April 3, 1956 E. A. SPRIGG 2,740,942

BI-METAL CONTACT SPRINGS

Filed June 5, 1953

Fig. 1.

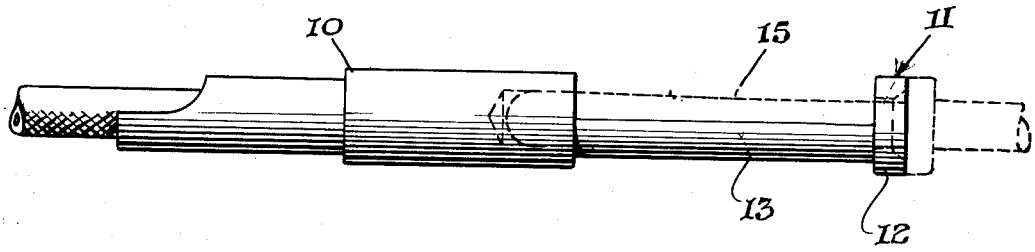


Fig. 2.

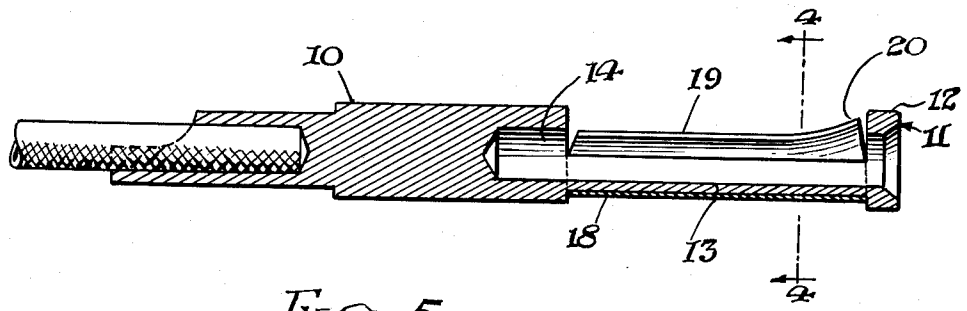


Fig. 5.

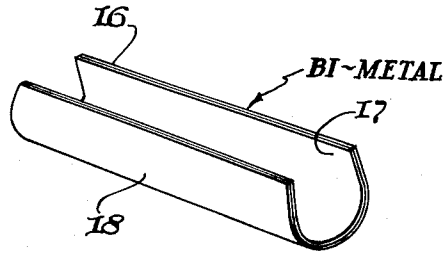


Fig. 4.

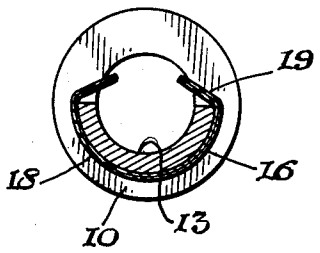
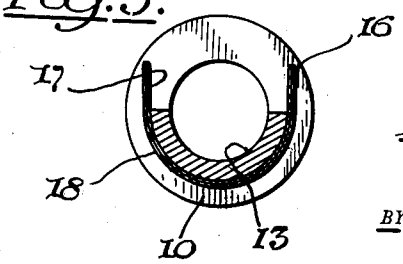


Fig. 3.



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BI-METAL CONTACT SPRINGS

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4 Claims. (Cl. 339—30)

This invention relates to electrical connectors, and particularly to those in which the contact members comprise a socket member and pin insertable therein. Where pin and socket type contacts have been employed, it has been found necessary to use a pressure spring member for the purpose of maintaining the conductive contact between said pin and socket. Previously, most spring contact members have formed from Inconel or a type of stainless steel which would retain its spring pressure loading at elevated temperatures under which the contacts might have to operate. Despite the careful selection of suitable spring contact metals, it has been found that the pressure loading available through the use of any spring material decreases with a rise in temperature, due to the inherent expansion characteristics of the metal involved.

Accordingly, it is an object of the present invention to provide a spring contact member which will actually increase in pressure loading effectiveness as the operating temperature increases.

Another object of the present invention is to provide a spring pressure member which will co-operate with the socket contact of a pin and socket connector to increase the conductive contact therebetween.

A further object of the present invention is to provide a spring contact member which may be inserted or removed from the connector assembly for replacement or repair, with a minimum amount of effort.

A feature of the present invention is the use of a bi-metal spring pressure member.

Another feature of the present invention is the specific split D shape of the spring pressure member which envelops the contact.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawings, forming a part hereof, is illustrated a complete form of embodiment of the invention, in which:

Figure 1 is a view in side elevation of a socket contact member, such as is used in connection with the present invention, with a complementary pin member shown in dashed lines.

Figure 2 is a longitudinal section taken through the contact member shown in Figure 1, with the pressure spring member applied thereto.

Figure 3 is a cross-sectional view of a socket member showing the pressure spring member slipped thereon, prior to being secured to the said contact.

Figure 4 is a cross-sectional view taken on line 4—4 in Figure 2, looking in the direction indicated by the arrows.

Figure 5 is a view in perspective, showing the pressure spring member made in accordance with the present invention.

Referring to the drawings, 10 indicates a socket member having a pin receiving portion 11 at the front thereof. The pin receiving portion 11 consists of a ring 12 and a pin receiving channel member 13 having a substantially semi-circular cross-section connecting the ring 12 with the lead receiving portion of the contact. The lead receiving portion of the connector 10 is bored as indicated at 14 to receive the end of the pin 15.

In order to maintain the conductive contact between the pin and socket contacts, there is provided a pressure spring member 16, best shown in Figures 3, 4 and 5. The pressure spring member 16 is formed from two dissimilar metals secured together in the nature of a bi-metallic strip. The inner metal 17 of the spring 16 is selected from a suitable group of low expanding metals. The outer metal 18 of the spring 16 is chosen from among the high expanding metals.

The spring 16 is curved in the form of a sleeve, as shown in Figure 5, and slipped upon the channel member 13 of the contact 10, as shown in Figure 3. The size of the bi-metallic spring 16 is such that when slipped upon the channel member 13, its ends extend above the edges of the channel member 13. Thereafter, the bi-metallic pressure spring member 16 is inwardly swaged into a substantially split D-shaped cross-section, as indicated at 19 in Figures 2 and 4, so as to lie within the path of the pin 14, as it is inserted in the socket member 10.

The pin receiving ends of the pressure contact spring 16 is flared outwardly, as indicated at 20, for the purpose of admitting the pin 15 therebetween. Thus, as the pin is inserted through the ring 12 and along the channel member 13, it forces the inwardly swaged portions 19 of the spring 16 apart, and is thereby held in tight conductive contact with the socket member 10.

When the assembly is subjected to high temperatures, the high expanding metal 18 on the outside of the pressure spring 16 expands at a faster rate than the low expanding metal on the outside of the spring member. Accordingly, rather than losing its spring pressure loading at elevated temperatures, the present structure and assembly increase its efficiency and maintain the conductive contact between the pin and socket member.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. A socket assembly for a pin and socket contact comprising, a socket member having an electrical lead receiving body part at one end thereof, a contact pin receiving ring portion at the opposite end, a semi-cylindrical channel-shaped section connecting the ring portion and the body part and a bimetallic pressure spring in the form of a split D-shaped sleeve disposed about the channel-shaped section.

2. A socket assembly for a pin and socket contact comprising, a socket member having an electrical lead receiving body part at one end thereof, a contact pin receiving ring portion at the opposite end, a semi-cylindrical channel-shaped section connecting the ring portion and the body part and a bimetallic pressure spring in the form of a split D-shaped sleeve, said sleeve having a high extending metal forming the outer layer thereof and a lower extending metal on the inner layer of the bimetal disposed about the channel-shaped section.

3. A socket assembly for a pin and socket contact comprising, a socket member having an electrical lead receiving body part at one end thereof, a contact pin receiving ring portion at the opposite end, a semi-cylindrical channel-shaped section connecting the ring portion and the body part and a bimetallic pressure spring in the form of a split D-shaped sleeve disposed about the channel-shaped section so that the edges thereof overlie the pin receiving channel of the socket member.

4. A socket assembly for a pin and socket contact comprising, a socket member having an electrical lead receiving body part at one end thereof, a contact pin receiving

ring portion at the opposite end, a semi-cylindrical channel-shaped section connecting the ring portion and the body part and a bimetallic pressure spring in the form of a split D-shaped sleeve, said sleeve having a high extending metal forming the outer layer thereof and a lower extending metal on the inner layer of the bimetal disposed about the channel-shaped section so that the edges thereof overlie the pin receiving channel of the socket member, said spring member having its edges adjacent the ring portion outwardly flared to receive the pin therebetween.

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