

No. 749,909.

PATENTED JAN. 19, 1904.

R. D. UPHAM.
SHEATHING FOR VESSELS.
APPLICATION FILED APR. 4, 1903.

NO MODEL.

Fig. 1.

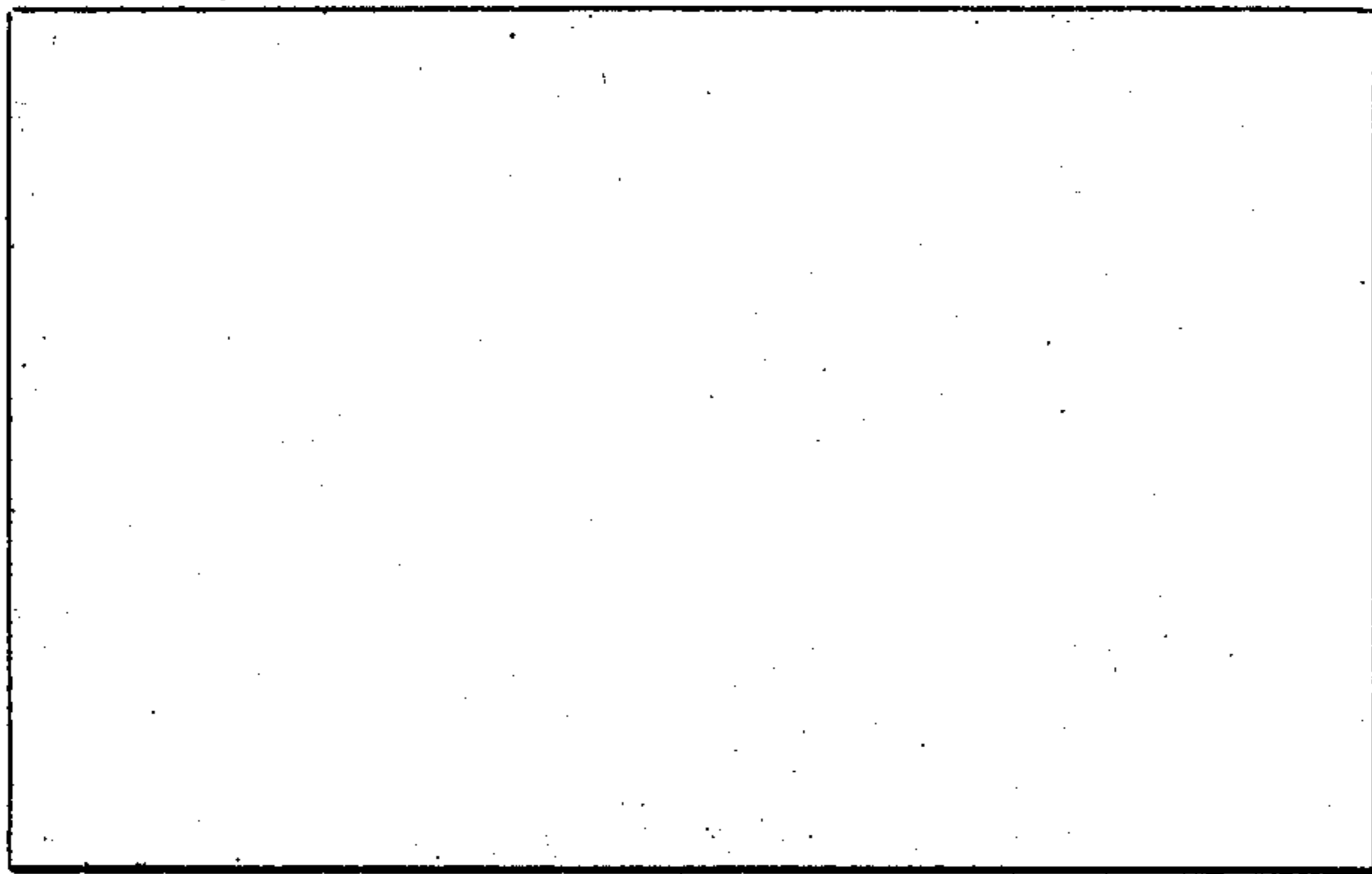


Fig. 2.

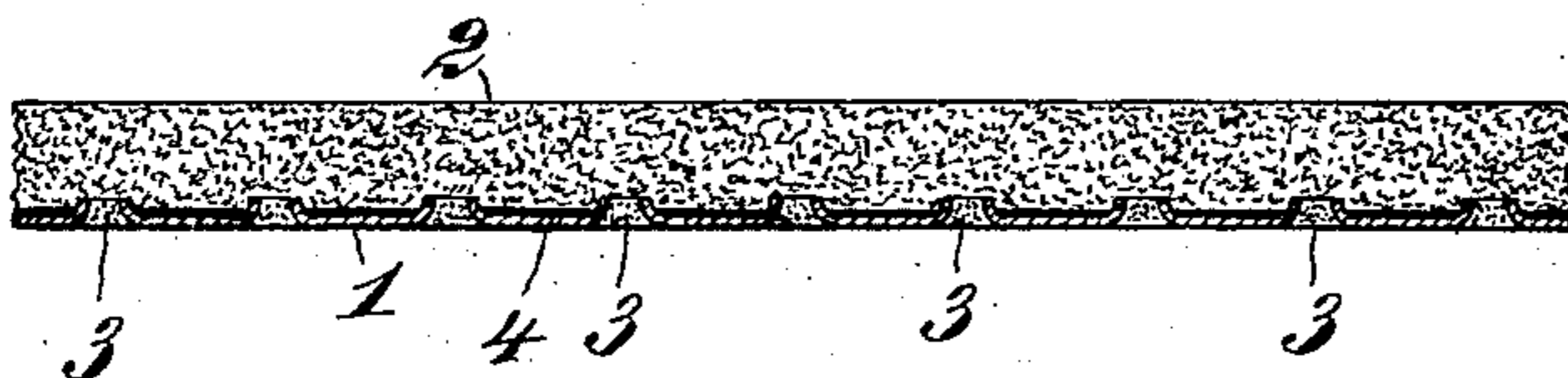


Fig. 3.

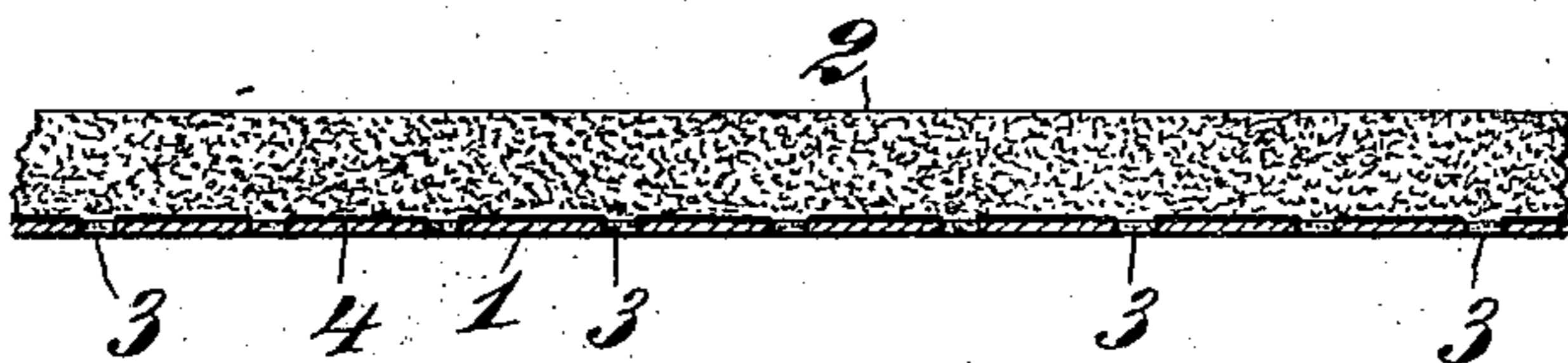
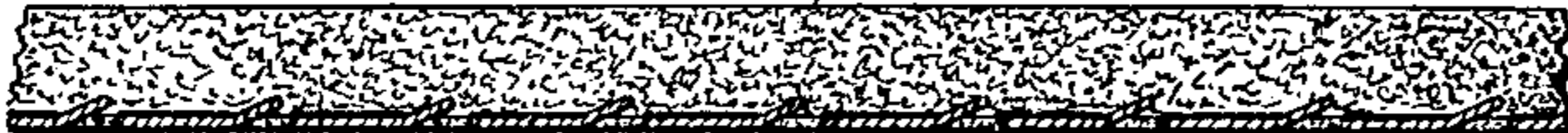


Fig. 4.

WITNESSES:



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SHEATHING FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 749,909, dated January 19, 1904.

Application filed April 4, 1903. Serial No. 151,015. (No model.)

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 for Vessels, of which the following is a specification.

This invention relates to sheathing and sheathing-plates for iron, steel, and wooden ships to protect the ship from accumulations of marine growths and the like. In Letters Patent No. 561,296, granted to me June 2, 1896, a sheathing composition consisting of a plastic compound of asphaltum or other bituminous materials and comminuted metal, preferably copper, is described and claimed. This composition is therein described as applied while hot to the surface of the vessel with a trowel, then smoothed down, and afterward when cold polished.

It is found that in some cases the method necessarily employed with the above composition cannot be satisfactorily applied and that for general use it is preferable to employ the sheathing composition in the form of flexible plates, as will hereinafter be described.

To this end the present invention is embodied in a flexible plate consisting of a thin and flexible backing-sheet, preferably roughened or perforated, and a composition of a plastic bituminous substance—such as asphaltum or asphaltum cement, for example, mixed with comminuted or finely-divided metal—such as copper, for example. The backing-sheet is first coated with paint, or hot tar by preference, and the composition applied hot. The compound plate is then passed between rolls to compress or compact the plastic composition and unite it firmly to the backing-sheet and also to gage it to a uniform thickness, and after the composition is thus finished its surface is polished.

In the accompanying drawings, which serve to illustrate an embodiment of the invention, Figure 1 is a face view of the rectangular finished plate. Fig. 2 is a cross-section of the plate on an exaggerated scale. Fig. 3 is a view similar to Fig. 2, but showing simply plain perforations in the backing-sheet. Fig. 4 is a similar cross-section to Figs. 2 and 3,

but illustrating another means for roughening the metal backing-sheet, so as to cause the plastic composition to adhere thereto.

In the views, 1 designates a thin backing-sheet, preferably of tough metal, such as annealed sheet-iron, and 2 designates the composition of bituminous material and comminuted metal. The sheet 1, as shown in Fig. 2, is perforated, as seen at 3, and the margins of the perforations turned up in such a manner as to roughen the outer surface of the plate. This roughening, together with the perforations themselves, forms points of attachment uniformly distributed over the surface of the sheet for the attachment of the plastic material 2. Fig. 3 shows only plain perforations as a retaining means for the composition.

Obviously the backing-sheet may be provided with suitable points of attachment or roughening by other means than that described with reference to Figs. 2 and 3. For example, bits of the backing may be partly detached from the sheet and bent or struck up, as at 3^a in Fig. 4, so that the plastic composition may take under or behind them.

Previously to applying the plastic material 2 to the backing-sheet 1 the latter will have, by preference, a coat of paint, hot coal-tar, hot pitch, or the like applied to it to better insure the complete adhesion of the plastic material to the sheet at all points. It is important that a perfect junction between the backing and the composition be effected at all points over the surface of the plate.

The rolling of the plate after the composition has cooled effects, as before stated, a uniform gaging of the plates as to thickness, a uniform compression of the plastic material, and the surfacing of the latter.

Any tough pliable material may be employed for the backing-sheet; but iron—say of No. 28 gage—is preferred for various reasons. The sheathing will be, by preference, formed into rectangular plates, thirteen by twenty-six inches being a convenient proportion and size; but the invention is not restricted to the size and contour of the plates. The rolling is effected after the applied composition has solidified, and the thickness of the plate, including the backing, will be, preferably, about

three-sixteenths of an inch. In polishing the surface of the plate the film of asphalt is removed, leaving particles of copper bare as to their outer faces.

5 If asphaltum and comminuted copper be employed in the composition, a proportion which will produce a good product may consist of seventy-five pounds of copper filings or particles to thirty pounds of asphaltic cement, 10 this latter being composed of pure asphalt, forty-three pounds; flux, seven pounds, and pulverized silica, fifty pounds. This asphaltic cement and the finely-divided copper are brought together, heated, and thoroughly 15 mixed. The copper is chosen because of its possessing antifouling properties. However, the invention is not limited strictly in respect of proportions of ingredients of the composition nor to the particular ingredients, except 20 that the latter shall consist of comminuted metal and a waterproof flexible insulating material, as bitumen, the latter being either alone or mixed with other suitable material. As equivalents finely-divided brass or aluminium 25 and coal-tar pitch may be mentioned. Not less than fifteen per cent. of the metal should be used to get good results.

The plates constructed as above may be applied to the vessel by first covering the surface thereof with a coating of hot asphalt or 30 other similar tenacious and waterproof substance and then applying the plates and screwing them fast. The heads of the screws should be countersunk and covered with the asphalt 35 and metal compound, and the joints between the plates should also be carefully closed by the same.

The present invention is not limited to any special or intentional roughening of the backing, as in some cases the material used for the 40 backing may not require it. The primary painting or coating of the backing, as indicated by the black line at 4 in the sectional views, may not in all cases be necessary, and 45 the invention is not limited thereto. The facing compound 2 will have, in combination with the finely-divided metal, a flexible insulating substance to separate electrically the metallic particles; but this substance or com- 50 pound of substances may vary as to its character or constitution, the bituminous substances mentioned serving the purpose very well.

As will be obvious, a sheathing-plate for 55 vessels composed of a flexible backing faced with a composition of copper and asphaltum or other suitable insulating material may be safely applied to iron or steel ships without danger of causing injurious galvanic action, 60 because each particle of copper in the facing composition or wearing-surface of the plate, even the most minute, is insulated electrically from every other particle, as well as from the

iron or steel beneath. Moreover, as the surface exposed to the water is worn away by at- 65 trition new surfaces are exposed, in which every particle of copper is insulated as before, and no amount of wear or damage caused by abrasion of the surface, even if some of the plates are torn off, can set up galvanic action 70 upon the hull of the vessel. The sheathing is applicable, of course, for the protection of any submerged surface liable to fouling.

By the term "flexible" as herein used in describing the backing-sheet and the com- 75 pleted sheathing-plate is meant capability of flexure to any reasonable extent without cracking or injury, and not merely being capable of bending to a slight extent, and it is meant to exclude metal plates coated with a vitreous 80 enamel. The sheathing-plate embodying this invention is not affected by expansion and contraction under varying temperatures, and the composition will not crack under such in- 85 fluences and expose the backing. It is also easily cut to proper size and contour without the use of special tools.

Having thus described my invention, I claim—

1. A sheathing for vessels and the like, com- 90 prising a backing of flexible and tough sheet material, and a flexible facing compound on said backing and attached thereto, said compound consisting of a suitable insulating substance, and comminuted metal, intimately 95 mixed and compressed, substantially as set forth.

2. A sheathing-plate for vessels and the like, comprising a roughened backing-sheet of flexi- 100 ble, tough material, and a flexible facing compound attached thereto and composed in the main of comminuted or fine particles of copper and a suitable insulating substance, intimately mixed and compressed, substantially 105 as forth.

3. A sheathing-plate for vessels and the like, comprising a flexible sheet of metal, rough- 110 ened on its outer surface, and a facing composed of finely comminuted or divided metal intimately mixed with a suitable insulating substance, said flexible facing being attached to the backing, compressed, and of substan- 115 tially uniform thickness, as set forth.

4. A sheathing-plate for vessels and the like, comprising a tough, flexible perforated and 115 roughened metal sheet and a facing on said sheet of bituminous material and comminuted copper, thoroughly mixed and compressed on the sheet.

In witness whereof I have hereunto signed 120 my name, this 2d day of April, 1903, in the presence of two subscribing witnesses.

RICHARD D. UPHAM.

Witnesses:

PETER A. ROSS,
WILLIAM J. FIRTH.