

No. 865,913.

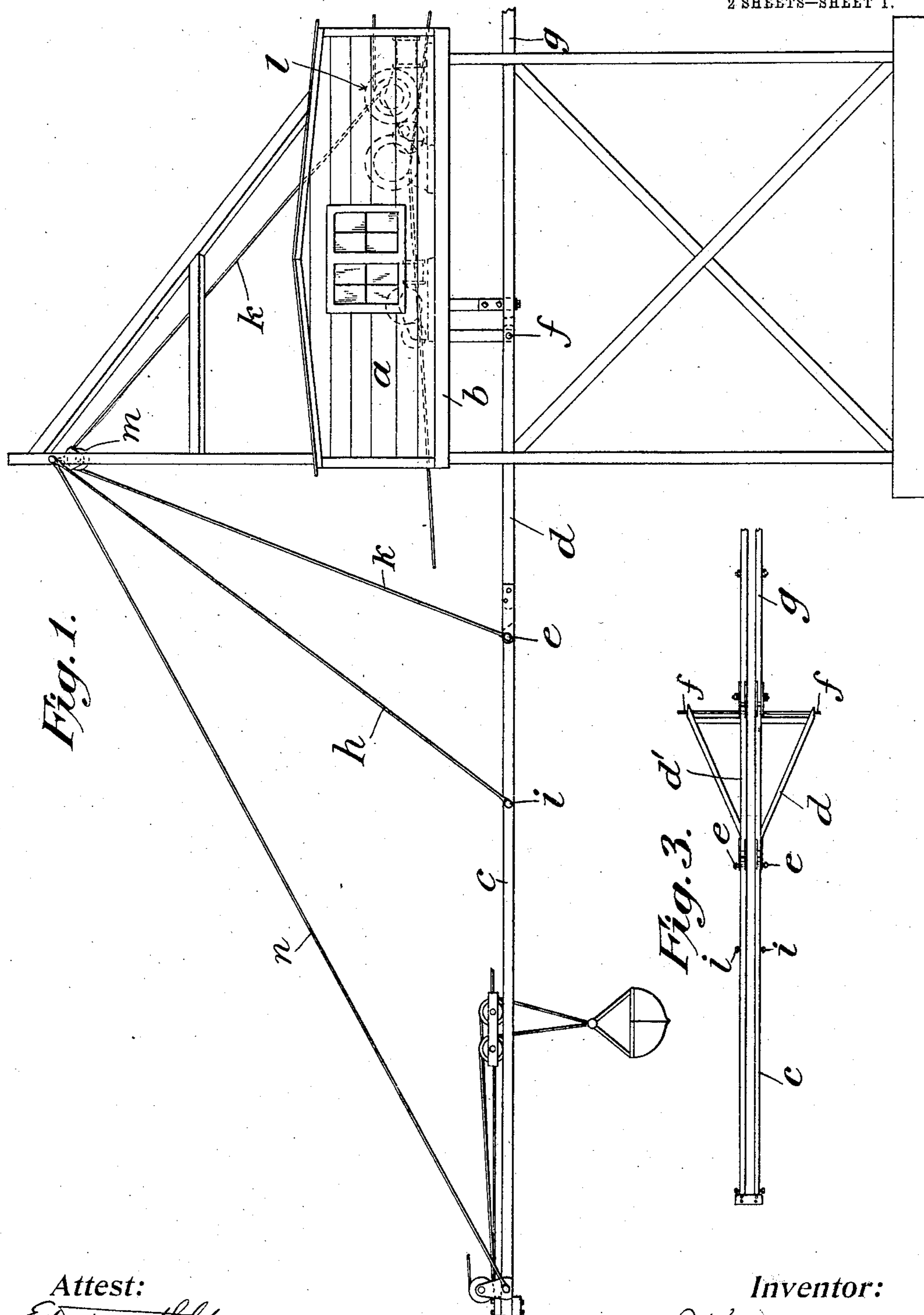
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C. C. KING.

MACHINERY FOR HANDLING COAL, ORE, &c.

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2 SHEETS—SHEET 1.



UNITED STATES PATENT OFFICE.

CHARLES C. KING, OF NEW YORK, N. Y., ASSIGNOR TO C. W. HUNT COMPANY, OF WEST NEW BRIGHTON, NEW YORK, A CORPORATION OF NEW YORK.

MACHINERY FOR HANDLING COAL, ORE, &c.

No. 865,913.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES C. KING, a citizen of the United States, residing in West New Brighton, in the borough of Richmond, in the city of New York, in the State of New York, have invented certain new and useful Improvements in Machinery for Handling Coal, Ore, &c., of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 The object of this invention is to provide an improved folding boom for steeple towers or bridge terminals in plants for handling coal, ore, etc. Steeple towers are now sometimes provided with booms which fold side-
15 wise or vertically against the face of the tower, the point of the boom swinging down and the flexing of the boom being in an upward direction. By reason of their construction, however, they are somewhat limited in length and it is practically impossible to continue the boom track back through the tower or to make it con-
20 tinuous with a bridge track.

In accordance with the present invention the boom is made to flex downward while the point swings upward and the outer member of the boom is supported by and fulcrumed upon guys which extend from the
25 top of the tower to the boom at a point between its ends, the point of attachment being so selected that the parts of the boom on opposite sides thereof are nearly in balance. The amount of work required in operating the boom therefore becomes nearly zero. The weight of
30 the parts within the point of support, however, preferably slightly over-balances the weight of the parts beyond the point of support so that the tendency of the boom is always to swing to its position of rest against the tower, and in the event of any accident the out-
35 ward portion of the boom will therefore swing away from the vessel over which it may be suspended. Such power as is required to operate the boom is preferably applied through ropes extended over suitable guide sheaves at the top of the tower to the joint between the
40 inner and outer members of the boom and guys are extended from the outer end of the boom to the top of the tower, being so adjusted as to be brought into tension as the boom reaches its operative position.

The improved construction and arrangement of parts
45 permits the operating engines to be placed upon a platform above the boom so that the track can be continued back through the tower and, if desired, made continuous with a bridge track, thereby greatly extending the usefulness of the machinery. The improved construc-
50 tion also permits the inner member of the boom to be made stiff and rigid and the outer member of the boom

to be lighter and therefore longer than is ordinarily possible. Moreover as all of the parts are suspended from above and are in tension there is no tendency to tip
55 sidewise as may be the case when the members of the boom are in compression, as in the ordinary construction. It follows, furthermore, that when the fulcrum is described and the flexing is downward, the boom is supported, when in its operative position, at a low point and a long boom can be used without permitting its free
60 end to project to a dangerous point above the tower.

The invention will be more fully explained herein-
after with reference to the accompanying drawings in which it is illustrated and in which—

Figure 1 is a view in side elevation of a steeple tower
65 to which the invention is applied, the boom being shown in its operative position. Fig. 2 is a similar view but with the boom folded. Fig. 3 is a plan view of the boom and track, on a smaller scale.

The invention is illustrated in the drawings as ap-
70 plied to a steeple tower *a* of ordinary construction except that, as permitted by the invention, the engine platform *b* is above the boom and the track is continued backward from the boom through the tower. The boom comprises an outer member *c* and an inner mem-
75 ber *d*. The two members are hinged together at *e* so that they form a continuous track when extended and the inner member *d* is hinged to the tower, as at *f*, to form, when in position, a continuous track with the track *g*, which may be suitably supported on the tower
80 or may be a bridge track. As shown in Fig. 3, the inner member *d* of the boom, since its weight is practically balanced, as will be explained, by the outer portion of the boom, may be quite heavy and therefore of such construction as to be very stiff and rigid and
85 thereby to afford substantial support for the outer member of the boom. The outer member of the boom, being thus substantially supported and counterbalanced, may be made of considerably greater length than has been considered possible heretofore. As is
90 usual, the outer member *c* is of such construction as to form a double track which is continued by the track portion *d'* of the inner member *d* and by the track *g*.

From the head of the tower there are extended guys
95 *h* to the outer member *c* of the boom at a point between its ends but nearer the inner end so that the moment of the portion beyond the point of attachment *i* substantially counter-balances the moment of the portion within the point *i* and the inner member *d*. The entire boom is therefore fulcrumed and nearly balances upon
100 the guys *h*, the exact point of attachment of the guys to the boom being preferably so selected as to make the

moment of the parts within the point i slightly overbalance the moment of the parts beyond the point i , whereby the tendency of the boom is always to assume its folded or inoperative position, as shown in Fig. 2.

5 The boom operating ropes k are extended from the drum of one of the engines, indicated at l , on the platform b , over the guide sheave m at the tower head to the boom at or near the point of flexing e . The hauling in of the ropes k therefore elevates the point of flexing and
10 swings the boom about its point of support i , which also moves outward from the tower at the same time, until the boom assumes its operative position when the guys n , extended from the tower head to the outer end of the boom, are brought into tension and thereafter sustain a
15 portion of the load. But little more tension on the operating ropes is required to retain the boom in operative position than is necessary to support the load as the truck passes over the point of attachment of the operating ropes. Should these ropes give way the boom will
20 immediately swing into its inoperative position clearing the rigging of any vessel which may have been lying beneath the boom.

While the engine platform is preferably located above the track, as shown, obviously it might be located
25 at any convenient point, suitable leading sheaves being provided for the ropes.

While the moment of the parts within the point of support is preferably slightly greater than that of the parts outside of the same, nevertheless the moment of
30 the parts outside of the same might be the greater so that the boom would swing into operative position of itself when released and the operating rope, so attached as to oppose the greater moment, would then act to restore the boom to inoperative position.

35 Reference has been made herein to a plurality of guys attached to the boom at different points and to a plurality of operating ropes, but it will be understood that with such a construction of boom as that shown a single guy may be employed at each point with a suitable stirrup and a single operating rope, also with a
40 suitable stirrup, and that single guys and a single operating rope might be employed with booms of other construction.

45 Various other changes in details of construction and arrangement may be made to suit different conditions of use and the invention is, therefore, not restricted to

the precise construction and arrangement shown and described herein.

I claim as my invention:—

1. In machinery for handling coal, ore, etc., the combination of a support, a boom hinged at its inner end to swing downwardly and comprising two parts hinged together and flexing downward, a supporting guy attached to said boom between its ends and upon which said boom is fulcrumed and nearly balanced, and an operating rope
55 attached to the boom to oppose the parts having the greater moment.

2. In machinery for handling coal, ore, etc., the combination of a tower, a boom hinged at its inner end to the tower to swing downwardly and comprising two parts
60 hinged together to flex downwardly, a supporting guy from the tower head attached to the boom at a point between its ends, and upon which the boom is fulcrumed and nearly balanced and an operating rope attached to the boom near the point of flexing.
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3. In machinery for handling coal, ore, etc., the combination of a tower, a folding boom hinged at its inner end to the tower to swing downwardly and comprising two parts hinged together to flex downwardly, a supporting
70 guy from the tower head to the boom at a point between its ends and upon which the boom is fulcrumed and nearly balanced, an operating rope attached to the boom near the point of flexing, and a guy from the tower head to the outer end of the boom and brought into tension as the boom assumes its operative position.
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4. In machinery for handling coal, ore, etc., the combination of a tower, a folding boom hinged at its inner end to the tower to swing downwardly and comprising two parts hinged together to flex downwardly, a supporting
80 guy from the tower head to the boom at a point between its ends and upon which the boom is fulcrumed and nearly balanced, an operating rope attached to the boom near the point of flexing, and a relatively fixed track continuing the boom track rearwardly through the tower.

5. In machinery for handling coal, ore, etc., the combination of a tower, a fixed track supported by the tower, a boom hinged to the tower and comprising two parts hinged together to flex downwardly, the track of the boom being continuous with the fixed track when the boom is in
85 operative position, a supporting guy from the tower head to the boom at a point between its ends, an operating rope attached to the boom near the point of flexing, and an engine platform supported by the tower above the fixed track and boom.
90

This specification signed and witnessed this 6th day of June, A. D., 1907. 95

CHARLES C. KING.

Signed in the presence of—

GEO. S. HUMPHREY,

CHAS. E. SIMONSON.