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COPPER COBALT ALLOY.

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The invention is a group of alloys containing copper and cobalt.

I have discovered that copper alloys containing 2% or more of cobalt are remarkable in that they can be brought into a condition of great hardness and strength, and are still more remarkable in that the hardness and strength persist when the alloys are heated and even when they are held for considerable times at a temperature of 700° C. At somewhat lower temperatures the alloys resist annealing indefinitely. In addition to these unusual properties the alloys of the invention possess the resistance to corrosion and other known characteristics of the copper alloys, and this combination of properties renders them valuable for many purposes.

To prepare an alloy of this class for use it is first heated to a temperature between 850° C. and its melting point, and held at such temperature until the cobalt is in solid solution. The alloy is then quenched from this temperature and thereby hardened. The hardness and strength can be increased by cold work. The cold-worked alloy retains a large proportion of its strength and hardness when heated to moderately high temperatures although its ductility is increased by such heating. Thus at temperatures as high as 700° C., a binary alloy containing 3% of cobalt may show a Brinell hardness of 90 and a tensile strength of over 55,000 pounds per square inch, combined with the ductility indicated by an elongation of 25%.

The invention is not restricted to binary alloys as cobalt has a similar effect when added to any of the alpha alloys of copper, for example its alpha alloys with zinc, aluminum, tin, or manganese. The cobalt content of the alloys may of course be increased as desired but because of the present high price of cobalt it is preferred to keep it in the vicinity of 2 to 5%.

I claim:

1. The method of treating copper to improve the physical strength thereof which consists in alloying it with 2% to 5% of cobalt, heating the alloy to a temperature above 850° C. and quenching from that temperature.

2. The method of making non-annealable corrosion resisting articles which comprises forming an article from an alloy consisting predominantly of copper, and containing not less than 2% of cobalt, and no more cobalt than can be caused to go into solid solution at 850° C., and quenching the article from a temperature above 850° C.

In testimony whereof, I affix my signature.

MICHAEL G. CORSON.