No. 625,135. Patented May 16, 1899.

W. I. BABCOCK & J. W. SEAVER.

CRANE STRUCTURE.

(Application filed June 13, 1898.)

(No Model.) 3 Sheets—Sheet 1.

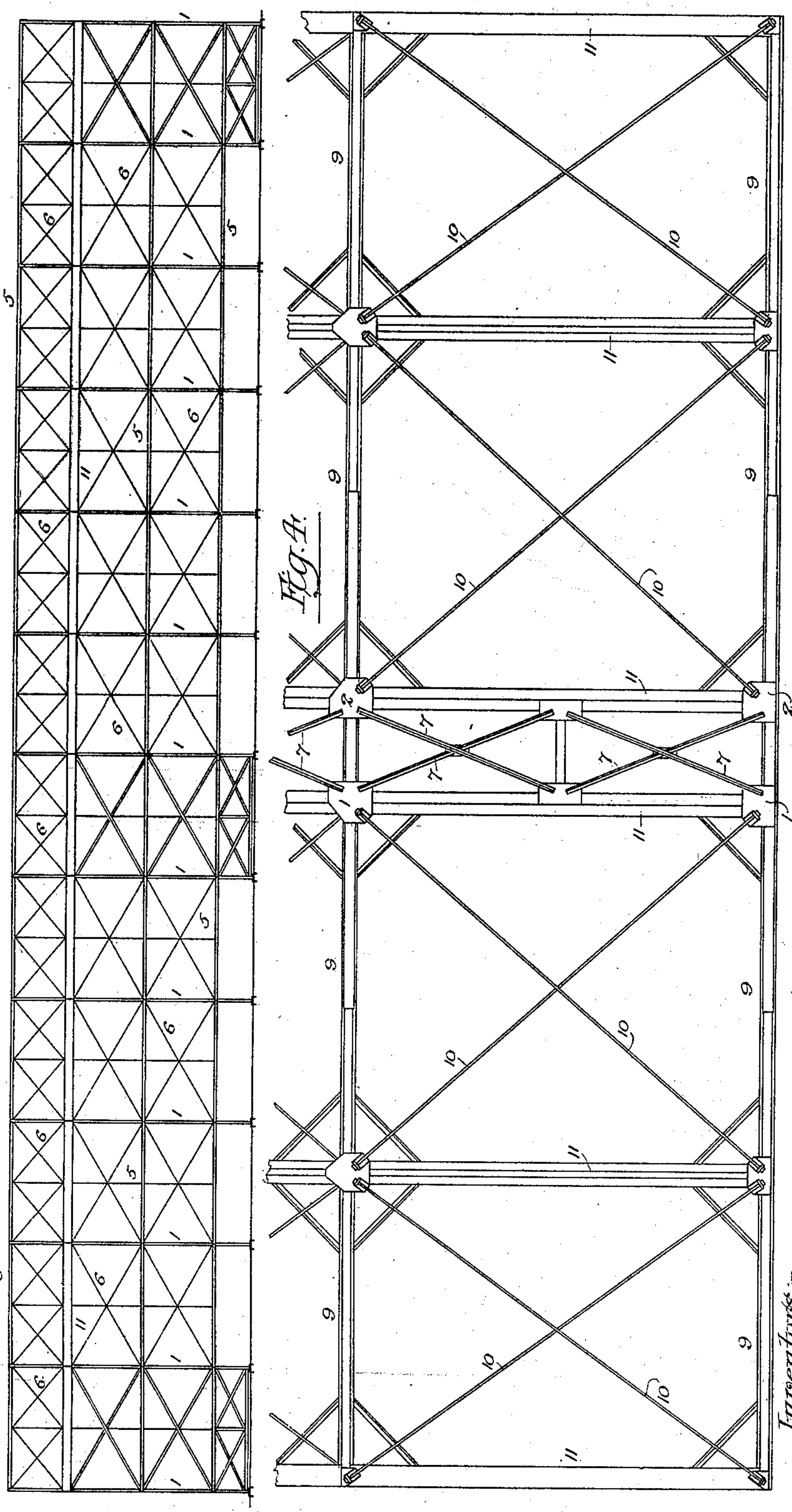

Fig. 1.

Fig. 4.

Witnesses:-
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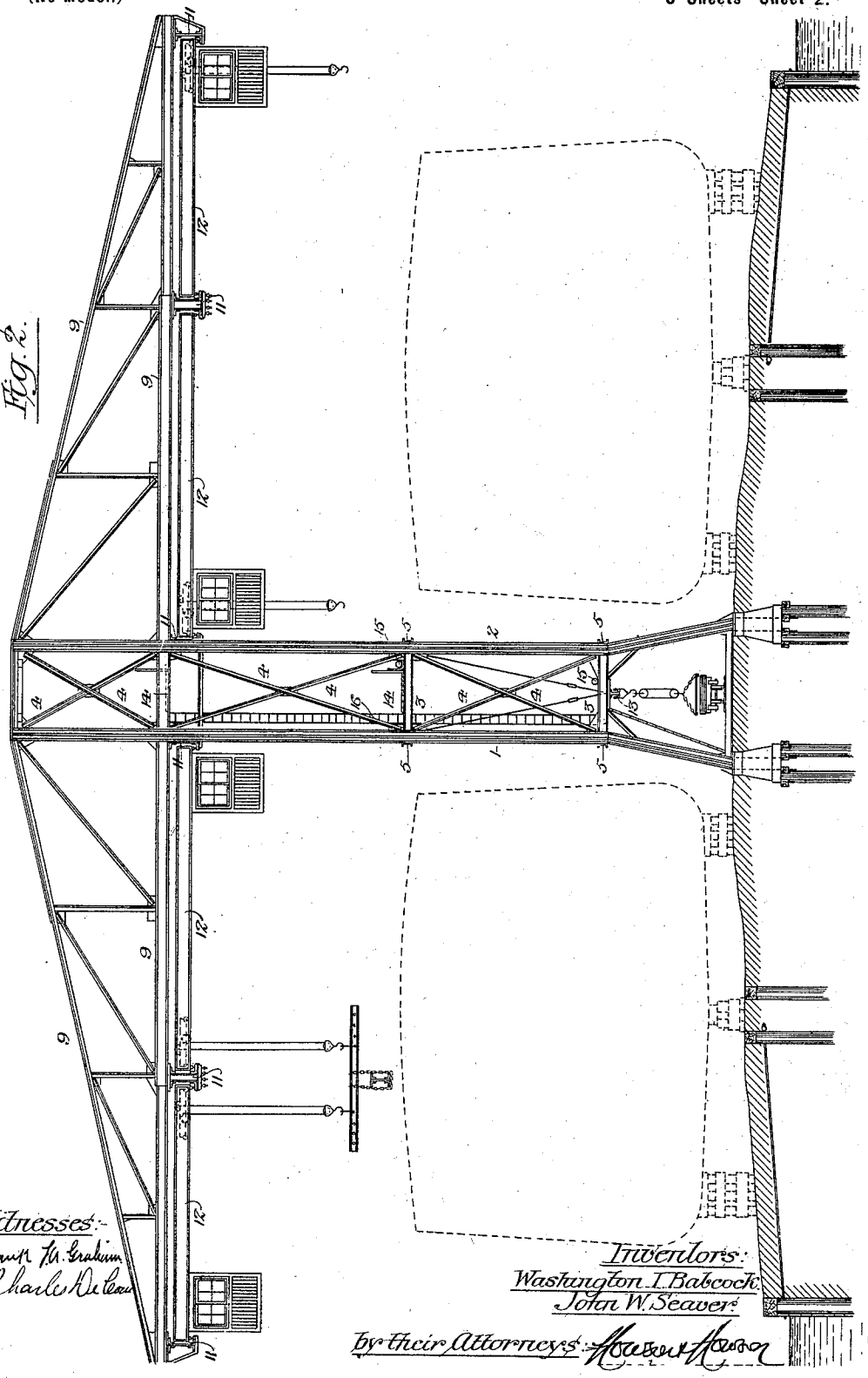
Fig. 2.



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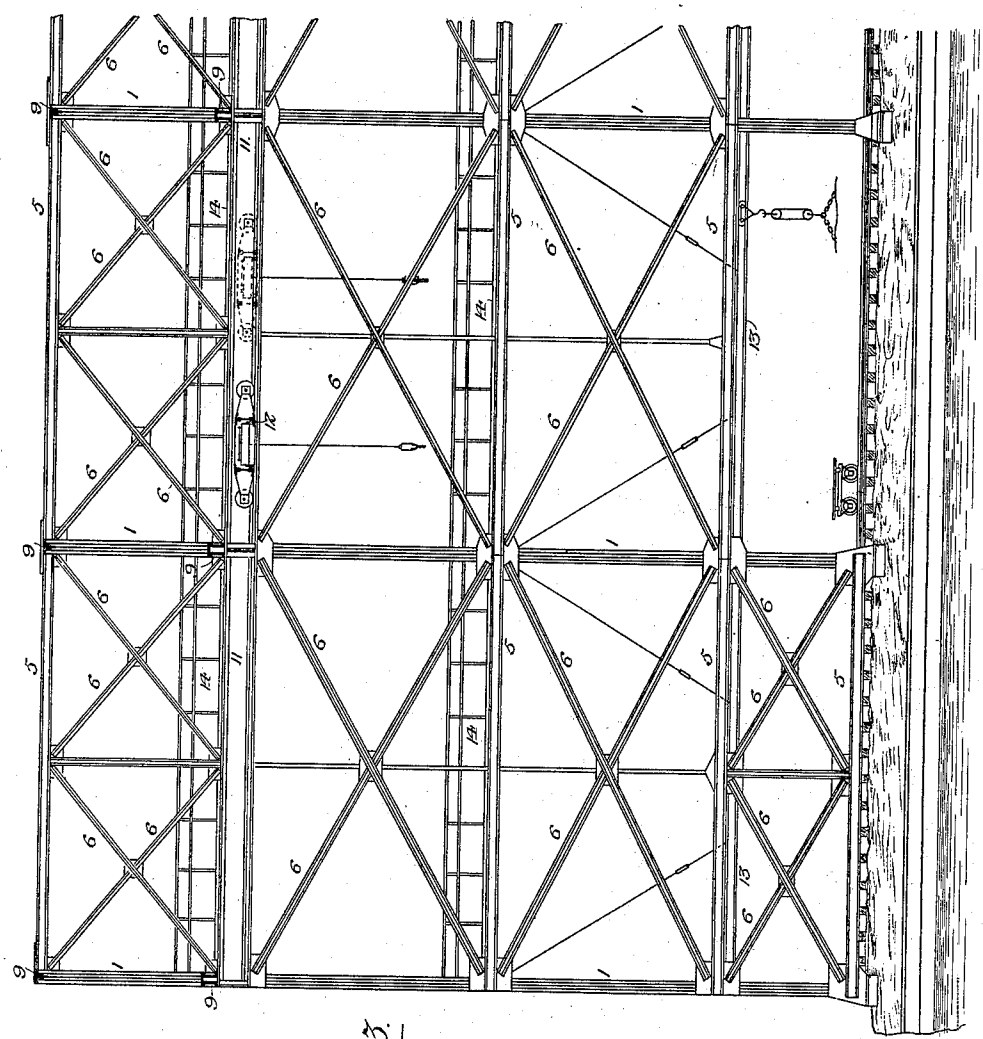

Fig. 3.

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UNITED STATES PATENT OFFICE.

WASHINGTON IRVING BABCOCK, OF CHICAGO, ILLINOIS, AND JOHN WRIGHT SEAVER, OF CLEVELAND, OHIO.

CRANE STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 625,135, dated May 16, 1899.

Application filed June 13, 1898. Serial No. 683,337. (No model.)

To all whom it may concern:

Be it known that we, WASHINGTON IRVING BABCOCK, of Chicago, Illinois, and JOHN WRIGHT SEAVER, of Cleveland, Ohio, citizens of the United States, have invented certain Improvements in Crane Structures, of which the following is a specification.

Our invention consists of certain improvements in or modifications of the crane-supporting structure shown in the patent granted to Samuel T. Wellman, Charles H. Wellman, John W. Seaver, and Washington Irving Babcock, No. 606,497, dated June 28, 1898, such a crane being especially designed for shipyard-work.

The objects of our present improvements are to provide an extremely stiff and rigid supporting structure for the overhanging cantaliver-trusses of the crane, to resist the overturning strains upon said structure without the necessity of anchoring the outer ends of said trusses, and to facilitate the handling of material by the crane. These objects we attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a crane-supporting structure constructed in accordance with our invention. Fig. 2 is a transverse section of the same on a larger scale. Fig. 3 is a side elevation, partly in section, of part of the crane on the same scale as Fig. 2; and Fig. 4 is a plan or top view of part of the crane structure on the same scale as Figs. 2 and 3.

Our present crane-supporting structure consists of a series of vertical towers, each consisting of opposite vertical posts 1 2, connected together by horizontal braces 3 and diagonal braces 4, these towers being located at any convenient distance apart and as many of them being employed as the desired length of the structure may demand. Thus in one structure which we have devised in accordance with our invention there are fifteen of these towers located at a distance of forty feet apart, thus forming a structure with an aggregate length of five hundred and sixty feet.

The posts 1 of the series of towers are suitably secured together by horizontal longitudinal braces 5 and diagonal longitudinal braces 6, and similar braces connect the posts 2, and the towers are also connected together by horizontal diagonal braces 7, as shown in Fig. 4. Hence the towers are rigidly braced both laterally and longitudinally, and a strong and stiff longitudinal structure is thus provided.

The tops of the towers carry cantaliver-trusses 9, which project to any desired distance laterally beyond the towers and are braced together horizontally, as shown at 10 in Fig. 4, this bracing being in the plane of the bottom chords of the trusses.

Suspended from the cantaliver-trusses, directly under the bottom chords of the same, are girders 11, which are provided with tracks on their lower flanges, and on these tracks run the bridges 12 of the crane, each bridge having a trolley traversing the same from end to end and carrying suitable hoisting mechanism and both bridges and trolleys being actuated by any available form of power driving mechanism.

The innermost girders 11 are secured to the posts 1 and 2 of the supporting-towers and form part of the longitudinal bracing of the same.

The girders 11 constitute runways extending throughout the entire length of the crane structure, and the bridges 12 can traverse the entire length of these runways. Hence when the crane is used as part of a shipyard equipment the hoisting mechanism mounted upon either crane-bridge can be brought over any desired portion of the length of the ship beneath it without reference to the position of the hoisting mechanism of the other cranes. Should it be desired to combine the lifting power of two cranes, the trolleys can be brought together and the lifting-tackles connected, as shown at the left-hand side of Fig. 2.

We have shown three girders constituting two runways, one laterally beyond the other on each set of cantaliver-trusses, so as to provide for two independent crane-bridges on each side of the central supporting structure, and this number may be multiplied by mounting two, three, or more crane-bridges on each runway or by multiplying the number of runways by increasing the number of girders depending from the projecting cantaliver-trusses, or by both of these methods. By thus

using a number or light-capacity high-speed cranes we are enabled to handle the material with greater facility and convenience than would be possible if a smaller number of more powerful and slower-running cranes were employed.

It is obvious that loads suspended from either of the overhanging cantaliver structures, especially from the outer portions of the same, will set up an overturning strain, which would tend to tip the entire structure over sidewise on account of the narrow base of the central supporting-framework, and in order to provide for this strain we utilize the diagonal or X braces 4, which connect the posts 1 and 2 at the tops of the towers, as shown in Fig. 2, strain coming up the top chord of either cantaliver-truss being transmitted down to the bottom chord of the cross-trusses and cantalivers and thereby resolved into a vertical strain on the posts of the tower, and as each post is thoroughly braced and stayed by means of diagonal side bracing and as the posts are connected together so that the entire series act in unison it is impossible to lift up one of the posts without lifting all of the posts in that line, and sufficient weight is thus provided to counteract any lifting tendency which is likely to be exerted.

At the bottom of the row of towers is arranged a runway 13 for transporting material throughout the length of the structure, and there is also a longitudinal track running along the bases of the towers, between the side posts of the same, for a like purpose, and suitable gangways 14 and air-pipes 15 are mounted upon the transverse braces 3, connecting the tower-posts, while ladders 16 provide a means of travel from top to bottom of either tower.

Although we have shown the central structure as supporting cantaliver-trusses projecting laterally in both directions therefrom, it will be evident that our invention may also be embodied in a structure consisting of a row of connected towers from which the cantaliver-trusses project laterally in but one direction.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. A crane-supporting structure consisting of a longitudinal row of vertical towers connected by longitudinal bracing and each supporting a projecting cantaliver-truss, said trusses being likewise connected by longitudinal bracing, substantially as specified.

2. A crane-supporting structure consisting of a longitudinal row of vertical towers connected together by longitudinal bracing and each supporting a pair of cantaliver-trusses projecting laterally therefrom, one in one direction and the other in the opposite direction, said cantaliver-trusses being likewise connected by longitudinal bracing, substantially as specified.

3. A crane consisting of a longitudinal structure with cantaliver-trusses projecting from one or both sides of the same, said cantaliver-trusses carrying longitudinal girders forming runways one laterally beyond another for the reception of traveling-crane bridges, substantially as specified.

4. The combination, in a crane, of vertical towers having laterally-projecting cantaliver-trusses, and longitudinal bracing in a vertical plane connecting said towers in a direction at right angles to the cantaliver-trusses, whereby uplifting or overturning strain upon the posts of any one of the towers is transmitted to the posts of adjoining towers, substantially as specified.

5. The combination, in a crane, of vertical towers having laterally-projecting cantaliver-trusses, and longitudinal bracing in a vertical plane connecting said towers in a direction at right angles to the cantaliver-trusses, said longitudinal bracing comprising both horizontal and diagonal members, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WASHINGTON IRVING BABCOCK.
JOHN WRIGHT SEAVER.

Witnesses to signature of W. I. Babcock:
H. W. HOBBS,
GEO. WERNER.

Witnesses to signature of J. W. Seaver:
C. W. COMSTOCK,
JOHN MCGEORGE.