

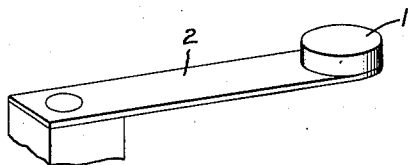
Oct. 13, 1936.

L. ZICKRICK

2,057,604

ELECTRICAL SWITCH CONTACT

Filed Sept. 19, 1935



Inventor:
Lyall Zickrick,

by *Harry E. Dunham*
His Attorney.

UNITED STATES PATENT OFFICE

2,057,604

ELECTRICAL SWITCH CONTACT

Lyall Zickrick, Schenectady, N. Y., assignor to
General Electric Company, a corporation of
New York

Application September 19, 1935, Serial No. 41,244

11 Claims. (Cl. 200—166)

This application is a continuation-in-part of my prior application Serial No. 727,143, filed May 23, 1934, and entitled "Electrical contacts."

The present invention relates to electrical switch contacts. Prior to the present invention, considerable difficulty has been experienced in the operation of such contacts due to the tendency of the contacts to stick together and to form arcs during closing and opening of the contacts. It is one of the objects of the present invention to provide a switch contact which substantially eliminates these difficulties and which is particularly resistant to wear.

The novel features which are characteristic of my invention will be set forth with particularity in the appended claims. The invention itself, however, will best be understood from reference to the following specification when considered in connection with the accompanying drawing in which the single figure represents a switch contact which embodies the features of the present invention.

In carrying out my invention, I employ a switch contact 1 which may be mounted on any suitable supporting means 2 and secured thereto either by mechanical means or by brazing. The contact member 1 consists principally of silver and molybdenum, to which I add a small amount of lead, preferably in the form of lead oxide. The addition of lead to the silver and molybdenum provides a contact substantially free from sticking and arcing.

The ingredients of the alloy contact may vary considerably. I have obtained satisfactory results with contacts containing about 0.5% to 20% lead oxide, the remainder of the contact consisting of silver and molybdenum. In such contacts the relative proportion of silver and molybdenum employed will depend upon the service to which the contact will be subjected. Very satisfactory results have been obtained with contacts containing about 95% silver, about 3% lead oxide, and about 2% molybdenum, also with contacts containing about 35% silver, 1% lead oxide and 64% molybdenum.

The contact is fabricated from powdered ingredients which are mixed together, pressed into a desired shape and then sintered into a compact mass. The sintering temperature employed will vary with the composition of the alloy, for example, an alloy contact containing 95% silver, 3% lead oxide and 2% molybdenum would be sintered in a muffle furnace with an oxidizing or neutral atmosphere at a temperature of about 735° C. However, if the molybdenum content of

the contact is increased a lower firing temperature is desirable. For example, an alloy contact containing 94% silver, 2% lead oxide and 4% molybdenum would be fired at a temperature of about 700° C. On the other hand, if the molybdenum content of the alloy is very high as, for example, in an alloy contact containing 35% silver, 1% lead oxide and 64% molybdenum the firing temperature employed would be about 900° C.

In sintering the last mentioned alloy contact, a reducing atmosphere such as hydrogen may be employed. However, if the alloy contains a low molybdenum content, for example, about 2%, it is preferably fired in a neutral or oxidizing atmosphere.

The lead content in the alloy may vary from about 0.5% to 20%. Preferably, however, I employ from about 1% to about 3% lead in the form of lead oxide. If the lead content of the contact is greater than 3%, the wear resisting quality of the alloy is somewhat impaired.

Although I prefer to employ molybdenum as one of the ingredients in the alloy contact, it may be replaced partly or entirely by tungsten.

Instead of employing a contact consisting substantially of silver, lead and molybdenum, I may employ a contact consisting substantially of silver and lead oxide. The lead oxide content of the alloy may vary from about 0.5% to 20%. In fabricating such a contact the silver and lead oxide ingredients are mixed in powdered form, pressed into shape and then fired in an oxidizing atmosphere at a temperature preferably in the neighborhood of 735° C. If the sintering temperature is materially lower than 700° C. the sintering period required is too long while if it is higher than 850° C. the contact swells up and becomes defective. While a contact of this character does not stick or arc, it does not have the wear resisting quality of the contact which contains molybdenum.

Although I prefer to employ lead oxide in the fabrication of my improved contacts, I may substitute in whole or in part therefor thallium oxide, or other metal oxides, which likewise have a relatively high melting point and the property of substantially eliminating sticking of such contacts.

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

1. A sintered switch contact containing silver and an appreciable quantity of lead oxide, said contact being substantially free from sticking and arcing.

2. A switch contact consisting substantially of silver and lead oxide, the lead oxide comprising about 0.5% to 20% of said contact, said oxide being substantially uniformly distributed through said contact.
3. A sintered switch contact containing silver and about 1% to 3% lead oxide.
4. A sintered switch contact containing about 0.5% to 20% lead oxide, the remainder of said contact consisting substantially of silver.
5. A sintered switch contact containing about 0.5% to 20% lead oxide, the remainder of said contact consisting of silver and metal from a group consisting of tungsten and molybdenum.
6. A sintered switch contact containing about 1% to 3% lead oxide, the remainder of said contact consisting of silver and metal from a group consisting of tungsten and molybdenum.
7. A sintered switch contact containing about 95% silver, about 3% lead oxide and about 2% of molybdenum.
8. A sintered switch contact containing about 35% silver, about 1% lead oxide and about 65% molybdenum.
9. A sintered switch contact containing about 35% to about 65% silver, about 1% lead oxide and about 65% to about 35% molybdenum.
10. A sintered switch contact containing about 0.5% to 20% of oxide from a group consisting of lead oxide and thallium oxide, the remainder of said contact consisting substantially of silver.
11. A sintered switch contact containing about 0.5% to 20% of oxide from a group consisting of lead oxide and thallium oxide, the remainder of said contact consisting substantially of silver and metal from a group consisting of tungsten and molybdenum.

LYALL ZICKRICK.