No. 625,643. Patented May 23, 1899.

T. A. COFFIN.

HOISTING APPARATUS.

(Application filed Feb. 20, 1899.)

(No Model.) 4 Sheets—Sheet 1.

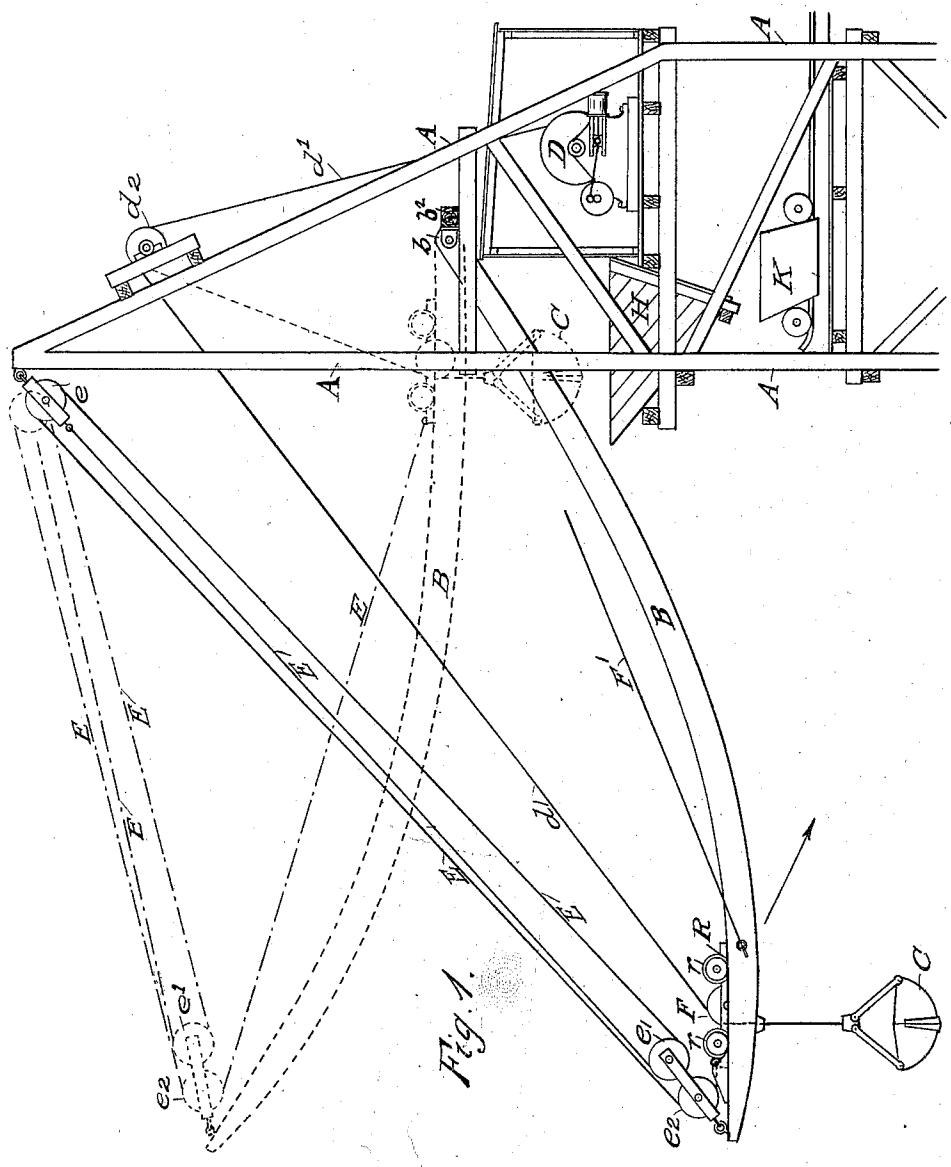


Fig. 1.

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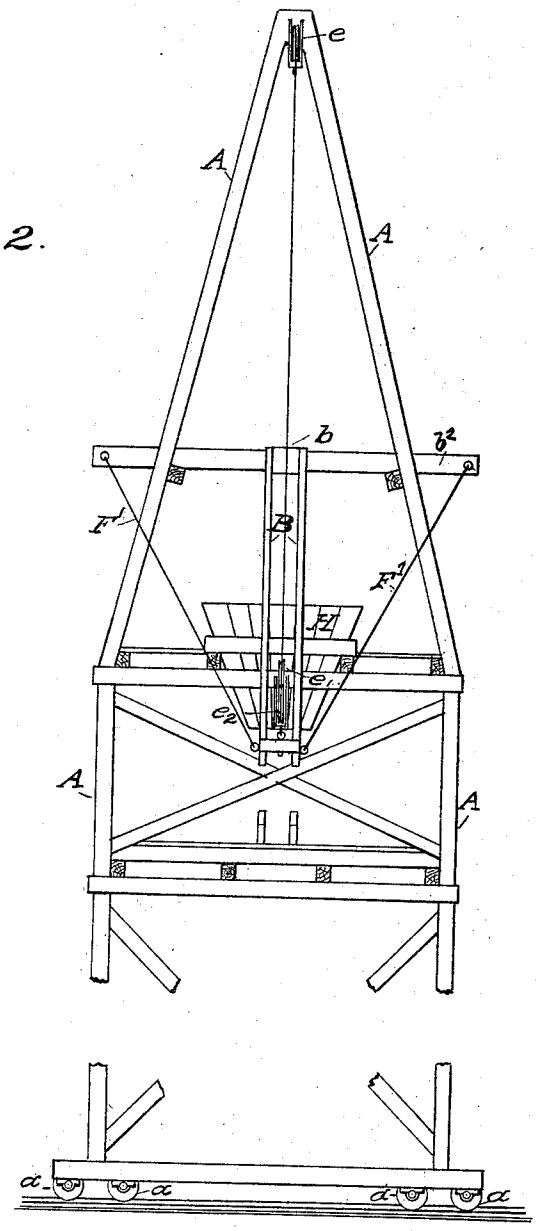
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Fig. 2.



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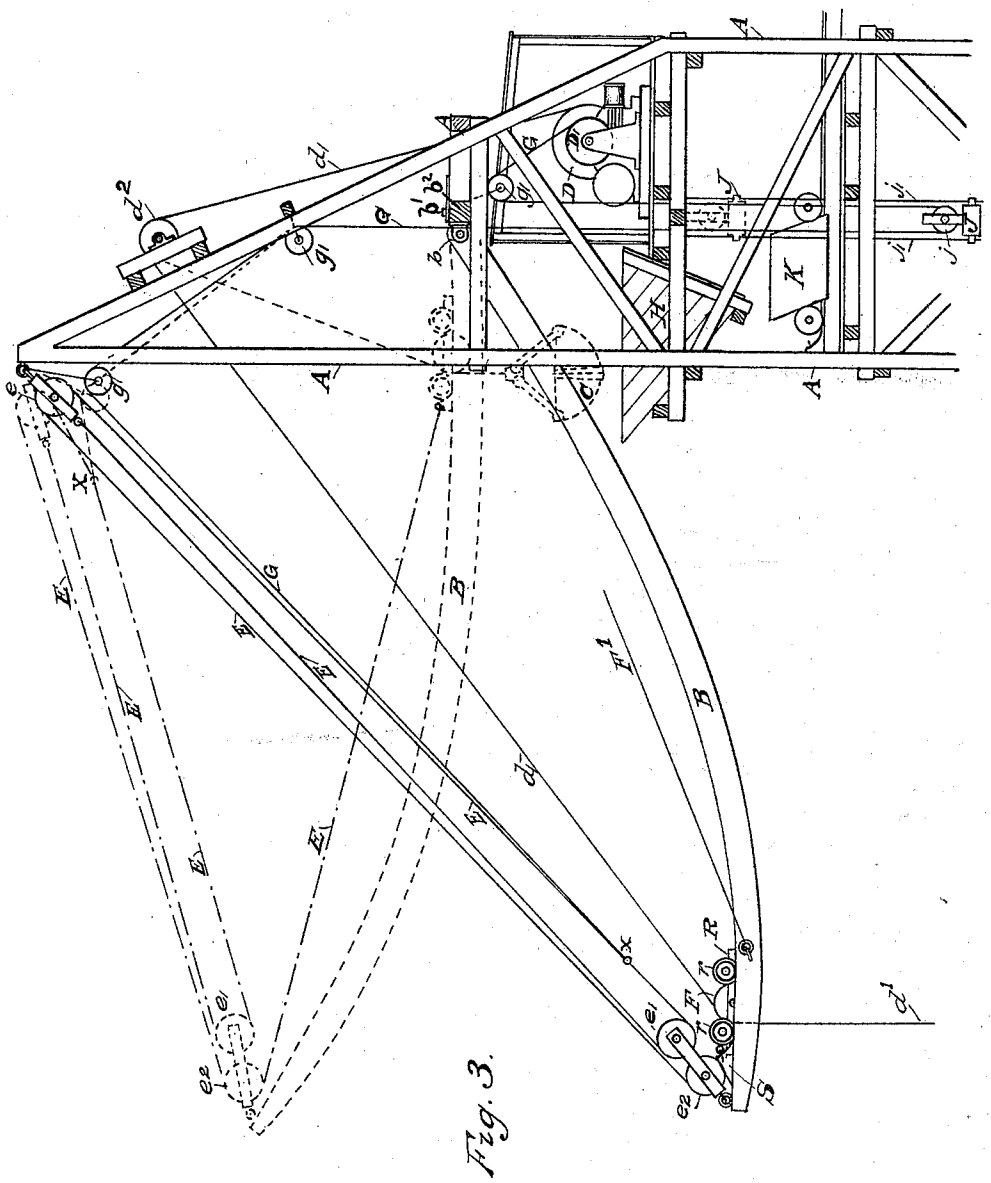


Fig. 3.

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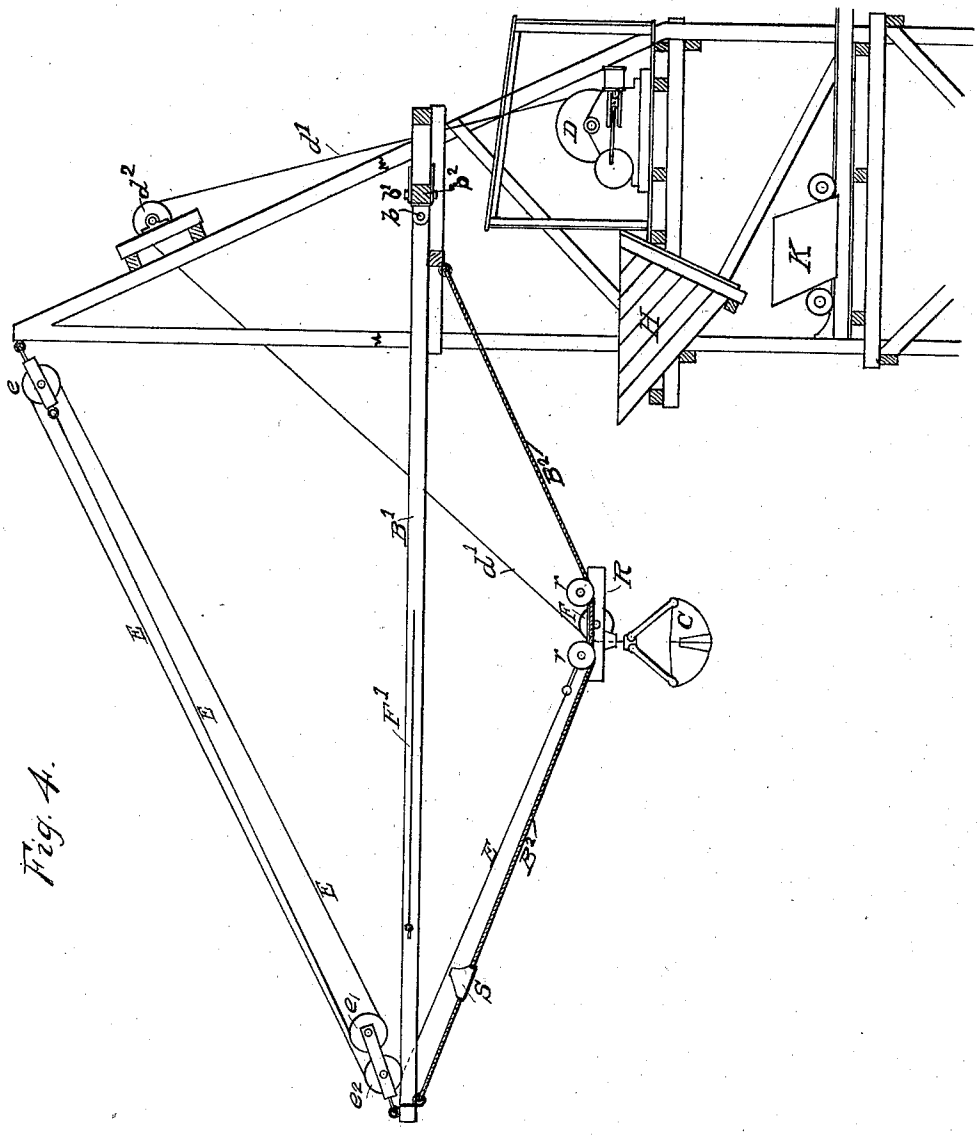


Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS AMORY COFFIN, OF NEW YORK, N. Y.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 625,643, dated May 23, 1899.

Application filed February 20, 1899. Serial No. 706,245. (No model.)

To all whom it may concern:

Be it known that I, THOMAS AMORY COFFIN, a citizen of the United States of America, residing in West New Brighton, Staten Island, borough of Richmond, New York city, New York, have invented an Improved Hoisting Apparatus, of which the following is a specification.

My invention has reference more particularly to that class of hoisting apparatus in which an overhanging boom is employed—as, for instance, hoisting apparatus of the type commonly known under the name of the "Boston tower"—used for unloading canal and other boats and transferring coal, grain, &c., from such boats to storage-bins, cars, &c. In such apparatus there is provided a vertical framework or tower, either a fixture or mounted upon wheels, upon a wharf, float, or elsewhere, and upon this tower is mounted a horizontally-projecting boom upon which a truck can be traversed between the tower and the outer end of the boom. This truck carries a sheave or sheaves, over which the hoisting-rope passes for the raising and lowering of the clam-shell bucket, tub, skip, or other load-carrier. The sheave-truck is to be held out near the end of the boom during the first part of the lift of the carrier, and afterward it has to be moved in toward the tower, where finally it is brought over a hopper, into which the load is discharged. The sheave-truck and empty carrier are then traversed outward again to the end of the boom, and the carrier is let down into the hold of the boat or wherever it has to be loaded. Commonly this inboard and outboard travel of the sheave-truck on the boom is controlled by a hoisting-drum supplementary to the main hoisting-drum in the tower; but this requires the presence of a second man to manipulate the second hoist. In some cases a counterbalance has been connected with the truck to cause the inboard travel of the latter; but that construction has not proved satisfactory.

By my invention the inboard and outboard travel of the sheave-truck is effected by raising and lowering the boom upon its pivot at the proper times through the load-hoisting mechanism.

In the accompanying drawings, Figure 1 is a side elevation of the upper part of such a hoisting apparatus embodying my invention. Fig. 2 is a front elevation of the same, but showing also the lower part of the frame or tower. Fig. 3 is a side elevation similar to Fig. 1, but showing a modification; and Fig. 4 is a view of another modification.

Referring to Figs. 1 and 2, A A is the framework or tower, which may be a fixture on a wharf, float, or other situation; but in Fig. 2 I have shown it as mounted upon wheels *a a* to run on rails, as is common. In this tower is a suitable receiving-hopper H, below which there may be any suitable conveying means. In the present instance I have shown a trolley-car K to receive its load from the hopper and then run off to any suitable delivery-point at a distance. At any suitable point on the frame there is also provided a hoisting-drum D, from which runs the hoisting-rope d' over a sheave d^2 near the peak of the tower.

B is the outwardly-projecting boom, which is mounted so as to be capable of swinging vertically upon a pivot *b* on the tower, and it may also be mounted so as to be adjustable horizontally on a vertical pivot b', Figs. 3 and 4, so as to accommodate varying hatches in boats. The outer end of the boom is sustained by a three-part rope E, passing around the sheave *e*, carried by the peak of the tower, and the two sheaves e' and e^2, connected to the outer end of the boom. One end of this rope is connected to the tower-peak directly or through the sheave or block *e*, and thence the rope passes around the sheave e' back toward the tower and around the sheave *e* and thence toward the boom and around the sheave e^2, with its end connected to the sheave-truck R, which travels on the boom. This truck runs on wheels *r* on the boom B and carries a sheave F, over which passes the hoisting-rope d', the bucket, tub, skip, or other carrier C being suspended from this hoisting-rope. The boom B may be sustained against lateral strain by guy-ropes F′, connecting the outer end of the boom with a cross-beam b^2 on the tower approximately in line with the pivot of the boom, Figs. 1 and 2.

The parts are so balanced that the inward pull on the truck R, caused by the angle of the hoisting-rope and the weight of the carrier and its load, with a resultant pull in the direction of the arrow, Fig. 1, is more than balanced by the outward pull on the rope E, caused by the weight of the boom and its

load—that is to say, the rope E will keep the sheave-truck R out against the stop-chocks S, as shown in Fig. 1, even when the carrier is loaded and prevent the loaded carrier from traveling inward and downward to wreck the tower-frame. Therefore when the hoisting-drum D is set in operation the carrier will be drawn up with its load in a vertical direction until the carrier or other stop on the hoisting-rope comes into contact with the under side of the truck or the boom and tends to free the strain on the rope E. Immediately that this occurs the truck R will move inboard on the boom, the latter rising as the three-part rope E is thus shortened up until the boom and truck have reached the positions indicated by dotted lines in Fig. 1, with the carrier over the receiving-hopper. As soon as the carrier is emptied and the strain on the hoisting-rope slightly relaxed the weight of the boom acting through the rope E will draw the truck and carrier out again to the positions shown by full lines in Fig. 1.

To provide the necessary equilibrium or balance during the inboard travel of the truck R, it is desirable, if not necessary, that the track on which the truck travels shall be curved. This may be provided for by curving the boom B itself, or it may be provided for by employing with a straight or other suitably-shaped boom B′, Fig. 4, a double ropeway B^2 for the track of the truck R. Although at any given moment the ropes of this ropeway present angular lines, as shown in Fig. 4, the line of travel of the truck R with reference to the beam B′, for instance, is a curved one, as will be understood.

In Fig. 3 I have shown substantially the same construction as already described with reference to Figs. 1 and 2, but with an additional means, whereby the inboard travel of the truck and carrier may be started sooner than in the construction shown in Figs. 1 and 2, with the result of getting a practically straight path of travel for the carrier from the point where it clears the hatch of a boat to a point over the hopper. For this purpose I provide a secondary hoisting-rope G to aid in raising the boom, but provided with a slack loop and counterweight to delay the raising of the boom until the load has "cleared" below. As a convenient way of doing this I hook up to the second turn of the three-part rope E—say at *x*, Fig. 3—the rope G, which thence passes up to and around a sheave *g*, carried by the peak of the tower, thence around a guide-sheave *g′*, and thence down and around a sheave *j* on a bob or counterweight J. From this sheave *g′* the rope G passes upward again, preferably around a guide-sheave *g′*, to a drum D′ on the same shaft as the main hoisting-drum D. The counterweight J is guided by vertical guides *j′* and can rise to the position shown by dotted lines, where it will be arrested by contact with a fixed part of the framework. At the beginning of the hoisting movement the counterweight J′ is in its lowered position, as shown by full lines, and the rotation of the hoisting-shaft, while causing the carrier to rise vertically out of the boat's hold, will not cause the rope G to pull on the rope E until the counterweight J has been drawn up to the position shown by dotted lines. Then the loaded carrier being clear of the boat, the rope G will begin to pull on the rope E and allow the sheave-truck R to move in toward the tower in proportion to the rise of the carrier, which takes a practically straight course to a position over the hopper H.

I claim as my invention—

1. A hoisting apparatus having a framework and load-hoisting means with a vertically-swinging boom, a traveling sheave-truck on the latter, connections between the boom and hoisting means, whereby the latter raises and lowers the boom, and means whereby the travel of the truck is controlled by the raising and lowering of the boom.

2. A hoisting apparatus having a framework, a load-hoisting means, a vertically-swinging boom, and a traveling truck on the latter in combination with sheaves and a rope connecting the peak of the frame, the end of the boom and the traveling truck to normally sustain the boom in a balanced position, and connections between the boom and hoisting means, whereby the latter raises and lowers the boom to cause the inboard and outboard travel of the truck.

3. A hoisting apparatus having a framework and load-hoisting means, a vertically-swinging boom and a traveling truck on the latter in combination with connections between the hoisting means and the boom, whereby the latter raises the boom and causes the inboard travel of the truck, and devices whereby said travel is started as soon as the load has cleared below, substantially as described.

4. A hoisting apparatus having a framework and hoisting means with a vertically-swinging boom, a traveling sheave-truck on the latter, sheaves and a rope connecting the peak of the frame, the end of the boom and the traveling truck, a secondary hoisting-rope to aid in raising the boom, but provided with a slack loop and counterweight, substantially as described.

5. A hoisting apparatus having a framework and a load-hoisting means, a vertically-swinging boom having a curved trackway and a traveling sheave-truck on the latter, in combination with connections between the boom and hoisting means, whereby the latter raises and lowers the boom, and means whereby the travel of the truck is controlled by the raising and lowering of the boom.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS AMORY COFFIN.

Witnesses:
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ROBERT D. WHITE.