UNITED STATES PATENT OFFICE.

GEORGE D. COLEMAN, OF BOSTON, MASSACHUSETTS.

METHOD OF APPLYING ANTIFOULING COATING TO SHIPS' BOTTOMS.

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To all whom it may concern:

Be it known that I, GEORGE D. COLEMAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in the Methods of Applying Antifouling Coatings to Ships' Bottoms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improved method of applying antifouling coating to ships' bottoms or structures submerged in or exposed to the action of water, and particularly sea-water.

The object of my invention is to produce an efficient method of applying such antifouling coatings; and to the above end the present invention consists in the improved method of applying antifouling coatings hereinafter described and claimed.

According to my invention I apply an antifouling coating which presents a compact surface to the water or aqueous vapors, which consists of a substantially continuous coating of metallic copper which is applied to the structure desired to be protected.

My improved method of applying such a coating is described as follows: I first apply to the structure a layer of paint which will be proportionate in thickness to the thickness of the coating desired. The paint should preferably be a quick-drying paint, and I have found to be especially suitable for this purpose a paint made of a mixture of red lead and varnish. The varnish is preferably made of forty gallons of linseed-oil to one hundred pounds of kauri gums. Any suitable quick-drying paint may be employed, and the time within which the paint will dry may be varied by increasing or decreasing the amount of oil or other diluent, so that sufficient time will be allowed within which the subsequent processes may be carried on before the paint shall become dry. To this layer of paint while still fresh—that is to say, within a half or three-quarters of an hour from the time of application of the paint—is applied by a blower or other suitable means finely-divided metallic copper which in amount will vary from three-quarters of a pound to one and one-half pounds per square foot of surface covered. The particles of copper being projected against the layer of paint by the blower or other suitable means will project themselves into the layer of paint and firmly attach themselves thereto. The adhering layer of particles of copper, which I term the "body-copper," because it constitutes the body of the coating, is now rubbed down or burnished or hammered to embed it in the first layer of paint and to bind the layer of body-copper firmly thereto, after which the paint is allowed to dry and become quite hard. It is immaterial to my invention to what degree of hardness the paint shall dry so long as it shall set sufficiently to be able to resist the air-pressure of the subsequent processes—that is to say, this layer of paint, with its adhering layer of copper, must dry sufficiently hard not to flow or move upon itself under the pressure of air to which it is subsequently exposed, as hereinafter described. I next apply another layer of the same kind of paint, but preferably a lighter layer—that is, a layer which is not so thick as the first layer—to the layer of copper and paint previously applied. I prefer also that the paint of this layer should be thinner than the paint of the preceding layer. I prefer that this layer of paint should contain a smaller proportion of red lead. To this second layer of paint I now apply by a blower or other suitable means a layer of finely-divided copper, and I prefer that the particles of copper should be finer than the particles of copper composing the preceding layer of body-copper. This layer of copper I term the "surface" copper, because it is the copper of which the surface of the coating is made. The second layer of paint, with its adhering surface copper, is now permitted to dry until the paint becomes tacky, and then I rub it down with a polishing-iron. Some suitable implement is employed which is rubbed over the surface of the coating, which turns the fine particles of surface copper in the matrix of the second layer of paint and forces them down into the interstices between the particles of the body layer of copper and turns them so they present flat surfaces to the surface of the coating and at the same time thoroughly compacts them together, so that they form substantially a continuous surface coating of copper. This surface should be burnished or hammered or rolled in order thoroughly to effect the compacting of the particles of copper together. Upon this smooth surface of surface copper thus compacted together I apply a paint which is preferably still lighter and

thinner than the last preceding layer of paint for the purpose of filling the interstices between the fine particles of surface copper and for the purpose of binding together these fine particles. The coating is now allowed to dry hard, after which it is rubbed down with some polishing or burnishing tool or material, and I have found in practice that the substance known in the trade as "steel-wool" is particularly well adapted for smoothing and polishing the surface of the coating at this time. It cuts off any slight projections and brings the coating to a fine finish. I then proceed to finish the surface and bring it to a high polish with a buffing-wheel or other suitable apparatus which may be employed in connection with crocus-stone, rotten stone, or any suitable polishing powder, by means of which the surface coating is brought to its perfected condition, exposing a substantially continuous layer of metallic copper, which upon seagoing vessels is especially valuable by reason of the accumulation thereon by decomposition of the poisonous salts of copper, which effectually prevent the adhesion of marine animal or vegetable life; but the method may be employed in the covering of structures exposed to the action of dampness or moisture wherever they may be found. This method is particularly adapted for the coating of wood, although it may be used efficiently for the coating of other things.

Having thus described my invention, I claim—

1. The method of applying antifouling coating to ships' bottoms and structures submerged in or exposed to the action of water and particularly sea-water, which consists, first, in applying to the surface to be coated a layer of paint, second, in projecting into the moist layer of paint particles of metallic copper which adhere to said first layer of paint and form a body of copper, third, in rubbing, or hammering or burnishing the said layer of copper to embed it in the layer of paint, fourth, in applying to the body layer of copper a layer of paint, fifth, in applying to the moist layer of paint last before mentioned a layer of still more finely divided copper, sixth, in allowing the last-named layer of paint with its adhering layer of surface copper to dry until it becomes tacky, seventh, in rubbing or hammering or burnishing the surface layer of copper so as to embed it in the second layer of paint and into the interstices between the particles of the body-copper, eighth, in applying a third layer of paint thinner relatively than the preceding layer, ninth, in allowing the last-named layer of paint to dry, and tenth, in polishing the surface, substantially as described.

2. The method of applying antifouling coating to ships' bottoms and structures submerged in or exposed to the action of water and particularly sea-water, which consists, first, in applying to the surface to be coated a layer of paint, second, in projecting into the moist layer of paint particles of metallic copper which adhere to said first layer of paint and form a body of copper, third, in rubbing, or hammering or burnishing the said layer of copper to embed it in the layer of paint, fourth, in applying to the body layer of copper a layer of paint, fifth, in applying to the moist layer of paint last mentioned a layer of still more finely divided copper, sixth, in allowing the last-named layer of paint with its adhering layer of surface copper to dry until it becomes tacky, seventh, in rubbing, or hammering or burnishing the surface layer of copper so as to embed it in the second layer of paint and into the interstices between the particles of the body-copper, and eighth, in polishing the surface, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE D. COLEMAN.

Witnesses:
HORACE VAN EVEREN,
ALFRED H. HILDRETH.