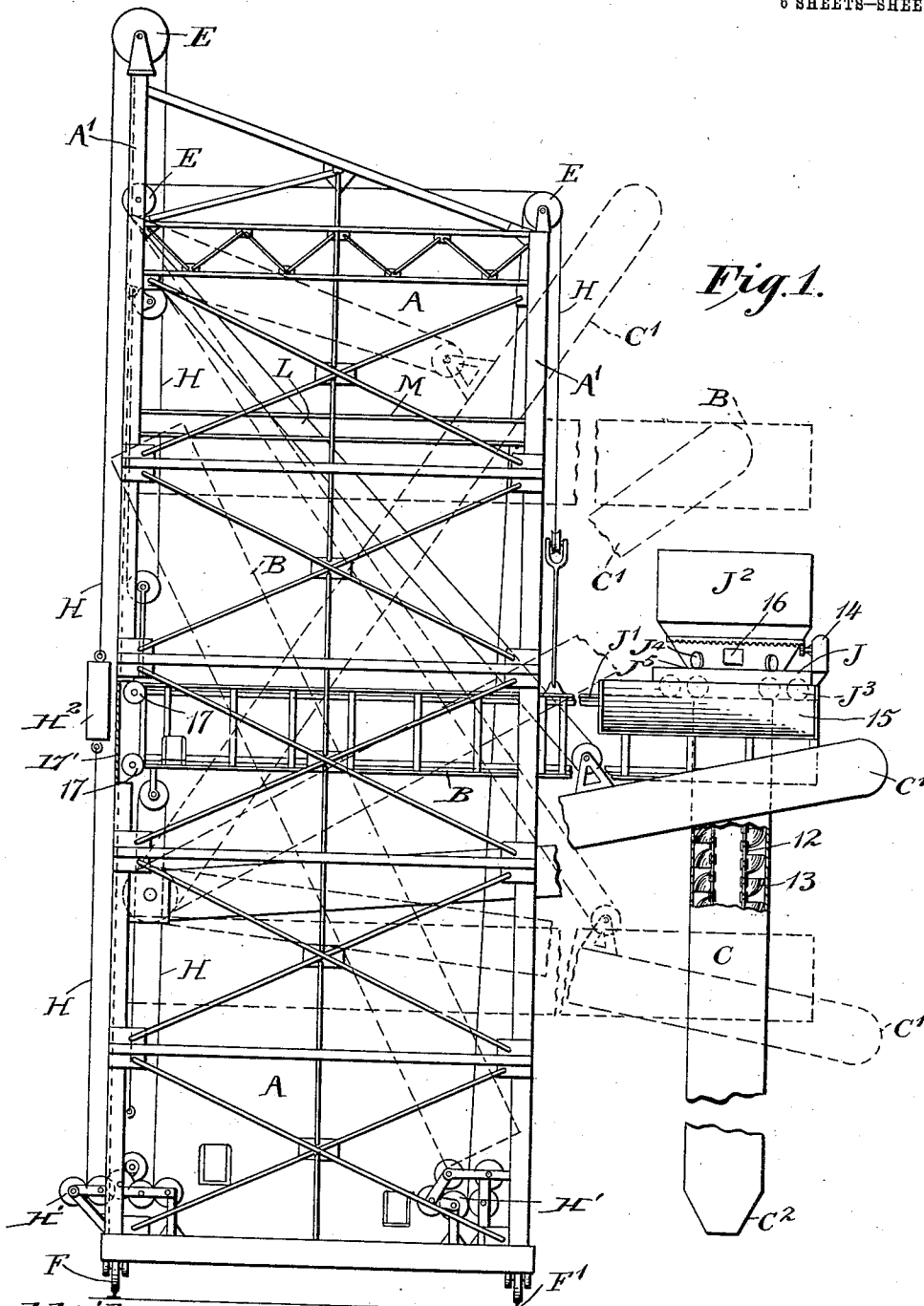


G. C. CHADWICK.
 APPARATUS FOR UNLOADING VESSELS.
 APPLICATION FILED OCT. 2, 1909.

1,064,443.

Patented June 10, 1913.

6 SHEETS—SHEET 1.



Witnesses:

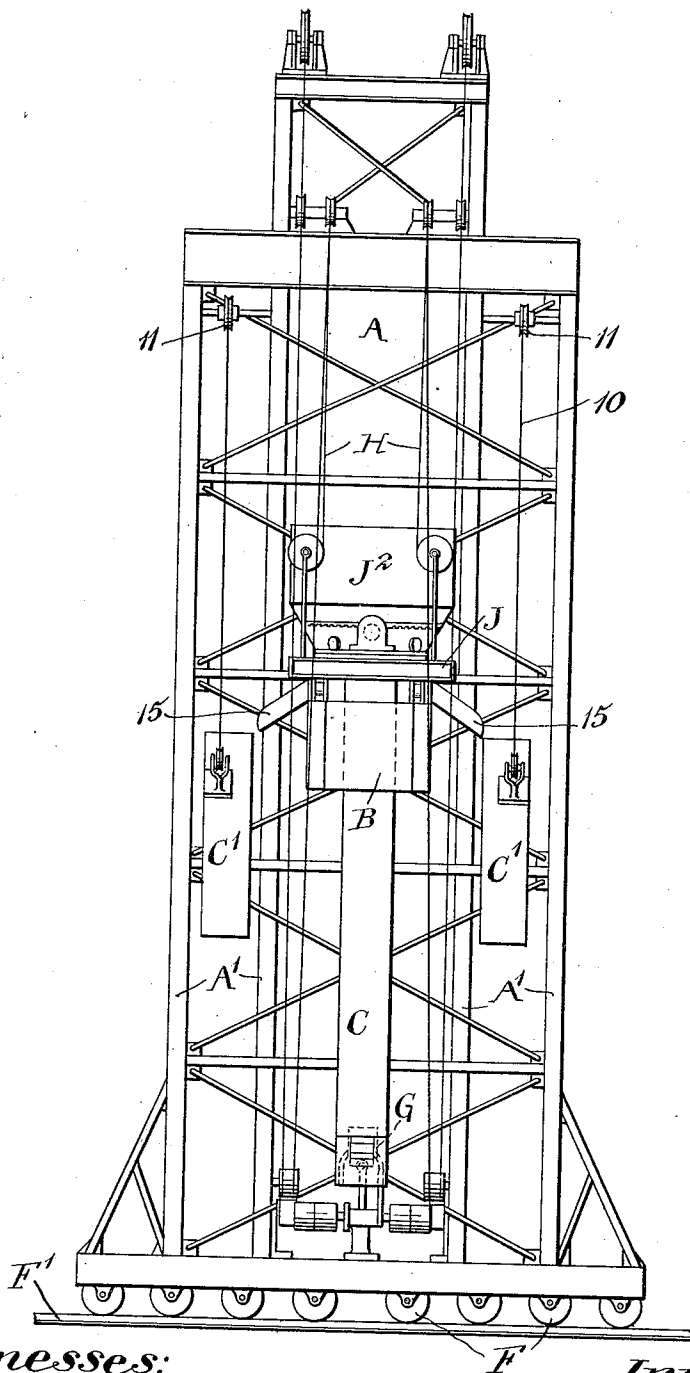
Alex. Scott
 C. K. Berryman

Inventor:
 George C. Chadwick
 by Harold Terrell
 his atty.

G. C. CHADWICK.
 APPARATUS FOR UNLOADING VESSELS.
 APPLICATION FILED OCT. 2, 1909.

1,064,443.

Patented June 10, 1913.
 6 SHEETS—SHEET 2.



Witnesses:

Alex. Leach
C. R. Burman

Fig. 2.

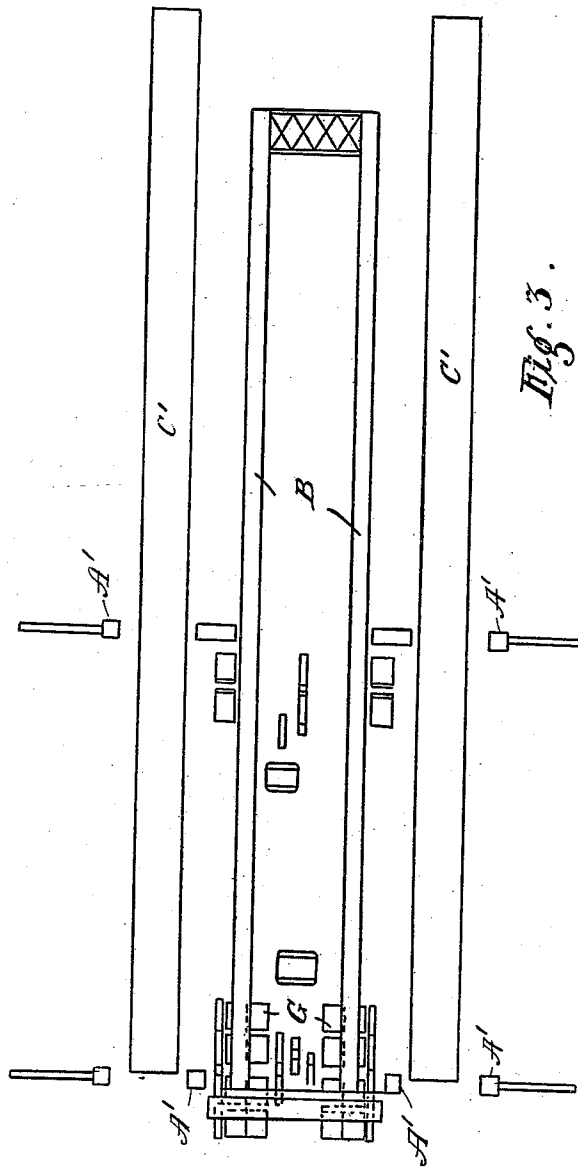
Inventor:

George C. Chadwick
by Harold Terrell
his atty.

G. C. CHADWICK.
APPARATUS FOR UNLOADING VESSELS.
APPLICATION FILED OCT. 2, 1909.

1,064,443.

Patented June 10, 1913.
6 SHEETS—SHEET 3.



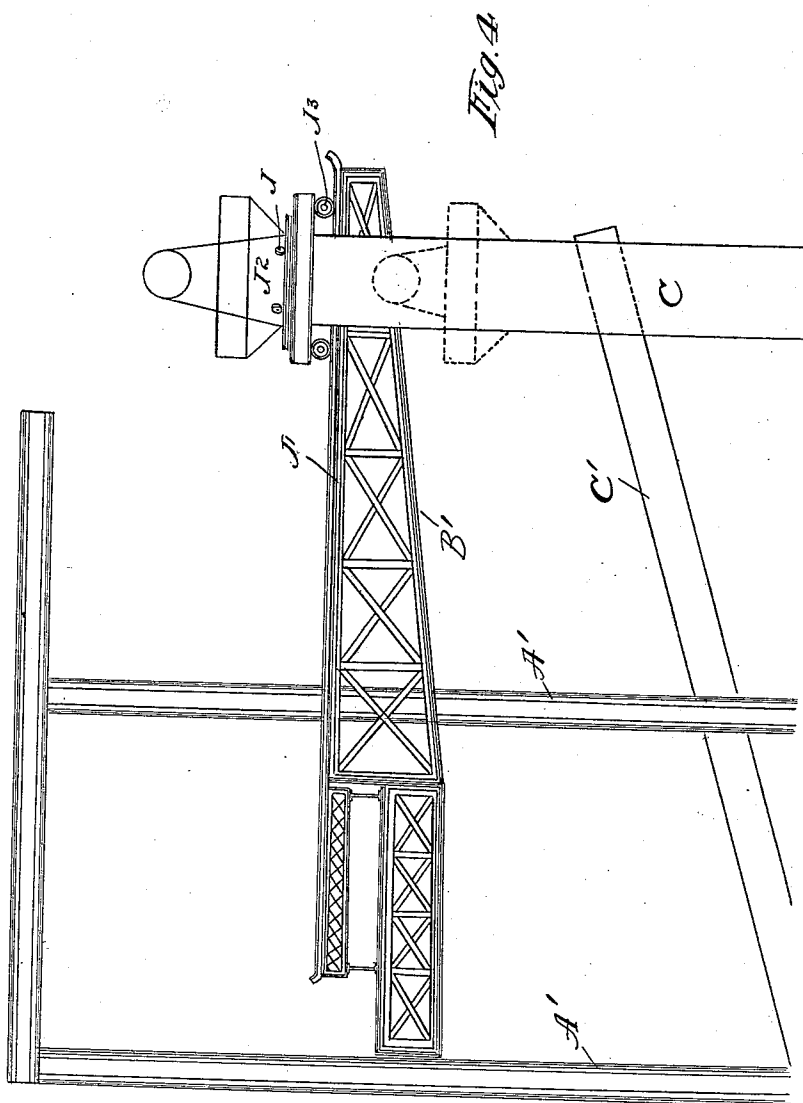
Witnesses
Chas. H. Smith
A. H. Serrell

Inventor
George C. Chadwick
by Harold Serrell
his Atty.

1,064,443.

G. C. CHADWICK.
APPARATUS FOR UNLOADING VESSELS.
APPLICATION FILED OCT. 2, 1908.

Patented June 10, 1913.
6 SHEETS—SHEET 4.



Witnesses
Charles H. Smith
A. G. Serrell

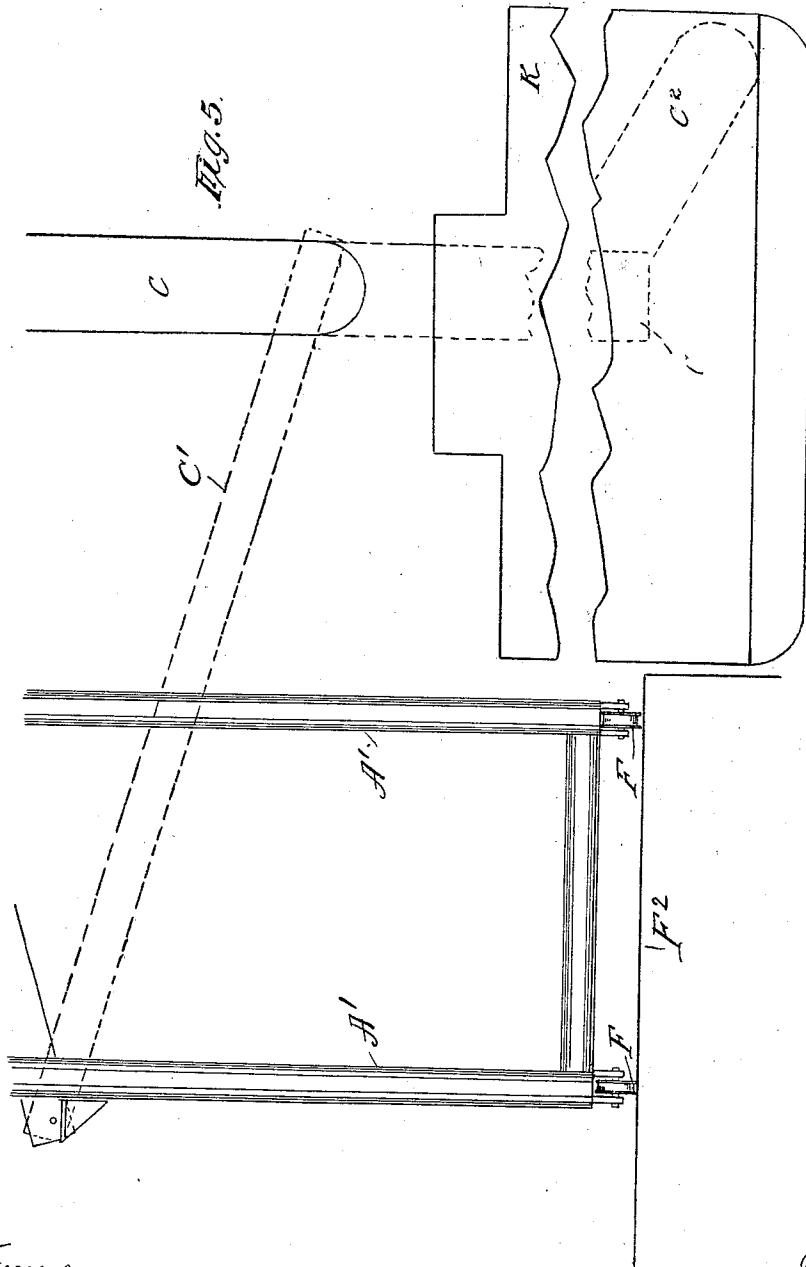
Inventor
George C. Chadwick
by Harold Serrell
his atty.

G. C. CHADWICK.
 APPARATUS FOR UNLOADING VESSELS.
 APPLICATION FILED OCT. 2, 1909.

1,064,443.

Patented June 10, 1913.

6 SHEETS—SHEET 5.



Witnesses

Chas. H. Smith
 A. H. Serrell

Inventor

George C. Chadwick

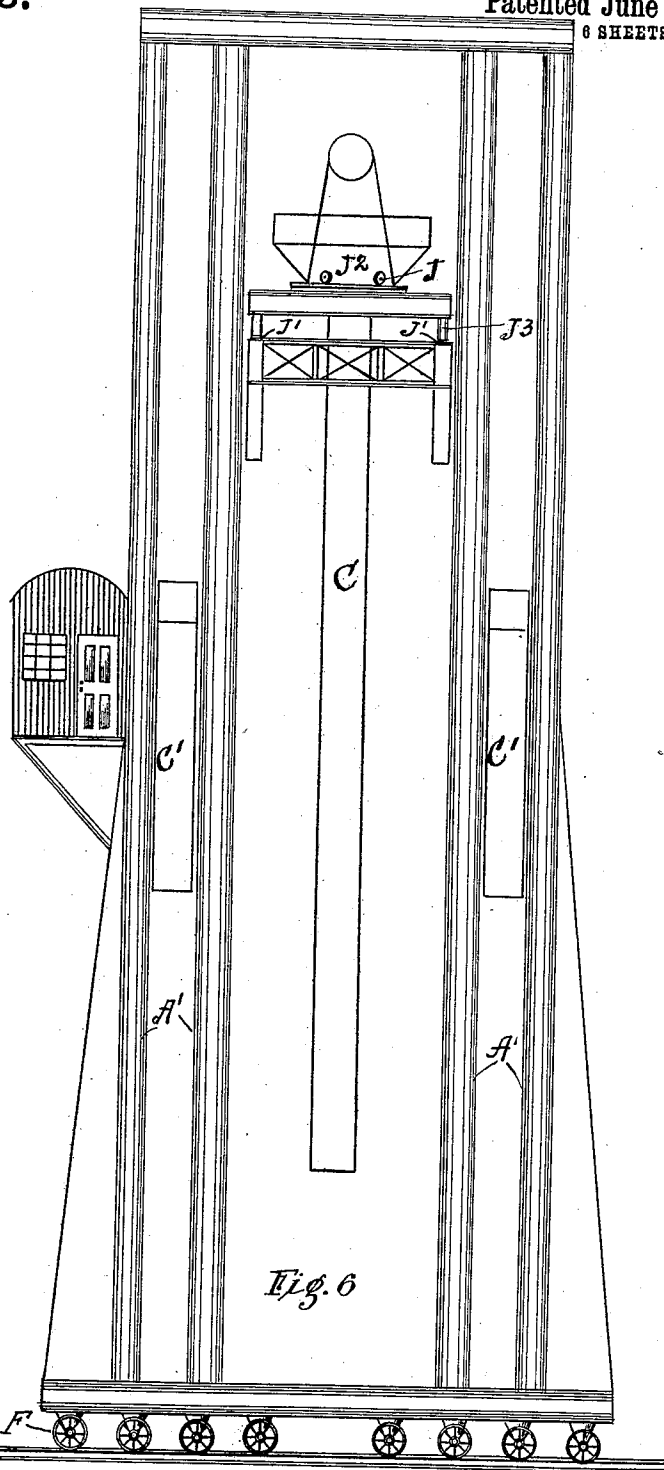
by Harold Serrell

his atty.

G. C. CHADWICK.
 APPARATUS FOR UNLOADING VESSELS.
 APPLICATION FILED OCT. 2, 1909.

1,064,443.

Patented June 10, 1913.
 6 SHEETS—SHEET 6.



Witnesses
 Charles Smith
A. B. Serrell

Inventor
 George C. Chadwick
 by Harold Serrell his atty.

UNITED STATES PATENT OFFICE.

GEORGE CHARLES CHADWICK, OF MELBOURNE, VICTORIA, AUSTRALIA.

APPARATUS FOR UNLOADING VESSELS.

1,064,443.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed October 2, 1909. Serial No. 520,636.

To all whom it may concern:

Be it known that I, GEORGE CHARLES CHADWICK, a subject of the King of Great Britain, residing at 414 Collins street, Melbourne, in the State of Victoria, Australia, have invented certain new and useful Improvements in Apparatus for Unloading Vessels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an apparatus for unloading coal or other similar materials from barges or other vessels, and the construction of the apparatus is such that it may be operated without manually handling the materials. The apparatus furthermore is so constructed that when not in use, the portions overhanging the wharf may be readily stowed to occupy little space so that there will be no projecting parts to interfere with vessels coming close to the wharf.

In the drawing, Figure 1 is a side elevation of my improved elevator apparatus. Fig. 2 is a rear elevation of my improved elevator apparatus. Fig. 3 is a diagrammatic plan view of my improved elevator apparatus. Fig. 4 is a diagrammatic elevation of the tower, boom and elevator, showing the boom and elevator in their uppermost position. Fig. 5 is a diagrammatic elevation of the lower portion of the apparatus showing the elevator extending into a barge or other vessel, and Fig. 6 is a diagrammatic rear elevation of the entire apparatus.

In these drawings, the parts comprise a staunch tower or upright framework A constructed of stanchions or columns A' suitably braced and in which are suspended a boom B carrying an elevator C and conveyers or chutes C' for receiving material from the elevator C and carrying it to discharge chutes whence it may go wherever directed. At the top of the tower there are mounted a number of pulleys E. The whole tower is built on a base which is mounted on wheels F and can be moved as required along rails F' arranged on the wharf F², by means of an electric motor G.

The boom B is constructed mainly of two staunch girders and is suspended by ropes or chains H passing over certain of the pulleys E at the top of the framework A. Preferably four ropes H are employed for

this purpose, two being secured to the front portion and two to the rear of the boom B. These ropes after passing over the pulleys are connected at their other ends to drums or windlasses H' operated by any suitable means. When in its working position, one end of the boom B projects from the front of the framework A, and the other end, within the framework A, is preferably rounded off, or provided with rollers 17 which move in suitable guides 17' provided on the columns for this purpose, and counterweights H² may be employed with the ropes H to lessen the power required to operate the boom.

The elevator C is constructed with its lower portion C² at an angle (see Fig. 5) or hinged to the upright portion thereof, so that the former may be moved to different angles by any suitable means.

The elevator C is suspended vertically from a turntable J mounted on wheels J³ running on rails J' secured on the boom B. The turntable J consists of two parts, the upper part J², carrying the elevator, having wheels J⁴ turning on a circular track J⁵ on the lower part, the lower part being that which is mounted on the wheels J³. The turntable J is preferably operated by an electric motor mounted on the same, and designated by reference numeral 14.

The conveyer frames or chutes C' are pivoted at one end at the rear of the main framework A, and their other ends project from the front of the frame. They are sufficiently long to be placed in a position to receive materials from the elevator C and there is one of these chutes at either side of the boom B. They may be moved in a vertical plane by ropes 10, each secured at one of its ends to one of the chutes and passing over pulleys 11 at the top of the framework A, and at their other ends connected to suitably operated drums or windlasses.

The elevator C consists of an endless chain 12, carrying buckets 13, which are operated within the elevator frame work by any suitable mechanism.

In the operation of the apparatus for unloading coal, the boom B is lowered to lower the elevator C through the hatch of a vessel or barge K to be emptied (see Fig. 5) and the buckets dig into the coal and raise it, the offset or pivoted portion C² of the elevator C enabling the parts of the vessel to

be reached which could not be reached by a straight elevator. The elevator C has a discharge opening or openings near its top and delivers the material to a director-plate 5 15 surrounding the elevator, which when the apparatus is in operation, receives the material in whatever position the discharge opening or openings 16 happen to be, and directs the same to one or both of the conveyers or chutes C'. The conveyers or chutes C' carry the coal and deliver it to other chutes and bins or to such other conveyers as may be required.

As coal or other material is removed from 15 the vessel, the boom B is lowered by the operation of the apparatus operating the ropes H suspending the same, and in this manner the elevator C may be further lowered into the hold K, and at the same 20 time the chutes C' may be correspondingly lowered.

The boom B', as illustrated in Fig. 4, is similar in all respects to that shown in Fig. 1, with the exception of being provided with 25 a recessed portion which enables the tracks J' to register with the tracks M.

Near the top of the framework A two girders L are fixed, on which rails M are arranged to the same gage as those on the boom B. The boom is cut away at its rear 30 portion and its line of rails is of such a length that when the boom is brought to its highest position by the ropes H, the rails J' on the boom will come into line with 35 those indicated by M fixed on the main framework A. The turntable J carrying the elevator C may be now run onto these rails, thus transferring the weight of the elevator C from the boom B to the framework A. 40 The elevator C is thus brought within the tower when the apparatus is not in use, and the front of the boom B is then lowered by the respective ropes H. The outer ends of the conveyers or chutes C' may be also 45 raised by their ropes, so as to bring them practically within the framework A, thus guarding against excess pressure of wind and storm, by reducing the strain on the framework of the heavy projecting parts 50 such as the boom B, elevator C and conveyers or chutes C' to a minimum, and also preventing such parts from forming obstructions to shipping or other operations.

I claim as my invention:

55 1. An elevator apparatus for coal and similar materials, comprising a tower, a boom vertically movable in said tower, a

conveyer horizontally movable on said boom and a chute also movable in said tower and pivotally connected at one end so as to be 60 placed and supported in an inclined position for conveying away the material raised by the elevator.

2. An elevator apparatus for coal and similar materials comprising a tower, a 65 boom, means for supporting and vertically moving the said boom in the tower, a conveyer horizontally movable on said boom, and a chute pivotally mounted at one end and movable in said tower, so as to be ar- 70 ranged in conjunction with the conveyer for carrying away the material raised by the conveyer.

3. An elevator apparatus for coal and similar materials, comprising a tower, a 75 boom, means for supporting and vertically moving the said boom in the tower, a conveyer horizontally movable on said boom, chutes, and means for moving the said chutes to properly place the same in posi- 80 tion to carry away the materials raised by the elevator.

4. An elevator apparatus for coal and similar materials comprising a tower, a boom, means for supporting and vertically 85 moving the said boom in the tower, a turntable mounted on the said boom so as to be horizontally movable thereon, a conveyer secured to the said turntable, chutes, and means for moving the said chutes to prop- 90 erly place the same in position to carry away the materials raised by the elevator.

5. An elevator apparatus for coal and similar materials comprising a tower, a boom, means for supporting and vertically 95 moving the said boom in the tower, a turntable mounted on the said boom so as to be horizontally movable thereon, a conveyer secured to the said turntable, chutes, means for moving the same to properly place the 100 same in position to carry away the materials raised by the elevator, and means fixed in the tower for receiving the turntable and conveyer, when not in use, and then directly supporting the same, the said means being 105 so arranged that the turntable and conveyer may run directly thereon from the boom.

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

GEORGE CHARLES CHADWICK.

Witnesses:

A. O. SACHSE,
ALICE HARKER.