 33. Between the sleeve 29 and teeth 28, the opposite sides of the jaw 25 is formed to provide parallel flats 35 which are continued as ears 36 and which carry a transverse pivot pin in the form of a rivet 38 arranged normal to these flats.

The other jaw 26 is formed at its inboard end to provide parallel flats 39 on ears 40 which fit outside the ears 36 with the flats 35, 39 in face-to-face relation with each other and these ears 36 pivotally connecting with the rivet 38.

The helical central part 42 of a grasshopper spring 43 is arranged between the jaws 25, 26 surrounding the rivet 38 and with each opposite leg in pressure contact with the opposing channel-shaped faces of these jaws and extending to the outboard ends thereof to bias them apart.

The connector is completed by a dielectric sleeve 45 mounted for axially sliding movement on the cylindrical inboard end 29 of the jaw 25 and movable to engage and cam against the external surface of the jaw 26 so as to move it against the resistance of the spring 43 toward the other jaw 25.

In use, when the connector is to be connected with a socket 12 as shown in FIG. 1, the sleeve 45 is manually moved toward the outboard ends of the jaws 25, 26 so as to draw them together. This drawing together is in opposition to the spring 43 and is effected by the camming action of the sleeve 45 against the exterior face of the jaw 26. With the jaws drawn together, they are inserted into the bore 11 following which the sleeve 45 is withdrawn onto the tubular part 29 of the jaw 25 so as to release the jaw 26. The grasshopper spring 43 then biases the exterior surfaces of the jaws 25, 26 into firm contact with the bore 11.

When the connector is to be attached to a male part, such as the bare wire 10, FIG. 2, the sleeve 45 is withdrawn axially onto the cylindrical end 29 of the jaw 25 and the open jaws placed around the wire 10. Upon now moving the sleeve 45 toward the outboard ends of the jaws 25, 26, it exerts a camming action along the exterior surface of the jaw 26 to move it toward the other jaw and hence into clamping relation with the wire 10.

With the form of the invention shown in FIGS. 4—7, the connector comprises a pair of elongated sheet metal rounding cup-shaped alligator jaws 50 and 51 having rounding noses at their outboard ends, the opposing surfaces of which are in the form of interfitting rounding teeth 52 along the opposing edges of the jaws. The inboard end of the jaw 50 is in the form of a cylindrical split sleeve 53, the split or seam of which is indicated at 54. The insulation 55 of an electric wire 56 is shown as snugly fitted in the bore of the sleeve 53 and as extending through an opening 58 to the exterior thereof and electrically connected thereto by a screw 59. Between the sleeve 53 and teeth 52, the opposite sides of the jaw 50 are formed to provide parallel flats 60 which are continued as ears 61 and which carry a transverse pivot pin in the form of a rivet 62.

The other jaw 51 is formed at its inboard end with parallel flats 63 on ears 64 which fit between the ears 61 with the flats 60 and 63 in face-to-face relation with each other and these ears 64 pivotally connecting with the rivet 62.

The helical central part 65 of a grasshopper spring 66 is arranged between the jaws 50, 51 surrounding the rivet 62 and with each opposite leg 67 in pressure contact with the opposing channel-shaped faces of these jaws and extending toward the inboard ends thereof to bias them together.

The outboard end of one or both jaws 60, 61 bulges radially outwardly or is of rounding cup-shaped form and

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is provided with one or more longitudinal slots 68 the edges of which form two or more longitudinal spring leaves 69 on each jaw which yield toward one another. Since these spring leaves bulge outwardly, it is merely necessary to shove the jaws into the bore 11 of the socket 12 to obtain electrical contact, the edges of the slot or spring leaves 69 yielding on contact with this bore. To apply the jaws 50, 51 to the bare wire 10, the inboard end of the jaw 61 is in the form of a thumb piece 70 which can be pressed inwardly to open the jaws which can be released when on opposite sides of the wire 10, the grasshopper spring 66 clamping the jaws against the bare wire.

I claim:

1. A readily attachable and detachable electrical connector, wherein the invention comprises a tubular metal body portion having one end extended along one side of the axis of said body portion to provide an integral first jaw which is channel-shaped in cross section with its concavity facing said axis and its edges provided with teeth to engage one side of the exterior of a male electrical part, means adapted to connect said metal body portion with an electrical test wire, a second jaw which is channel-shaped in cross section pivotally mounted on the base of said first jaw to swing about a second axis perpendicular to the axis of said body and generally in line with said teeth of

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said first jaw, said second jaw having its edges formed to provide teeth mating with the teeth of said first jaw and the exterior surfaces of said jaws, when closed, jointly being of generally cylindrical form throughout the greater part of their length to fit into the bore of a female electrical part, spring means urging said jaws apart, and manually operable means acting against the base of said second jaw to move said jaws together.

2. An electrical connector as set forth in claim 1 wherein said manually operable means comprises a sleeve around said tubular body portion and movable axially to engage the exterior face of said second jaw.

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J. H. McGLYNN, *Assistant Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,374,455

March 19, 1968

Dennis J. Sullivan et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 20, "Germany" should read -- Austria --.

Signed and sealed this 23rd day of September 1969.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents