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CONTACT ELEMENT

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This invention relates to electrical make and break contacts.

An object of the invention is to provide an electrical make and break contact which is suitable for use in connection with magnetos, relays and similar devices.

Another object is to provide an electrical make and break which may be substituted for contacts of the platinum, iridium and similar types.

A further object is the provision of an electrical make and break contact of comparatively high hardness and which, compared to contacts commonly used in the various fields mentioned, is relatively free from carburization.

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.

For many purposes, such as for magneto contacts, relay contacts, etc., it has heretofore been customary to use electrical make and break contacts composed of platinum-ruthenium or platinum-iridium alloys. While such contacts are fairly satisfactory due to their hardness and non-corrosiveness in normal and most industrial atmospheres, a low transfer (carry-over) under the electric arcing inherent to magneto and most relay operations, they possess the disadvantages of high initial cost and difficulty of fabrication. Moreover, the alloys platinum and iridium have shown a marked affinity for hydro-carbon vapors under electrical arcing conditions and this characteristic seems to increase with the increased percentages of iridium necessary to produce sufficient mechanical strength and hardness of magneto and similar uses.

According to my invention an electrical contact is formed of an alloy of silver with palladium or platinum, nickel and copper. It is preferred that the ingredients be present in the following ranges of proportions:

	Per cent
Silver	50 to 80
Palladium or platinum	12 to 25
Copper	5 to 15
Nickel—in excess of a trace up to	7

In place of nickel I may substitute an element having the alloying characteristics of this metal.

It will be noted that this alloy contains a predominance of silver. This alloy is well suited for substitution for platinum or palladium base alloys in the fabrication of electric contacts.

As examples of specific contact alloys which have been found especially suitable after exhaustive life tests and actual service operation the following two compositions are representative:

Contact alloy A

	Per cent
Silver	60
Palladium	23
Copper	12
Nickel	5

Contact alloy B

	Per cent
Silver	67
Palladium	14
Copper	13.4
Nickel	5.6

The contact in this invention compares favorably in the electrical characteristics with platinum or palladium base contacts, particularly on relay and magneto service, and is superior to such contacts from a carburization standpoint when exposed to hydrocarbon vapors. As compared with palladium base or platinum base contacts there is, in addition to other advantages, a substantial saving in cost.

The contacts have also been found to be well suited for thermostatic control contacts and for contacts to work in atmospheres which are normally destructive to contacts, such as in gases containing H_2S, SO_2 or NH_4OH. They are also useful wherever a very light contact pressure must be used, or a current of low value must be used, even at extremely high rates of operation.

The density of the alloy is comparatively low so that the cost per contact is low.

This alloy can be substituted for white gold, and can be used in jewelry, for a thermostatic material, for pyrometer controls and for dental inserts as well as for electrical contacts.

Contacts may be formed of the alloy by any of the usual methods of fabrication, such as by upsetting or heading, by screw machine operations, by molding or stamping or other methods.

This contact material has a relatively low vapor pressure, and consequently does not arc heavily or transfer readily when used on direct or pulsating current and, therefore has a low co-efficient of contact resistance rise.

It shows little or no tendency toward oxidation in service.

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 element formed of an alloy composed of about 5 to 15% copper, in excess of a trace up to 7% nickel, 12 to 25% of an element selected from the group consisting of palladium and platinum and 50 to 80% silver.

2. An electric contact element formed of an alloy composed of about 12% copper, 5% nickel, 25% palladium and 60% silver.

3. An electric contact element formed of an alloy composed of about 13.4% copper, 5.6% nickel, 14% palladium and 67% silver.

4. An electric contact element formed of a preponderance of silver and containing 5 to 15% copper, 12 to 25% of an element of the palladium-platinum group and in excess of a trace up to 7% nickel.

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