

Aug. 4, 1942.

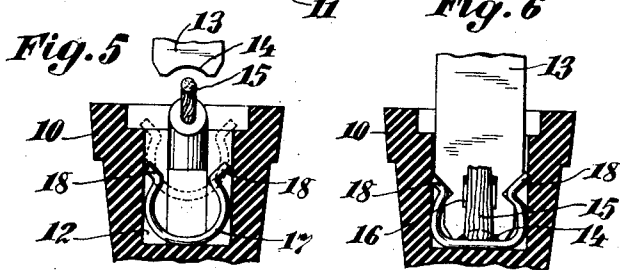
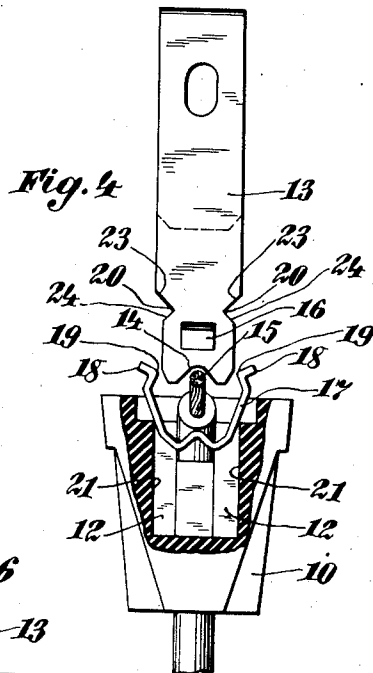
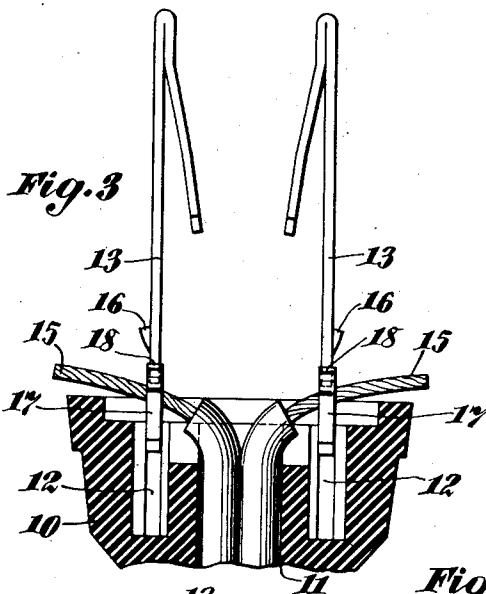
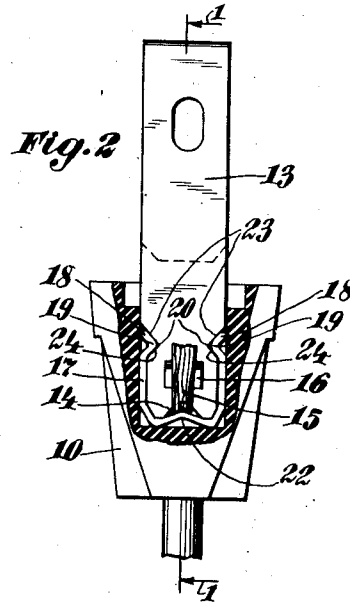
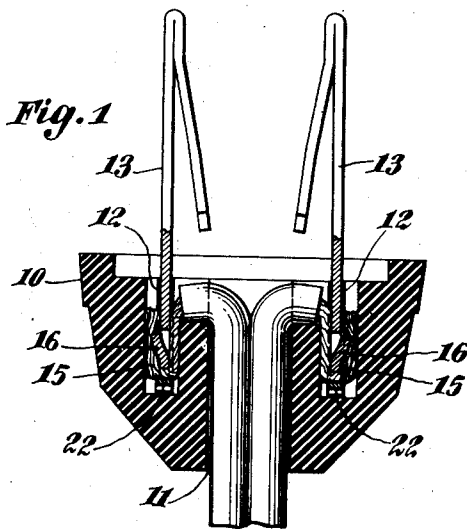
N. CHIRELSTEIN

2,292,053

ATTACHMENT PLUG

Filed Jan. 1, 1942

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7

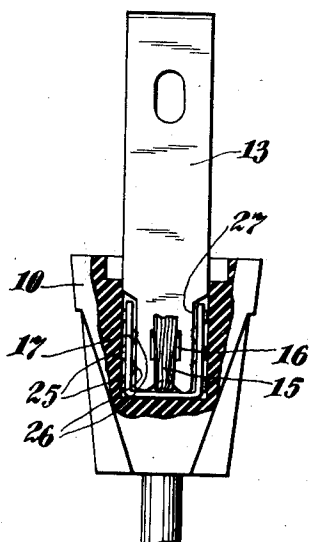


Fig. 8

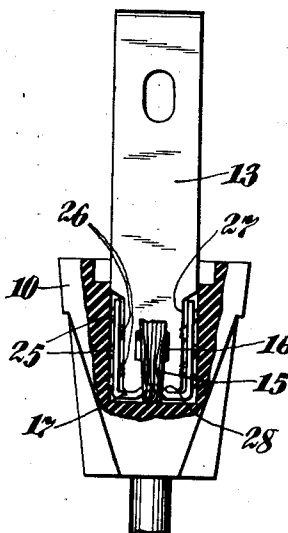


Fig. 9

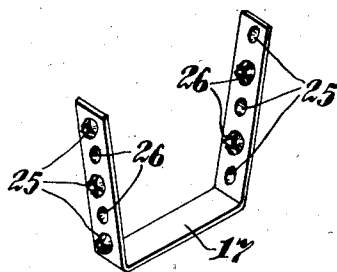


Fig. 10

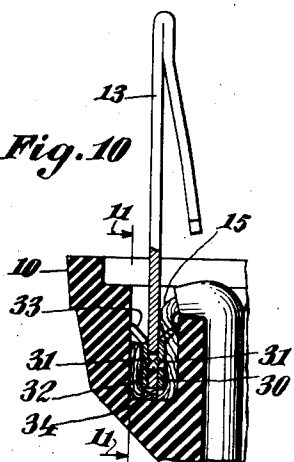
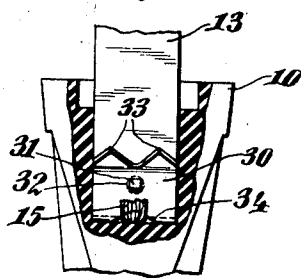


Fig. 11



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2,292,053

ATTACHMENT PLUG

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Application January 1, 1942, Serial No. 425,278

7 Claims. (Cl. 173—361)

The invention here disclosed relates to electrical devices in the nature of attachment plugs.

Special objects of the invention are to effect the anchorage of the contact blades in the cap and the connection of the conductor wires to the blades, positively and securely and without injuring or breaking any of the parts.

In previous constructions, the blades have been made of larger size than the openings intended to receive them and have been formed with barbed or toothed edges to form interlocking engagement with the cap material. Such constructions have been satisfactory where the cap is of rubber or like material, which can expand under the drive of the barbed blades. However, for Bakelite and like hard and frangible materials, such constructions are not always satisfactory, because the oversize blades strain and crack or break the cap material. The materials like Bakelite also are hard enough to bend back the barbs as they are driven and render them more or less useless. And at best, these barbs will only have a scraping effect on the Bakelite and will not actually have a truly anchored engagement in the cap.

The present invention aims to overcome all such objections and to provide a construction particularly suitable for hard Bakelite caps, in which the blades and wires will be fully anchored and secured, without any tendencies toward injuring or weakening any of the parts.

According to this invention, the anchorage of the blades is accomplished as a separate function. The blades are not oversize and do not have a driven fit in the cap. They simply have a mechanically proper easy sliding fit and the anchorage is effected by separate devices, of a material and design especially selected for the purpose and arranged to make positive interlocking engagement with the cap and with the blades.

The details of the invention and the novel features of construction by which all purposes of the invention are attained are set forth in the following specification, illustrated in the accompanying drawings and broadly covered in the claims.

The drawings show several different possible embodiments, but it will be realized, as the invention is appreciated, that structure may be modified and changed in various other ways, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a broken sectional view illustrating one practical embodiment of the invention, the

section being taken as on the plane of line 1—1 of Fig. 2.

Fig. 2 is a broken and partly sectional edge view of the plug.

Fig. 3 is a broken sectional detail similar to Fig. 1, but showing the blades, anchor clips and wires in process of being seated in the cap.

Fig. 4 is a view similar to Fig. 2, illustrating the assembly operation taking place in Fig. 3.

Figs. 5 and 6 are broken sectional details, illustrating the assembly and final positions of a modified form of the invention.

Figs. 7 and 8 are broken sectional details of other embodiments of the invention.

Fig. 9 is an enlarged perspective view of one of the spring anchors used in the Fig. 7 form of the invention.

Figs. 10 and 11 are broken sectional views of another embodiment of the invention.

The cap body is represented at 10, of more or less usual design having central cord passage 11, and narrow relatively deep blade receiving seats 12, at opposite sides of said passage.

The contact blades 13, are shown as notched at the inner ends of the same at 14, for engagement over the wires 15, and as having outstruck wire contacting lugs 16, all substantially as illustrated in the earlier Chirelstein Patent 2,181,576 of November 28, 1939. In that patent however, the blades are held in place primarily by the frictional gripping effect of the rubber insulation of the wires compressibly gripped about the sides of the blades.

In the present invention, a separate definite anchor element, designed for the special purpose, is provided for each blade.

In the first form of the invention illustrated, Figs. 1 to 4, the anchor element consists of a narrow flat strip 17, of resilient spring material, such as steel, doubled into substantially U-formation and having interlocking engagement both in the cap and with the blade.

In this particular illustration, the interlocking engagement with the cap is effected by cutting the ends of the U-shaped strip with sharply bevelled or angled ends 18, Fig. 4, which when the blade is fully seated as in Fig. 2, are forced outwardly and positively bite into the end walls of the blade cavity and the interlocking engagement with the blade is effected by having the sides of the U-piece sharply angled inwardly at 19, to enter the notches or recesses 20, in the side edges of the blade.

As shown in Figs. 3 and 4, the U-shaped spring anchor clip 17, is of a width to slide into the

narrow blade openings 12, and may be "set" with a greater spread than the width of such openings, so as to engage the end walls 21, of the blade seats under tension, thereby to exert a constant spring gripping engagement in the cavity.

These anchor clips may be seated in the blade cavities prior to or at the time of seating the blades and either prior to or after entering the wires, or assembling of all parts to be effected as part of one single operation.

Figs. 3 and 4 illustrate one method in which the anchor clips 17, are located in or over the blade seats, the wires positioned over the clips and the blades then driven in, forcing ahead of them the wires and clips to the fully seated and secured condition illustrated in Figs. 1 and 2.

The shanks of the blades need only have an easy sliding fit in the seats and the anchor clips need only have a free sliding engagement. Hence only very little force is necessary to assemble the parts. Once assembled however, the parts to all practical effects are permanently secured, because the anchor clips are positively interlocked to the cap and positively interlocked to the blades as well.

The U-clips first shown have an upwardly bent middle portion 22, which forces the wire sharply up into the notch in the lower end of the blade shank, both to more firmly anchor the wire and assure good electrical engagement with the blade.

The inwardly convergent inclines 23, of the notches 20, tend to drive the sharp edges 18, of the clips outward into more firmly interlocked engagement in the cap as the blades are forced to their seats and, to similar effect, the reversely inclined shoulders 24, tend to force the sharp holding edges the more firmly outwardly in holding engagement with the cap material, if the attempt is made to pull the blades out of their seats. And when assembled, the expansive spring force of the clip serves continuously and at all times to hold the parts snugly retained in the interlocked relations described.

While flat strip stock may be generally preferred, the locking spring may be of round wire material, substantially as represented in Figs. 5 and 6, where the same reference characters have been employed.

Fig. 7 illustrates a form of the invention in which the anchor clip is simply a flat bottom and straight sided U-shaped spring member having outwardly struck points 25, formed as by piercing the metal outwardly, to bite into the cap material and inwardly struck points or barbs 26, to engage in the edges of the blade shank. In this construction, the shank of the blade may have substantially straight sides, but the shank reduced in width as indicated at 27, to freely enter in between the sides of the anchorage clip.

Fig. 8 illustrates another embodiment, generally similar to that last described, but having an upward indentation 28, to engage over the wire end, this construction illustrating the arrangement in which it is intended to first locate the wire ends and to seat the clips in holding engagement over such ends over the wires. In this form, the parts may be assembled, all as part of one operation, or the wires, be located, the clips then seated over the wires and finally the blades driven into the anchor clips.

While it may be considered that the invention is particularly suited to Bakelite and other frangible plug caps of a more or less brittle and non-yielding nature, it is realized that the invention

is suited as well to caps made of materials such as soft rubber, semi-hard rubber, hard rubber, fiber, porcelain, glass or other materials. The anchor elements, interposed between the side edges of the blades and the opposing walls of the seat, to some extent, at least, take up the free space and being of spring material, compensate for variations in size or inaccuracies in manufacture, and also compensate to an extent for such changes as might result from sudden extremes in temperature or the like. The blades can be of relatively soft metal, best suited to electrical conducting purposes, since they perform no anchoring functions and the anchor elements, on the other hand, can be of hard spring steel, since they need serve only for anchorage purposes. The space occupied by the anchors in the blade seats reduces to that extent, the amount of the more expensive blade material required.

Instead of engaging the edges of the blades, the anchor clips may extend over a face or over opposite faces of the blades and engage with an opening or openings formed in the blades.

Thus as shown in Figs. 10 and 11, the anchors may be in the form of relatively flat U-clips 30, embracing opposite faces of the blades, having inwardly struck lugs 31, to enter and interlock in openings 32, in the blades and having outwardly flared points 33, at the upper edges interlockingly engaged with the opposite faces of the blade cavities. The lower looped ends of these clips are shown as notched at 34, to pass the conductor wires. These clips have enough inherent spring tension to take up space in the oversize blade seats and thus firmly hold the blades locked in their seated relation in the plug cap.

What is claimed is:

1. An electric device in the nature of an attachment plug, comprising an insulating body having a seat, a U-shaped spring clip having outturned locking edges at the free ends of the same for engagement with opposite walls of said seat and inwardly directed bends below said outwardly angled end portions, a contact blade disposed in said seat between the side arms of said spring clip and having recesses in opposite edges receiving said inwardly directed bends and a conductor wire in said seat and in engagement with said contact blade.

2. In an electrical device of the character disclosed, an insulating base having a cord passage and blade receiving openings at opposite sides of said cord passage, anchors of narrow, thin, flat strip material bent in U-formation seated in said blade receiving openings, contact blades having shank portions disposed within said U-shaped anchors, said U-shaped anchors having outwardly struck portions interlocked with the walls of the blade receiving openings and inwardly struck portions interlocked with the shanks of the contact blades and wires extending through said cord passage and electrically connected with the anchored blades.

3. An attachment plug, comprising a cap of insulating material having a cord passage therethrough and blade seats at opposite sides of said passage, U-bent anchors of spring wire disposed in said seats, contact blades having shank portions entered in said U-bent anchor wires and having indentations in the side edges of the same, said wires having inwardly bent portions entered in said indentations and sharp-edged outwardly angled ends interlocked with the opposing walls of the blade seats and conductor

wires extending through the cord passage and electrically connected with said contact blades.

4. An attachment plug, comprising a cap of insulating material having a cord passage there-through and blade seats at opposite sides of said passage, U-bent anchors of spring wire disposed in said seats, contact blades having shank portions entered in said U-bent anchor wires and having indentations in the side edges of the same, said wires having inwardly bent portions entered in said indentations and sharp-edged outwardly angled ends interlocked with the opposing walls of the blade seats and conductor wires extending through the cord passage and electrically connected with said contact blades, the ends of said wires being squeezed between the ends of the blade shanks and said anchor wires.

5. In an electrical device of the character disclosed, an insulating base having a cord passage and blade receiving openings at opposite sides of said cord passage, anchors of narrow, thin, flat strip material bent in U-formation seated in said blade receiving openings, contact blades having shank portions disposed within said U-shaped anchors, said U-shaped anchors having outwardly struck portions interlocked with the walls of the blade receiving openings and inwardly struck portions interlocked with the shanks of the contact blades, wires extending through said cord passage and electrically con-

nected with the anchored blades, the ends of said wires being caught between the ends of said blades and said anchor strips.

6. In an electric device of the character disclosed, an insulating base having a cord passage and blade receiving openings at opposite sides of said cord passage, flat contact blades in said openings and U-shaped anchors in said openings engaged over the ends of said blades and extending over opposite faces of the same, said U-shaped anchors having inwardly struck lugs interlocked with the blades and having outwardly flared ends interlocked with the walls of said blade receiving openings.

7. An attachment plug, comprising an insulating plug base having a cord passage and blade receiving seats at opposite sides of said passage, U-shaped blade anchoring clips located in said seats, flat contact blades driven into the bights of said U-shaped clips and having the opposite sides of said U-shaped clips embracing opposite sides of said blades, said U-shaped clips having inwardly extending portions interlockingly engaged with the blades entered therein and outwardly extending portions interlockingly engaged with the opposing walls of the seats in which said clips are located and wires in said cord passage having their ends secured in said seats by said U-shaped clips and entered blades.

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