

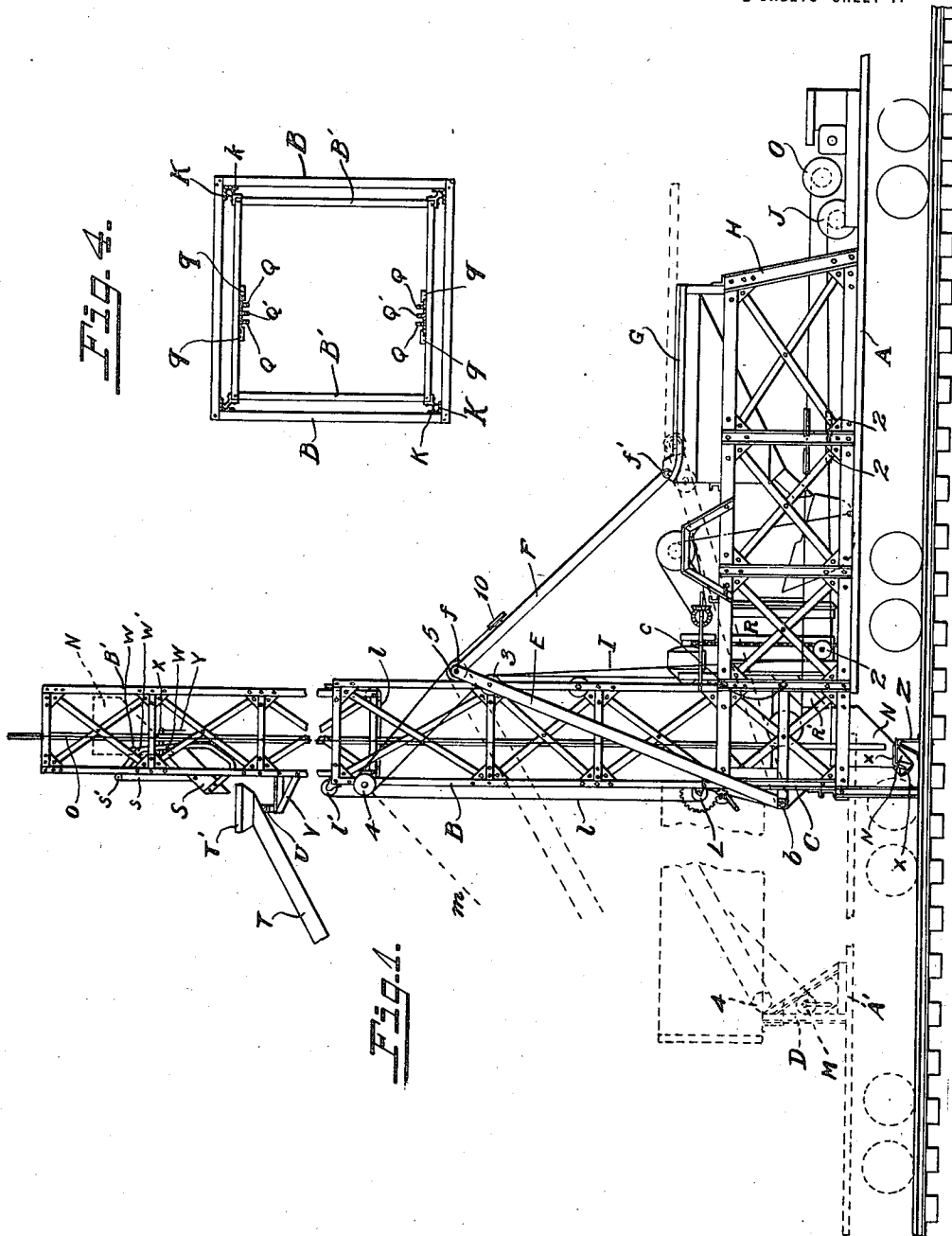
C. W. LEVALLEY, D. FRASER & S. SHAFER, JR.
ELEVATING AND HOISTING APPARATUS.

APPLICATION FILED JULY 9, 1914.

1,281,179.

Patented Oct. 8, 1918.

2 SHEETS—SHEET 1.



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Fig. 3.

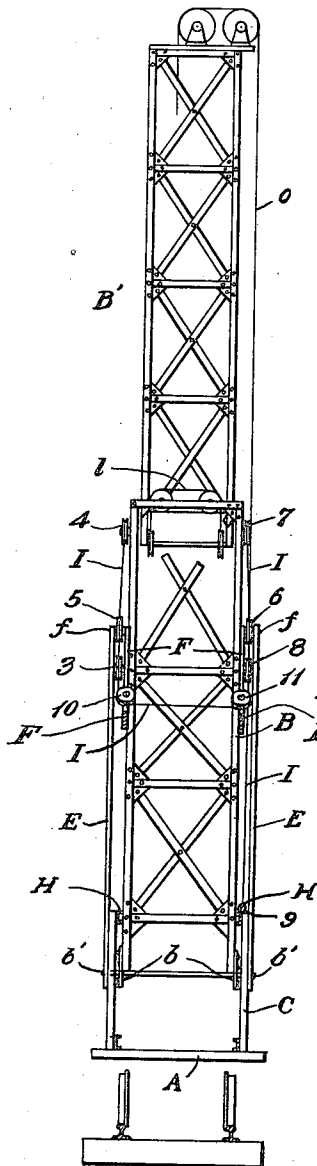


Fig. 2.

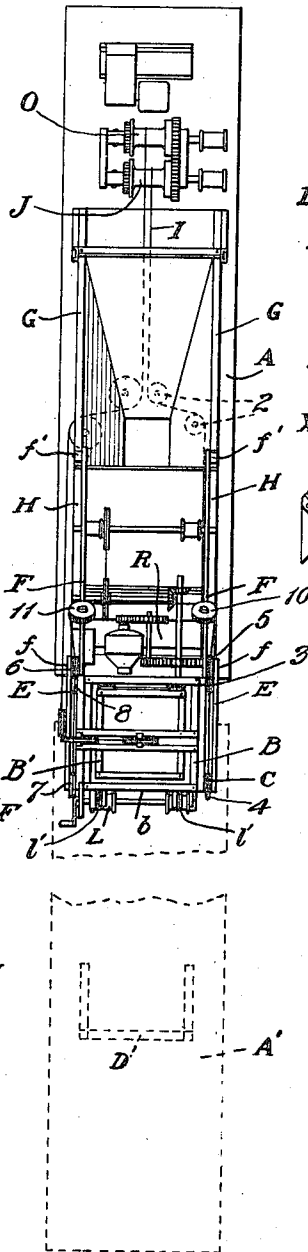
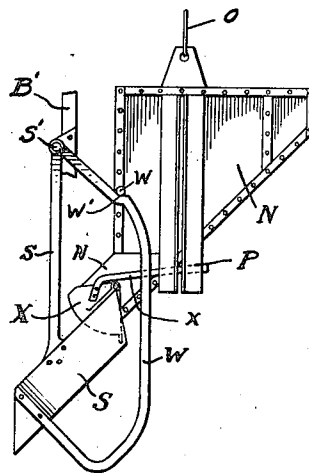


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELEVATING AND HOISTING APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHRISTOPHER W. LEVALLEY, DONALD FRASER, and SAMUEL SHAFER, Jr., citizens of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Elevating and Hoisting Apparatus, of which the following is a specification.

Our invention relates to elevating and hoisting apparatus and has been devised with especial reference to being used for elevating mixed concrete and delivering it at a considerable height, so that it may be employed in the rapid and economical construction of retaining walls, although, as will be understood, the invention is not limited, in its useful applications, to an elevating apparatus of this particular kind.

In the accompany drawings,—

Figure 1 is a side elevation of an apparatus embodying our invention;

Fig. 2 is a plan view of the same;

Fig. 3 is a transverse sectional view of the apparatus showing the tower in elevation;

Fig. 4 is a horizontal sectional view taken through the two sections of a telescoping tower.

Fig. 5 is a side elevation illustrating the relationship between the discharge chute and the elevator bucket, and the means for automatically controlling the delivery of the material discharged from the latter.

The apparatus illustrated is usually supported upon a movable truck, as for instance, a platform railway car A, upon which, preferably near one end, is supported a folding tower B, which is preferably of hollow skeleton construction, and, when of great height, is formed of telescoping sections. The tower is pivoted, at *b*, to a base frame C secured to the car, and on this pivot it turns when being moved from the reclining position occupied when in transit and indicated by dotted lines, to the upright working position shown in full lines, and vice versa. When a very tall tower is employed it is usual to provide a second car A' which may be coupled to the car A, and carries cradles or supports D on which the tower rests when let down.

In order to provide for raising and lowering the tower, we employ gin poles or jack towers E, preferably one on each side

of the tower B, in which are supported pulleys over which pass the cable or cables by which the movements of the tower are controlled. Each gin pole is adapted to be folded down out of the way when not in use, and is hinged at its lower end, preferably upon the same axis or hinge *b*, as that employed for the tower B.

Brace pieces F are pivotally connected with the upper ends of the gin poles at *f*, and extend rearwardly and downwardly therefrom. They are adapted to be securely fastened to stationary framework, as at *f'*, when the gin poles are raised into working position. The lower ends of the braces F are supported upon and guided by tracks G on the top of the framework H as the braces are moved in letting down or raising the gin poles. The positions of the gin poles and braces when elevated and secured in working position, are illustrated in full lines in Fig. 1, and those occupied by them when let down are indicated by dotted lines.

I designate the cable by means of which the movements of the tower are controlled. It extends from a suitably driven winding drum J over guide pulleys 2, 2, in the framework H, thence to a pulley 3 supported by one of the gin poles near its upper end, thence to and around a pulley 4 on the tower, and back to a pulley 5 at the end of the gin pole carrying the pulley 3, thence to and around a pulley 10 on that brace piece F which is connected with the said gin pole, thence across to the opposite brace piece and around a pulley 11 supported thereby, thence to a pulley 6 on the end of the gin pole to which the last mentioned brace piece is connected, thence to a pulley 7 on the side of the tower across from the pulley 4, and back to a pulley 8 on the gin pole on that side of the apparatus, whence it extends to some suitable point on the stationary frame where it is secured, as at 9. By this arrangement the raising and lowering of the tower is controlled by means of a single cable; but of course the cable arrangement described and illustrated might be varied from that shown and two cables employed instead of one though the arrangement shown is preferred.

The tower illustrated consists of two sections, the main lower section B, and an upper section B'. The section B is preferably

of skeleton construction and rectangular in cross section, and into it the upper section B' telescopes. In order to guide and brace the upper section B' it is provided at its corners with rubbing pieces *k* that are adapted to engage with angular guides K carried by the main, lower section B. The movable section of the tower is raised by means of a cable or cables *l* that pass to a drum L that may be either hand-operated or power controlled, as found most desirable. These cables are secured to the movable section of the tower near its lower end, and pass, in their course to the drum, over pulleys *l'* supported near the upper end of the lower tower section B.

When the tower B is only of moderate height a single section will be sufficient, but when the height is forty feet or more, it is found desirable to employ a plurality of sections and arrange them telescopically as described.

When the tower is moved into upright position and is ready for work, it is rigidly secured to the supporting base C by bolts, or otherwise, as indicated at *c*.

A rope or cable *m* extending from the tower to a winding drum M, suitably located, may be employed for starting the tilting of the tower when it is desired to lower the same. After the tower has been tilted or swung sufficiently far to cause it to fall under the influence of gravity, its movements are controlled by the cable *l*.

N represents a hoisting bucket for conveying material, arranged to travel up and down within the tower. In its general features it may be of any usual or preferred construction, and its movements are controlled by a cable *o* leading to a hoisting engine O.

The bucket is provided on its sides, with guide pieces P, preferably two on each side, spaced apart as indicated in Fig. 5. These guide pieces engage with guide rails carried by the tower. When the tower is formed of two sections telescoping one into the other, as has been described, we prefer the arrangement of guide rails which will now be described. Q', Q', are T-shaped rails secured fast to the upper movable section B' of the tower. At the sides of these rails, and parallel therewith, are other guide rails Q, Q, that, at their lower ends, are secured fast, in any suitable manner, to the lower portion B of the tower, and have their upper free portions held in place and guided by clips *q* secured to the section B' of the tower. This arrangement permits the sections of the tower to be moved with reference to each other, and yet maintains continuous guides for the bucket whether the tower be extended to its full capacity or the sections be more or less telescoped together.

The tower and elevating devices described

have been devised with especial reference to being used in connection with a concrete mixing machine, which is designated R. This may be of any usual or preferred type and need not be further described. It delivers its product to the bucket through a chute R'.

S designates a chute supported in the upper portion of the tower into which the contents of the bucket may be discharged. It in turn delivers to a conduit or conveyer by which the concrete or other material is carried to the desired place of delivery. As shown, it consists of a spout T provided with a receiving hopper T' into which the chute S discharges. The end of the conveyer carrying the hopper T' is mounted upon a pivoted support U that permits the spout to be turned so that its range of delivery may be over a wide area. The support U is mounted in a bracket V carried by the tower.

The chute S is pivotally supported so as to be automatically moved out of the way of the bucket as it travels up and down the tower.

We prefer that it should be suspended by links *s* pivoted to the tower at *s'*.

W designates a cam bar secured to the chute S and arranged to be engaged by a contact pin or projection *w* carried by the bucket. The shape of the bar W is such that as the bucket approaches the chute, when moving in either direction, the pin engages therewith and forces it and the chute to one side, sufficiently far to permit the bucket to pass the chute without engaging therewith. As soon as the bucket has passed and the pin *w* disengages the bar W, the chute comes back to normal position by gravity.

The cam is provided with a seat *w'* in which the pin *w* rests when the parts are in proper position for the bucket to discharge into the chute S. When the pin rests in this seat the chute is held with sufficient firmness to prevent it from swinging or moving away from the bucket when the charge of the latter passes to the chute. The shape of the seat is such, however, that when the bucket starts to descend, the pin *w* passes out of the seat and forces the cam bar to one side, moving the chute to let the bucket pass.

The bucket is preferably formed with a spout *n*, and this is closed by a pivoted gate X. *x* indicates an arm connected with the gate and by means of which its movements may be controlled. *y* represents a cord that may be secured to the arm and serves as the means by which the gate may be opened to discharge the bucket into the chute S, by an attendant stationed adjacent to the mixing machine R. Z represents a stop or contact device with which the arm *x*

is adapted to engage as the bucket reaches the lower end of its travel, and is in position to receive a charge from the machine R.

5 This stop operates to positively and forcibly close the gate, thus guarding against its being accidentally left open during the period the bucket is being filled.

10 The space below the framework H may be utilized for the location of storage bins in which may be placed the materials from which the concrete mixed in the machine is made.

What we claim is:—

1. The combination of a supporting base,
15 a tower pivoted thereto, a gin pole pivoted to the base, a brace pivotally connected with the gin pole near its upper end and adapted to have its lower end connected with the base to hold the gin pole in a fixed upright
20 position, a cable-connecting means between

the upper portion of the gin pole and the tower, and means for controlling the movements of the cable-connecting means, whereby the tower may be raised and lowered.

2. The combination of a tower pivoted 25 to a supporting base, a gin pole pivoted at its lower end, a brace pivotally connected to the upper end of the gin pole arranged to hold the latter rigidly in upright position, a track for guiding the free end of 30 the brace as the gin pole is being lowered, and flexible means for controlling the movements of the tower extending between it and the upper end of the gin pole.

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