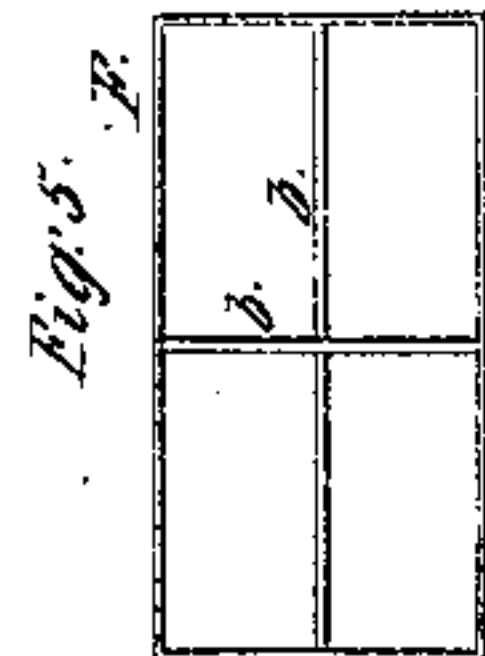
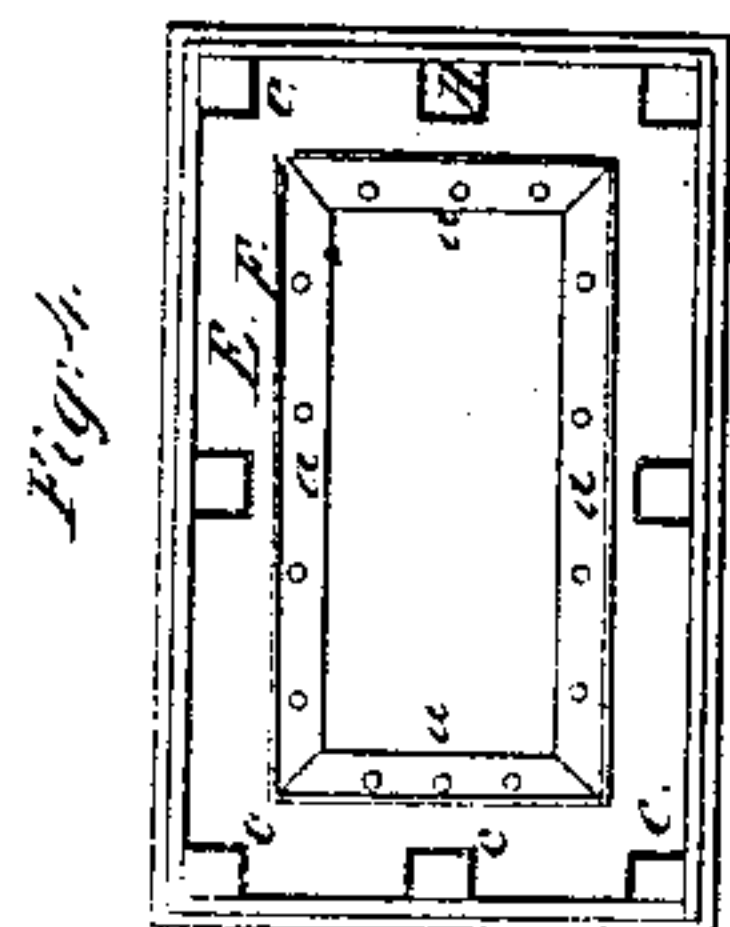
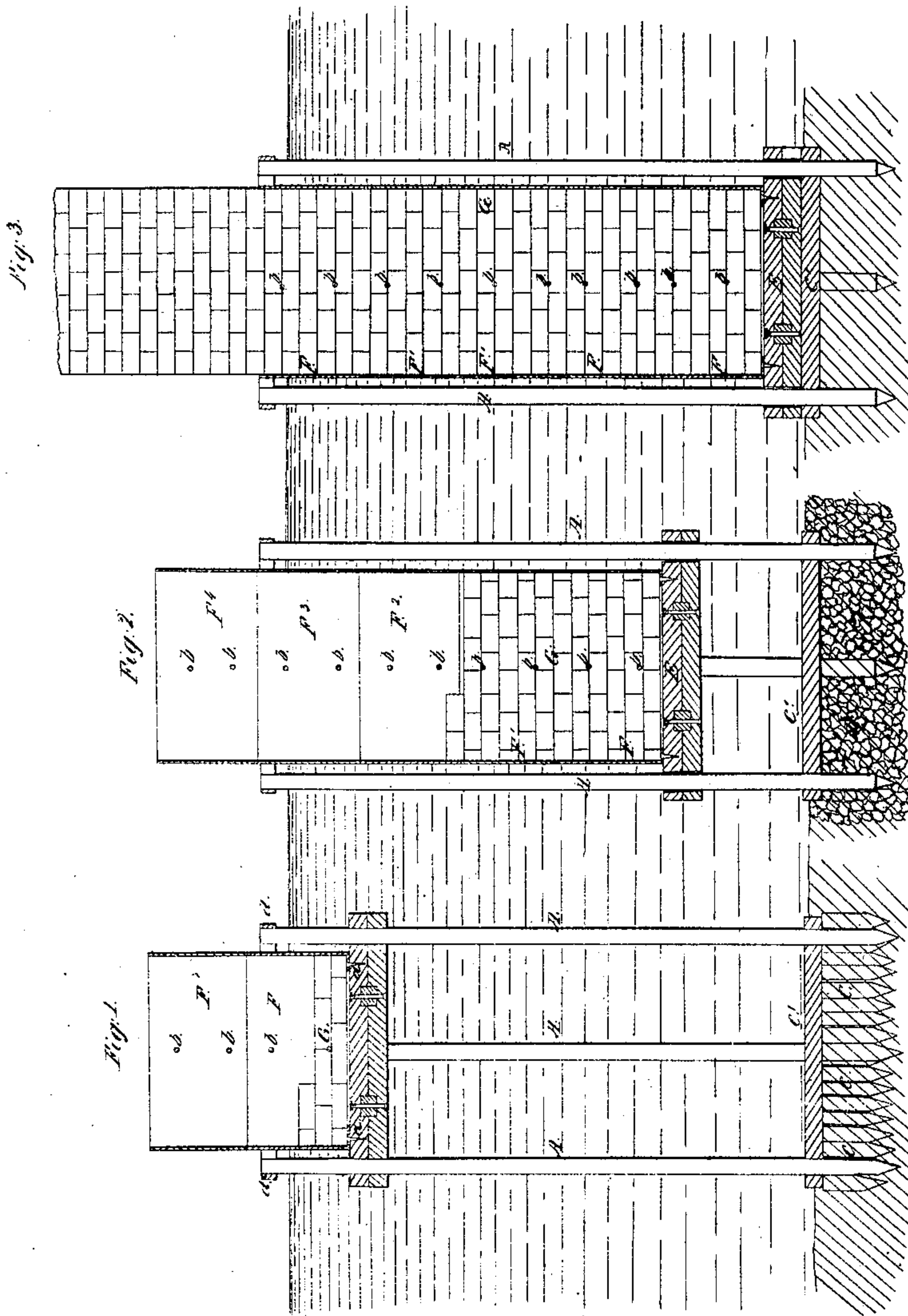


J. Du Bois.

Caisson.

N^o 36,512.

Patented Sept. 23, 1862.



Witnesses:

Osmond B. Smith
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Inventor:

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UNITED STATES PATENT OFFICE.

JOHN DU BOIS, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN MODE OF BUILDING PIERS FOR BRIDGES.

Specification forming part of Letters Patent No. 36,512, dated September 23, 1862.

To all whom it may concern:

Be it known that I, JOHN DU BOIS, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Improvement in Building Piers for Bridges and other Structures and Setting the Same; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view illustrating a pier partly built; Fig. 2, a similar view illustrating a pier in a further stage of progress. Fig. 3 is also a similar section showing a pier set and nearly completed according to my invention. Fig. 4 is a horizontal section showing the means which are employed in the building and setting of piers according to my invention. Fig. 5 is a plan of one section of the water-tight casing within which the stone-work is laid.

Similar letters of reference in the several figures indicate corresponding parts.

In the building and setting of piers for bridges and other structures in beds of rivers or streams it has been found necessary in most instances to erect stationary coffer-dams at the points where the piers are to be located. This operation requires a water-tight chamber to be constructed up from the bed of the river and then emptied of its water by a pumping process before the building of the pier can be proceeded with. The expense and inconvenience of this operation, as well as that of all other modes of building and setting piers in rivers, greatly enhance the cost of building bridges.

With my invention much of the inconvenience and expense thus incurred will be obviated, and a much firmer structure obtained.

To enable others skilled in the art to perform with my invention, I will proceed to describe its construction and operation.

To construct piers for a bridge across a river or stream, form a solid foundation by first driving long temporary piles A A into the bed of the stream outside of a given space. These piles are left extending up above the surface of the water, as represented. Then either drive down, between and near about the long piles A A, other short piles, C C, or firmly embed rock or other substantial material into the

earth or river bed, as represented at D, and, if desirable, slip down over the piles A A one or more broad and heavy stones or timbers, C', and embed the same firmly into the soil, so that they rest down upon the foundation and form a flat surface. Next construct a strong timber or other suitable character of platform, E, and bolt to its upper side one section of a hollow rectangular or other desirable form of box or tube, F F' F² F³ F⁴, which is used to incase and strengthen the pier, the said tube being composed of boiler-plate metal or other suitable material, and its lower section, F, having a bolting-flange, a, on its lower edge, running inward at right angles to its sides, so as to bolt horizontally to the platform E, as represented. This platform and section of the tube are calked and pitched or cemented, so as to be water-tight at bottom and on all sides except at top, where it is fully open, as shown. The first and several other sections of the tube should be strengthened laterally and longitudinally from sides and ends by means of strong rods b b, as represented. The structure E F should now be fitted to slide down over the sustaining and guide piles A A by cutting vertical holes c, corresponding with the shape of the piles, through the platform E. The structure, when thus fitted to the piles and let down to the surface of the water, floats by reason of its buoyancy. The upper ends of the piles are now framed together with ties d d, so as to stand firm. The preparatory steps for building and setting the pier having thus been consummated, and additional sections F' F² F³ F⁴ provided, so as to be brought into use as required, the stone-mason commences to lay the solid pier within the floating coffer-dam, using for the purpose common stone or other material deemed suitable, as shown in Fig. 1 at G. As soon as a sufficient height of mason-work has been set in the section F, to cause the structure E and F to descend nearly level with the surface of the water, another section, F', is bolted or otherwise firmly fastened upon the top edge of section F, so as to give the proper buoyancy and safety for continuing the work, as illustrated in Fig. 1. This done, the mason proceeds further with his work, and builds up the pier until it again becomes necessary to increase the buoyancy, when, as illustrated in Fig. 2, he bolts on other sections, F² F³ F⁴, of boiler-tubing, as shown in

Fig. 2, and proceeds with the building of the pier until the platform E and pier G rest down and become "set" upon the foundation, as shown in Fig. 3. He now finishes the pier above water without using any more sections of tubing, and may, if he deems best, use fine-cut stone or other finished material; or he may, if desirable, continue the tubing to the top of the pier, so as to obtain additional strength.

When the pier is completed, the piles A A are sawed off just above the top of the platform E, and their stumps, in connection with the weight of the pier, serve to prevent lateral movement of the platform and pier on its foundation.

A metal sectional boiler-plate tube has been described as the casing for the pier, because such tube possesses great strength at small expense and will serve to bind and support the masonry of the pier. It, however, is obvious that a floating water-tight coffer-dam, operating on the principle described, might be made of wood or other material than boiler-plate metal, and when the pier is finished the floating coffer-dam may be removed from around it, leaving the pier wholly uncovered from base to top.

The removed structure may be used in erecting other piers, if desirable.

I have given a minute description of means for carrying out my invention; but I do not wish to be confined to those means, but desire to be protected in the principle of operation embodied in a floating coffer-dam, substantially as described, for building and setting piers for bridges and other structures.

Having described one mode of carrying out my invention, what I claim, and desire to secure by Letters Patent, is—

1. Building and setting piers by means of a floating coffer-dam, substantially as set forth.
2. The use of the tube, which constitutes the dam, for incasing and strengthening the pier, substantially as set forth.
3. The guide piles A A, in combination with a floating coffer-dam, substantially as and for the purpose set forth.

Witness my hand and seal in the matter of my application for Letters Patent on improved mode of building and setting piers for bridges and other structures.

JOHN DU BOIS.

Witnesses:

ROBT. W. FENWICK,
DE WITT C. LAWRENCE.