Nov. 28, 1939. N. CHIRELSTEIN 2,181,575

ATTACHMENT PLUG

Filed June 13, 1938

Fig. 1

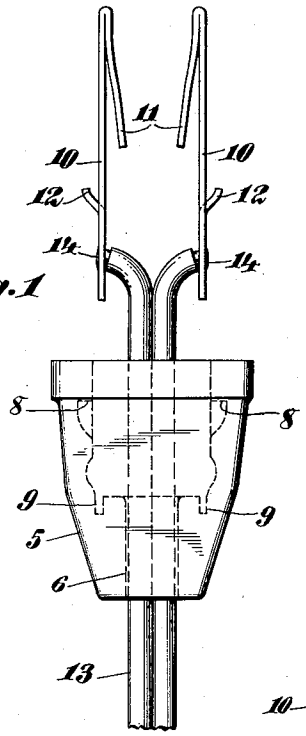


Fig. 2

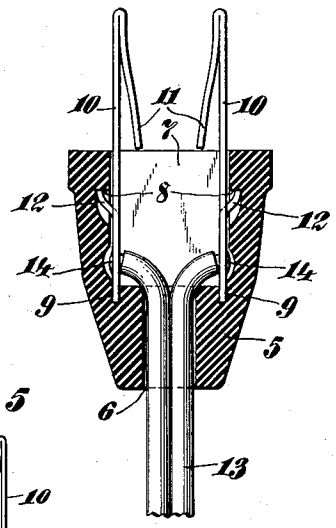


Fig. 5

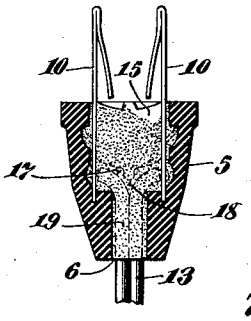


Fig. 3

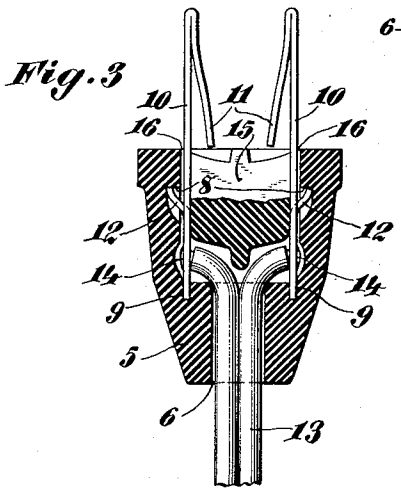
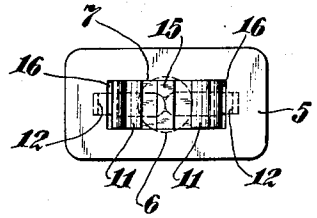


Fig. 4



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ATTACHMENT PLUG

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Application June 13, 1938, Serial No. 213,309

2 Claims. (Cl. 173—361)

The invention here disclosed relates to electrical attachment plugs or connector caps.

Objects of the invention are to provide a simple inexpensive readily assembled form of plug of a sturdy durable construction and in which all desirable flexibility to fit different sockets or receptacles will be provided for without permitting too great yieldability or resiliency in the parts.

Additional objects and the various novel features of construction, combinations and relations of parts by which the objects are attained are set forth hereinafter, illustrated in the accompanying drawing and broadly covered in the claims.

In the drawing accompanying and forming part of this specification, a practical commercial embodiment of the invention is illustrated, but the structure may be modified and changed all within the true intent of the invention as defined by the claims.

Fig. 1 is a side view showing the wires drawn through the body of the plug and attached to the blades.

Fig. 2 is a sectional view through the body of the plug showing the blades in their seated position.

Fig. 3 is a similar view showing the spacing member forced past the spring tips of the blades into seated relation in the plug body.

Fig. 4 is an end view of the completed plug.

Fig. 5 is a sectional view showing the parts united in a mass of insulating cement filling the internal cavities in the plug.

In the several views, 5 designates the plug body, molded in suitable insulating material with a wire passage 6, through the back of the same opening into a wider rectangular enlargement chamber 7, in the face of the plug. The end walls of this chamber are shown as having abruptly shouldered notches or seats 8, and at the bottom of the chamber in line with these end walls are narrow seats 9.

The contact blades 10 are of the type disclosed in Chirelstein Patent 2,037,562, comprising straight strips with doubled back spring tips 11. These blades are of the same or slightly less width than the chamber 7, so as to readily enter this chamber and lie flat against the end walls of the same with the lower ends of the blades fitting in seats 9. Projecting from the backs of these blades are outwardly inclined teeth or lugs 12, positioned to enter the recesses 8, in back of the abruptly angled shoulders when the blades are fully seated in the chamber, as in Fig. 2.

Fig. 1 indicates how the plug usually is assembled by passing the flexible cord 13, through the cord opening 6, and soldering or otherwise securing the ends of the wires to the blades at 14. Then by withdrawing the cord, the blades can be pulled back into fully seated relation in the plug body as shown in Fig. 2 with the spring tips 11 of the blades faced inwardly toward each other.

After the wires are secured to the blades and the blades positioned within the plug body as in Fig. 2, a spacing and closure member 15, Figs. 3 and 4, of a size to approximately fill the chamber space between the blades, is forced down between the projecting spring tips of the blades until it fully enters the chamber and is beyond or behind the inner free ends of the blade tips. In this relation, the blade tips will act as retainers to prevent the blade spacer and chamber closure from being withdrawn. The spring blade tips thus act in the nature of spring pawls to permit inward passage of the closure and then, snapping over the end of the closure acting to prevent removal of the latter.

The present construction permits the manufacture of the plug parts of rigid molded material, since neither the plug body or the closure need be distorted or deformed to permit assembly of the parts. The only yielding required to enable assembly of the parts is provided by the blades and particularly by the folded back spring tips of the blades, which are flattened by passage of the closure therebetween and then spring out behind that block to prevent removal of the same. By making these plug parts in hard rigid material, the dimensions of the plug can be kept quite small and only a small amount of insulating material be used. The lugs 12 struck out of the backs of the blades can yield if required, to a certain extent to facilitate complete entry of the closure between the blades, and for which reason, the chamber may be made slightly longer than the total dimensions of the closure and related blades, thus to leave slight spaces 16, at the backs of the blades, permitting them to readily yield to the insertion of the closure and also for accommodation of the same to various electrical outlets with which the plug may be used.

The several parts of the plug are simple, strong and inexpensive and these are quickly and easily assembled and finally secured without requiring any special fastenings or interlocking of the molded parts.

To secure the wires against twisting in the plug and particularly to hold them so that they can not be twisted loose from the contact blades, an insulating cement may be introduced into the plug, either before or after the parts are assembled, which in hardening or setting will lock the parts in their assembled relation. This feature is illustrated in Fig. 5, where 17 designates a filling occupying such space as is left within the plug about the several parts. This filling forms a transversely extending mass at 18, surrounding and connecting the divergent ends of the wires where they enter the plug chamber and spread into engagement with the respective terminal blades and this transverse mass is integrally united with a portion 19, surrounding the parallel or twin portions of the wire located in the plug passage 6. The whole then forms in effect a T-shaped block anchored in the plug chamber, so that it can not turn and will not permit the wires to be twisted. This filling of insulating cement also aids in interlocking the blades in the plug and the closure 15 to the blades and to the plug body.

Various kinds of insulating cement may be employed, such as a Bakelite cement or rubber base cement. The cement employed however should be of a type which is self-hardening or which will set to a sufficiently rigid state to hold the parts with passage of time or as by application of heat, or pressure, or both heat and pressure.

Usually the cord passage 6 is molded in substantially circular cross-section as indicated in Fig. 4, and this leaves ample space at opposite sides of the twin conductor cord for introduction of the adhesive through this passage as the parts are assembled. The cement however may be introduced or supplied into the opposite end of the plug either before or after the parts are fully assembled, for example, after the cord and blades have been pulled into position as in Fig. 2 and before the closure plug 15, is inserted in place. While particularly useful with soft rubber molded plugs, the use of the hardening insulating filling cement is also advantageous in certain forms of the Bakelite or hard molded plugs having inserted blades and conductor cord. The extent to which the cement may harden will depend upon the character of material employed. Preferably it is such as will adhesively unite with the insulation covering the wires and extending in through the cord passage into the blade receiving chamber. Cement of this type will also make adhesive connection with the material of the plug body. In the case of resilient rubber plugs, the hardening of the cement is not objectionable even though it becomes completely rigid, since this filling material need be only a small portion of the plug and is buried in the center of the plug where it will not affect or impair the resiliency of the plug to any objectionable extent. The insulating cement preferably also is waterproof and uniting closely as it does with the plug body and the wire, it thus serves to keep out moisture, as well as dust, etc.

What is claimed is:

1. An attachment plug, comprising a plug body having a chamber with spaced substantially parallel opposed end walls in the front of the same and a cord passage extending from said chamber through the back of the plug body, said spaced substantially parallel end walls of said chamber having abruptly shouldered recesses therein, contact blades of flat strip stock seated in said chamber with the backs of the same against said opposed end walls, said blades having lugs projecting from the backs of the same and engaged in said abruptly shouldered recesses, the outer end portions of said flat strip blades projecting from said chamber and doubled back inwardly toward each other into spring tipped portions which reach back to substantially the front end of the plug body and a generally rectangular block of insulating material of substantially the cross-sectional shape of the chamber space between said blades, to thereby hold said blades spaced with the lugs projecting from the backs of the blades engaged in the abruptly shouldered recesses and the inner opposed faces of the blades being clear to permit the forcing of said block between the opposed spring tips of the blades into position fully seated in the chamber with the front end of the same back of the ends of said spring tips and whereby said ends of the spring tips overstand the outer end of said block and prevent withdrawal of the same from a position holding the blades spaced apart in interlocked engagement with the plug body.

2. An attachment plug, comprising a plug body having a chamber in the front of the same and a cord passage extending from said chamber through the back of said plug body, said chamber having spaced opposed end walls with abruptly shouldered recesses therein, contact blades seated in spaced relation in said chamber against said end walls and having lugs projecting from the backs of the same engaged in said abruptly shouldered recesses, a conductor cord extending through said cord passage with space about the same and having the individual wires of the same secured to said contact blades within said chamber, a closure dimensioned to fit the chamber space between said contact blades to hold the latter in definitely spaced relation with the projecting lugs interlocked with said abruptly shouldered recesses and water-proof insulating cement filling said recesses, the incidental spaces in said chamber about said closure, contact blades and the wire ends secured to said blades, said cement filling extending from said surrounding portions within the chamber into and through the cord passage about the entered cord and adhesively united with said cord, plug body, wire ends, contact blades and closure and solidified in such relation to constitute a T-shaped embedded mass in and united with the plug body preventing such twisting of the cord as might shear the wire ends from their secured engagement with the contact blades.

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