

UNITED STATES PATENT OFFICE

2,184,716

METHOD OF MAKING AN ALLOY

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No Drawing. Application February 17, 1938,
Serial No. 191,111. In Great Britain February
26, 1937

2 Claims. (Cl. 75—162)

This invention has for its object to provide a method for producing a novel copper-aluminium alloy utilisable for miscellaneous purposes in the industry and particularly for making reflectors.

A further object of the invention is to provide by this method a novel copper-aluminium alloy wherein the proportions of the alloying constituents are such as to render said alloy easily malleable, moldable or workable.

A still further object of the invention is to provide a method of making a copper-aluminium alloy suitable for use in manufacturing light-reflectors, particularly those which are capable of reflecting pure orange-colored light rays or rays of long wave length, said reflector being mostly utilisable in photography or cinematography, for clinical work, for piercing fog and mist, for projecting anti-dazzling beams or for numerous other purposes.

With these and such other objects in view as will incidentally appear hereafter, the invention comprises the novel features or characteristics that will now be described and pointed out in the appended claims.

According to the invention, the novel alloy comprises, by weight, from 89.50% to 92.50% of substantially pure copper and from 10.50% to 7.50% of substantially pure aluminium. The proportions of the alloying constituents may vary within these limits but the most suitable or optimum proportions for obtaining an easily malleable and workable alloy capable, when shaped into the form of a reflector, to provide a surface that will reflect exclusively orange-colored rays are as follows:

	Per cent by weight
Copper.....	90.05
Aluminium.....	9.95

Advantageously the copper alloyed to the aluminium is refined copper or cupric copper as produced by electrolysis.

Besides its prospective usages for the making of reflectors having the property of throwing back orange-colored rays exclusively, the novel alloy having the aforesaid proportions of copper and aluminium may be used for all suitable purposes.

According to the invention moreover, the improved reflector has a light reflecting surface or wall made entirely of the aforesaid copper-aluminium alloy. When manufacturing the reflector, any alloy having the respective proportions by weight of copper and aluminium as above stated may be used with advantage. However,

in order to obtain pure orange-colored light (as verified by spectral observation or analysis) an alloy containing 90.05% of copper and 9.95% aluminium should be used. If such proportions by weight are altered within the given scale, the results will be less perfect while being still satisfactory especially if the optimum proportions of the alloying constituents are approximated.

The property of reflecting light rays of long wave length and particularly orange-colored rays renders the improved reflector made of a copper-aluminium alloy as above described particularly valuable as a reflector in photography or cinematography (either for taking or for projecting moving pictures) also for surgical or clinical work and for the construction of motor car lamps or any other similar purposes because, as it is well known, orange-colored rays are non-dazzling and less detrimental to human eyes than white-colored light rays.

Furthermore, the property of rendering the reflected light rays capable of satisfactorily passing without diffraction through a heavy and dense mist or fog renders the improved reflector most valuable as a motor car lamp reflector or any other type of reflector as it facilitates traffic on roads in misty or foggy weather.

Moreover, this valuable property may be used with success in reflectors or projectors for the navy, anti-aircraft purposes, large mirrors for industrial purposes, ship beacons, projectors for locomotives and railway traffic, aviation, landing grounds, air signalisation devices, light houses, photography and cinematography purposes, street and road signalisation devices, also for street or road lighting, home lighting, workshop and factory lighting, theater stages, open air theaters, artistic lighting for buildings, advertising signs, etc. Many other fields of application may be suggested.

For producing the alloy of which many articles such as the improved reflector can be made, copper in the selected proportion should be molten, heating it to about 1160° C. The molten copper should then be withdrawn from the heating receptacle and left to cool to approximately 950° C. Aluminium in the form of small pieces, fragments, chips or scrap preliminarily heated to 150° C. should then be introduced into the mass of molten copper in which it readily melts and disperses itself. Proper mixing of both metal constituents to provide satisfactory alloying conditions may be performed in any suitable way. The alloy thus produced may be

poured or cast into suitable ingot moulds, preferably made of earthen ware.

If the improved reflector is used for example for surgical work, in photography or cinematography, in a motor car lamp or any other similar purposes, its reflecting surface should be perfectly smooth and polished, the outline of said reflector being of suitable shape, for instance of a parabolic shape for imparting perfect parallelism to a beam of light rays emanating from an electric or other source of light located at the focus. The transparent panel fitted in the hinged door of the casing of a lamp for motor cars should be made advantageously of a colorless glass. The rim in which such a glass panel is fitted may be made of the same alloy as the reflector. If such is not the case, the said rim should be so located outside the periphery of the reflector as to have no influence on the beam of reflected light rays.

For use in photography or cinematography or for clinical work, for the construction of motor car lamps or any other similar purposes, the source of light of suitable power located at the focus of the reflector made of the copper-aluminium alloy as above-stated may be provided advantageously with a forwardly located screen or shield of the same metal as the reflector capable of throwing back the rays emitted by the said source of light towards the wall of the reflector. Such a screen or shield may be constituted for instance by a coating applied to the front portion of the glass wall of an electric bulb of the usual type, if such a source of light is used. No constructional obstacle must be left inside the lamp that would interfere with the

proper path of the light rays reflected by the improved reflector.

What is claimed is:

1. The method of producing a copper-aluminium alloy which comprises the steps of heating a selected quantity of pure copper in a suitable receptacle to about 1160° C. in a furnace, withdrawing the receptacle containing the molten copper from the furnace and allowing the copper to cool to about 950° C., heating pure aluminium in the form of small fragments, such as chips or shavings, to about 150° C., adding said fragments of aluminium to the copper, and mixing the two metals to cause them to become alloyed, the proportions by weight of the alloying metals being so selected as to obtain an alloy comprising 89.50% to 92.50% of copper and 10.50% to 7.50% of aluminium.

2. The method of producing a copper-aluminium alloy which comprises the steps of heating a selected quantity of pure copper in a suitable receptacle to about 1160° C. in a furnace, withdrawing the receptacle containing the molten copper from the furnace and allowing the copper to cool to about 950° C., heating pure aluminium in the form of small fragments, such as chips or shavings, to about 150° C., adding said fragments of aluminium to the copper, and mixing the two metals to cause them to become alloyed, the proportions by weight of the alloying metals being so selected as to obtain an alloy comprising 90.05% by weight of copper and 9.95% by weight of aluminium.

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