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FUSE ALLOY

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The present invention relates to novel alloys and to devices prepared from these alloys. More particularly, it relates to electrical fuse alloys and to electrical fuse elements made of these alloys.

Electrical fuses designed to blow at relatively small currents present certain problems in design not encountered in fuses which are required to blow only at higher currents. A fuse element must have a relatively small cross section in order to blow at small current values. The ordinary low melting alloys used for forming electrical fuse elements possess a tensile strength which is so low that considerable difficulty is encountered in avoiding the breaking of the fuse elements in the manufacture of fuses containing elements of the required small cross section. Moreover, there is danger that the fuse elements having a small cross section and a low tensile strength will break during use when exposed to mechanical shock or vibration.

According to the present invention there are provided alloys which not only have the requisite tensile strength for forming fuse elements of relatively small cross section but which also possess the other desirable and necessary characteristics of fuse alloys, namely, a low melting point, electrical resistance characteristics such that the fuse is able to carry certain fixed currents and yet is able to blow at other fixed currents within a definite time limit, freedom from brittleness and good resistance to humidity and atmospheric corrosion. The following fuse alloy has been found very desirable for forming fuse elements, particularly those designed to blow at small currents:

	Per cent
Tin	50
Cadmium	30
Silver	17
Copper	3

The following manufacturing limits may be set up for the preparation of a fuse alloy having the composition given above:

	Per cent
Tin	50 -52
Cadmium	27 -30
Silver	17 -18
Copper	2.6- 3

This alloy has a melting point in the vicinity of 200 degrees centigrade. Fuse elements may be prepared from this alloy by melting in a vacuum or under a flux and casting in the form of a bar. The casting is then pressed between

hard steel blocks to about one-third of its original thickness or less. The pressed piece is then rolled into strips of the desired thickness and slit into tapes of the desired width. A tape prepared in this manner having a width of .006 inch and a thickness of .00125 inch has a breaking strength in excess of 50 grams. A fuse containing a one and one-half inch length of such a tape as a fuse element will carry .35 ampere for more than three hours but will blow at .5 ampere in less than 210 seconds.

The proportions of the ingredients of the alloy set forth above may be varied within certain limits. Suitable alloys may be prepared having tin contents between 40% and 60%, having cadmium contents between 20% and 35%, having silver contents between 15% and 25% and having copper contents between 2% and 5%.

Although the invention has been described in terms of its specific embodiments, certain modifications and equivalents will be apparent to those skilled in the art and are intended to be included within the scope of the present invention which is to be limited only by the reasonable scope of the appended claims.

What is claimed is:

1. An alloy having about the following composition:

	Per cent
Tin	50
Cadmium	30
Silver	17
Copper	3

2. A fuse alloy having substantially the following composition:

	Per cent
Tin	50 -52
Cadmium	27 -30
Silver	17 -18
Copper	2.6- 3

3. An alloy consisting of between about 40% and about 60% tin, between about 20% and about 35% cadmium, between about 15% and about 25% silver, and between about 2% and about 5% copper.

4. An electrical fuse element made of the alloy described in claim 1.

5. An electrical fuse element made of the alloy described in claim 2.

6. An electrical fuse element made of the alloy described in claim 3.

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