

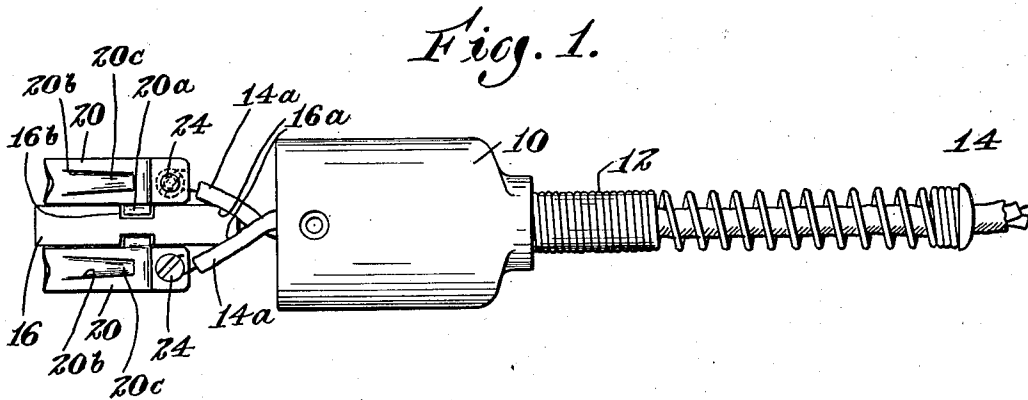
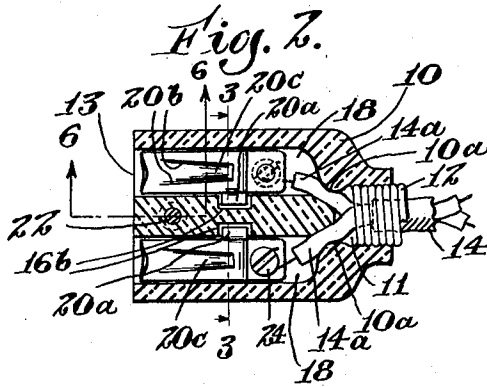
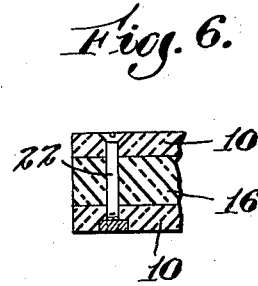
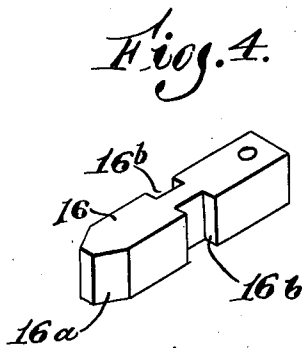
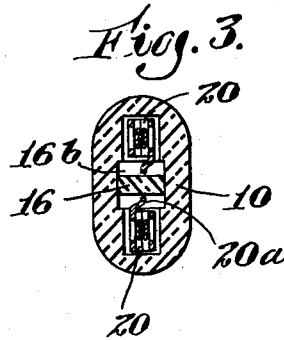
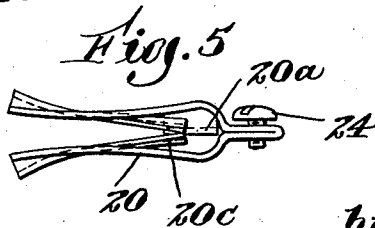
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PLUG SOCKET FOR ELECTRICAL CONNECTIONS

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UNITED STATES PATENT OFFICE

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PLUG SOCKET FOR ELECTRICAL CONNECTIONS

Application filed April 16, 1927. Serial No. 184,267.

This invention relates to improvements in plug sockets for electrical connections. More particularly it relates to a two-conductor receptacle or pair of sockets for receiving a pair of plug-like prongs such as may be employed on conducting cords for electrical heating appliances and the like.

It is an object of the invention to provide a simple socket piece, sometimes itself called a "plug", within which the cord conductors may be secured electrically to terminals without stresses, which may be imposed mechanically upon the conducting cord, having an effect to separate that cord from its electrical connections. To this end the two conductors are separately clamped tightly to the body of the socket by a removable wedge which constitutes a division wall between the two parts of the socket wherein lie the electrical terminals. An important feature is that the plug may be assembled and the said clamping of conductors effected without subjecting the terminal connections to strain. Another feature is that the conductor ends and their terminal connections lie loosely in separated chambers, being locked therein without being fastened to the body of the receptacle. Thus the transmission of heat is minimized. A further object of the invention is to provide terminals which are universal in the sense that they are adapted to receive either flat or round prongs, and which are inexpensive in that they can be made by stamping from sheet metal. After assembly a single small bolt passed through the molded shell and the wedge within it, and secured by a nut, can maintain the whole in operative condition. The complete socket may be manufactured at small cost, can be easily and quickly connected and constitutes a compact and exceedingly durable device.

These ends are gained with a one piece moulded shell structure having a suitably small opening at one end through which the conductors enter, and a suitably large opening at the other end through which an insulating moulded wedge or tongue is inserted rectilinearly so as to choke the entering conductors by a thrusting of the leading end of the wedge tightly into the throat of the

first mentioned opening, with one of the conductors lying on each side of the wedge. The conductor ends lie beside the wedge, connected to terminal spring members, loosely there placed. Each terminal spring has a lug engaging in a notch in the wedge, which thus holds them in the shell; and the wedge is maintained in place in its choking position by a single small bolt passing through it and the shell. The terminal springs consist each of a single strip of spring metal bent upon itself to form a sort of U, with two parallel and slightly separated spring arms having surfaces concave toward each other. Portions of these said arms are slashed along two parallel lines, cut free at that end of the slash which is toward the head of the U and then are in-bent as spring tongues. Each U is then capable of receiving and contacting with either flat or round prongs which may be inserted therein.

It is intended that the patent shall cover by suitable expression in the appended claims whatever features of patentable novelty exist in the invention disclosed.

In the drawings:

Figure 1 is an elevation of an attachment plug embodying features of the invention partly assembled, the internal elements being shown associated and ready for insertion in the shell;

Figure 2 is an elevation, in medial section, of a plug with the parts secured in assembled relation;

Figure 3 is a section on line 3—3 of Figure 2;

Figure 4 is a perspective of the wedge element;

Figure 5 is an elevation of a terminal spring member; and

Figure 6 is a section on line 6—6 of Figure 2.

Referring to the drawings, a single piece shell 10, which may be molded of any suitable insulating material, has at one end an axial hole 11 threaded to receive the usual wire spring guard 12 for the two-conductor cord 14. A block 16, also moulded of insulating material, has one end 16^a bevelled as a wedge, and is arranged in the hollow of the

shell 10, dividing the hollow into two chambers 18, with its bevelled end wedged between the conductors 14^a and jamming each against a shoulder 10^a on the shell, at the first mentioned hole; with a conductor end extending thence inward, free and loose at each side of the block, into one of the chambers 18. A terminal spring member 20 is arranged loosely in each chamber 18 and held therein by a lug 20^a formed on one side of it and engaging a notch 16^b in the side of the wedge block; and the block itself is secured in its said position in the shell by being transfixed by a bolt 22 which passes through the shell and wedge; and is retained by a suitable nut. The conductor 14^a within each chamber 18 is connected to the said terminal spring member 20 therein well separated from the other conductor and terminal.

An important feature resides in the structure of the terminal spring members 20. Each consists of a single strip of flat metal bent upon itself to form a U with two spaced parallel arms 20^a, which are for a short distance crushed together at the head of the U making a double thickness through which is set a terminal binding screw 24. The spaced arms are adapted to receive the end of a flat prong and they are shaped also to receive a round prong. The arms 20^a are formed concave toward each other whereby they are adapted to contact along a substantial portion of the length of a cylindrical prong inserted between them. To make this contact more effective for any thickness of either flat or round prongs, each arm 20^a of the U is slashed in two approximately parallel lines as at 20^b, with the portion 20^c cut away at the end nearest the terminal screw 24, thus making a tongue whose free inner end is pressed toward the similar tongue on the other limb of the U, so that the portions 20^c of the associated arms 20^a are close together, or they may even be in contact with each other; and these tongues are formed concave toward each other. With this structure, a flat prong, operatively inserted, will enter between and if not fitting tightly between the flat parts of the limbs 20^a it will at least make contact with the pressed in portions 20^c of the tongues. Similarly, if a cylindrical prong be inserted, it fits between the cavities of the pair of tongues, which readily may be spread apart by the inserted element and which hold the prong nicely.

The invention provides an inexpensive attachment plug which is compact and serviceable. The body of the shell, and the wedge can be moulded; the U's made by automatic machinery. The fastening of the conductors is relieved of all stresses coming from pulls on the cord, which are taken directly on the shell, due to the wedge-clamp connection. The simple manner of wedging the conductors in the shell, and the securing of all parts

therein by a single bolt, make the device easy to connect and to assemble. Figure 1 illustrates the method of assembly with two conductors installed.

The end of the cord having been thrust through the axial hole 11, through the hollow and out of its larger hole 13 to the position illustrated in Figure 1, the conductors 14^a may be connected to the binding posts 24, of their respective terminals 20. The wedge block 16 being then placed between the terminals, the entire group consisting of the wedge, the block, the two terminals and the conductors can be pushed back into the hollow to the position illustrated in Figure 2, where the two conductors become compressed between the wedge 16 and the throat of the hole 11. In reaching this clamping or compressing position the wedge moves with a straight line action within the shell. In consequence it can impose upon the conductor cords a severe compression which is a simple squeezing without rubbing or abrasion and therefore without injuring the insulation and without pulling them away from their binding posts. It can thus be made sure that this clamping action of the shell, rather than the attachment to binding posts, is the means which effects the attachment of the cord to the receptacle. The wedge is held in clamping position by the bolt 22. The flexibility of the conductors, and the slight inward movement of the wedge in becoming clamped tightly upon them after first engaging them, leave the binding screws 24 of the terminal free from any stress which may come along the cord 14 to the receptacle 10. The terminals 20 lie loosely each in its own compartment 18; and yet each is locked therein by its little lug which engages in a notch in the mid-partition 16.

The shells 10 and the wedge plugs 16 all may be molded initially to accommodate the conductors of standard sizes of cords, but if sockets capable of accommodating larger than standard size conductors are desired these readily and quickly may be produced by merely grinding or filing the bevelled ends of plugs 16, as these were initially designed. Standard sockets may be produced in quantities at relatively small cost, and these readily may be converted into non-standard sockets as the latter type are called for.

Plugs may be forced into pinching engagement with the conductors in any suitable manner, such as by a vise, and when the wedge has been transfixed by bolt 22 the conductors will be held fast.

I claim as my invention:

1. A plug receptacle comprising, in combination, a cup moulded as a single piece of insulating material, with an opening for conductors through the bottom of the cup; a wedge of insulating material set across the hollow of the cup, dividing said hollow non-

rotatably, and being thrustable longitudinally and non-rotatably into the said opening; terminal elements set in the divisions of the hollow; conductors extending thence out through said opening and individually clamped tight therein by the said wedge; and a pin transfixing the wedge and cup in the in-thrust, clamping position of the wedge, with the pin sustaining the pressure of wedge on conductors, and permanently locking the clamp.

2. A plug receptacle comprising, in combination, an integral cup of insulating material, having its hollow flattened in cross-section, and having an opening through the bottom of the cup; a removable non-rotatable insulating partition set across the narrow part of the hollow, and adapted for insertion to its seat by a straight line push and having an inner end adapted and positioned to compress against the bottom of the cup conductors which may pass through said opening to the divisions made in said hollow by said partition and a transfixing pin for the partition and cup constituting a positive lock for the partition in its said compression of conductors.

Signed at Hoosick Falls, New York, this 14th day of April, 1927.

CLINTON BATEHOLTS.