

UNITED STATES PATENT OFFICE

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ALLOY

No Drawing.

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This invention relates to an alloy and more particularly to an alloy adapted for use in the manufacture of cartridge cases for small arms ammunition.

Heretofore cartridge cases have been made of copper or gilding metal. Recently the pressures and velocities of rim fire ammunition have been increased to make the ammunition more suitable for rim fire target shooting. To obtain the increase in pressures and velocities, it is necessary to employ a more powerful charge of propellant powder. This has led to difficulties in ammunition manufacture due to the fact that the copper and gilding metal heretofore employed in the construction of cartridge cases do not have the inherent strength necessary to permit them to be used with the more powerful loads.

A suitable substitute must not only possess the necessary strength to withstand the increased load but must be workable to permit the formation of the cartridge cases in the usual manner and must be incapable of amalgamating with free mercury. It has been proposed to form the cases of brass and eliminate mercury fulminate from the priming mixture. While priming mixtures containing no mercury fulminate are known and have been used to some extent, such non-mercuric priming mixtures have not proved suitable for all purposes and accordingly the proposal referred to above has not solved the question.

I have found that a copper alloy containing silicon, manganese and zinc has the additional strength necessary to withstand the increased pressure to which cartridge cases are submitted in modern ammunition, can be easily worked to permit the manufacture of cartridge cases by the methods now employed and will not amalgamate with any free mercury that may be present in the mercury fulminate of the priming mixture.

I am aware of the prior use of manganese and silicon in a copper alloy to produce an acid resistant material. I have found, however, that by adding zinc to the alloy heretofore used and reducing the amount of silicon and manganese the tensile strength and workability of the alloy is increased to a

marked extent. I therefore propose to use the ingredients in substantially the following proportions:

Silicon	0.15% to 1.00%	—preferably 0.69%	
Manganese	0.17% to 1.00%	—preferably 0.24%	
Zinc	4.0% to 6.00%	—preferably 5.00%	55
Copper	Balance.		

The metals may be alloyed in any suitable way by melting the proper proportions together and casting into ingots. The cast ingots are mechanically worked and cold rolled into thin sheet or strip metal to further increase the strength and made ready for subsequent operations of cartridge manufacture. The resulting alloy is readily workable permitting it to be used in the manufacture of cartridge cases and also possesses high tensile strength permitting its use with modern ammunition.

The alloy may not only be used in the manufacture of cartridge cases but also in the manufacture of other products in which the properties referred to above are desired.

I claim:

1. An alloy comprising the following ingredients in substantially the following proportions:

Silicon	0.15% to 1.00%		
Manganese	0.17% to 1.00%		
Zinc	4.0% to 6.00%		75
Copper	Balance.		80

2. An alloy comprising the following ingredients in substantially the following proportions:

Silicon	0.69%		
Manganese	0.24%		85
Zinc	5.00%		
Copper	Balance.		90

In testimony whereof I affix my signature.
 CHARLES F. HAMMOND.

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