

UNITED STATES PATENT OFFICE

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ALLOY

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This invention relates to alloys used for brazing and welding purposes and is concerned more particularly with a novel quaternary alloy which has relatively low melting and flow points and which can be used with great facility in producing joints of excellent tensile strength, as, for example, between objects of copper and brass.

The new alloy consists of silver in an amount varying from about 5% to about 20%, copper in an amount varying from about 55% to 84%, cadmium in an amount varying from about 1% to 25%, and phosphorus varying from about 2% to 5%. Specific examples of the new alloy may have approximate compositions as follows:

	Per cent
1. Silver.....	5
Copper.....	65
Cadmium.....	25
Phosphorus.....	5
2. Silver.....	10
Copper.....	80
Cadmium.....	5
Phosphorus.....	5
3. Silver.....	15
Copper.....	60
Cadmium.....	22
Phosphorus.....	3
4. Silver.....	20
Copper.....	55
Cadmium.....	20
Phosphorus.....	5

These and other alloys within the ranges mentioned offer the advantages of having melting points which are substantially lower than those of the alloys commonly known as "silver solders". They are cheaper than such solders and they may be used in making butt joints of copper with or without flux. The use of a flux is preferred, however, with the alloys containing the larger amounts of cadmium, and also when joints between brass objects are being made.

The alloys within the ranges mentioned have closely similar melting and flow points as, for

example, the alloy given in Example No. 1 has a melting point of 1080° F. and a flow point of 1200° F., while the alloy in Example No. 4 has a melting point of 1120° F. and a flow point of 1210° F. The thermal properties of the alloys thus lie within reasonably close limits over a considerable range of composition and different alloys within the composition ranges given may be chosen for specific purposes according to the character of the work to be done.

In producing the alloys, the silver and copper may be melted down in a graphite crucible under a charcoal cover. The phosphorus is then added in the form of a 15% phospho-copper alloy and the cadmium is added just before pouring.

Because of the relatively low temperatures at which the new alloy can be employed, it can be used to great advantage in various manufacturing operations in which the two objects to be united are not capable of withstanding the temperatures required in the use of silver solders.

What I claim:

1. An alloy consisting of silver ranging from about 5% to about 20%, copper ranging from about 55% to about 84%, cadmium ranging from about 1% to about 25%, and phosphorus ranging from about 2% to about 5%.

2. An alloy consisting of silver ranging from about 5% to about 10%, copper ranging from about 60% to about 84%, cadmium ranging from about 1% to about 25%, and phosphorus ranging from about 2% to about 5%.

3. An alloy consisting of silver ranging from about 10% to about 15%, copper ranging from about 60% to about 84%, cadmium ranging from about 1% to about 25%, and phosphorus ranging from about 2% to about 5%.

4. An alloy consisting of silver ranging from about 15% to about 20%, copper ranging from about 55% to about 60%, cadmium ranging from about 20% to about 22%, and phosphorus ranging from about 3% to about 5%.

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