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CADMIUM COMPOSITION

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4 Claims. (Cl. 75—22)

This invention relates to a metallic composition and the manufacture thereof.

This is a division of co-pending application Serial No. 167,023, filed Oct. 2, 1937.

It is an object of the invention to provide a material which will have useful properties for many applications and which will be particularly suitable for electrical contacting members, because it will provide low contact resistance and long life under arcing conditions such as are encountered in electrical contacts used for making and breaking electrical circuits.

It is a further object of the invention to provide a material which will be useful for bearing purposes.

It is a further object of the invention to produce a new metallic composition and combinations of metallic elements the production of which heretofore has not been practicable.

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 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 invention contemplates the provision of a metallic body consisting of elements which it has been impossible to alloy by the standard methods of the prior art. The new metallic composition comprises the combination of such elements as cobalt and nickel with cadmium.

The complete composition may contain the combined ingredients in the following ranges of proportions:

	Per cent
Metal of the nickel-cobalt group	25 to 90
Cadmium	Balance

In some instances a minor portion of the cadmium may be replaced by zinc. Likewise up to 5% of silver or gold may be added.

The selection of the exact composition to be used for any purpose will, of course, depend on the specific properties desired for the application contemplated.

One example is as follows:

	Per cent
Nickel	80
Cadmium	20

This composition is particularly suitable for an electrical contacting material. By varying the proportions of the nickel or cobalt and the cadmium the material can be adjusted for serving different contact purposes.

In certain cases, for instance, it is necessary to have non-sticking properties and a higher percentage of cadmium is found advisable. This cadmium content also will tend to lower the contact resistance. In other applications the cheapness of the material is the outstanding factor and the contact applications are not extremely severe. For such purposes, material high in a metal taken from the nickel-cobalt group is used because this will cheapen the contact.

Furthermore, the selection of the specific composition depends on the type of manufacturing procedure that is used.

In producing the metal compositions of the nature disclosed, the standard alloying methods of the prior art can not be used. It is impossible, for instance, to melt down the nickel or cobalt and to add the cadmium to such a melt, because cadmium volatilizes at very low temperatures and would be almost completely lost during the standard alloying processes.

I have found it possible to make the metal compositions by another method. Nickel powder for instance, is mixed with a small percentage of metal powder taken from the first group of the periodic system, compressed and sintered in a reducing atmosphere or in vacuum, then a certain weight of cadmium is placed on top of this mixture and soaked into the mixture by capillary action. The product obtained is very homogeneous.

The nickel-cobalt metal and cadmium may also be mixed together as powders (with or without small proportions of zinc, silver or gold) and pressed and sintered.

In experimenting with the above mixtures, I have made a complete microscopic study and from such a study, it can be found out definitely what times and temperatures of sintering must be employed for different size pieces, to obtain the desired properties.

In order to process the metallic composition of the present invention, it is possible to vary the mechanical and heat treatments. For instance, after the material has been pressed and sintered, it may be re-pressed and re-sintered, or it may be forged, rolled and swaged and then from such swaged strips or wires, contact plates or contact rivets might be procured which are fastened to some sort of a support by either a brazing or a welding method and used in electrical equipment as contacting elements.

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 in-

tended to cover the invention broadly within the spirit and scope of the appended claims.

What is claimed is:

1. A sintered metal composition of mixed finely divided metal powders, composed of 25 to 90% of metal selected from the group consisting of nickel and cobalt and the balance substantially all cadmium metal.

2. A sintered metal composition composed of mixed finely divided nickel and cadmium metal powders, said nickel forming 25 to 90% of said composition and said cadmium forming 10 to 75% thereof.

3. A metal composition consisting of about 80% nickel and about 20% cadmium.

4. An electric contacting member formed of a sintered metal composition of mixed finely divided metal powders, composed of 25 to 90% of metal selected from the group consisting of nickel and cobalt and the balance substantially all cadmium metal.

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