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ELECTRIC CONTACT

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This invention relates to electric contacts.

An object of the invention is to improve silver electric contacts.

Other objects of the invention will be apparent from the following description taken in connection with the appended claims.

The present invention comprises the combination of elements, methods of manufacture, and the product thereof brought out and exemplified in the disclosure hereinafter set forth, the scope of the invention being indicated in the appended claims.

While a preferred embodiment of the invention is described herein, it is contemplated that considerable variation may be made in the method of procedure and the combination of elements without departing from the spirit of the invention.

The present invention contemplates the improvement of silver contacts by the addition of lithium thereto. The contacts may be prepared, for example, by melting the silver and lithium together in the desired proportions. The lithium acts as a deoxidizer in the melt and frees the silver from harmful impurities and hence the resulting contact alloy has a somewhat lower percentage of lithium present than would be expected from the amount added if no loss occurred.

According to the present invention sufficient lithium is used so that a small proportion of lithium is retained in the silver base after the melting and subsequent solidification. According to the present invention the completed electric contact may be formed of

Lithium	-----per cent .005 to 3
Silver	-----Balance

The contact alloy is preferably prepared by melting the ingredients together in the correct proportions. The lithium may be added in the form of a silver-lithium master alloy containing approximately 15% of lithium. This master alloy has a very low melting point which is in the neighborhood of 410 to 450 degrees C. and, therefore, will go readily into solution when added to molten silver.

The effect of lithium is to completely deoxidize the silver melt and to free the melt from other impurities which are harmful. Part of the lithium will be eliminated during the melting together with those impurities which are removed by the lithium and the remaining melt will be free from inclusions and oxides. The presence of excess lithium after deoxidation also prevents the further oxidation of the melt during the heating periods to which the melt may be subjected. The lithium imparts to the silver a very high fluidity in the molten state, thereby improving the pour-

ing qualities and resulting in extremely clean castings.

It is, of course, possible in original melt to use deoxidizers other than lithium for deoxidizing the melt. The present invention contemplates, however, that the finished contact alloy in its solid state shall contain lithium in the proportions given above.

Lithium improves the working qualities of the silver enabling it to be more readily rolled, drawn or headed. The resulting forms are free from surface blemishes and oxide stringers and an improved surface finish is also obtained.

The electrical characteristics of the silver for contact purposes are greatly improved by the addition of lithium. Not only is the material transfer between co-operating contacts substantially reduced but the contact resistance is also reduced.

It is of special interest to find that the material transfer for this composition was from the cathode to the anode. With most silver base alloys the material transfer is in the opposite direction, i. e. from the anode to the cathode. It is, therefore, possible by using a contact of silver and lithium according to the present invention in cooperation with a contact formed of a silver base alloy having opposite transfer characteristics to substantially neutralize the contact transfer.

Contacts of the composition contemplated by the present invention also lend themselves more readily to brazing to a supporting arm or screw than coin silver or sterling silver contacts of the prior art and most silver contact alloys. The silver-lithium alloy is readily wetted by brazing materials such as silver solders.

Since the lithium decreases the melting point of silver very materially and since an eutectic is formed at 2.7% lithium, having a melting point of 610 degrees C. care must be exercised when these materials are processed at elevated temperatures, especially when the higher proportions of lithium are present.

While the present invention, as to its objects and advantages, has been described herein as carried out in specific embodiments thereof, it is not desired to be limited thereby but it is intended to cover the invention broadly within the spirit and scope of the appended claims.

What is claimed is:

1. An electric contact formed of .005 to 3% lithium and the balance silver.
2. A silver electric make-and-break contact characterized by the presence of .005 to 3% lithium.

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