

UNITED STATES PATENT OFFICE.

RICHARD DANA UPHAM, OF NEW YORK, N. Y.

SHEATHING COMPOSITION.

SPECIFICATION forming part of Letters Patent No. 561,296, dated June 2, 1896.

Application filed February 6, 1896. Serial No. 578,281. (No specimens.)

To all whom it may concern:

Be it known that I, RICHARD DANA UPHAM, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Sheathing Compositions, of which the following is a specification.

My invention relates to sheathing compositions of a plastic character when hot, but which are adapted to harden or set when cold, and are of a waterproof character, so as to be especially adapted for use as a protective covering or sheathing for iron or wooden ships.

It is the object of my invention to provide a sheathing composition of the foregoing general character composed of bituminous matter—such as tar, pitch, asphaltum, or the like—upon the one hand and of particles or minute portions of copper or other suitable metal upon the other, and which shall in no sense be a paint, but a true metallic sheathing. I have found that the foregoing ingredients when intimately commingled form in a heated condition a heavy and solid plastic mass, which when cold constitutes a body of very great toughness and durability and yet of a nature so elastic that it will readily adapt itself to the expansion and contraction arising from changes in temperature of the surface to which it may be applied.

In the shipbuilding art it has been found necessary to protect the hulls of wooden vessels from the attacks of the *Teredo navalis* and from the excessive growth of barnacles and other forms of marine life.

Many kinds of paint have, with more or less success, been tried, but the life of paint upon the hulls of vessels is, on account of the violent attrition of the water, very short, and experience has demonstrated that a sheathing formed of copper is the most desirable for the purpose. Copper, however, as applied in a commercially pure state, owing to the large quantity necessarily used and to the expense incident to attaching it, adds greatly to the cost of the vessel. It is, moreover, open to the objection that when applied in sheets the water is apt to penetrate the interspaces between the sheets and that it is subject to injurious galvanic action. With respect to iron and steel ships this last objection, coupled with the difficulty of attaching

the copper sheets to the metal hull, has made it necessary to abandon the use of copper and to rely upon paint to prevent fouling and preserve the iron hull against destruction by rust. Paint, however, being a mere film, must frequently be renewed, and the expense of docking, scraping, and repainting, with the consequent costly delay, must be frequently incurred. In the case of war-ships this expense is enormous, and yet it is impossible to keep them at sea for more than nine months or a year, as their speed is materially decreased by marine growth and their plates attacked by rust.

It is the especial object of my invention to provide a composition of matter, compounded of copper or other suitable metal, in a subdivided condition, and of asphaltum, adapted to be used as a sheathing material for ships.

In the manufacture of my improved composition I prefer to use asphaltum or an asphaltic cement, although of course other bituminous substances, such as tar or pitch, may for some uses to which the composition may be applicable answer the purpose. I prefer, furthermore, to employ pure metal filings or finely-subdivided particles of copper in connection with the asphaltum, although I may employ filings of any metal that is not susceptible to injurious action of water and that possesses the necessary antifouling properties. The proportions of the respective ingredients—that is to say, of the bituminous ingredient and the metallic ingredient—will depend upon the nature or condition of the bituminous ingredient and upon the character of the metallic ingredient. I prefer, furthermore, to employ an asphaltic cement that will be practically unaffected by water or asphaltum properly manipulated and treated or tempered with a suitable flux—such, for instance, as liquid asphalt and filings or sawdust of copper—that is to say, copper in a finely-divided condition—or of aluminium or other suitable metal. In forming the composition of these two ingredients I find that a good result is obtained by using seventy pounds of copper filings to thirty pounds of asphaltic cement, the asphaltic cement being composed of forty-three pounds pure refined asphalt, seven pounds flux, and fifty pounds pulverized silica. I do not, however, confine

myself to these proportions, as they can be varied to suit the end in view.

It is desirable in the manufacture of my composition of matter that the percentage of copper as compared with the percentage of asphaltum should be as large as possible to obtain a compound best suited for the purpose for which my composition is to be used. I limit my compound, however, to one which contains at least fifteen per cent. of copper.

The two ingredients—namely, the asphaltic cement and the metallic filings—are brought together and while heated thoroughly admixed and commingled in any selected mixing or stirring apparatus.

The sheathing composition thus formed is to be applied while hot to the surface of the vessel in any desired manner—as, for instance, by laying it on with a plasterer's trowel—and is then to be compressed by rolling, tamping, or other suitable operations and permitted to become cold. When cold, it may, if desired, be polished. The surface of the metal may, moreover, be first painted with asphaltic cement before the coating is applied, to the end of securing a more perfect bond.

The composition formed of asphaltic cement and copper filings will when applied harden or set as soon as it is cold and will form upon the exterior of a vessel a facing or sheathing of any desired thickness, which will adhere firmly to said surface, whether the latter be of wood or metal. It will, moreover, be non-oxidizable, not subject to galvanic action, capable of taking and retaining a high degree of polish, and possessing, equally with copper itself, the characteristics which prevent the excessive growth of barnacles and other forms of marine life. As, moreover, it is free from joints or interstices and is absolutely waterproof it will afford a perfect protective covering that will prevent the rapid oxidation due to the action of salt water upon the iron hull.

As will be obvious, a sheathing for ships composed of asphaltum and copper filings or

copper in a finely-divided or pulverized condition will, while answering all the purposes of a sheathing formed of pure copper, be not only less expensive in first cost, but also less expensive in cost of application to and maintenance upon the vessel, and is a practical and economical solution of the problem of attaching copper sheathing to steel and iron ships. It is also advantageous in that repairs can easily be made, it being simply necessary to heat the damaged surface, scrape off the softened material, and reapply new material to recoat the scraped surface.

I am aware that compositions of iron particles and a bituminous substance have heretofore been employed for roadways and sidewalks and lay no claim to the same, especially as any such compound would be worthless as a sheathing composition for ships, because the iron particles would be destroyed by contact with salt water, and as the iron hull, which the sheathing is intended to protect, would be destroyed by the same action. Iron particles, moreover, possess no antifouling properties.

I am aware of the fact that in United States Letters Patent to J. N. Longden, No. 446,818, a marine paint is described consisting of precipitated copper, asphaltum, and linseed-oil. To such a composition I lay no claim.

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

A waterproof protective sheathing composition for vessels, of a plastic nature when hot, adapted to harden when cold, and composed of asphaltum or asphaltic cement and of copper or other suitable metal in a finely-divided condition, substantially as specified.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 1st day of February, A. D. 1896.

RICHARD DANA UPHAM.

In presence of—

O. E. THURBER,
N. C. LYON.

It is hereby certified that in Letters Patent No. 561,296, granted June 2, 1896, upon the application of Richard Dana Upham, of New York, N. Y., for an improvement in "Sheathing Composition," errors appear in the printed specification requiring correction as follows: Page 1, line 91, after the word "water" and line 94, after the word "asphalt" commas should be inserted, and line 93, after the word "flux," and line 96, after the word "condition" the dashes should be stricken out and commas inserted instead; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 14th day of July, A. D. 1896.

[SEAL.]

WM. H. SIMS,
First Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER,
Acting Commissioner of Patents.