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MATERIAL FOR CONTACT POINTS AND THE LIKE

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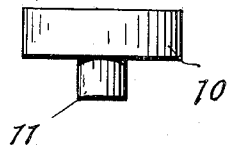


Fig. 1.

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MATERIAL FOR CONTACT POINTS AND THE LIKE

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This invention relates to a new and improved material for contact points and the like, and has for its chief object to provide a material which is more satisfactory and serviceable than the metals or materials used heretofore.

More particularly it is the aim of the invention to provide a material for the purpose mentioned, which has long life, low resistance, more cohesiveness against the disruptive action of the electric arc, and which when incorporated in a pair of co-operating contacts carrying direct current does not pit on one contact and build up on the other to an objectionable extent or manner and to the extent that the pitting and building up occurs with other contact materials.

Further the invention aims to provide a material which will not oxidize materially under the action of the electric arc, and which, while having all the desirable features of harder and more brittle commonly employed materials such as tungsten, can be swaged, and therefore directly fastened to the member adapted to support the contact point.

The above and other objects are attained by my invention which may be here briefly summarized as consisting in a certain novel combination of ingredients which will be described in the specification and set forth in the appended claims.

In the accompanying sheet of drawings, Fig. 1 is a side view of a contact point in the form that it generally assumes, but on a greatly enlarged scale.

In carrying out my invention I provide a material formed from several ingredients which preferably consist of silver, copper and cobalt. Although the proportions of the ingredients may be varied, I find that very good results are obtained by mixing the ingredients in the proportion of approximately 75 per cent by weight of silver, 23 per cent by weight of copper and 2 per cent by weight of cobalt.

My improved contact material may be obtained from the above ingredients in different ways, but the method which I have carried out very effectively is as follows: I mix 2 parts by weight of cobalt with 23 parts by weight of copper, and these materials are then melted in a crucible and thoroughly stirred. I then take 25 parts by weight of the copper-cobalt mixture or alloy with 75 parts by weight of silver, place them together in a crucible and melt them, thoroughly stirring the same when melted.

The resulting mixture or alloy is cast into suitable form and swaged or rolled to a convenient shape, and the contact points are punched from the material in the form shown in Fig. 1, the point having a body portion 10 and a protuberance or rivet 11 adapted to be upset or riveted to the spring or holder.

Inasmuch as this material has properties not possessed by the individual metals or ingredients, I am of the opinion that a true alloy is formed, but whether all three ingredients are alloyed together, or whether an alloy is formed of two of them, I am not certain, nor do I believe it material in so far as the patentability of my improvement is concerned. The material has a series of very important properties and advantages over the best materials used heretofore for contact points. These are as follows:

1. It has long life, which is an essential characteristic for commercial contact material.

2. The material has low resistance, which is a very desirable characteristic for ignition systems at all times, but particularly in cold weather when a hot spark is desired.

3. It is not disrupted by the action of an electric arc to an extent and in the same way as with the best materials employed heretofore. In this connection it might be stated that direct current is now employed almost universally for ignition systems, and the effect of the direct current is to electrolytically transfer the material from one point to the other, forming a pit in one point and a protuberance on the other. With certain materials such as tungsten, this pitting and building up takes place not only quite extensively but in an unsatisfactory manner, especially as the protuberance is rather sharp and causes a decided increase in the resistance of the contacts. On the other hand, with my improved material the pitting and building up

occurs to a less degree and more slowly than heretofore, and what does occur is not of a serious nature as the pitting and building up take place practically uniformly over the entire active faces of the two contacts, causing very little change in the resistance of the contacts.

4. My improved material does not oxidize, at least to any appreciable extent, but after continuous use of the material over a long period of time, the active faces are bright, indicating almost complete absence of oxidation.

5. The material though successfully withstanding the action of the electric arc occurring at the contact points of ignition systems is ductile and can be swaged, making it possible to rivet it directly to the contact holding member. This is a distinct advantage over the use of tungsten, which is so hard and brittle that it has been necessary heretofore to braze the tungsten point to a softer material, generally iron, and commonly referred to as an iron tack, which can be riveted to the contact holding member. In this connection it might be stated that in brazing a contact point of tungsten or other hard, brittle material to a softer material such as iron, it is very difficult to keep the brazing material from flashing over onto the active face of the point. Since the best brazing material is copper, or contains free copper, when a small portion of the brazing material gets onto the active surface of the point it in some manner contaminates the point, rendering it useless, or at least destroying its utility as far as service and durability are concerned.

Above I have listed some of the important advantages of my improved contact material over the best materials used heretofore, and above I have mentioned the fact that I am not certain that all the metals are alloyed together, though such may be the case. At any rate, the material does not possess the disadvantages of the individual ingredients if used or attempted to be used alone for contact point purposes. For example, silver has the disadvantage that it flakes off; copper if used alone is destroyed almost instantly, and cobalt is too hard, none of these disadvantages appearing at all with my improved material. Furthermore, free copper, such as might get onto the active face of a contact point brazed to an iron tack, destroys the life of the contact point as stated above, but there is no evidence of free copper in my improved material so far as service and use are concerned, and this leads me to belive that the copper is alloyed with one or both of the other ingredients.

While I have described the preferred materials and the preferred proportions, I do not desire to be confined either to the precise materials or proportions, but aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention.

Having described my invention, I claim.

1. A homogeneous material for contact points and the like containing copper, cobalt and silver with the latter in larger proportion than the copper and cobalt.

2. A homogeneous material for contact points and the like containing about 75 parts by weight of silver and about 25 parts by weight of copper and cobalt.

3. A homogeneous material for contact points and the like containing approximately 75 per cent by weight of silver, approximately 23 per cent by weight of copper and approximately 2 per cent by weight of cobalt.

In testimony whereof, I hereunto affix my signature.

JOSEPH A. WILLIAMS.