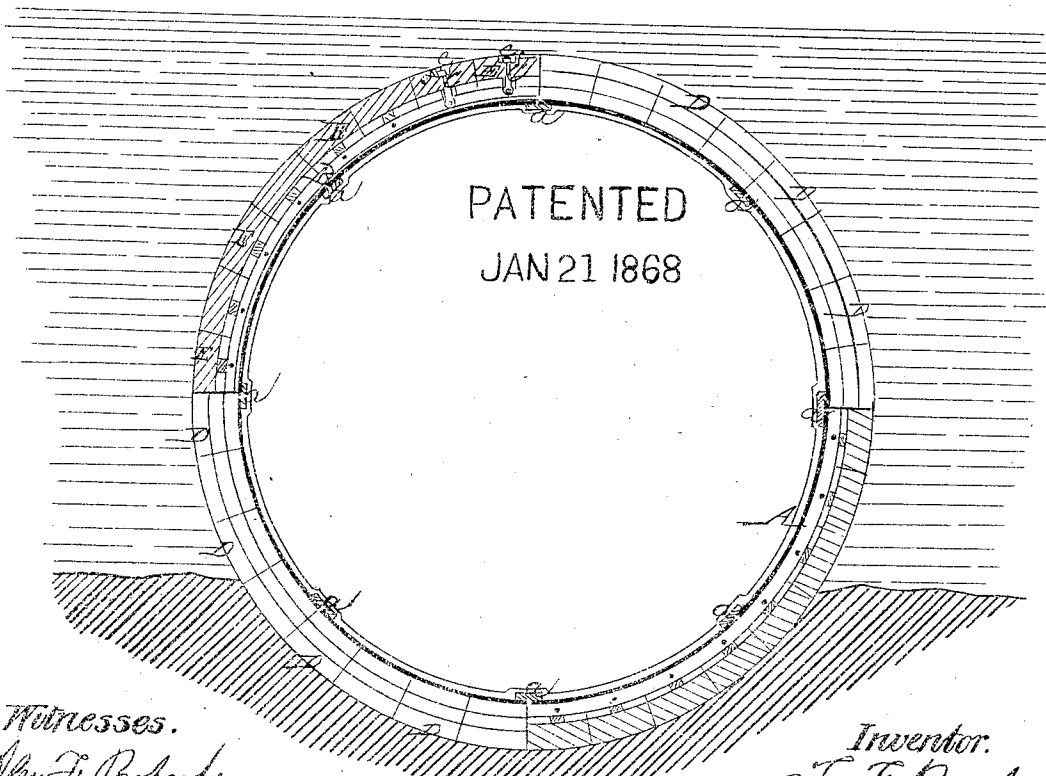


T.F. Rowland's Subaqueous Tube.

73656 *Fig. 1.*



Witnesses.
Alex. J. Roberts

Inventor.
T. F. Rowland
per Munn & Co.
Attorneys

Fig. 2.

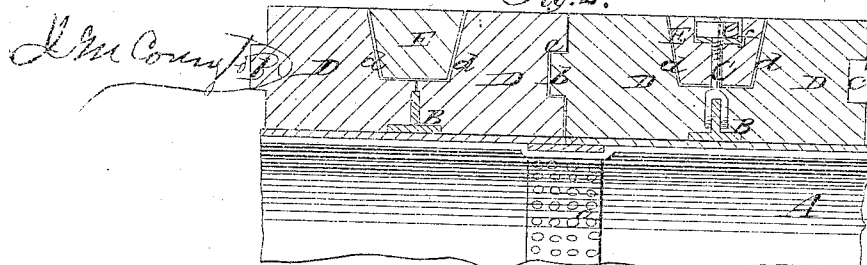
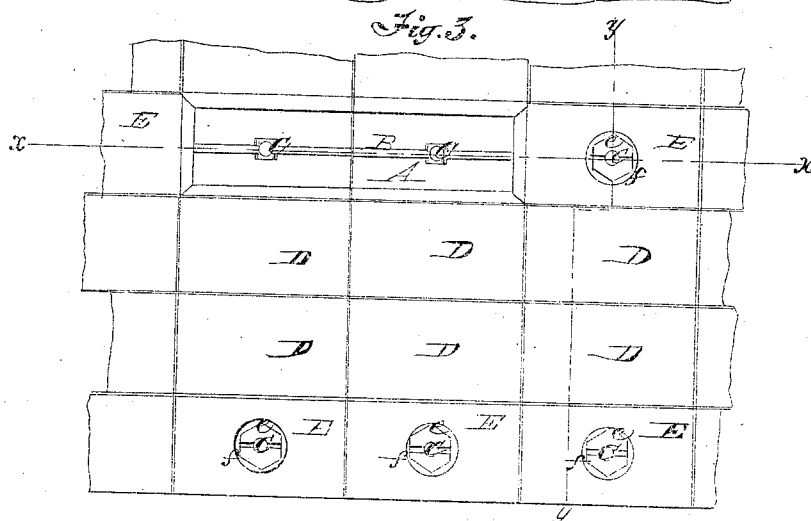


Fig. 3.



United States Patent Office.

THOMAS F. ROWLAND, OF GREENPOINT, NEW YORK.

Letters Patent No. 73,656, dated January 21, 1868.

IMPROVED SUB-AQUEOUS TUBE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, T. F. ROWLAND, of Greenpoint, in the county of Kings, and State of New York, have invented a new and useful Improvement in Constructing and Protecting Subaqueous Tubes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful improvement in constructing and protecting subaqueous iron tubes; and it consists in encompassing the same with blocks of cement or tile, arranged or applied in the manner substantially as hereinafter set forth, whereby the water cannot come in contact with the iron tube, nor the tile or cement-blocks be detached from the tube. In the accompanying sheet of drawings—

Figure 1 is a transverse vertical section of my invention, taken in the line *x x*, fig. 3.

Figure 2, a longitudinal section of a portion of the same, taken in the line *y y*, fig. 3.

Figure 3, an external view of a portion of the same, taken in the line *y y*, fig. 3.

Figure 4, an external view of a portion of the same.

Similar letters of reference indicate corresponding parts.

A represents an iron tube, which I design to construct of rolled-iron plates, of suitable size, having their edges abutted together, and secured in close contact by means of metal straps *a*, which are fitted over the joints at the inner side of the tube, and to which straps the edges of the plates are riveted, as will be understood by referring to figs. 1 and 2. On the exterior of this iron tube A, at suitable distances apart, I shrink or otherwise secure or attach angles or T-shaped bands B, to which bolts C are secured by pivots at equal and suitable distances apart. D represents blocks, of tile or cement, of suitable and equal size, of quadrilateral form, and each being the section of a cylindrical tube. These blocks are fitted together by tongues *b* and grooves *c*, as shown clearly in fig. 2, one row of blocks being provided with tongues *b*, and the adjoining row provided with grooves *c*, to receive the tongues. The ends of the blocks D, which are not provided with the tongues or grooves, are cut out or recessed, as shown at *d*, to receive blocks E, as will be understood clearly by referring to fig. 2; and these blocks E have the bolts C passing centrally through them, the blocks D being directly over the bands B. These bolts C are provided with nuts *e*, which, when screwed down, fit in countersinks *f* in the outer surfaces of the blocks E.

It will be seen from the above description that by this arrangement the tile or cement-blocks will all be firmly secured to the iron tube, and cannot possibly become detached therefrom. After the blocks D E are secured to the iron tube A, their exterior surfaces are covered with cement, which fills up the countersinks *f*, in which the screw-nuts *e* are fitted, and also fills up the joints between the blocks D E. By this means a perfectly watertight covering is obtained for the iron tube, and the latter will consequently last an indefinite period of time.

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

The application to the exterior of a subaqueous iron tube, of blocks composed of cement, tile, or other suitable material, secured to the tube by tongues, and grooves, and bolts, in the manner substantially as herein shown and described.

THOS. F. ROWLAND.

Witnesses:

WM. F. McNAMARA,
ALEX. F. ROBERTS.