C. H. LILIENTHAL.

PIER FOR BRIDGES.

No. 109,637. Patented Nov. 29, 1870.

Fig: 1.

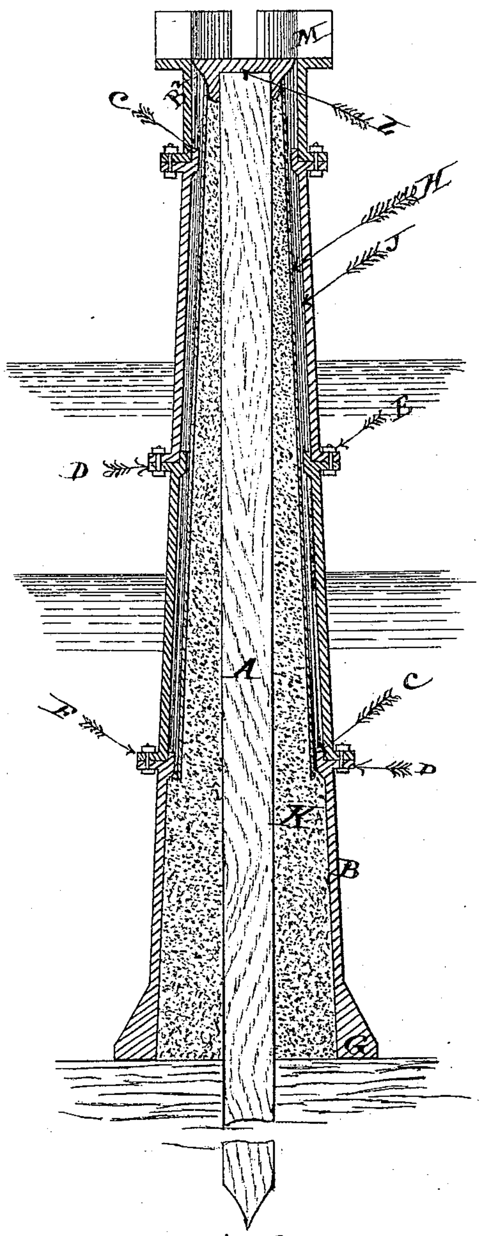
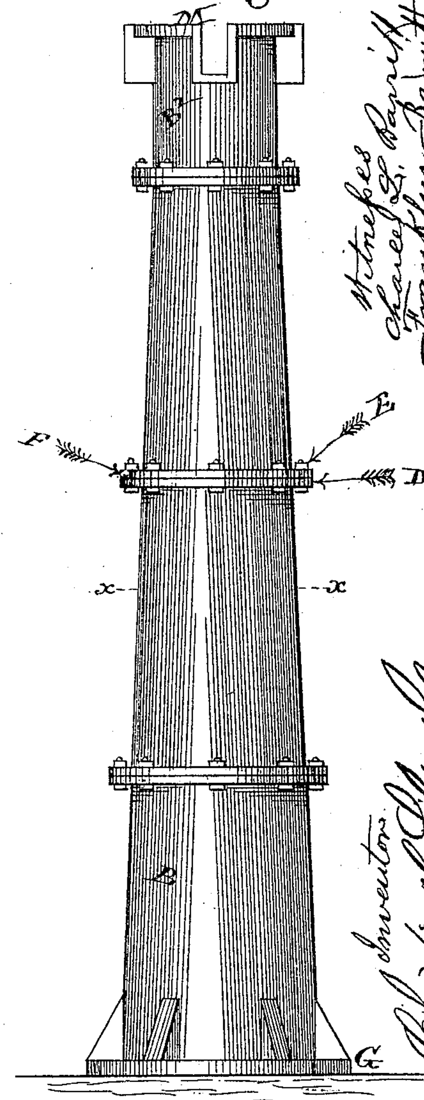


Fig: 2.



Witnesses
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Fig: 3

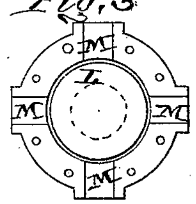
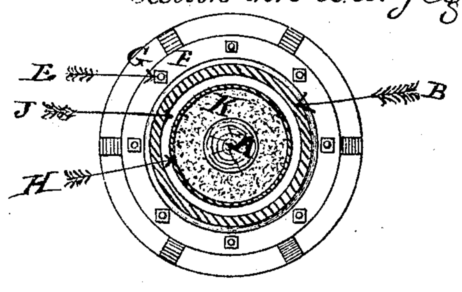


Fig: 4.

Section thro' x.x. fig: 2



United States Patent Office.

CHRISTIAN H. LILIENTHAL, OF YONKERS, NEW YORK.

Letters Patent No. 109,637, dated November 29, 1870.

IMPROVEMENT IN PIERS FOR BRIDGES.

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, CHRISTIAN H. LILIENTHAL, of Yonkers, Westchester County and State of New York, have invented certain new and useful Improvements in the Construction of Spiles or Piers for Bridges, Wharves, and other purposes; and I do hereby declare that the following is a full description of the same.

The nature of my invention consists in combining with a wooden spile well driven into the bed of the river, or other earthy foundation, a metal case of greater internal diameter than the spile of timber, and then filling the intervening space between the shell or case and spile from the upper end, with a concrete of Roman or other cements and coarse gravel or broken stones; also, in combination with a spile thus constructed, a four-way metal cap, for the purpose of securing the girders thereto, in the construction of bridges and other structures.

But to describe my invention more particularly I will refer to the accompanying drawing forming a part of this specification, the same letters of reference wherever they occur referring to like parts.

Figure 1 is a vertical cut-section of the spile and metal case, as filled in with the concrete of cement.

Figure 2 is a vertical view of the spile.

Figure 3 is a detached view of the metal girder-plate.

Figure 4 is a transverse cut-section of the spile through line x x, fig. 2.

Letter A represents the wooden spile, which is first driven into the bed of the river to any suitable depth for a solid foundation.

Over this spile is then placed a metal case, B, which, according to the depth it is sunk into the bed of the river, is made in two, or three, or more sections, with a gradual taper from the base to the top of the spile.

For the purpose of securing these sections together firmly, and with water-tight joints, a ledge, *c*, is formed on the inside of the upper edge of each section of the metal case, and a flange, *d*, on the outer edge of the joint.

Upon this flange and against the ledge *c* the lower edge of the case next above is inserted or adjusted, and by means of bolts, E, through the flange F, on its lower and outer edge, and the flange D, the two sections are firmly secured together.

It will be obvious that any number of sections may be united together by this means.

The lowermost one of these sections is intended to have a flange, G, formed on its outer lower edge, so as to give it a broad and solid support on the bed of the river; and is also made some three or more times larger in internal diameter than the spile of wood which it surrounds, with each section above gradually diminishing in diameter till the uppermost end of the case is only about twice the diameter of the spile.

On the inside of the outer case B is secured a thin sheet-metal case, H, which extends down from the top of the spile to the upper end of the first section of the outer case, or to any other point desired.

This inner case is arranged so as to leave an air space, J, between it and the outer case.

This inner case will be inserted from time to time as the sections of the outer case are secured together.

When the sections of the outer case are all bolted together, or any number of them sufficient to form a column reaching to the surface of the water, a concrete of Roman or other cement, and coarse gravel or broken stones, is filled into the space between the spile A and case B, as shown by the letter K.

As the specific gravity of the concrete is much greater than the mud and slime overlying the clayey bed of the river, and into which the spile has been driven, it will gradually settle down to the hard-pan, and thus, as it hardens, form a solid rock-like column or pier for the support of a frame-work for bridges and other purposes.

Letter L is a metal cap, adjusted on the upper end of the spile A, and filling the upper end of the case B^2, which has its upper edges formed into a four-way cap, M.

The object of this formation is to admit of the locking together the girders for forming the bridge, and at the same time giving them a firm and secure as well as solid support.

It will be obvious that where a series of piers or spiles is used they may be connected together by diagonal braces of either metal of wood, secured by straps around the spiles or piers, or to the flanges where the sections of the outer case are bolted together.

Having now described my invention, I will proceed to set forth what I claim. I do not claim broadly the inner cap, but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In combination with the metal case B, made in sections and joined together as set forth, the inner case H, for the purposes hereinbefore described.

2. In combination with the spile A the metal caps L and M, the former resting directly on the spile and case, as set forth.

CHRISTIAN H. LILIENTHAL.

Witnesses:

CHARLES L. BARRITT,
FRANKLIN BARRITT.