UNITED STATES PATENT OFFICE.

WILLIAM W. HUBBELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN ALLOY FOR COIN.

Specification forming part of Letters Patent No. **211,630**, dated January 28, 1879; application filed December 13, 1878.

To all whom it may concern:

Be it known that I, WILLIAM WHEELER HUBBELL, in the city of Washington, District of Columbia, have invented a new and useful Improvement in Alloy Metal for Coin, of which the following is a specification:

This invention is an improvement upon the alloy metal patented by me October 22, 1878, which consisted of one part gold, sixteen and one-tenth parts silver, and one and nine-tenths part copper, and a variation of the silver to fourteen parts to one of gold. Further experiment has enabled me to increase the density to a greater degree above the density of pure silver, and to finish this metal surface either in purple and gold color or copper and gold color, and more perfectly accomplish the results sought for in the said patent of October 22, 1878.

In this improvement the silver is less than the fourteen parts to one of gold, and the whole mass of the gold and silver is nine-tenths fine, or one-tenth part is copper.

I make the present alloy of nine grams or one part of pure gold, ninety-nine grams or eleven parts of pure silver, and twelve grams or one-tenth part of pure copper, smelted or fused and mixed together, whereby I make an alloy, twelve grams weight of which stamped into a coin constitutes a piece metric in all respects in weight; and on this improved alloy I am enabled to create either a purple and gold color or a copper and gold color in the finish of the coin or metal.

Such a metric coin of twelve grams weight contains sixty cents value of gold and forty cents value of silver, on a ratio of one gram or part of gold as equivalent to sixteen and five-tenths grams or parts of silver, and one and a half gram of pure gold as equal to one hundred cents or one dollar.

The density of the alloy is about 11.5 at the highest compression, and its proportions and component parts better enable me to make even gram weight of metric coin of superior density and surface-finish of color, and in these respects is an improvement in the alloy metal I have patented, as stated.

To finish this alloy in purple and gold color, immerse the planchets when annealed in a solution of nitric acid and water, one ounce of the acid to three ounces of water, first for one minute, then into a solution of muriate of ammonia and water, one pound of muriate of ammonia in half a gallon of water, for one hour, then wash them in a solution of soda and water, dry and wipe them off with chamois-skin or flannel. The purple color will appear on the parts of the coin subjected to the greatest pressure, and the gold color show clearest on the raised parts of the coin or metal.

To finish this alloy in light copper color, use sulphuric acid in solution in place of the nitric acid hereinbefore stated in water in the same proportions. Dip the planchets which have been annealed for three minutes into it, take them out and dip them into the muriate-of-ammonia bath for fifteen minutes, wash them off in the soda-water, and the light copper color shaded by the gold will appear.

To finish this alloy in purple color, first dip the planchets for five minutes in the sulphuric acid and water bath before stated, then remove them and dip them into a muriate-of-ammonia and water bath, two pounds of muriate of ammonia dissolved in one gallon of water, for one hour, and the purple color will appear. Wash the planchets in water and soda.

The gold color is developed by the alloy admitting of the cleaning off of the oxide of copper and leaving the gold prominent, and preventing waste.

The light copper and gold color is produced by the removal of the oxide of copper, formed in annealing the planchets.

The purple-gold color is produced by the removal of the oxide of copper and the conversion of the surface into copper and gold, or purple and gold, most prominent.

The proportions of the silver and copper to the one part of gold or nine parts of gold may be slightly varied. The silver may be increased to any quantity up to fourteen parts of silver to one part of gold, and diminished to any quantity down to eight parts of silver to one of gold, the copper being always one-tenth of the whole mass or weight, and either troy or metric weights be used.

This alloy giving the best results is, as stated, equal to one part of gold, eleven parts of silver, and one and one-third part of cop-

per, or nine pounds of gold, ninety-nine pounds of silver, and twelve pounds of copper, which is the best for the density and color for metric coin metal.

In making slight variations, regard must be had to value as well as to density and color, and I make the alloy in these proportions, which are practical and serve as directions: Take eight hundred and eighty-five milligrams of pure gold, nine grams and nine hundred and fifteen milligrams of pure silver, and one gram and two decigrams of pure copper. Fuse or smelt and mix them; they will form the density and color when finished, and twelve grams of this alloy will constitute a dollar or one hundred cents, on a ratio of sixteen of silver as equivalent to one of gold. I also make the alloy of fifteen and three-tenths grams of gold, two hundred and thirty-six and seven-tenths grams of silver, and twenty-eight grams of copper; fuse and mix them. Fourteen grams of this alloy constitute one hundred cents of value, on a ratio of sixteen of silver as equivalent to one of gold.

These results have been attained by experiment, and in the finished alloy combine the desired density, color, sonority, and durability.

What I claim is—

The alloy metal of gold, silver, and copper, in or about the proportions of nine parts of gold, ninety-nine parts of silver, and twelve parts of copper, fused together, as an improved coin metal, as described.

WM. WHEELER HUBBELL.

Witnesses:
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