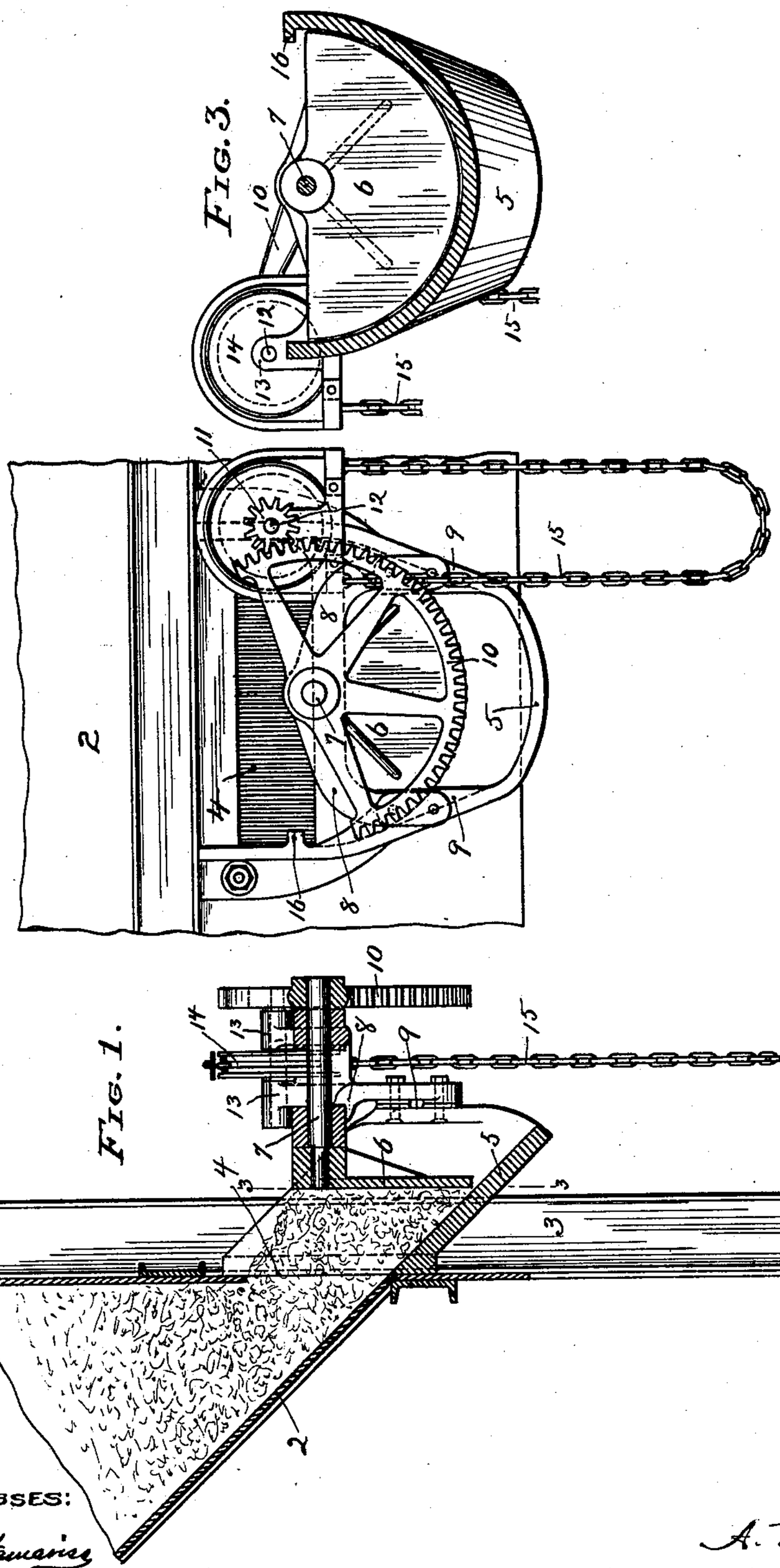
No. 685,153. Patented Oct. 22, 1901.

A. M. LEVIN.

ORE GATE.

(Application filed Feb. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.



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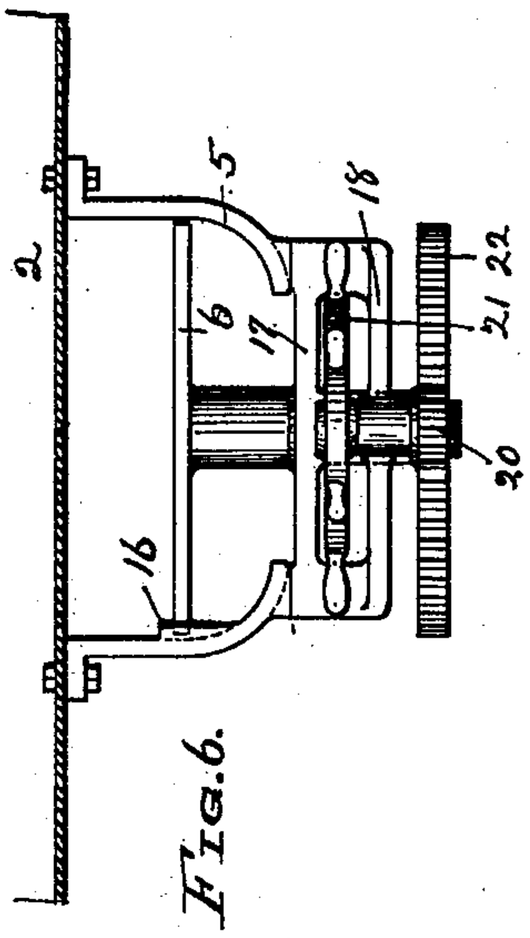

FIG. 6.

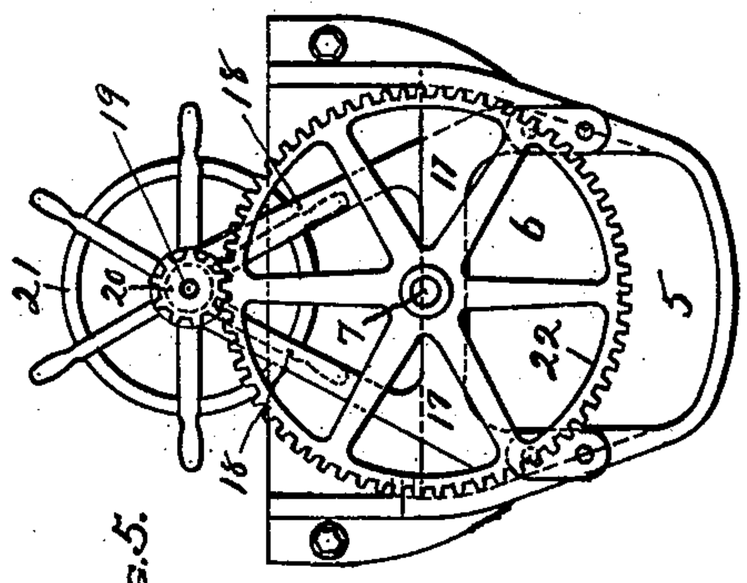

FIG. 5.

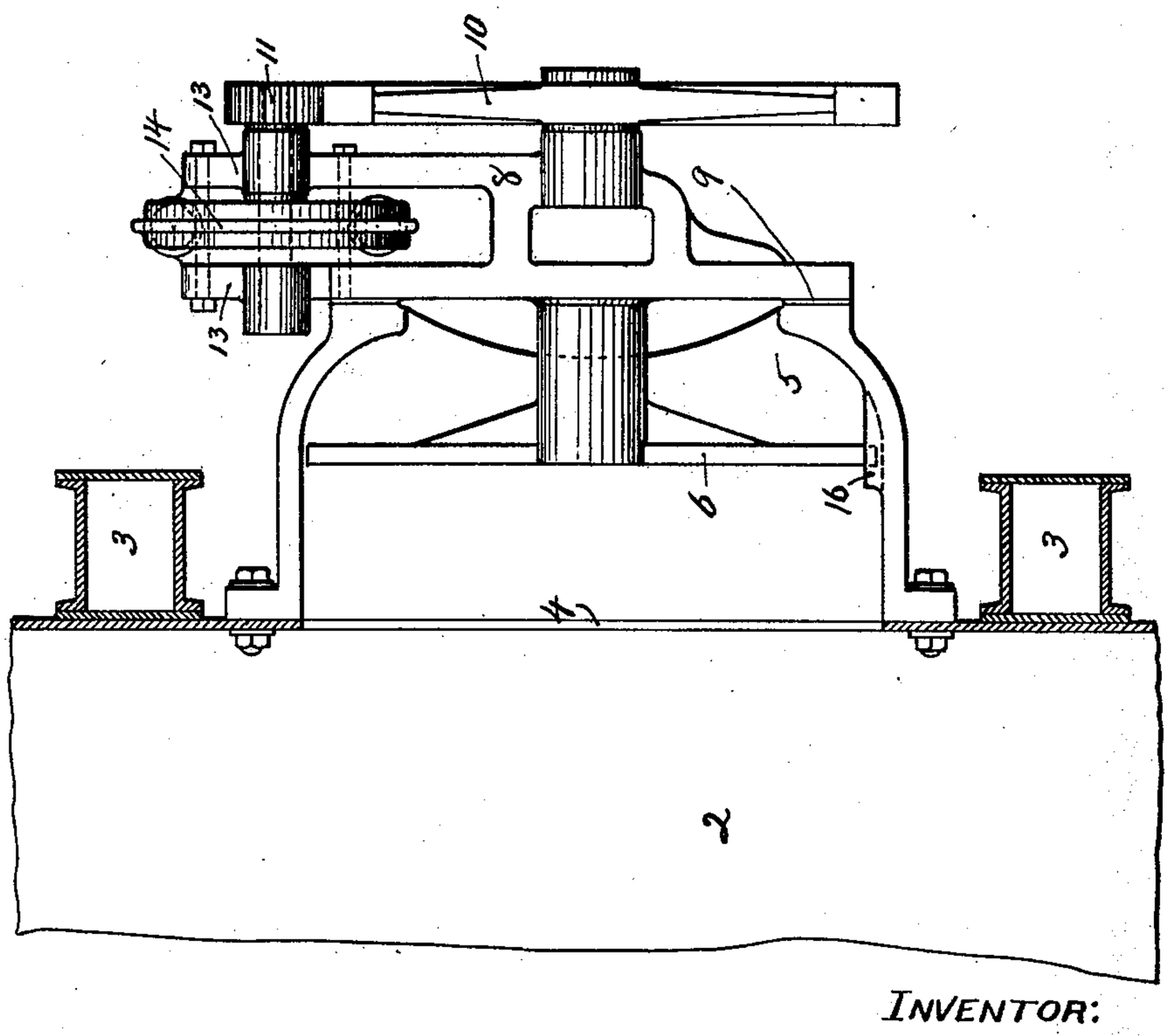

FIG. 4.

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UNITED STATES PATENT OFFICE.

ARVID M. LEVIN, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO THE BROWN HOISTING MACHINERY COMPANY, A CORPORATION OF DELAWARE.

ORE-GATE.

SPECIFICATION forming part of Letters Patent No. 685,153, dated October 22, 1901.

Application filed February 11, 1901. Serial No. 46,814. (No model.)

To all whom it may concern:

Be it known that I, ARVID M. LEVIN, a subject of the King of Sweden and Norway, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Ore-Gates, of which the following is a specification.

Ore-gates now in general use are arranged to slide either vertically or horizontally across the discharge. One objection to this form of gate is that it cannot always be fully closed at the instant desired, for a boulder or other obstruction in the ore may stop its progress by becoming lodged between the extremity of the gate and the wall of the chute and which must be allowed to pass down or be forced back before the gate can be closed, in the meantime permitting ore to pass down over or around the obstruction in excess of the quantity desired; also, the operation of sliding gates is sluggish and laborious, owing to the resistance of the ore which bears against the gate. To obviate these objections and to provide a gate of simple and effective construction and easy of operation is the object of the present invention.

The invention consists in the novel structural features and combination and arrangement of parts hereinafter fully described and claimed, and illustrated by the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of an ore gate and chute constructed in accordance with my improvements. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical cross-sectional view taken on line 3 3 of Fig. 1. Fig. 4 is a plan view. Fig. 5 is a front elevation, and Fig. 6 a plan view illustrating actuating mechanism of modified form.

Referring to the drawings, 2 represents a bin, only a portion of which is shown, and 3 represents supporting-posts. Secured to the exterior of the bin around discharge-opening 4 is a chute or spout 5, the bottom of which is semicircular in cross-section, as shown.

Rotatably mounted within the chute and in concentric relation to the semicircular bottom thereof is the segmental or semicircular gate 6, which is here shown secured to the inner end of shaft 7. This shaft has a bearing in bracket 8, which is secured to the faced extremities 9 of the chute sides. On the outer extremity of shaft 7 is the segmental gear 10, and meshing therewith is pinion 11 on short shaft 12, the latter being journaled at one side of shaft 7 in forked extremity 13 of bracket 8. On shaft 12 is pulley or chain-wheel 14, carrying the endless hand-operating chain 15, which depends within easy reach of the floor or ground. A stop 16 projects from an upper edge of the chute into the path of gate 6, and thus limits its movement either in opening or closing. If desired, a full circular gear may be substituted for segmental gear 10.

Instead of operating the gate from the floor it may be so arranged as to be operated by a man positioned on the chute, such a construction being shown in Figs. 4 and 5, wherein a bracket 17 is employed, secured in the same manner as bracket 8, and rising therefrom is a stand 18, supporting a short shaft 19, this shaft having at one end a pinion 20 and at the other end tiller-wheel 21. In this arrangement gate-shaft 7 is provided with a full gear-wheel 22, with which pinion 20 meshes.

In addition to those features of the operation which will instantly occur to those skilled in the art it may be stated that after the gate has been opened and a sufficient quantity of ore discharged the gate in its closing movement advances through the ore with a cutting action and in such manner as to easily and effectively check and stop the flow of ore. The upper edge of the gate being straight and this being the edge that advances through the ore when closing, any boulders or other obstructions which it encounters are forced either downward or upward in the chute or are lifted bodily with the gate by the straight edge thereof, falling either in front of or behind the gate, as the case may be; but under no circumstances is it possible for an obstruction to stop the movement of the gate and permit more ore to pass than is wanted, as is the case with sliding gates. It will be observed that the gate is shown positioned outward a short distance from the bin and also with a space intervening between the same and the actuating mechanism, this arrangement affording ample room for the elevation

of boulders and for their fall in either direction without clogging the gate or interfering in any way with its operation.

Obviously many different forms of operating mechanism may be employed without affecting the spirit or scope of the invention, and while in its preferred form the invention is embodied in a curved gate arranged to operate within a curved chute I do not restrict myself thereto, as the invention contemplates and is designed to include any and all forms of gates operating in or across ore and other bin spouts or discharges in substantially the manner herein indicated.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an ore-discharge, a gate, and a journal for the gate extending longitudinally of the discharge, whereby the gate is adapted to turn transversely across the discharge, substantially as shown and described.

2. The combination of an ore-discharge, a journal above the plane of the discharge and extending longitudinally thereof, and a gate mounted on the journal and adapted to turn transversally across the discharge, substantially as shown and described.

3. The combination of an ore-bin chute open at the top, and a vertically and transversely rotatable gate operative within the chute at a point removed from the inner end thereof, thereby leaving an open top space between the gate and the inner end of the chute, substantially as shown and described.

4. The combination of an ore-bin chute having a curved bottom and an upright gate within the chute and rotatable transversely thereof, a portion of the gate edge being straight and a portion thereof curved complementary with the chute-bottom, substantially as shown and described.

5. The combination of an ore-chute having its bottom curved in cross-section, and an upright gate within and rotatable transversely of the chute, the lower portion of the gate being curved complementary to the chute, substantially as shown and described.

6. The combination of a chute having its bottom curved in cross-section, an upright gate journaled above the center of the chute and rotatable transversely thereof, the journal being adjacent the upper edge of the gate which is substantially straight, with the edge of the lower portion of the gate curved complementary with the chute, substantially as shown and described.

7. The combination of an ore-chute, a bracket secured thereto, a shaft journaled in the bracket, a rotatable gate secured to the shaft and operative in the chute, and means for actuating the shaft, substantially as shown and described.

8. The combination of an ore-chute, a bracket secured thereto, a shaft journaled in the bracket, a rotatable gate secured to the shaft and operative in the chute, a gear-wheel on the shaft, a second shaft carrying a pinion meshing with said gear-wheel, and actuating means on the second shaft, substantially as shown and described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARVID M. LEVIN.

Witnesses:
J. M. NESBIT,
ALEX. S. MABON.