

No. 875,283.

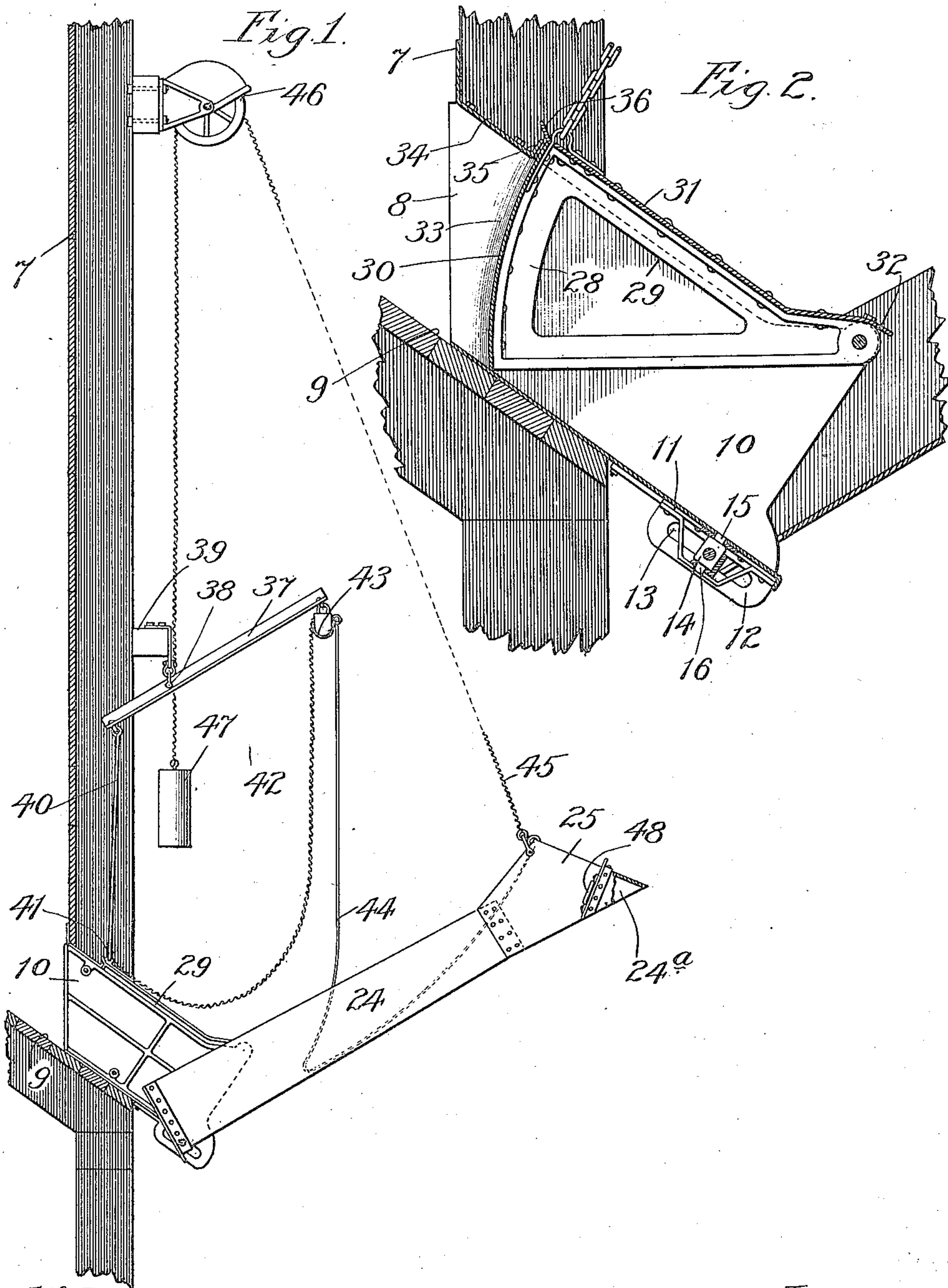
R. A. OGLE.

PATENTED DEC. 31, 1907.

CHUTE AND CONTROLLING MECHANISM THEREFOR FOR ELEVATORS,  
BINS, AND THE LIKE.

APPLICATION FILED AUG. 15, 1907.

2 SHEETS—SHEET 1.



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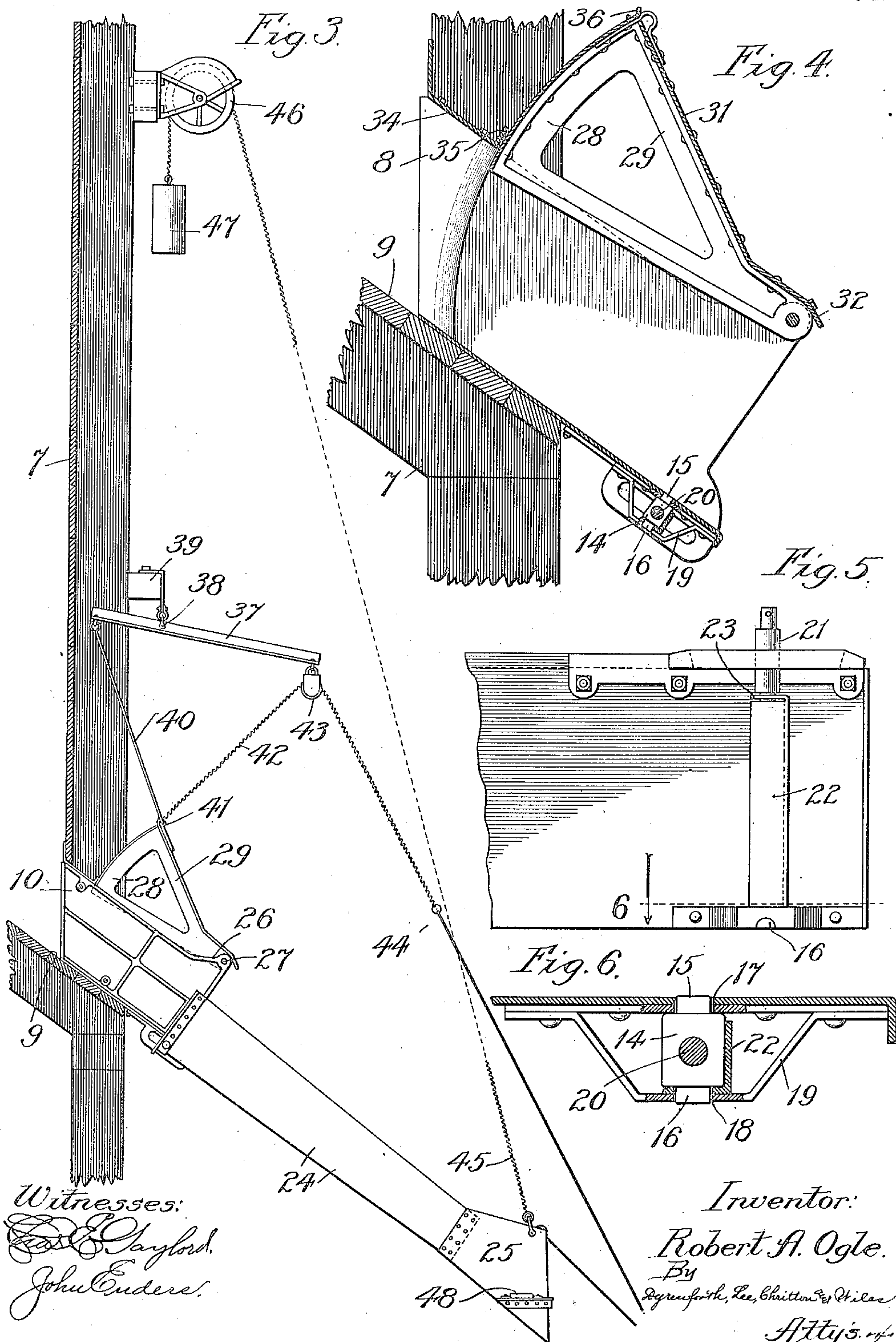
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ROBERT A. OGLE, OF CHICAGO, ILLINOIS.

CHUTE AND CONTROLLING MECHANISM THEREFOR FOR ELEVATORS, BINS, AND THE LIKE.

No. 875,283.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed August 15, 1907. Serial No. 388,601.

*To all whom it may concern:*

Be it known that I, ROBERT A. OGLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Chutes and Controlling Mechanism Therefor for Elevators, Bins, and the Like, of which the following is a specification.

My invention relates to improvements in chutes and controlling mechanism therefor, used in connection with elevators, bins, or the like, for directing and regulating the discharge from the bin or elevator, of its contents.

One of my objects is to provide improvements in the mechanism for controlling the discharge of the contents of the elevator or bin, to the end of rendering its operation less difficult, more reliable and more effective; and other objects are to provide other improvements in apparatus of this character to the end of better adapting the apparatus to its use and rendering the operation of it less difficult and less hazardous to the operator.

Referring to the accompanying drawings—Figure 1 shows by a view in side elevation my improved apparatus, with a bin with which it may be used shown in vertical section, the parts of the apparatus being shown in the positions they assume when the discharge-spout, or apron, is moved out of the discharging position and the gate for controlling the discharge of the bin-contents is closed. Fig. 2 is an enlarged broken sectional elevation taken longitudinally through the chute, gate and apron, with these parts in the relative positions shown in Fig. 1, the view showing the floor of the bin in section. Fig. 3 is a view like that illustrated in Fig. 1, with the parts of the apparatus in the positions they assume when the apron is turned to discharging position and the gate is raised for allowing the bin-contents to discharge through the apron. Fig. 4 is a view like that shown in Fig. 2, the section being taken through the chute and gate, with these parts in the relative positions shown in Fig. 3. Fig. 5 is a bottom plan view of one corner-portion of the chute, showing the apron-supporting shaft and its connection with the chute; and Fig. 6, a section taken at the line 6 on Fig. 5 and viewed in the direction of the arrow.

My invention is illustrated in the drawings

as applied to a bin for receiving coal to be discharged, when required, through a swinging apron into a coal car (not shown) or other receiver. The bin 7, of which but a small portion only is shown, has a discharge-opening 8 in one side thereof, through which the inclined bottom 9 of the bin extends. An inclined chute 10, open at its opposite ends, is fastened in the opening 8 and rests on the protruding bottom 9. Depending from opposite sides of a plate 11 fastened to the chute-bottom, are lugs 12 each having an elongated slot 13 extending longitudinally of the chute 10. A head or block 14 is journaled at its reduced opposite ends 15, 16, in a position intermediate the sides of the chute, in openings 17, 18 provided respectively, in the bottom plate of the chute and a truss-frame 19 fastened to its bottom plate. A shaft 20 extending transversely of the chute passes through this head and projects through and beyond the slots 13 in the lugs 12, the shaft being provided with a roller 21 on each end to engage the walls of these slots, and thus permit the shaft to be readily moved in the slots. The shaft is reinforced by means of a bar 22, preferably of angle-iron as shown, fastened between its ends to the block and having flanges 23 through which the shaft extends. A swinging chute-section, or apron, 24, open at its top, is pivoted near one end near its bottom, to the chute 10 on the ends of the shaft 20 beyond the rollers 21, thus enabling the apron to be swung up and down and oscillated sidewise, relative to the chute, to position the discharge-opening 24<sup>a</sup> in the hood 25, carried at the end of the apron, as desired.

The outer upper end-portions of the chute-sides are forwardly deflected, as represented at 26, and at their extremities is hinged, as represented at 27, a rearwardly-extending swinging overcut-gate 28, to be swung in and out of the chute. This gate is preferably of general triangular shape in longitudinal section, as represented, and comprises two side-members 29, 29; an end-plate 30 preferably of the curved shape illustrated, secured to the members 29, 29 and of a width approximating the width of the interior of the chute 10; and a top-plate 31 which projects beyond the side-members 29, 29 and end-plate 30 and serves to entirely close the open top of the chute when the gate is closed, this top-



plate extending over the hinge-connection 27, as indicated at 32, thus serving to prevent access of moisture to the bearings.

The chute 10 has flanges, or offset portions, 33, 33, on opposite sides of its inner wall, shaped to conform to the curved end-plate 30, for preventing the contents of the bin discharged through the chute from wedging between the edges of the end-plate and the chute-sides. The chute is closed at its top for a portion of its length by a plate 34 having an upturned flange 35 which serves as a gutter, and cooperating with this flange is a flange 36 on the top-plate 31, which, when the gate is closed, overlaps the flange 35 and prevents access of rain and moisture to the valve.

The mechanism for raising and lowering the gate on its hinge-connection comprises a lever 37, preferably fulcrumed at one side of its center, as indicated at 38, on a beam 39 fastened to the wall of the bin, a link 40 connecting the short end of this lever with the upper free end of the gate at an eye 41 thereon, a chain 42 passing over a pulley 43 on the long arm of the lever and fastened at one end to the eye 41 of the gate, and a cable 44, preferably of fiber rope, connected at one end to the free end of the chain 42, and preferably connected at its opposite end to the hood 25. The normal position of the gate is the closed one illustrated in Fig. 1, which it assumes by force of gravity, its weight causing it to turn downward on its hinge-connection.

The apron 24 is connected at its free end with one end of a chain or cable 45, which passes over a pulley 46 and carries on its other end a counter-weight 47 of any suitable construction, whereby the apron may be readily moved up and down at its free end and be caused to remain in any position of adjustment, a handle 48 being provided on the hood 25 for manipulating it.

Assuming the bin to contain coal, or other material, and the parts of the apparatus to be in the positions represented in Fig. 1, in which the apron 24 occupies the raised position and the gate 28 is closed, to discharge the bin-contents into the receiver, the apron 24 is manually drawn down at its free end, and swung laterally, if necessary, to properly position the discharge-opening 24<sup>a</sup> in the hood over the place at which it is desired to discharge a portion of the bin-contents.

The rope 44 is then manually drawn down by the operator with the result of depressing the longer arm of the lever 37 and raising its shorter arm, thereby swinging the gate upon its pivot 27 and retracting its end-plate 30 from the chute 10 and allowing the bin-contents to pass through the chute and apron. When the rope 44 is released the weight of the gate 28 causes its end-plate 30 to cut its way through the material in the chute and rest on the bottom of the chute and thus

stop the passage of the bin-contents into the apron. The weight of the portion of chain 42 between the pulley and the gate 28, when the latter is closed, being longer than the portion on the other side of the pulley, this chain will run over the pulley and lie along the top-plate 31 and in the chute, as represented in Fig. 1. Thus the rope 44 is drawn to a position where it will be out of the way and cannot afford obstruction.

By pivoting the gate to swing downwardly through the arc of a circle transversely through the chute, as described, the movement of the end-plate 30 tends toward the direction of movement of the bin-contents as they move through the chute, and thus the gate may be readily swung to close the chute. Furthermore, by pivoting the gate, as described, the operation of raising it for partially or fully opening the chute is rendered simple and the amount of discharge may be positively regulated.

Employment of the lever-mechanism illustrated and described permits the gate to be raised by a relatively slight amount of power, and without requiring the use of counter-weights, as the lever is of the compound type, requiring the exertion of but relatively little power on the long arm to raise the short arm and with it the gate. It is manifest that the portions of the lever on opposite sides of its fulcrum may be so proportioned in length as to make it practicable for one man to operate the gate readily, regardless of its size.

What I claim as new, and desire to secure by Letters Patent, is:

1. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, of a shaft pivoted to the chute and an apron connected to the shaft, whereby the apron may be raised and lowered and moved laterally relative to the chute.

2. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom provided with guides, of a shaft pivoted at the bottom of the chute and engaging said guides, and an apron connected with the shaft at opposite ends thereof, whereby the apron may be raised and lowered and moved laterally relative to the chute.

3. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, and containing elongated guide-openings, of a shaft pivoted at the bottom of the chute and extending through said guide-openings, and an apron connected with the shaft beyond said guides, whereby the apron may be raised and lowered and moved laterally relative to the chute.

4. The combination with an elevator, bin, or the like, having a discharge-opening and a



chute leading therefrom, of a block pivoted to the bottom of the chute, a shaft extending through the block and an apron connected with the shaft near its opposite ends, for the purpose set forth.

5 5. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom containing guide-openings, of a shaft pivoted at the bottom of the chute and extending through the guide-openings, rollers on the shaft adjacent to the guide-openings, and an apron connected with the shaft beyond said guide-openings, for the purpose set forth.

15 6. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, of a block pivoted to the bottom of the chute, a bar secured to the block and extending beyond it at its opposite sides and provided with flanges containing openings, a shaft extending through the block and openings in the flanges, and an apron connected with the shaft beyond said flanges.

25 7. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, of a truss-frame secured to the under side of the chute-bottom, a block pivoted in the chute-bottom and truss-frame, a shaft extending through the block, and an apron connected with the shaft near its opposite ends.

35 8. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, provided on its opposite sides with elongated guide-openings, of a truss-frame, a block pivoted in the bottom of the chute and truss-frame, an angle-iron bar secured to the block and extending beyond it at its opposite sides and provided with flanges containing openings, a shaft extending through the block and openings in the flanges, rollers on the shaft adjacent to the elongated guides, and an apron connected with the shaft beyond said guide-openings.

45 9. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, of means for controlling the passage of the bin-contents through the chute, comprising an overcut-gate pivoted to the chute and composed of side-members, an end-plate and a top-plate

projecting over the pivotal connection and forming a shield for the bearings, for the purpose set forth.

10. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom provided with transverse offsets on its inner surface, of means for controlling the passage of the bin-contents through the chute, comprising a gate movable transversely of the chute and cooperating with said offsets, for the purpose set forth.

11. The combination with an elevator, bin, or the like, having a discharge-opening and valve-mechanism for controlling the discharge of the bin-contents from the bin, of means for actuating the valve-mechanism, comprising a lever fulcrumed between its ends, means connecting one end of the lever to the valve-mechanism, and a flexible hauling-medium connected at one end to the valve-mechanism and slidably engaging the opposite end of the lever, for the purpose set forth.

12. The combination with an elevator, bin, or the like, having a discharge-opening and valve-mechanism for controlling the passage of the bin-contents from the bin, of means for actuating the valve-mechanism, comprising a lever fulcrumed between its ends above the valve-mechanism, a link connecting one end of the lever to the valve-mechanism, a flexible hauling-medium connected at one end to the valve-mechanism adjacent to the point of connection of said link with the valve-mechanism and slidably engaging the opposite end of the lever, for the purpose set forth.

13. The combination with an elevator, bin, or the like, having a discharge-opening and a chute leading therefrom, having a portion of its top covered by a plate, of a flange extending along the outer edge of the plate, and a gate for controlling the passage of the bin-contents through the chute, having an end-plate movable past said flange and a top-plate projecting beyond and cooperating with said flange, for the purpose set forth.

ROBERT A. OGLE.

In presence of:

RALPH SCHAEFER,  
W. T. JONES.