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Grant

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[54] **ELECTRIC WALL PLUG**

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[52] **U.S. Cl.** ..... **339/196 R,** 339/210 R

[51] **Int. Cl.** **H01r 33/06**

[58] **Field of Search** ..... 339/63, 97 R, 98, 339/99, 107, 196, 206, 208, 210, 17 F, 176 MF, 195 R, 195 M

[56] **References Cited**

UNITED STATES PATENTS

2,032,470	3/1936	Chirelstein	339/63 R
2,042,580	6/1936	Bernfeld	339/63 R
1,988,725	1/1935	Glade	339/196 R X
1,956,018	4/1934	Gilbert	339/99 R
2,196,052	4/1940	Benander	339/63 R

FOREIGN PATENTS OR APPLICATIONS

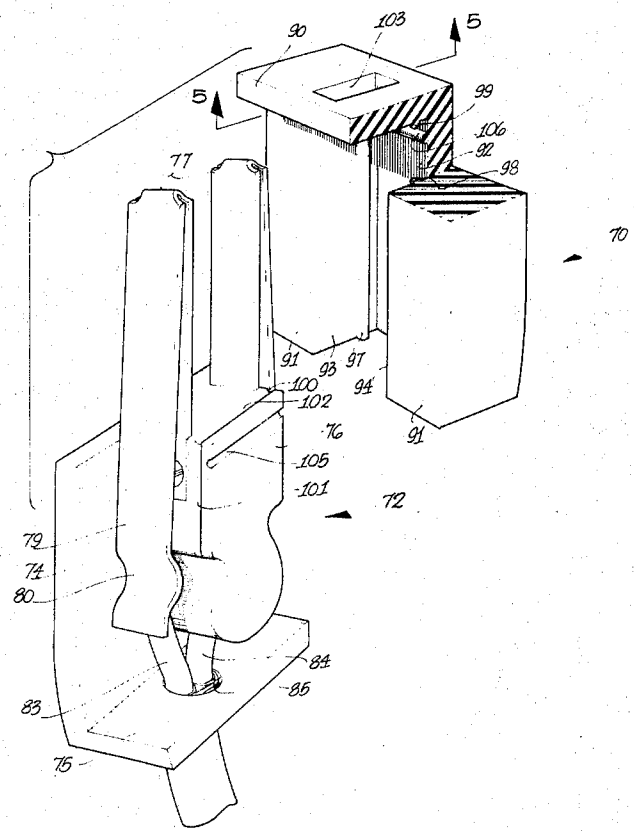
72,541	5/1951	Denmark	339/196 R
882,872	7/1953	Germany	339/195 R

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[57] **ABSTRACT**

An electric wall plug having a sleeve or insert member maintaining the contact ends of the flexible prongs in secure engagement with the ends of the connector wires without any need for wrapping the wires around the contact ends. This permits rapid assembly and disassembly of the plug.

2 Claims, 8 Drawing Figures



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Fig. 1.

Fig. 2.

Fig. 3.

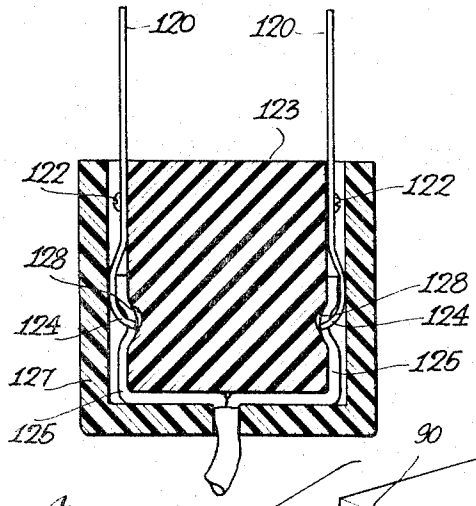


Fig. 6.

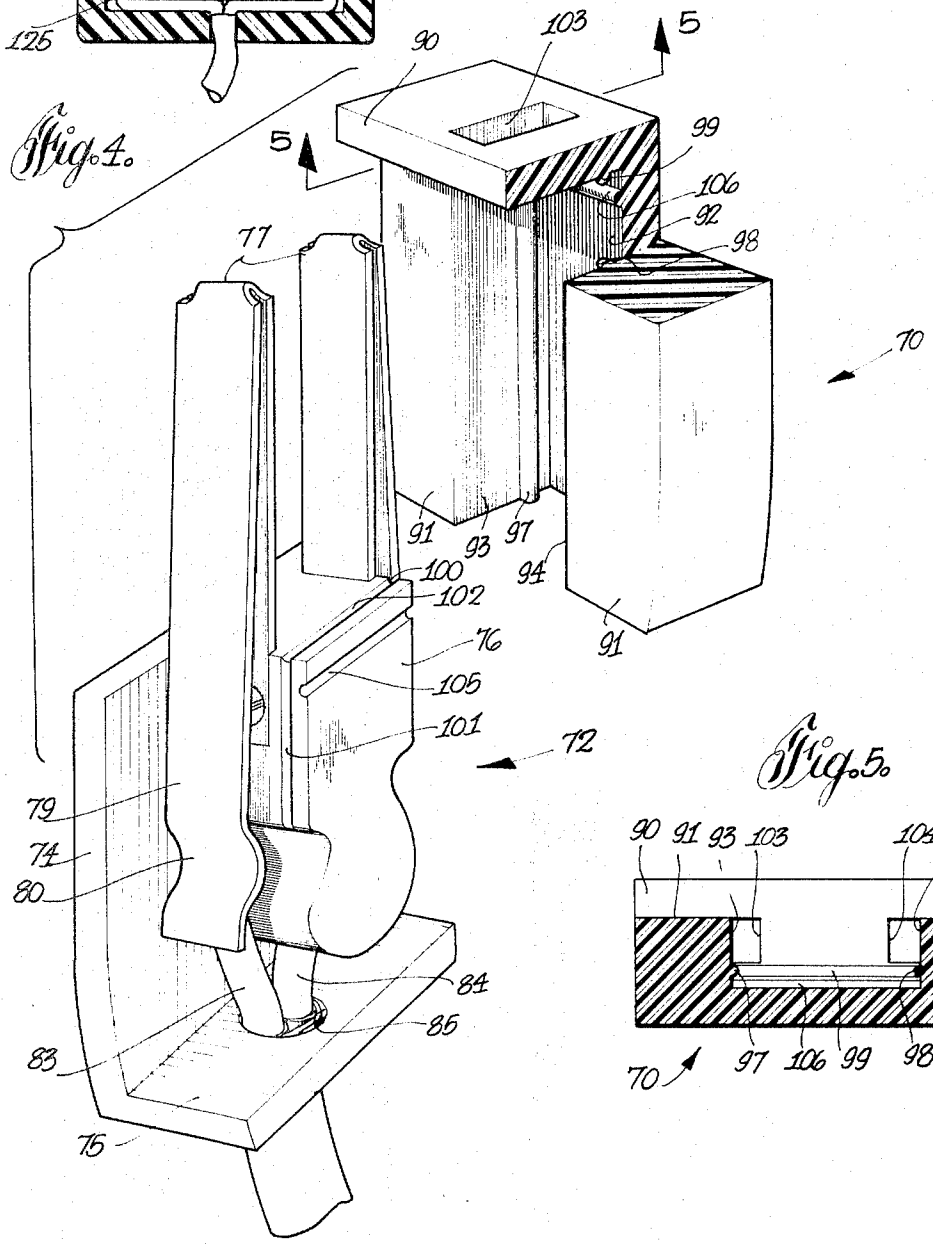
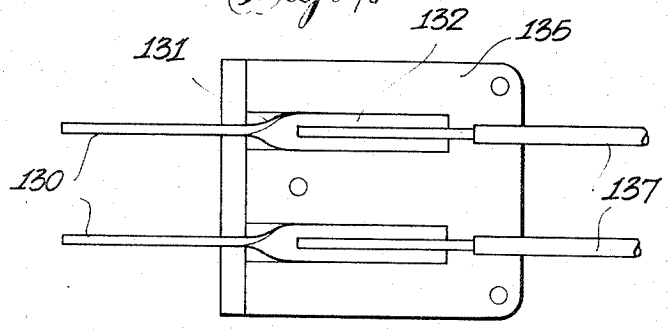


Fig. 4.

Fig. 5.

Fig. 7.



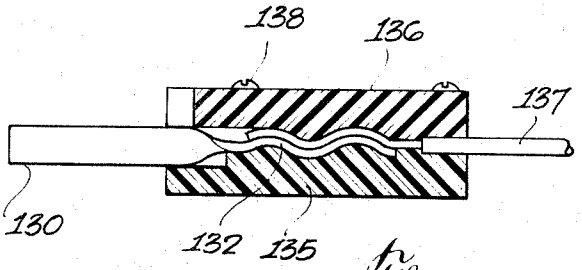


Fig. 8.

ELECTRIC WALL PLUG

This invention relates to an electrical outlet plug and, particularly, to a plug which is easily assembled and disassembled and makes a secure and positive electrical contact.

A problem well known to the householder is that of an electric wall plug where the connecting wire has been broken due to being placed under too large a tension while the plug is removed from an outlet receptacle. This occurs when pressure is applied to the wire rather than the body of the plug. Alternatively, the wire attached to the plug may require shortening or lengthening. It then becomes necessary either to repair or replace the wire and even the plug. Some plugs are formed in such a manner that when the wire is broken adjacent the plug, repair is impossible and the whole unit must be replaced. In other types of plugs, the wire conductors are placed in electrical contact with the prongs by means of screws. The wires must, firstly, be bent around the shank of the screw, and, secondly the screw must be screwed in to tightly engage the wire and force it against the prong. To keep the inside diameter of the bend of the wire in close proximity with the shank of the screw often presents a problem and quite often a poor and dangerous connection is made.

It is the intention of this invention to eliminate these problems and this is accomplished by providing an electrical wall plug of novel and simplified construction, thus offering advantages to both manufacturer and user. Preferred embodiments of the invention will now be described in conjunction with the drawings in which:

FIG. 1 is a perspective view, partially in section, of one embodiment of the invention;

FIG. 2 is a view, in cross-section, of the same embodiment;

FIG. 3 is a view, in cross-section, of an alternative embodiment;

FIGS. 4 and 5 are views of yet another embodiment;

FIG. 6 is a cross-sectional view of a further embodiment; and

FIGS. 7 and 8 are views of a still further embodiment.

Reference will now be made to FIGS 1 and 2. The electrical wall plug **10** consists essentially of a body member **11**, a pressure applying sleeve **12**, a pair of resilient prongs **13, 13** and two wire electrical conductors **14.**

The body member **11** includes a base portion **15** and a central portion **16** which extends from and is integral with the base portion. The top surface of the base portion, as viewed in FIGS. 1 and 2 forms a shoulder **17.** Within the base portion **15,** two passageways **18** and **19** are formed through which the wire **14** extends. The passageways are joined at one end. The other ends open in shoulder **17** as illustrated. A recess **22** is formed on both sides **23** of the central portion **16.** The recess locates and accommodates the prong **13** during assembly of the plug.

The prongs **13** are fastened to the central portion of the body member by means of screws or rivets **25** which extend through a hole appropriately formed in end **27** of the prongs. It will be appreciated that the use of screws is not essential to the successful operation of this invention. Any of a number of methods may be used to fasten the prongs to the body member. The other end **28** of each prong is formed with an inwardly directed protuberance **29** adapted to cooperate with

grooves **30** formed in the central portion **16.** The bared ends of the wires are positioned in these grooves.

The pressure applying sleeve **12** is formed with an opening or cavity **32** to receive the central portion of the body member **11.** The lower end of the sleeve abuts shoulder **17** and its upper end is flush with the upper surface of the body member **11,** as illustrated in FIGS. **1** and **2.**

To assemble the plug becomes a simple matter. The prongs **13** are positioned in recesses **22** and fastened thereto by means of screws or rivets **25.** A length of the wire **14** is bared and passed through passageways **18** and **19** a sufficient distance so that the ends thereof may be positioned between protuberances **29** and grooves **30.** The prongs are pressed inwardly with the fingers and the sleeve **12** is then positioned over the prongs and pressed towards the base portion **15** until one end of the sleeve engages shoulder **17.** As the sleeve is moved over the prongs, it will become apparent that the prongs are kept pressed inwardly, thereby securing the wire between the end **28** of the prong and the sides of the central portion **16** of the body member.

The embodiment just described discloses a plug which is rectangular in cross section. It will be appreciated that, without departure from the spirit of the invention, the plugs could be circular or any other desired configuration in cross section. Similarly any number of prongs could be provided without departing from the scope of the invention.

FIG. **3** shows a slightly different embodiment than that of FIGS. **1** and **2.** FIG. **3** shows a plug **40** having a body member **41** and, instead of a sleeve, an insert **42.** The body member **41** is formed with a cavity **45.** A pair of recesses **52** are provided in the body member to locate the prongs **43.** In a manner similar to that of the previous embodiment, the prongs may be fastened to the body member by means of screws or rivets **55,** at the ends **57** thereof. Ends **58** of the prongs are curved forming outward protuberances **59.** The insert **42** is preferably solid and has dimensions which closely approximate those of the cavity **45.**

It can be seen, therefore, that when the wires are placed between the protuberances **59** and the walls of the cavity and the insert is pressed into position, the prong will apply an outward force to the wire thereby securing them in position and providing a positive contact for the flow of current.

FIGS. **4** and **5** show another embodiment of the present invention. The electrical outlet plug consists of a pressure invention. The electrical outlet plug consists of a pressure applying member **70** and a main body member **72.** For clarity FIG. **4** shows the pressure applying member **70,** partially in section, removed upwardly from the body member and rotated so that the internal details can be more easily seen.

The body member **72** is formed with a main wall **74** and an abutment or lower lip **75.** A block **76** extends from wall **74.** A pair of contacts **77** are securely fastened to the block adjacent wall **74.** An end **79** of each contact is formed with a protuberance **80.** The block is formed with recesses **82** which cooperate with the protuberances **80** to retain the ends of wires **83** and **84** when the pressure applying member **70** is in engagement with the body member **72.** The wires extend through an opening **85** formed in the abutment **75.** It will be noted that a space is provided between the block **76** and the abutment **75** in order that the wires

may be easily inserted in position. In an alternative embodiment opening **85** can be provided on the line of junction of abutment **75** and the side wall of member **70,** by forming cooperating semi-circular openings in each member.

The pressure applying member **70** has a lip **90,** outer abutments **91** and an inner wall **92.** A pair of side walls **93** and **94** together with walls **92** define a cavity in member **72.**

Formed integrally with side walls **93** and **94** are tongues **97** and **98.** A similar tongue **99** is formed in the lower surface of lip **90.** Tongues **97, 98** and **99** cooperate with grooves **100, 101** and **102** respectively formed in block **76** of body member **72.** A fourth tongue **106** formed integrally with wall **92** cooperates with a corresponding groove **105** is formed in block **76.** Lip **90** includes a pair of openings **103** and **104** through which the contacts **77** extend.

The assembly of the electric wall plug will now be described. The contacts **77** are first fastened to the block **76** of body member **72** by means of screws or rivets. The ends of the wires **83** and **84** are bared, passed through opening **85** and positioned between the block **76** and the ends **80** of the prongs **77.** Prongs **77** are pressed inwardly by the fingers to retain the wires in position. The pressure applying member **70** is then positioned in such a manner that the contacts extend through openings **103** and **104** and tongues **97** and **98** are aligned with grooves **100** and **101,** respectively. The pressure member **72** is then moved downwardly until the lower surface thereof contacts abutment **75.** At this time tongue **106** engages groove **105** and, thereby, relative axial movement between body member **72** and pressure member **70** is prevented. Separation of members **70** and **72** is prevented by means of engagement between tongues **97, 98** and **99,** and grooves **100, 101,** and **102,** respectively.

FIG. **6** shows an alternative embodiment in which the plug end of the resilient prong **120** is formed with an inwardly curved portion **124** notched to receive the wire end **125.** Body portion **123** is formed with a cooperating recess **128** and, after assembly, sleeve member **127** maintains the prong in secure contact with the wire. It will be noted that prong **120** is a flat strip, not doubled back on itself, held to body portion **123** by screws or rivets **122.**

A still further embodiment is shown in FIGS. **7** and **8.** Resilient prongs **103** are each formed from a flat piece of metal having a bend at **131** so that the half sections occupy planes at right angles to one another. Section **132** also includes additional corrugations forming a pair of inwardly directed protuberances. The plug housing comprises cooperating lower and upper sections **135** and **136** which are formed with grooves having surfaces conforming to the corrugations in each contact section **132.** In the assembled condition the bared ends of wires **137** are positioned against the protuberances in contact sections **132** and maintained in that position by housing **134,** its upper and lower sections being held together by suitable means such as screws **138.**

I claim:

1. An electrical plug comprising in combination a body member and a sleeve-type pressure applying member of complementary form,

said body member being formed with a substantially planar wall, a lower lip at one end thereof and a block centrally located on the wall having a pair of shallow recesses for receiving the ends of electrical conductors in substantially linear configuration,

a pair of V-shaped resilient prongs secured one on each side of said block, each prong having a protuberance registering with the corresponding recess in the block,

said pressure applying member being formed by a pair of spaced abutments connected together by an upper lip and substantially planar rear wall to define a central cavity,

said block being formed with a pair of grooves extending in the direction of said prongs and said abutments having cooperating tongues whereby said body member and said pressure applying member fit together by sliding action with said planar walls defining the outside surface of said plug, said spaced abutments urging said protuberances against the ends of the corresponding conductors towards the recesses to form secure electrical contact.

2. An electrical plug as defined in claim **1** wherein said block is formed with a further groove extending at right angles to the direction of the prongs and said pressure applying member has a further tongue cooperating with said further groove to maintain the plug in its assembled condition.

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