W. D. COOLIDGE.

ELECTRICAL CONTACT.

APPLICATION FILED AUG. 4, 1913.

1,181,742. Patented May 2, 1916.

Fig. 1.

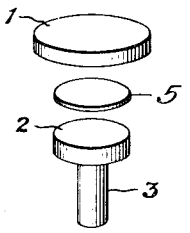
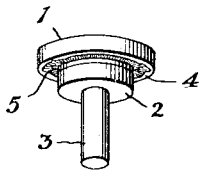


Fig. 2.



Witnesses:

J. Ellis Glen

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Inventor:

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UNITED STATES PATENT OFFICE.

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ELECTRICAL CONTACT.

1,181,742. Specification of Letters Patent. Patented May 2, 1916.

Application filed August 4, 1913. Serial No. 782,793.

To all whom it may concern:

Be it known that I, WILLIAM D. COOLIDGE, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electrical Contacts, of which the following is a specification.

The present invention relates to electrical contacts, suitable for electrical circuit making and breaking devices, and the like, for example, such as described in my prior Patent No. 1,089,907.

This application describes as one embodiment of my invention a contact comprising a disk of tungsten welded to a support of ferrous metal by an interposed film of copper. The weld is made by heating the three metals to be united to the melting point of copper in hydrogen. In my prior application the contact disk and support are disclosed as having the same diameter, or, in other words, the edges of the contacting faces were flush. Under these conditions copper is apt to creep up the sides of the tungsten disk when the parts of the contact are assembled and in some cases even flow over on the contacting surface. This necessitates a separate finishing operation, such as grinding or acid treatment to remove the copper, as it has deleterious effect upon the make and break action of the contact. In accordance with my present invention, this finishing operation may be omitted by constituting the support of lesser diameter than the body of tungsten, or other refractory metal which constitutes the contact.

In the accompanying drawings, Figure 1 shows the parts of the contact before attaching, and Fig. 2 illustrates the completed contact.

As shown in Fig. 1 a small disk 1 of tungsten, or other refractory metal, constitutes the contact proper and this disk is attached to a small malleable contact or support 2, consisting preferably of ferrous metal such as steel or iron. The shank 3 of this support serves to fasten the contact, by riveting, for example, to the spring or whatever form of holder is provided. As clearly shown in Figs. 1 and 2 the tack 2 is of lesser diameter than the contact disk 1 so that an annular space 4 is provided on the underside of the disk 1 between the contiguous surface of contact 2 and the outer edge of the disk.

The contact as a whole is built up by placing upon the support 2 a thin plate 5 of copper and placing upon this plate the disk 1 of tungsten. While copper is preferred, other cupreous metal, or even silver or gold may be used in a like manner. The three parts are properly held in position by placing them on a suitable support, which may consist of graphite, alumina or other refractory material, and then heating in a suitable furnace in a hydrogen atmosphere to the melting point of copper. Under these conditions, and in the absence of oxidizing gases, the copper will wet the surface of both the ferrous metal support and of the body of tungsten, or other refractory metal, so as to form a continuous metallic union, firmly uniting the two metallic bodies as indicated in Fig. 2.

When the annular space is provided between the metal 5 and the edge of the contact disk I find that the copper or other metal will not creep over the edge of the contact disk so that the contacts may be used immediately without any finishing operation, thus cheapening their manufacture.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

The combination of a tungsten contact, a ferrous metal base therefor and a uniting film of cupreous metal set from a fluid state, all of said parts being substantially intact, the base having a smaller diameter than the contact whereby the cupreous metal is prevented from creeping up the sides of the tungsten when fluid.

In witness whereof, I have hereunto set my hand this first day of August, 1913.

WILLIAM D. COOLIDGE.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.