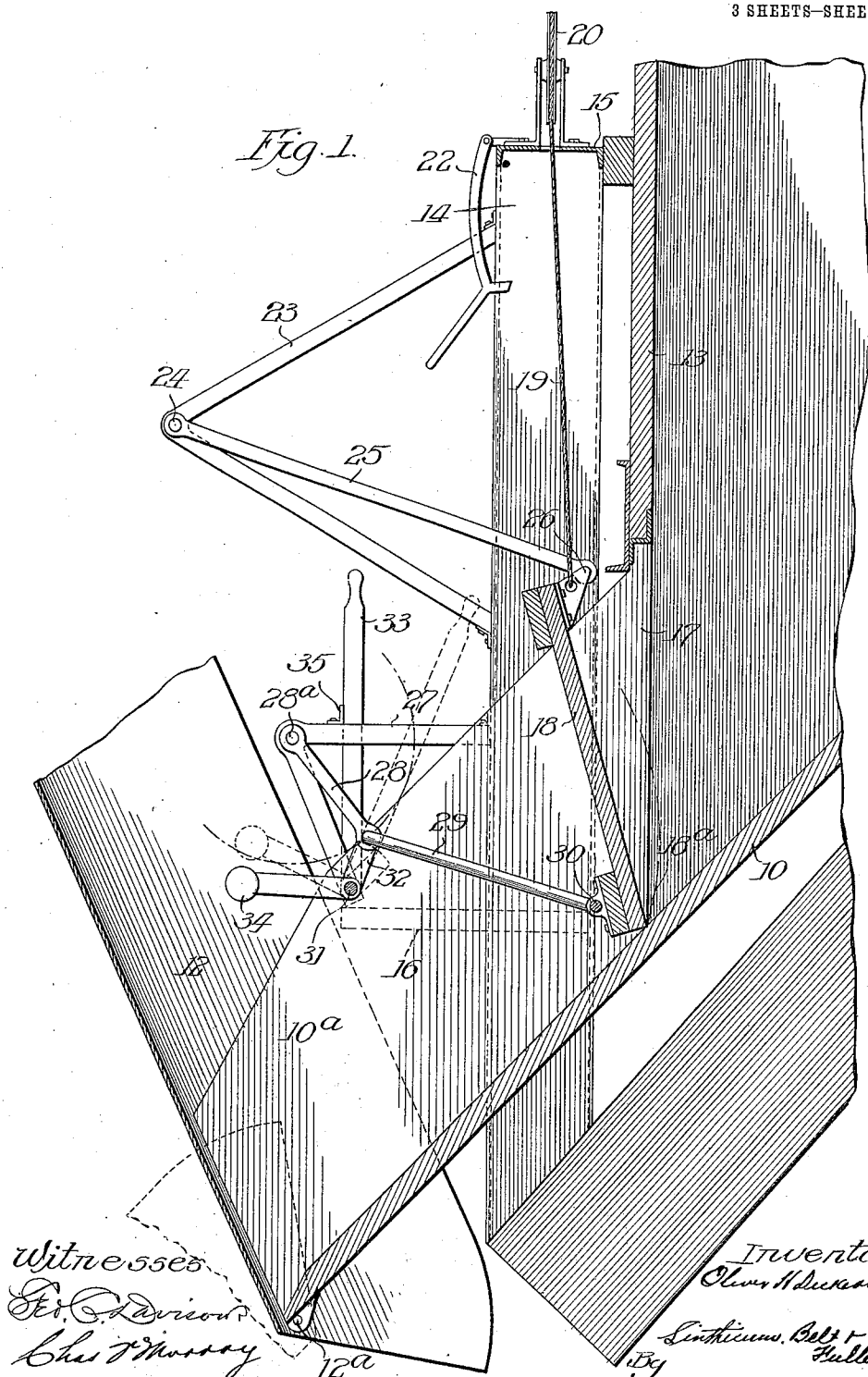


O. H. DICKERSON.
ORE BIN DOOR.
APPLICATION FILED APR. 17, 1911.

1,041,444.

Patented Oct. 15, 1912.

3 SHEETS—SHEET 1.

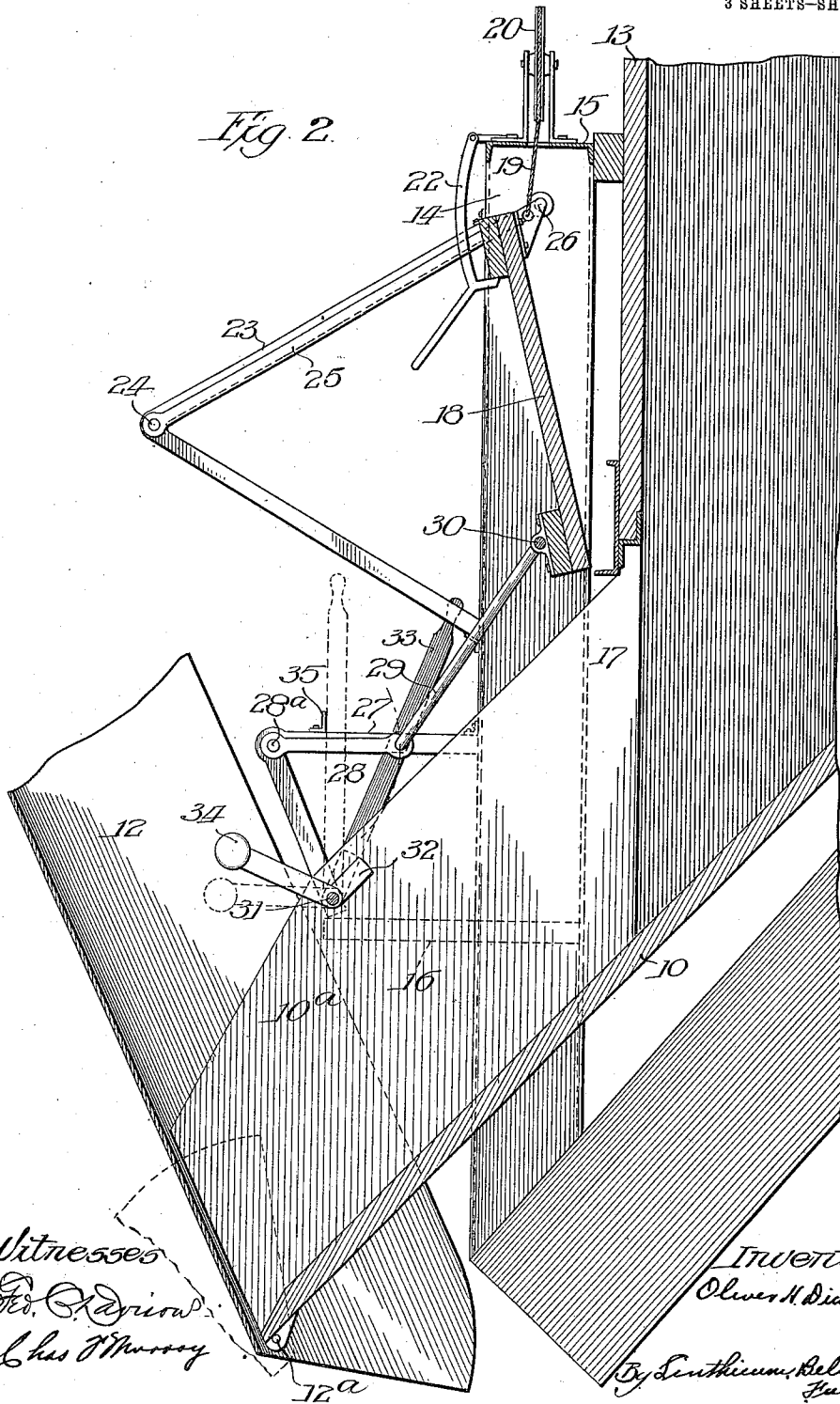


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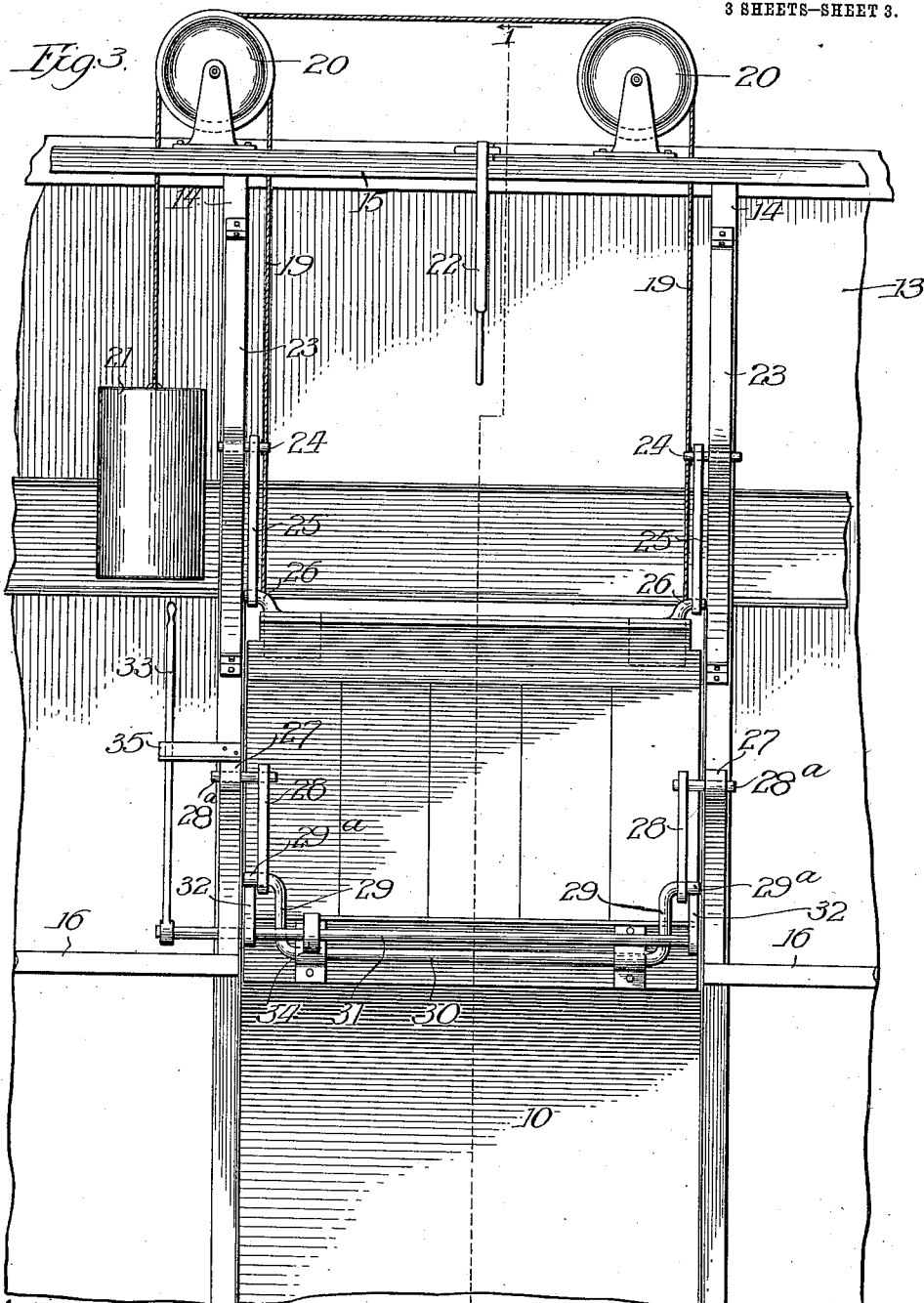


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3 SHEETS-SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

OLIVER H. DICKERSON, OF DULUTH, MINNESOTA.

ORE-BIN DOOR.

1,041,444.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed April 17, 1911. Serial No. 621,633.

To all whom it may concern:

Be it known that I, OLIVER H. DICKERSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Ore-Bin Doors, of which the following is a specification.

My invention relates to closing means for bins adapted to contain ore, coal or other similar materials and has particular reference to a door of a character such as described in my copending application Serial No. 616,688, filed March 24, 1911.

One of the particular objects of the present invention is the provision of means in connection with an ore bin whereby a door is arranged to be operated to open the bin and to close the opening against the weight of material being discharged therethrough. In the present application this is accomplished by a system of levers or links as contrasted to the construction shown in the application above identified wherein the door is guided in a series of ways or grooves.

It will be understood that usually a large amount of material is stored in the bins; that the door which closes the discharge end is under heavy pressure and that the opening of the door under such circumstances is attended with difficulties. Furthermore, after the door is opened it has been found difficult to close the opening during the discharge of the material because of the momentum of the ore passing therethrough.

The objects of my invention therefore are to provide a door which may be readily opened under pressure and which may be closed against the momentum of the ore passing through the opening without unnecessary expenditure of power.

My invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a transverse section through the discharge spout of an ore bin, illustrating my novel door operating means and showing the door in closed position. Fig. 2 is a similar view showing the door in its opened position, and Fig. 3 is an end elevation of the construction as shown in Figs. 1 and 2.

Referring more particularly to the drawings it will be seen that the bin to which my improved door is fitted is composed of an inclined floor 10, which extends beyond the front wall of the bin and joins the upper end

of a discharge spout 12, pivoted at 12^a, to the floor 10. This spout 12 is adapted for swinging movement and is shown in dotted lines in its lowered position. The bin has a front wall 13 supported by vertical beams 14, capped by a channel beam 15. A suitable platform, a portion of which is shown at 16, will be provided, but inasmuch as this forms no part of my present invention, I have not shown the same in detail. The floor 10, at the point outside of the bin is provided with vertical extensions or flanges 10^a, these constituting the sides of the chute.

The construction of the bin described provides an opening 17 in the front wall and this opening is closed by means of a door 18, which is supported by cables 19, passing over sheaves 20, a counter-weight 21 serving to assist in supporting the door. Preferably the counter-weight is of less weight than the door and in such case a swinging catch or hook 22 is provided in order to hold the door in its raised position, as shown in Fig. 2.

Mounted on the vertical beams 14, I provide brackets 23, on which are pivoted at 24, two links 25, the inner ends of which are pivoted at 26 to a portion of the door 18. Also secured to the uprights 14 and the platform 16, are brackets 27 to which links 28 are pivoted at 28^a. These links 28 are connected to the outer ends of a bale or strut 29, pivoted at 30 to the lower end of the door 18. Also pivoted to the bracket 27 at 31, I provide catches or stops 32, controlled by an operating handle 33, and normally held in the position shown in Fig. 1, by means of the counter-weight 34. A stop 35 is provided on the bracket 27, in order to limit the movement of the operating lever 33.

The action of the door 18 in opening or closing is shown by the lines in Fig. 1. On shifting the lever 33 to the right, as viewed in Fig. 1, the catches 32 are removed from beneath the ends 29^a of the strut 29, and the outer end of the strut will follow a downward path, as indicated by the semi-circular line. The lower end of the door will swing outwardly permitting the material to pass out freely; the door is then drawn upward by means of the cables and counter-weight until it reaches the position of Fig. 2, the catch resting beneath a cross-piece in order to hold the door in upright position, the link 28 and the end of the strut 29 meanwhile following the circular path with 28^a as a center. In order that the link 28

and strut 29 may reach the position shown in Fig. 2, they must pass the stop 32, but this is accomplished against the action of the counter-weight, the lever assuming its original position thereafter. Assuming that the door is to be closed, the catch 22 is removed permitting the door to drop. The lower end of the door will fall in a substantially vertical line until the end 29^a of the strut 29 strikes the stop 32, when the lower end 18^a of the door will describe a circular path on a radius substantially equal to the distance from the end 29^a of the strut. It will be seen that the motion of the door thereafter will be somewhat in the direction of the flow of material and that the material will assist in closing the door rather than deter its closing.

It will be understood that my device is capable of modifications, many of which will be apparent to those skilled in the art and I do not therefore wish to limit my invention to the exact construction herein shown and described.

I claim:

1. A device of the class described, comprising in combination, a bin having an opening in one wall thereof, a closure for said opening, a series of struts acting as the closure guiding means and so arranged that the closure is bodily moved in an arcuate path during a portion of its closing movement, the outer end of one of the struts which guides the lower edge of the closure having a floating pivot and being connected by a link to a fixed pivotal point, which lat-

ter point is above the path of materials escaping from said bin, substantially as described.

2. A device of the class described, comprising in combination, a bin having an opening in one wall thereof, a closure for said opening, a series of struts acting as the closure guiding means for the closure, one strut being pivoted to the upper edge of the door, and another strut pivoted to the lower edge of the door, said lower strut having a floating outer pivot, and a connecting link between said floating outer pivot and a fixed pivotal point, said fixed pivot being out of the path of materials passing through said opening, substantially as described.

3. A device of the class described, comprising in combination, a bin having an opening in one wall thereof, a closure for said opening, a series of struts acting as the closure guiding means and so arranged that the closure is allowed a combined swinging and bodily movement, the bodily movement in closing being in the arc of a circle whereby the weight of materials passing through the opening assists in the closing movement, the lower strut for said closure having a fixed and a floating pivot, the fixed pivot being located in a plane above the path of materials passing through said opening, substantially as described.

OLIVER H. DICKERSON.

Witnesses:

ARTHUR E. MAUTHEY,
GEORGE A. FLINN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."