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ELECTRICAL CONNECTORS

Filed July 31, 1959

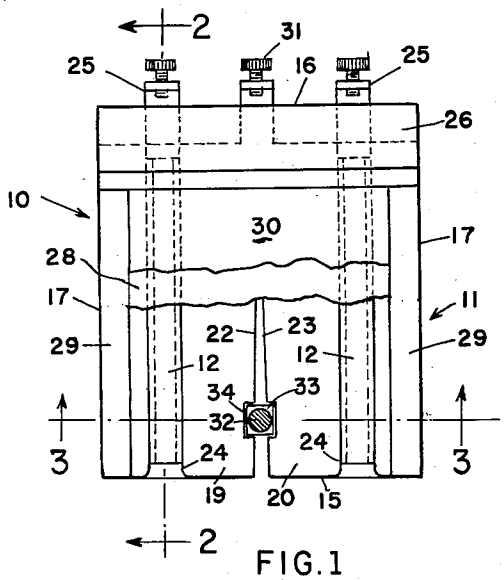



FIG. 1

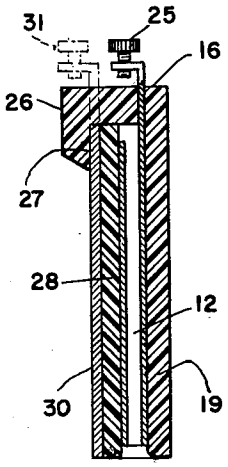



FIG. 2

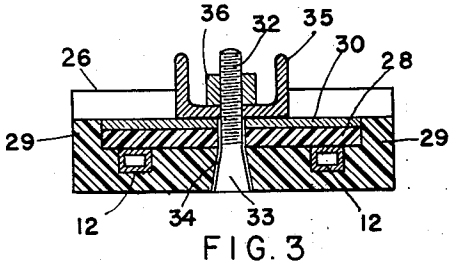



FIG. 3

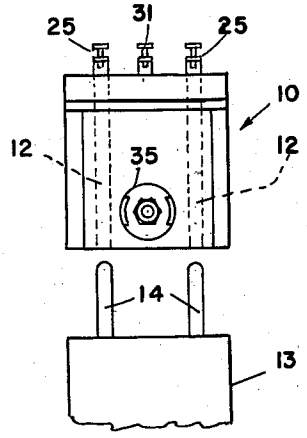



FIG. 5

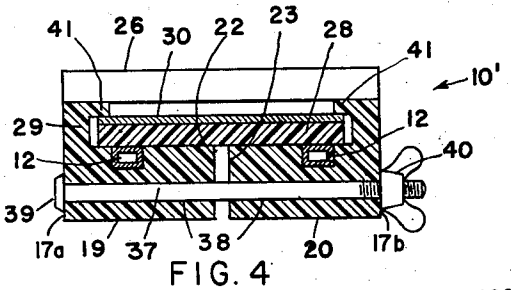



FIG. 4

*INVENTOR.*
JOSEPH SOLINSKY

BY Philip G. Hilbert

ATTORNEY

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# ELECTRICAL CONNECTORS

Joseph Solinsky, 21 Carlyle Place, Hartsdale, N.Y.

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This invention relates to electrical connectors, and more particularly, concerns connectors of the frictional connect-disconnect type.

In connecting various electrical devices such as motors, appliances or the like, to a source of current for energizing the same, it is common to use complementary frictional connectors such as plugs and sockets to effect the desired connection. Such connectors are usually of the straight push in-pull out type and the connection is adequate providing the frictional grip between the associated connector elements is not disturbed.

However, in many cases, due to the manner of use or environmental conditions, constant or occasional stresses or tension may be applied to the engaged connector elements. Such tensions may result in accidental and annoying disconnections. While various locking devices have been suggested to prevent such accidental disconnections, the locking devices represent a substantial additional cost and are usually associated with connectors of special application where cost is a minor factor.

Accordingly, the principal object of this invention is to provide an improved electrical connector of the plug-socket type, which is of simple construction and economical in cost, yet provides means for avoiding accidental disconnections between interconnected electrical devices, cables and the like.

Another object of this invention is to provide an improved electrical connector of the character described, which may be normally used as a conventional plug-socket connector, but when necessary may be converted to a connector having increased gripping action by simple manipulation of a single element of the connector.

A further object of this invention is to provide an improved electrical connector including simple means for increasing the frictional gripping action of the connector when desired; the connector being compact in form and substantially without increase in bulk as compared to conventional connectors.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawing, FIG. 1 is a plan view of an electrical connector embodying the invention;

FIG. 2 is a longitudinal section taken on the line 2—2 of FIG. 1;

FIG. 3 is a transverse section taken on the line 3—3 of FIG. 1;

FIG. 4 is a transverse section of a modified form of the electrical connector, illustrating another embodiment of the invention; and

FIG. 5 is a plan view of the electrical connector shown in FIG. 1, in association with the conventional, complementary plug.

As shown in FIG. 1, the electrical connector embodying the invention, generally designated at **10**, comprises a molded plastic base member **11** for carrying a pair of elongated electrical connector elements **12**, shown as socket members. Connector **10** is adapted to be used with a conventional plug connector **13** having a pair of fixedly spaced, parallel blade or plug connector elements **14** frictionally receivable in socket members **12** for effecting a connection, and removable therefrom, for disconnection.

Base member **11** may be of rectangular shape with a front edge **15**, a back edge **16** and side edges **17**. The member **11** is split longitudinally inwardly from front



edge **15** to a point spaced inwardly of back edge **16**; thus providing a pair of laterally related base portions **19**, **20** which are in effect hinged together by a rear portion of member **11**. Opposed edges **22**, **23** of base portions **19**, **20** taper somewhat toward the base portion **19** to allow for relative movement of said base portions toward and away from each other.

Each of the base portions **19**, **20** is longitudinally grooved as at **24** to receive therein the socket connector elements **12**. The socket elements **12** include terminal connector lugs **25** at the rear ends; such lugs projecting rearwardly through openings in a transversely disposed raised portion **26** at the rear edge **16** of base member **11**. Raised portion **26** is transversely grooved as at **27** to receive the rear edge of a flat plate **28** of insulating material which overlies base portions **19**, **20** and the socket members **12** carried therein. Plate **28** is laterally confined by longitudinally extending raised portions **29** at edges **17** of base **11**.

A conductive metal plate **30** may be superposed on insulating plate **28**, to provide a ground terminal. Plate **30** has its rear edge also received in groove **27** of raised portion **26**, and a terminal connector lug **31** extending from plate **30** projects through an opening in raised portion **26**. Ground terminal plate **30** may be suitably engaged by a contact element, not shown, on connector **13**, or other interconnected device. Plate **30** is also laterally confined between raised base portions **29**.

Means is provided for effecting movement of base portions **19**, **20** away from each other. To this end, a screw **32** having a wedge shaped head **33** is located between base portions **19**, **20**; head **33** being received in complementary tapered openings **34** at opposed edges **22**, **23**, adjacent front edge **15**. The upstanding threaded portion of screw **32** passes through registering openings in plates **28**, **30** and has a wing nut **35** and lock nut **36** screwed on said threaded portion.

It will be apparent, that base portions **19**, **20** will be in parallel relation, thus allowing plug elements **14** to be frictionally received in socket elements **12**. If the grip between associated elements **12**, **14** is to be increased, wing nut **35** is turned in a direction to displace base portions **19**, **20** apart by the upward movement of wedge head **33** of screw **32**. A very slight displacement of the socket members **12** from their normal parallel relation will exert a substantial gripping action on the engaged plug elements **14**. The lock nut **36** retains the wing nut **35** in its turned position to maintain the desired grip on the plug connector **13**.

An alternative form of the invention is shown in FIG. 4, wherein connector **10'** is similar to device **10** except as hereinafter pointed out. In lieu of wedge means for effecting relative movement of base portions **19**, **20**, in device **10'**, a transversely extending screw **37** is disposed in aligned openings **38** in said base portions, with screw head **39** bearing on edge **17***a* while a thumbnut **40** screwed on screw **37** bears on edge **17***b*.

In device **10'** base portions **19**, **20** are moved toward each other by turning nut **40** in the proper direction, thus displacing socket elements **12** from their normal parallel relation, to increase the grip on plug elements **14**, as previously described. Inwardly turned flanges **41** on raised lateral portion **29** aid in confining plates **28**, **30** in place.

It is understood that base member **11** is molded of a plastic such as vinyl copolymer, polystyrene, nylon or the like, which has a degree of resiliency to allow for relative movement of hinged base portions **19**, **20** towards and away from each other; the rear hinge portion being of a thickness to avoid cracking despite repeated hinged movements of said base portions.

While connector elements **12** are shown as socket members, it will be apparent, that such elements may be plug elements and the complementary connector will carry fixedly spaced, parallel socket elements for engagement by the plug elements which can be moved toward and away from each other, as described above, to achieve the increased grip as desired.

The terminal lugs **25**, **31** are connected to power cables, and the like, not shown. It is understood that more than two connectors **12** may be disposed on devices **10**, **10'** in accordance with the circuit connections to be made.

As various changes might be made in the embodiments of the invention herein disclosed without departing from the spirit thereof, it is understood that all matter herein shown or described is illustrative and not limiting except as set forth in the appended claims.

Having thus disclosed my invention, I claim as new and desire to protect by Letters Patent:

1. An electrical connector comprising a flat molded plastic base member split from one end thereof to a point short of the other end thereof to provide laterally related base portions, each base portion having a groove therein, and a portion resiliently and integrally interconnecting said split base portions at said other end thereof, said base portions being arranged for movement away from each other, an elongated electrical connector element longitudinally disposed in the groove of each base portion, said connector elements being normally in parallel relation for frictionally engaging a pair of fixedly spaced parallel complementary electrical connector elements, an insulating cover plate overlying said base portions and the connector elements disposed therein for retaining the connector elements in the grooves of said base portions, each of said first mentioned connector elements including terminal means extending therefrom, and means for laterally displacing said base portions to increase the frictional grip between the respective engaged pairs of connector elements, said displacing means comprising a screw disposed between opposed edge portions of said base portions, said screw including a wedge head portion in wedging relation to the opposed edge portions of said base portions, the threaded portion of said screw extending through an opening in said cover plate and a nut on said screw whereby rotation of said nut on said screw in one direction will wedge said base portions away from each other, the upper surfaces of said base portions having sliding contact with the bottom surface of said cover plate.



2. An electrical connector as in claim 1 and further including a conductive ground plate overlying said cover plate, said ground plate including terminal means extending therefrom, said ground plate having an opening therein in registry with the opening in said cover plate for passing the threaded portion of said screw.

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