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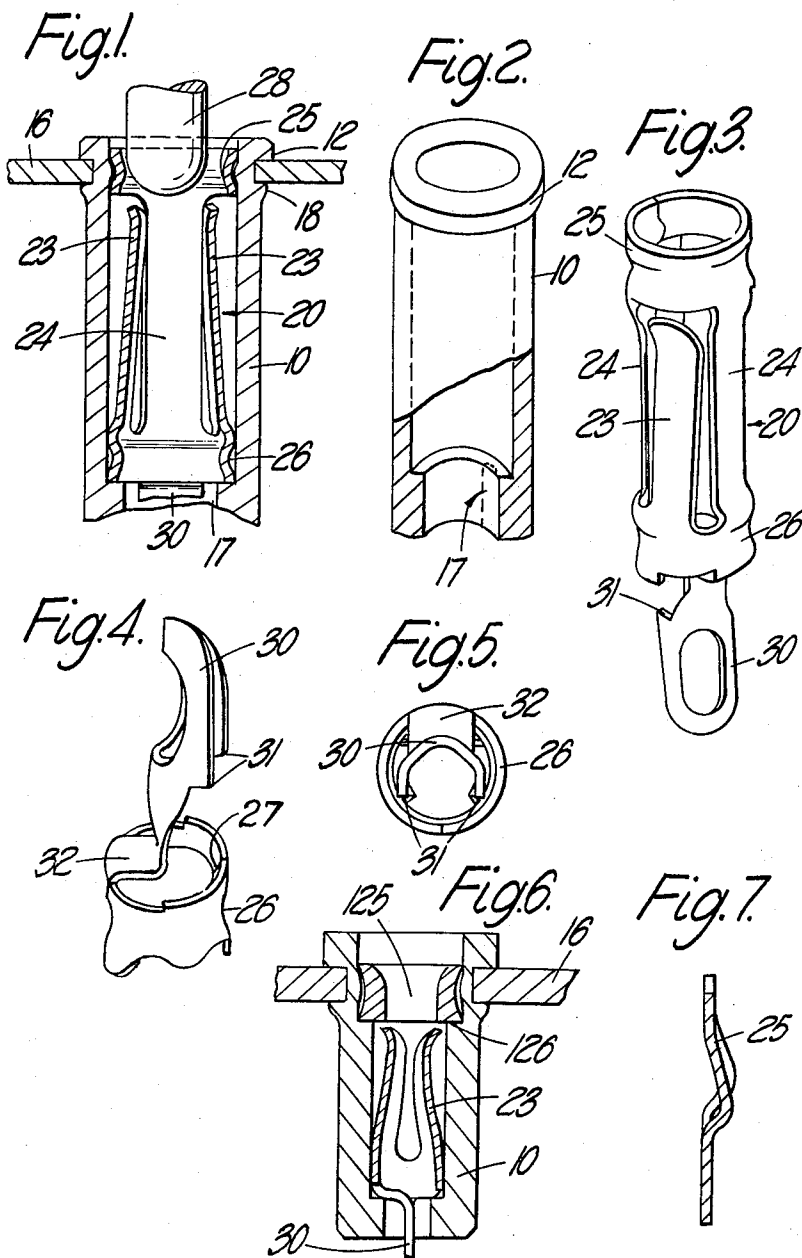
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ELECTRIC SOCKET CONTACTS

Filed Jan. 24, 1962

2 Sheets-Sheet 1



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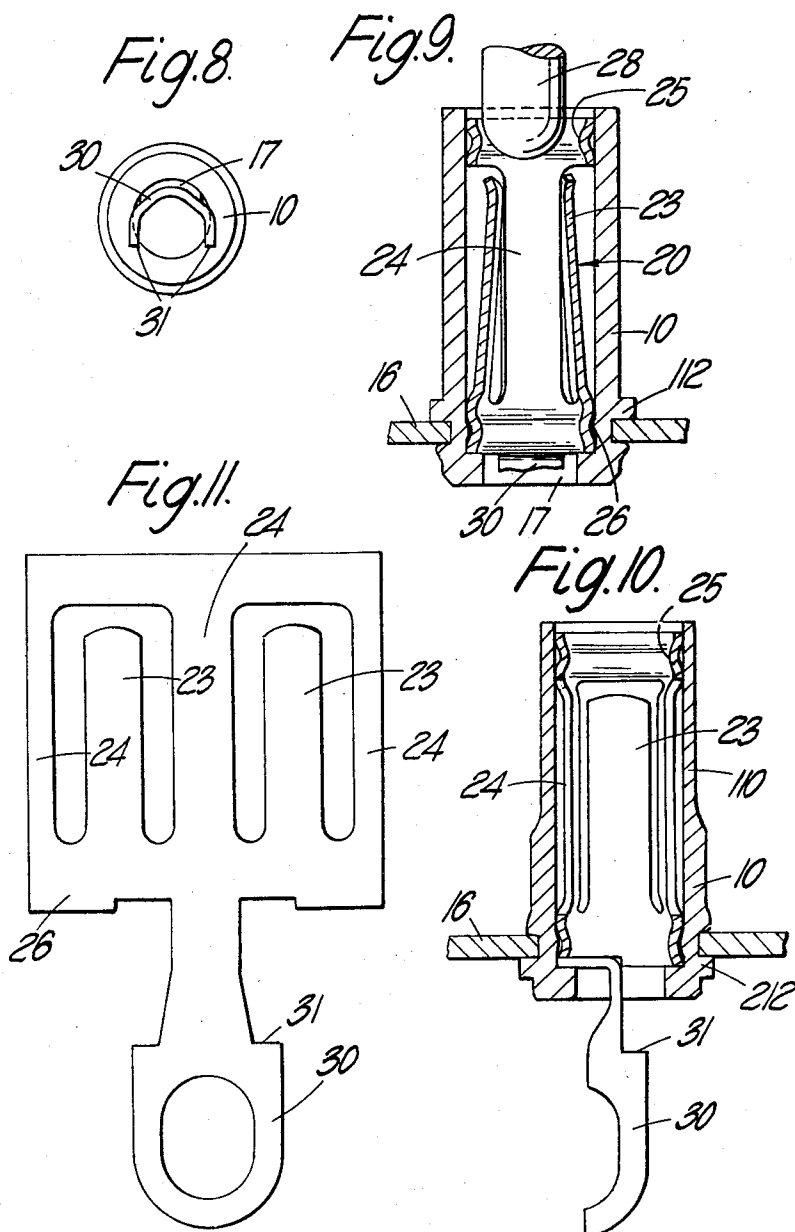
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ELECTRIC SOCKET CONTACTS

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9 Claims. (Cl. 339-126)

The invention relates to electric socket contacts of the kind comprising a socket contact element held in a sleeve of deformable, insulating plastic which may be pushed into a tight-fitting hole in a metal or other plate and gripped thereby.

A disadvantage of such contacts as at present constructed is that the sleeve, which is usually quite thin, is insufficiently strong and rigid to resist deformation in the hole with the result that the contact is not held firmly enough and may, in use, either become detached from the plate or the contact may be pulled into a sloping attitude, relative to the plate, for example by a lateral pull from a wire attached to a contact pin inserted in the socket. It is an object of the invention to avoid or reduce this difficulty.

The invention provides an electric socket contact of the above kind characterised by a reinforcing or supporting ring (e.g. of metal) within the sleeve at the position where the sleeve is to be gripped by the plate.

The ring may have a peripheral groove or recess opposite to the edge of the plate.

As is usual, the sleeve may have an external lip or flange which rests on the face of the plate to locate the sleeve axially in the hole.

Preferably the ring forms the mouth of the contact element and it may be an integral part of the element. Thus the ring may also serve as a guide for leading a contact pin into the socket element.

In one construction according to the invention, the sleeve has a hole in its base (i.e. the end opposite to the socket mouth) and the element has a tag or tongue which passes through the hole and engages on the underside of the end of the sleeve to prevent withdrawal of the element from the sleeve.

Some specific examples of socket contacts according to the invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 is a section, partly broken away, through one construction of contact,

FIGURE 2 is a perspective view, partly sectional, through the sleeve used in the contact of FIGURE 1,

FIGURE 3 is a perspective view of the contact element used in the contact of FIGURE 1,

FIGURE 4 is a perspective view showing, inverted, the lower end of the element of FIGURE 3,

FIGURE 5 is an underplan of the contact element,

FIGURE 6 is a view, similar to FIGURE 1, of a second example,

FIGURE 7 is a section through one side of a reinforcing ring,

FIGURE 8 corresponds to FIGURE 5 but shows the contact element in position in the sleeve,

FIGURE 9 is a view, corresponding to FIGURE 1 but showing a different arrangement for securing the socket contact to a support plate,

FIGURE 10 is a view, also corresponding to FIGURE 1 but showing another different arrangement for securing a socket contact to a support plate, and

FIGURE 11 shows a sheet metal blank used for the formation of the contact element used in the examples shown in FIGURES 1-5 and 8 and in FIGURES 9 and 10.

In the example shown in FIGURES 1-5 and 8, there is

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a thin-walled cylindrical sleeve 10 which has a flange 12 at one end and an axial hole 17 drilled in the other end. The sleeve is produced by turning from a rod of polytetrafluoroethylene. In use the sleeve is installed in a hole in a metal plate or panel 16, the sleeve being a tight fit in the hole so that it tends to expand beneath the plate as shown at 18, whereby the sleeve is located in the plate between the flange 12 and the enlargement or step at 18.

Within the sleeve is a contact element 20 which is formed from a sheet metal blank (FIGURE 11) to tubular form with its opposed vertical edges in substantial abutting relation as shown at 27 in FIG. 4. The element has, at its upper end, a ring 25 and, at its lower end, a ring 26. These rings are a close fit within the sleeve before insertion of the sleeve into the plate. The ring 25 has a groove or depression at a position which is opposite to the edge of the plate after insertion. The ring provides internal support to the sleeve in the region of the hole and so resists deformation of the sleeve at this position. The groove serves both to stiffen the ring and also to receive, if necessary, material of the sleeve forced inwardly by the hole.

The rings 25, 26 are interconnected by arcuate strip portions 24 which are joggled inwardly to serve as guides for a contact pin 28, inserted into the socket. Between the portions 24 there are two resilient tongues 23 which project from the ring 26 and make pressure contact with the pin 28, when inserted.

A tag 30 projects downwardly from the ring 26, the tag being attached to one side of the ring and cranked at 32 to the axis of the element. The tag which projects beyond the circumference of the hole 17 is passed through and deforms the hole 17. The tag has steps or teeth 31 and when these have passed through to the underside of the hole, the deformed hole contracts over them so that they hold the contact element against withdrawal. FIGURE 8 shows the assembled construction.

The example shown in FIGURE 6 is similar to that described above except that the ring 125 is separate from the remainder of the socket element, the portions 24 being omitted. The ring is a push-fit in the sleeve and is located by a step 126.

FIGURES 9 and 10 show two alternative ways in which a socket contact may be secured to a support plate 16. In each case, the contact element is as shown in FIGURE 3 and the ring 26 instead of ring 25 is used to support the sleeve in the region of the hole in the support plate. The contact shown in FIGURE 9 has on the sleeve a collar 112 which is the equivalent of the flange 12 but is near the bottom and serves, by engagement with the plate 16, to locate the contact with the ring 26 within the hole. This contact is inserted into the plate downwardly. FIGURE 10 shows a construction which is inserted into the plate upwardly. In this case the flange 212 is at the bottom of the sleeve. It is to be noted that the sleeve is, externally, reduced in diameter, at 110, in the region of the ring 25. This is to facilitate insertion of the upper portion, where it is supported by ring 25, through the hole. The portion of the sleeve 10 in FIGURES 1-5 below the ring 25 may similarly be reduced in diameter to facilitate insertion into the hole.

It is an advantage of the grooved or recessed formation of the rings 25, 26 that, in effect, this formation provides additional thickness at the mating edges of the strip to resist one edge engaging within the other when inserted in the plate and so losing a proportion of the supporting effect of the rings. FIGURE 7 shows an equivalent arrangement in which the mating edges are joggled and, in the form shown, slightly misplaced axially. The two edges, even so, abut and will do so if they are also radially misaligned to a limited extent. If it is desired to obtain an appropriate amount of resistance, the mating

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edges of the rings 25, 125, may be initially spaced apart to a small extent.

What I claim is:

1. An electric socket contact comprising a socket contact element and a sleeve of deformable insulating plastic surrounding said element, said element being constructed of sheet metal bent to open-ended tubular form with its opposed edges in substantially abutting relation and having at each end a complete ring broken only at the joint between said edges of the sheet, the walls of the tube being cut axially between the rings to provide two diametrically opposed strip portions inter-connecting and integral with the end rings and to provide between the strips two opposed tongues extending axially from one ring, the tongues being integral with that ring and having their free ends set inwardly of the tube, at least one of said rings fitting tightly within the sleeve.

2. An electric socket contact as claimed in claim 1 in which the said one ring which fits tightly within the sleeve has a circumferential groove in its outer surface.

3. An electric socket contact as claimed in claim 1 in which said sleeve has an external flange opposite one end of the ring aforesaid which fits tightly within the sleeve.

4. A socket contact as claimed in claim 1 in which the element has a tag which passes through one end of the sleeve and engages with the end of the wall of the sleeve to prevent withdrawal of the element through the other end of the sleeve.

5. An electrical socket structure comprising a sheet metal socket made from a single blank formed in cylindrical shape with its opposed vertical edges in substantially abutting relation, and a thin-walled bushing of deformable insulating material and provided with a bore extending downwardly from its upper end receiving the socket and having an apertured lower wall forming a seat for the socket, said socket having generally U-shaped vertical struck-out sections providing spring contacts whose free ends are set inwardly to engage a contact pin, and ringlike sections at the upper and lower ends of the socket which engage and support the inner walls of the bushing, the upper ring like section serving as a guide for said contact pin when it enters the socket and a solder-

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ing tag extending from said lower end passing through the lower wall of the bushing.

6. An electrical socket for receiving a contact pin and comprising a sheet metal socket made from a single blank formed in cylindrical shape with its opposed vertical edges in substantially abutting relation, and a bushing of deformable insulating provided with a bore extending downwardly from its upper end receiving the socket and having an apertured lower wall forming a seat for the socket, said socket having generally U-shaped vertical struck-out sections between its upper and lower ends providing spring contacts, whose free ends are set inwardly to engage said contact pin, the socket having upper and lower ring-like sections engaging the bushing and affording internal support therefor, the upper ring-like section forming a guide for the pin and having an inwardly extending annular recess forming a restricted pilot section for the incoming pin, and a soldering tag carried by the socket at its lower end and passing through the lower wall of the bushing.

7. The structure recited in claim 6 wherein shoulders are formed on the tag below the lower wall of the bushing to retain said socket in the bushing.

8. The structure recited in claim 6 wherein the socket walls between the spring contacts are joggled inwardly to guide the incoming contact pin.

9. The structure recited in claim 6 wherein the upper end of the bushing has an external flange to limit inward travel into a hole in a supporting plate.

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