

Feb. 7, 1928.

1,658,713

T. S. FULLER
ELECTRICAL CONTACT
Filed Oct. 30, 1923

Fig. 1.

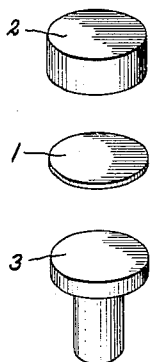
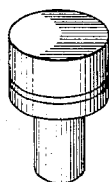


Fig. 2.



Inventor:
Truman S. Fuller,
by *Myron S. Lunt*
His Attorney.

UNITED STATES PATENT OFFICE.

TRUMAN S. FULLER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRICAL CONTACT.

Application filed October 30, 1923. Serial No. 671,785.

The present invention relates to electrical make and break contacts, as for example, the vibratory contacts in an ignition system for an internal combustion engine.

5 When refractory metals such, for example, as tungsten or molybdenum are utilized as tips for make and break contacts, the pellets of refractory metal between which the circuit is broken have been secured by a layer
10 of copper to a base or tack of steel, or other metal suitable for riveting, which solidly binds the tip of refractory metal to the base to make a unitary structure. As described in Coolidge Patent 1,181,741, of May 2, 1916,
15 the brazing of the tip and base by copper is carried out by interposing copper as a thin plate between the contact tip and the base and then melting the copper in a hydrogen atmosphere.

20 Although copper is entirely satisfactory to produce a strong joint, great care must be exercised not to permit any excess of copper to remain on the contacting face or on the sides of the contact disk of refractory metal
25 as this will cause arcing at the contacts during subsequent operation accompanied by overheating and burning of the contact points. This tendency of copper to cause arcing when present upon the contacting surfaces necessitated a separate grinding operation in the
30 manufacture of make and break contacts. But even a careful removal of copper from the contact disk did not always obviate the danger of arcing, as copper sometimes
35 worked through cracks in the contact disk to the contact face and caused arcing.

I have discovered that when the brazing metal in an electrical contact is constituted by a suitable alloy of silver and copper that
40 no arcing occurs when the brazing alloys remain on the face of the contact disk, or creeps on the contact face during operation of the contact.

The accompanying drawing illustrates a
45 contact embodying my invention, Fig. 1 showing the parts before assembly, and Fig. 2 the completed contact.

Although the base whereby a contact is attached may consist wholly of soft metal,
50 as silver-copper alloy in the present instance, I shall describe my invention as applied to

the manufacture of contacts having a base of other metal.

Referring to the drawing, the disk 1 of silver-copper alloy is interposed between the
55 contact disk 2 and the stem or support 3. The silver alloy may contain from about 15 to 28 per cent copper, the lower content of copper of this range being preferred. The contact disk may consist of tungsten, molyb-
60 denum, or other refractory metal. The base 3 ordinarily consists of soft steel, but to advantage may consist of copper or bronze which have a higher heat conductivity than steel. The contact parts thus assembled are
65 heated to the melting point of the brazing materials while held on a suitable form or support, preferably consisting of graphite in a furnace provided with an atmosphere of filling of hydrogen, as described in Coolidge
70 Patent 1,181,741.

The silver-copper alloy readily wets both the tip of tungsten or other refractory metal and the base of iron or steel in the presence of a reducing gas. The mechanical proper-
75 ties of the completed contact containing an interjacent brazing layer of silver-copper alloy are substantially the same as a contact containing a brazing film of copper while as
80 already indicated no grinding or other finishing step is required to remove excess brazing material, and no difficulty is experienced by brazing metal working through cracks of the contact disk to the face of the contact.

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

1. An electrical make and break contact comprising a contact head having a substantially flat surface and a parallel, substantially
90 flat backing therefor consisting of an alloy of silver and copper, said backing being joined to said head by fusion.

2. An electrical make and break contact comprising a contact head of refractory
95 metal, a base and an alloy of silver and copper uniting said head and base by fusion said alloy consisting largely of silver and containing not more than 28% of copper.

3. An electrical make and break contact
100 comprising a contact head of refractory metal having a substantially flat surface, a base consisting of cuprous metal, said base

having a substantially flat surface, and an alloy of silver and copper interposed between said flat surfaces to unite said head and base.

4. An electrical make and break contact comprising a contact head of non-arcing, refractory material and a backing material consisting of an alloy of 85 to 72% parts silver and about 15 to 28 per cent copper.

5. An electrical make and break contact comprising a head of tungsten, a base of 10 copper and an interjacent layer of silver-copper alloy containing at least about 72 parts silver.

In witness whereof, I have hereunto set my hand this 29th day of October, 1923.

TRUMAN S. FULLER.