# UNITED STATES PATENT OFFICE.

CHAS. WETTERSTEDT, OF MARSEILLES, FRANCE, ASSIGNOR TO CHAS. KEENAN.

## IMPROVEMENT IN METALLIC-ALLOY PAINTS.

Specification forming part of Letters Patent No. **8,275**, dated August 5, 1851.

*To all whom it may concern:*

Be it known that I, CHARLES DEWETTERSTEDT, of the city of Marseilles, in the Republic of France, have invented a new and useful improvement in covering ships' bottoms and other surfaces to prevent their destruction; and I do hereby declare that the following is a full, clear, and exact description thereof.

The basis of my invention consists in the combination or mixture of regulus of antimony in various proportions, purified from all ferruginous particles, with copper, tin, zinc, or lead. These mixtures reduced to impalpable powders are combined with suitable articles to form paint and spread on the surfaces to be preserved.

First. When copper is the metal to be combined with antimony I find that one part of copper and from one-third to one-half part, or a little more, of the purified antimony are suitable proportions of the respective ingredients. The smaller proportion of antimony gives a more serviceable composition than the larger proportion above named, forming a more durable as well as a harder coating.

Second. In order to preserve zinc or copper from the action of air or water, I add to the above ingredients a quantity not exceeding three parts of oxide of copper, first heated to redness and quenched in cold water, taking care to remove impurities, to wash in a large quantity of water. Having dried and pulverized the clean mixture, it is ready for use.

Third. In order to combine the copper with the antimony, I melt in a suitable iron vessel coated externally with a proper coating of fire-clay about thirty-five pounds of antimony, previously broken up to nut size, and, having melted it, add quickly sixty-five pounds of old sheathing-copper folded and hammered together in close folds. When fully melted the alloy is taken out with an iron or other suitable ladle and poured in a small stream from a height of two or three feet into a vessel containing water, and furnished with any well-known form of agitator for keeping the liquid in motion. The pouring from a height combined with a continual agitation of the water serve to make the granulation of the alloy the more complete. The crucible, when empty, may be immediately refilled with a fresh charge to be melted and poured out with the ladle, as at first. The granulated compound is taken from the water, drained on a sieve or colander, and set therein in a suitable drying-room on a cast-iron plate over a moderate fire to dry, all impurities being previously separated, should any such have accidentally fallen into the granulating-vessel.

Fourth. The mixture of regulus of antimony with tin is made in the proportion of one and a half to two parts of antimony to one part of tin. For zinc I find one part of this metal to one and a half part of antimony to be suitable proportions; but with lead ten of antimony to one of lead is the relation of the quantities. These may require to be varied according to the purity of the respective metals. Even regulus of antimony alone may be employed when reduced to fine powder and mixed with linseed-oil, a little spirits of turpentine, and oxide of zinc.

Fifth. In forming alloys between the regulus of antimony and lead, zinc, or tin the fire around the crucible must be much less intense than for the alloy of antimony and copper; otherwise the zinc would be liable to loss by evaporation, and the other metals would be made impure by their own oxidation, and the subsequent pulverization would be rendered more difficult and the article produced inferior, while antimony would be lost by evaporation.

Sixth. The different alloys may be pulverized on a large flat iron plate with a cast-iron muller, similar in its action to the apparatus used by painters for grinding their colors, or in any of the well-known mills, stamps, or mortars adapted to pulverize hard substances, though steel or cast-iron mills are preferred, as least likely to impart impurities to the alloy. A muller of granite may be used to finish the grinding. While grinding the alloy is kept moistened with naphtha, ether, or other similar liquid, which prevents the oxidation of the alloy.

Seventh. The different antimonial alloys are formed into paints by mixing them with divers liquids, the proportions of which vary, as well as those of the alloys, according to the metal or other surface which I wish to protect. Two parts of purified vegetable tar, or the same

quantity of linseed-oil boiled with litharge or mixed with spirits of turpentine to make it more drying, forms a vehicle for the metallic alloys, to which I sometimes add a little varnish of yellow amber. In using the alloy of antimony and copper for the protection of iron, I form the mixture of six pounds of the powdered alloy with four quarts of a liquid composed of tar and naphtha in equal quantities, and finally add one pint of naphtha. To prepare the iron for receiving this coat I first spread over it a coat of the linseed-oil boiled with litharge; and, secondly, apply two coats of my alloy of antimony and lead, prepared as herein directed, and mixed with the boiled linseed-oil and litharge in the proportion of two pounds of the alloy to one pint of the oil, adding spirits of turpentine as required to make the paint flow easily.

Eighth. Surfaces of iron which are to be placed under water will, in addition to the above coats of paint, receive another composed of two pounds of the alloy of antimony and copper with four pounds of oxide of copper mixed with five pints of the mixture of tar and naphtha and then three pints of pure naphtha. This last coat is a more complete protection against the adhesion of barnacles and weeds than the other varieties of paint hereinbefore described.

Ninth. In applying these metallic paints care must be taken to prevent the brush from getting clogged. This is done by drawing it over the prongs of a Y-shaped metallic fork or prong, and the settling down of the heavy alloy will be obviated by moving the brush around the bottom and sides of the paint-pot when dipping it to take up the paint.

I may here observe that the advantages of employing antimony as a general constituent of metallic paint are threefold: first, it possesses great hardness and power to resist mechanical abrasion from the friction of the water, and this property it imparts to its alloys, as proved by the case of type-metal; secondly, both the regulus and its alloys are more brittle than other simple metals or their components, and this property is essential to every metal intended to be ground up and used as paint. Without this property the reduction of any of the metals into a state fit for paint would be attended with great difficulties; thirdly, the covering of copper, yellow metal, or iron ships' bottoms with antimony protects them in consequence of the protective effect of its galvanic action; but it keeps them clean at the same time by not running its reaction to the opposite extreme of over-protection, which was one of the evils early experienced in attempting to protect sheathing-copper after the manner of Davy. The oxide of copper is influenced by the antimony in a manner similar to that of metallic copper, and hence when used to form paint with antimony or its alloys is but slightly affected in consequence of the protective influence of the antimony; but it is allowed to dissolve just sufficiently to produce a poisoning of animals, &c., adhering to the surface.

Tenth. Iron exposed only to the action of air is protected by the paint formed with the alloy of antimony and lead or zinc, that formed with the lead being preferred. I apply the use of antimonial alloys to the protection of compound as well as simple metals, and especially to the protection of sheathing and tubes made of copper, tin, or lead, in which antimony is combined in small proportion with the other metal, as I now usually combine them.

Eleventh. I find great advantage in using compositions for paint in which pulverized antimony is separately mixed with colors of which the base is either tin, zinc, or lead, and the vehicle may be spirits of turpentine instead of naphtha, or the mixture of tan and naphtha herein described may be employed in whole or in part, as for the antimonial alloys.

Twelfth. The paints herein described dry very promptly, and are consequently well adapted to the painting of surfaces partly of metal and partly of wood. I consequently paint both the copper or other sheathing and the planking above the sheathing, taking care to spread thin coats of tar and pitch first, and then but a thin coat at a time of the metallic paint, thus allowing the first coat to remain without becoming mixed up with the alloy paint, and consequently securing the surface against the adhesion of shells and weeds.

Thirteenth. I find the metallic paints herein described to be advantageously used with a preparatory coating formed by mixing fifteen pounds of tar, fifteen pounds of pitch or of wood-charcoal, with two to three pounds of tallow or sperm-oil and from seven to ten pounds of chimney-soot well dried and sifted. The tar is first heated in a kettle, the pitch or charcoal is added, and the tallow and soot stirred in by degrees to prevent sudden swelling up and loss.

Fourteenth. This material for the preparatory coating may be dissolved or softened in naphtha to render it easy of application.

Fifteenth. In order that the oxide of copper may be of a character best suited to the purpose of mixing with the antimonial paint, I prepare it out of old sheathing-copper, folded together, placed in a receptacle or case made of copper, but having several passages around its sides for the free admission air. The case is set over a fire and the whole heated up to a temperature at which sulphur will combine with the copper, (which need not be so high as a red heat,) and then sprinkle among the folded plates at the open top of the case a quantity of powdered sulphur to the amount of about eleven and a half pounds of sulphur for every twenty pounds of copper. The first portion of sulphur is allowed to exhaust itself before another is added. When all the sulphur has been thrown on I cover the box with thin plates of iron or of copper, thereby maintaining the red heat then acquired by the copper sheets. The sulphuret of copper thus formed is cooled,

broken up, pulverized, passed through a sieve, laid upon cast-iron plates, heated moderately at first to prevent fusion, and finally heated to a cherry-red heat, stirred a long time, and calcined to expel the sulphur and oxidize the copper.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Making paints out of metallic antimony, whether prepared separately or combined with other metals to form alloys suitable for making paints, substantially as herein set forth.

2. Combining antimonial alloys with oxide of copper to constitute, with the painting-vehicles herein specified, the exterior coatings for ships' bottoms for the purpose of more effectually defending them against the adhesion of shells and weeds, substantially as herein set forth.

CHARLES WETTERSTEDT.

Witnesses:
JULS OLIVER,
P. BLOHORN.