

No. 854,890.

PATENTED MAY 28, 1907.

A. R. HOLMÉN.  
LOADING AND UNLOADING APPARATUS.

APPLICATION FILED JULY 16, 1906.

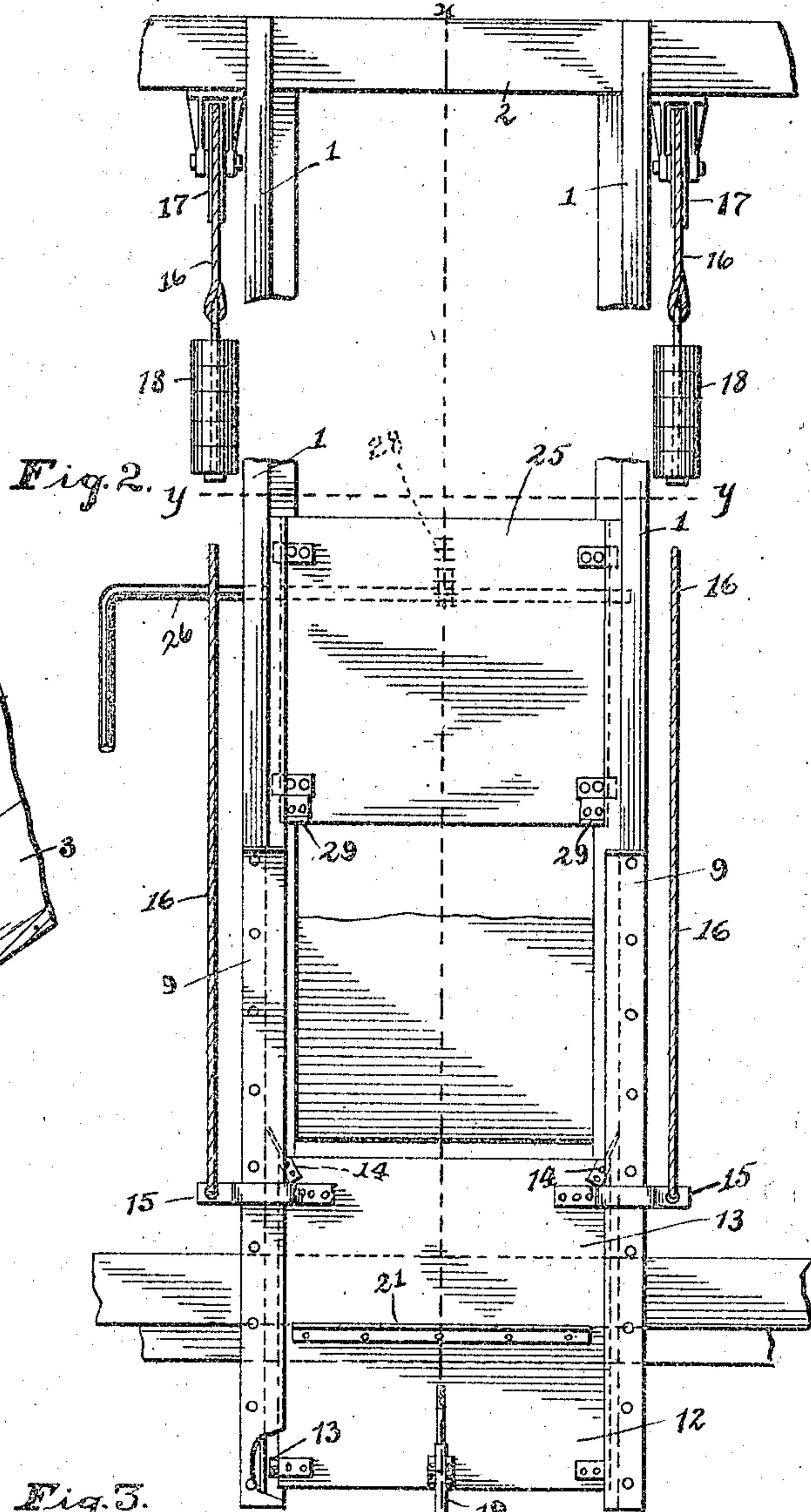
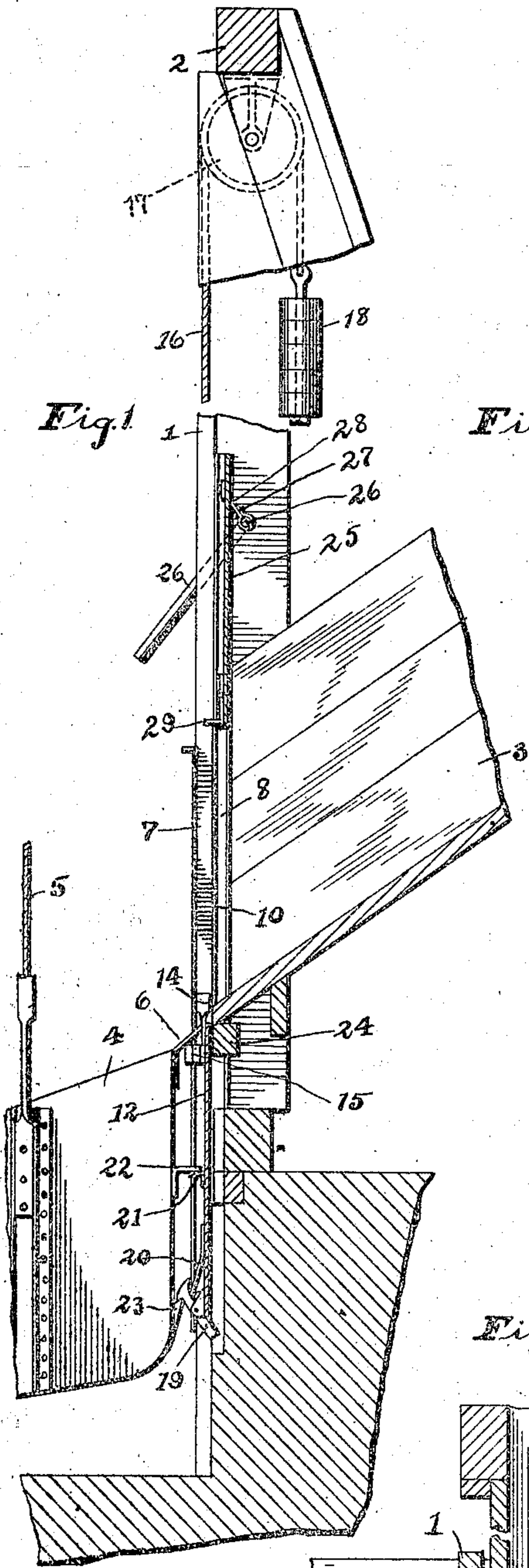
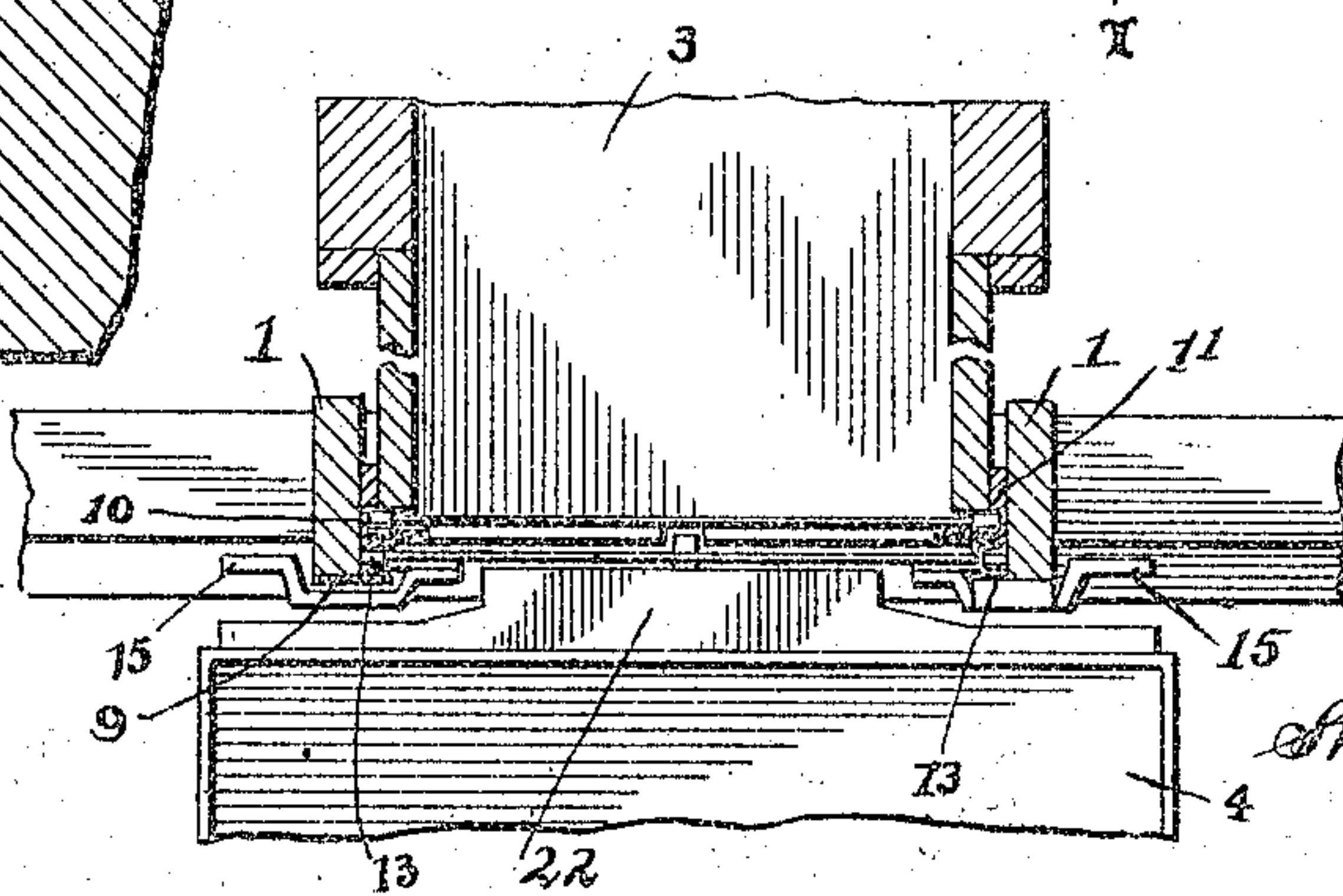


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## LOADING AND UNLOADING APPARATUS.

No. 854,890.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed July 18, 1906. Serial No. 326,347.

*To all whom it may concern:*

Be it known that I, AXEL R. HOLMÉN, a citizen of Sweden, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Loading and Unloading Apparatus, of which the following is a specification.

My invention has relation to an improvement in loading and unloading apparatuses, and particularly relates to improvements in the construction illustrated and described in my former patent No. 763,182, dated June 21st, 1904.

The object of my present invention is to provide a loading and unloading mechanism of the class referred to in said patent with means for automatically opening the coal chute when the bucket is descending to a filling position, and for closing said chute when the bucket is filled and is being elevated.

With the above and other objects in view, my invention consists of certain details of construction and operation which will be more clearly pointed out hereinafter.

These objects I accomplish in the manner illustrated in the accompanying drawings, in which:

Figure 1 is a central vertical sectional view of the shaft or hoisting apparatus taken on line *x x* of Fig. 2, Fig. 2 is a view in elevation of a portion of one of the hoisting shafts showing my improved gates or chute closing devices in connection therewith, and, Fig. 3 is a transverse section on line *y y* of Fig. 2.

Similar numerals refer to similar parts throughout the several views.

As in my said former construction, I employ a vertical shaft, of the elevator shaft type, comprising suitable vertical standards 1 and top cross frame pieces 2. Extending outwardly and upwardly from one face of the shaft is a coal chute 3.

4 represents a portion of one of the load carrying buckets which is disposed within the elevating shaft and movably supported by suitable cables 5. For the sake of clearness in illustration, this bucket is omitted from Fig. 2 of the drawing. The bucket 4 is designed to be lowered for the purpose of loading, to a point immediately beneath the outlet or lower end of the chute 3 and in order to insure a closure of the greater portion of the space between the bottom of the chute and the bucket, the latter is provided on its upper side with a projecting lip 6 which extends

toward said chute and which for the sake of clearness, is not shown in Fig. 3 of the drawing.

At the point where the chute 3 enters or connects with the shaft, the adjacent standards 1 are provided on their inner sides with oppositely located vertical guideways, there being two of these guideways in each of said standards and the same being indicated at 7 and 8. The guideway 7 is formed between the inwardly projecting portion of a plate 9 which is secured to the standard and the inwardly projecting member of an angle bar 10 which is secured to the inner face of said standard; while the guideway 8 is formed between said angle bar and a frame strip 11 which is also secured to the inner side of the standard.

12 represents a gate which is in the nature of a closure plate, said gate being provided at its upper and lower corners with projecting rotatable rollers 13 (see Figs. 2 and 3), which rollers are adapted to run in the opposing guideways 7. I also provide the upper corner portions of the gate 12 with outwardly and upwardly inclined guide fingers or bars 14 which extend into said grooves or guideways 7. The gate 12 has secured to its face and projecting laterally therefrom past the frame standards, bracket arms 15, with which are connected the lower ends of cables 16, the latter running over pulleys 17 having journaled supports from the upper frame cross bars 2. The ends of said cables are provided with suitable counterbalancing weights 18. Pivotaly mounted in lugs projecting from the lower and central portion of the gate 12 is the central portion of a catch bar 19 the outer and upper end of which is hook-shaped as indicated more clearly in Fig. 1 of the drawing. The hook end of the catch bar 19 is normally pressed outward by the free end of a spring strip 20, the remaining end of which is secured to the gate 12. The gate is also provided on its inner face with a transverse angle bar 21. On that face of the bucket 4 which is adjacent to the hereinbefore described standards 1, I provide a transverse angle bar 22. In Fig. 1 of the drawing, I have shown the load carrying bucket 4 supported beneath the mouth or outlet of the chute 3 in position to receive a load therefrom. In this position it will be observed that the projecting member of the bucket angle bar 22 is in contact with the upper face of the gate angle bar 21, while the



spring pressed hook end of the catch bar 19 is in engagement with an inclined lug 23 which projects from the lower portion of the bucket.

5 Assuming that the bucket has been filled with coal or other material from the chute 3, and that the mechanism for operating the bucket is put into operation, it will be seen that the elevation of the bucket will result  
10 through the engagement of the catch bar 19 and lug 23 in a corresponding elevation of the gate 12. When the gate has in this manner been raised until the outlet end of the chute 3 is closed thereby, the lower and outwardly  
15 extending end of the pivoted catch bar 19 will contact with a frame cross bar 24 which is arranged immediately beneath the outlet end of the chute, this contact resulting in  
20 disconnecting the catch bar from the lug 23 of the bucket and permitting the latter to continue its ascension independent of the gate which is held in its place by the counterbalances 18. The bucket having been dis-  
25 charged of its contents and being lowered again to receive another load from the chute, it will be understood that the projection 22 of the bucket will contact with the projection 21 of the gate 12 and force the latter down-  
30 ward until the catch bar 19 is again sprung into engagement with the lug 23.

In order to provide positive means for closing the discharge end of the chute in case of a failure in operation of the hereinbefore described gate, I provide a second or  
35 auxiliary gate of a similar character which is indicated at 25. This auxiliary gate as prescribed for the gate 12 is provided with laterally projecting rollers which are de-  
40 signed to run in the guideways 8. Extending on the outer side of the gate 25 is the horizontal portion of a crank shaft 26 which is journaled in the opposing frame standards  
1. This crank shaft carries thereon a fixed  
45 pawl or dog 27, the outer end of which is adapted to engage when said shaft is properly turned, one of a series of notches 28 which are  
formed one above the other in the outer face of the gate 25, this engagement resulting in  
50 said gate 25 being supported in an elevated position as shown in Figs. 1 and 2 above the main body of the chute. The gate 25 is pro-  
vided at its lower corners with lips 29 which project in the path of the lower gate 12, but  
55 which are out of the path of the bucket pro-  
jection 22 for the reason that the latter has its end portions cut away as indicated in Fig. 3.

60 In case of a failure of operation of the first described gate 12, it is obvious that the discharge end of the chute may be closed manu-  
ally by turning the crank shaft 26 until its pawl 27 is out of engagement with the gate

notches 28, thus permitting the upper gate to drop in front of the chute outlet. On the next upward movement of the lower gate, 65 however, it is obvious that the upper end of said lower gate will contact with the projections 29 of the upper gate and raise the latter to its normal or elevated position, in which position it may be retained by engagement 70 with the pawl of the crank shaft.

From the construction and operation shown and described, it will be observed that simple and substantial means are provided for the closing of the discharge end of the 75 loading chute when the bucket has been filled and for opening said chute when the bucket is assuming the filling position.

What I claim, is:

1. In a device of the character described, a 80 reciprocating gate adapted to open and close its outlet, dogs pivotally connected therewith, a reciprocating receptacle adapted to engage the dogs, and means to move the said dogs out of the path of said receptacle. 85

2. In a device of the character described, a reciprocating gate adapted to open and close its outlet, brackets on the gate, dogs pivotally secured to the said brackets, and a re- 90 ciprocating receptacle arranged to engage the said dogs.

3. The combination with a shaft having a loading chute leading therein, a vertically movable gate adapted to close the discharge end of said chute by being elevated in said 95 shaft frame, a second gate slidably mounted in the shaft frame and adapted when lowered to close the discharge end of said chute, and means for detachably supporting said upper gate in an elevated position, of a bucket mov- 100 ably supported in said shaft and adapted when elevated to carry said first mentioned gate to a closed position and when lowered to move the same to an open position.

4. In a device of the character described, 105 the combination with a supporting frame, of a vertically movable bucket, a chute the lower end of which is secured to said frame, a gate which when elevated closes the lower end of said chute, means carried by the 110 bucket for engaging the gate and depressing said gate to open the lower end of the chute as the bucket descends, pulleys mounted at the top of the frame, cables which pass over said pulleys and have one of their ends secured 115 to the gate, and counterbalancing weights which are secured to the other ends of said cables.

In testimony whereof I affix my signature in presence of two witnesses.

AXEL R. HOLMÉN.

Witnesses:

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CARL STOUGHTON.