

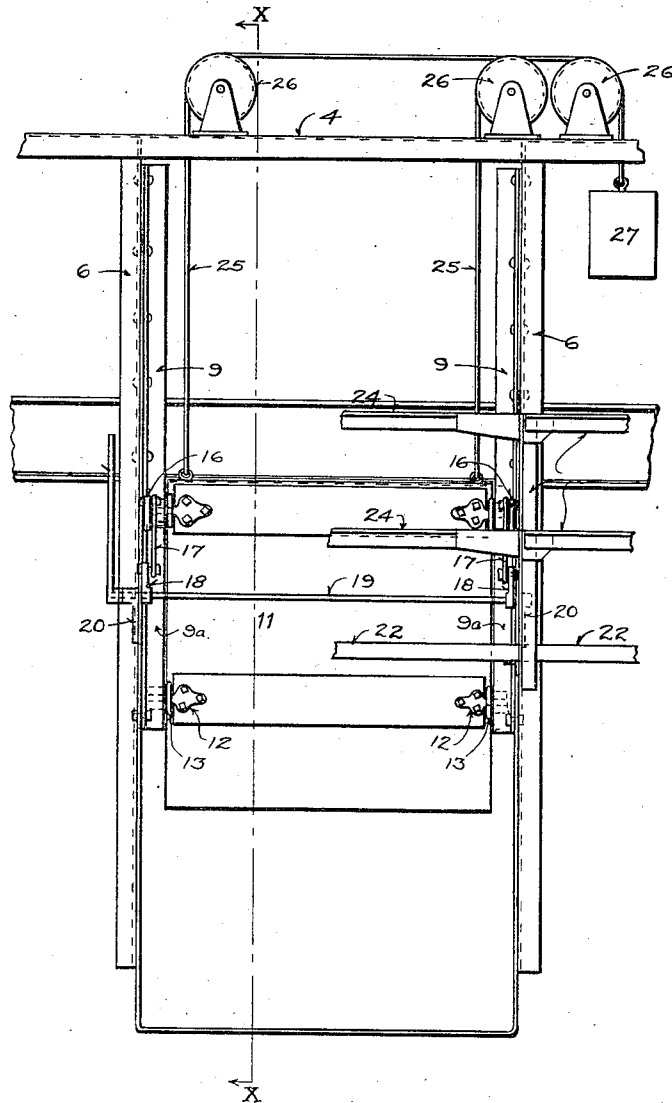
R. B. PEARSON.
BIN DOOR.
APPLICATION FILED OCT. 29, 1912.

1,057,769.

Patented Apr. 1, 1913

3 SHEETS-SHEET 1.

Fig. 1.



WITNESSES:

Francis B. Smith
J. M. Pearson

INVENTOR.

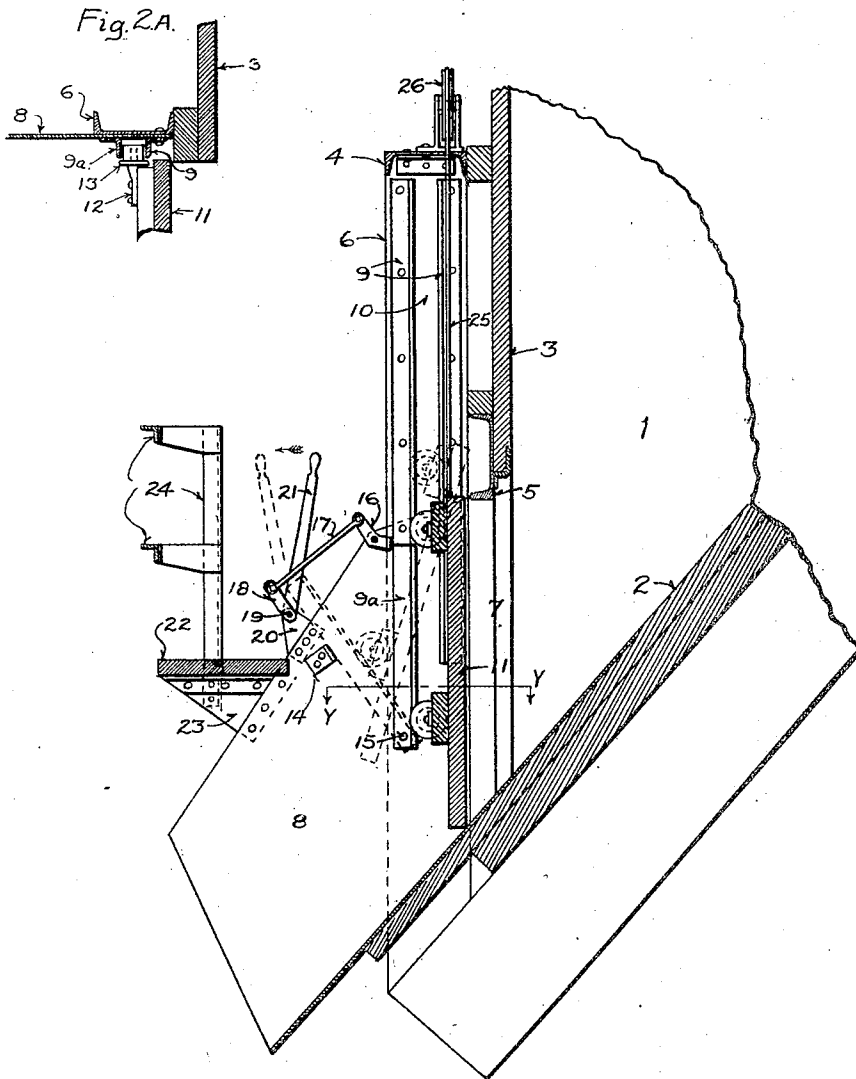
Robert B. Pearson

BIN DOOR.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 2.

Fig. 2.



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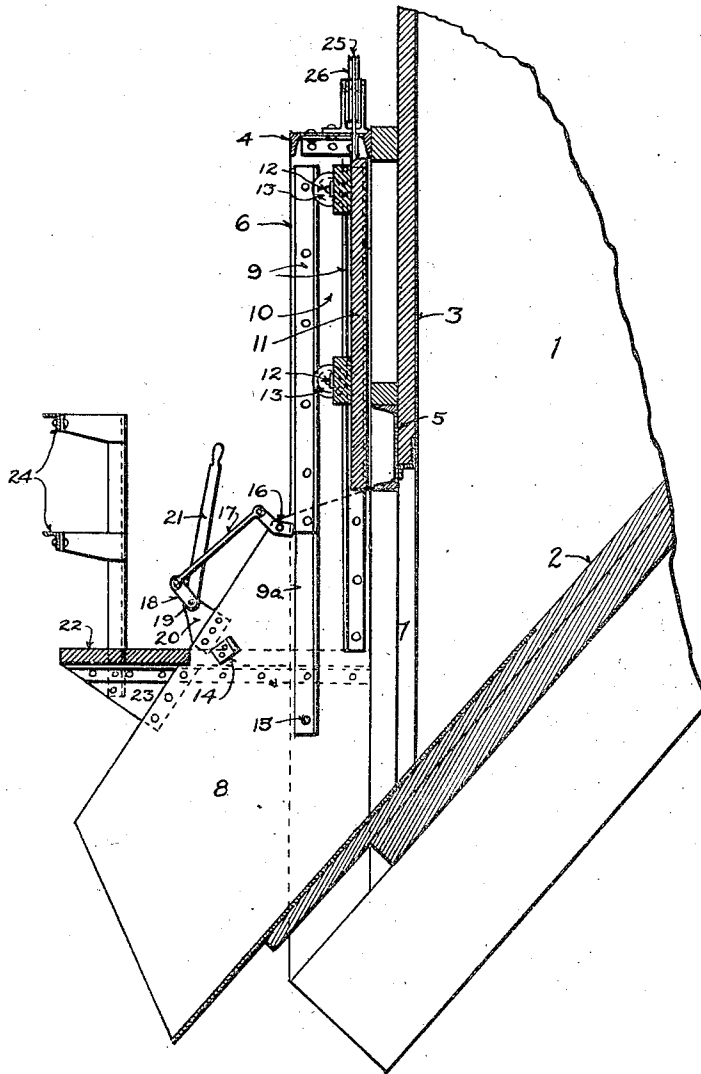
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3 SHEETS—SHEET 3.

Fig. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT B. PEARSON, OF DULUTH, MINNESOTA.

BIN-DOOR.

1,057,769.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed October 29, 1912. Serial No. 728,428.

To all whom it may concern:

Be it known that I, ROBERT B. PEARSON, a citizen of the United States, and a resident of Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Bin-Doors, of which the following is a specification.

This invention relates more particularly to that class of ore pockets or similar receptacles adapted to store one or more carloads of ore or other granular material at a time, such as are in use on the ore docks of the Great Lakes; and having a discharge opening wherefrom it is desired to deliver the material very rapidly and still be able to cut off the delivery thereof at the will of the operator, and has particular reference to the construction and arrangement of the door and appurtenances. As these bins or pockets are now built to hold as much as several hundred tons, the door closing the discharge opening is under very heavy pressure and the difficulties of opening them while under this pressure and closing them against the momentum of the flowing ore are very great.

Therefore, the principal objects of my invention are to so construct the door and appurtenances as to provide a simple, economical and efficient means for opening the door while under pressure, and closing it when desired, against the momentum of the flowing ore.

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

Figure 1 is a front elevation of a portion of an ore pocket having a door and appurtenances embodying my invention; Fig. 2 is a cross section on a vertical plane at right angles to the front of bin taken on the line X—X of Fig. 1; the door being in its normal closed position; Fig. 2^a is a horizontal section through the door posts taken on the line Y—Y of Fig. 2; Fig. 3 is the same section as Fig. 2, the door being in its raised position.

Referring again to the drawings; the bin 1 is formed in part by an inclined bottom 2 and a front wall 3 having a discharge opening 7 therein. Below this discharge opening is formed a chute by an extension of the bottom 2 of the bin and the side plates 8 attached to the door posts 6 on the respective sides of said opening. The

front 3 is partially supported by the steel channel girts 4 and 5 and the door posts 6 (also steel channels in this case) on each side of the opening 7. To these door posts 6 are attached steel angles 9 or similar members forming between them the guideway 10 in which a vertically movable swinging door 11 is adapted to close the opening 7 as shown. The lower part 9^a of one of the angles 9 forming the guideway 10 is attached pivotally to the side plate 8 of the chute in such a way that it can be swung about said pivot 15, out of its normal position with the guideway 10, when desired, in order to permit the door 11 to swing outwardly when desired. This angle 9^a to be held in its normal position generally by the dogs or levers 16 pivoted to the side plate near the top. These dogs in turn are connected by means of the connecting rods 17, to the cranks 18, on the crank shaft 19, which is supported by brackets 20 attached to the side plates 8 of the chute. The crank shaft also carries a handle 21 by means of which it may be handled by the operator. There is also provided a walk 22 for the operator, which is carried on brackets 23 attached to the side plates 8, and has a railing 24 on the outer edge. Between the chutes the walk extends in to the front wall 3 of the bin.

The door 7 has attached thereto brackets 12 which carry flanged wheels 13 (or plain trunnions if the door is small), which are guided in the groove 10, and is counterbalanced by means of the ropes 25 passing over the sheaves 26 mounted on the girt 4 and carrying on their opposite ends the counterweight 27.

To operate this device, assuming the door closed as shown in Fig. 2, and ore in the bin which it is desired to run out: The operator throws the handle 21 on the crank shaft 19 to the position shown by dotted line in Fig. 2 when the dogs 16 are withdrawn from the path of the movable portion 9^a of the guideway, allowing the pressure of ore against the door to force the lower end of door and the movable section of the guideway outwardly to the position shown by the dotted lines in Fig. 2. At this point these sections of the guideways are held by suitable stops 14 and form an inclined track up which the door is forced by the pressure of ore above, until the ore has a free passage beneath it. From this point the door can be raised by

hand when it will return to the perpendicular, and the lower wheels 13 reënter the guideways 10, following this up until the door clears the opening 7 as shown in Fig. 3.

5 The movable sections 9^A. of the guideways 10 are expected to be counterbalanced in a suitable manner so that they will return to their normal position as soon as the door is raised, but this is not illustrated in the

10 drawings in order to avoid confusion. The movable sections 9^A. having returned to their normal position the dogs 16 can be returned to engage with them and lock them in place either by the hand operation of the

15 lever 21 and the crank shaft 19, or the said crank shaft can be so counterbalanced as to return the dogs to their normal position automatically. This counterbalancing is also omitted in the drawings to simplify same

20 and avoid confusion. When the movable section 9^A. is locked in position the door can be closed by simply drawing it down by hand. If this is done while ore is still flowing through the opening 7, the ore will assist in drawing the door down to the closed

25 position, where it will be held until again released by the operating handle 21.

It will be understood that my device is capable of modifications, many of which

30 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.

Having thus illustrated and described my invention, I claim and desire to secure by

35 Letters Patent:

1. A device of the class described comprising, in combination, a bin having walls and a sloping floor, one of said walls being provided with a discharge opening, guideways

40 associated with said bin, a section of said guideways being pivotally attached to the structure, means to control said pivoted section of the guideways, and a door adapted to close said discharge opening and hav-

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ing portions coöperating with said guideways.

2. A device of the class described, comprising in combination a bin having an opening in one wall thereof, a guideway associated

50 with said bin and having a movable portion and means to control the movement of said movable portion, a closure for said opening adapted for compound movement in a vertical and horizontal direction and members

55 on said closure adapted to coöperate with said guideway, substantially as described.

3. The combination with an ore bin having a discharge opening and a vertical guideway having a movable portion, of a

60 door having members adapted to coöperate with said guideway, and means to control said movable portion of said guideway, substantially as described.

4. A device of the class described comprising in combination, a bin having a discharge opening therein and provided with vertical

65 guideways exterior thereof, each of said guideways having a movable portion pivoted at a fixed point, and a shiftable stop

70 mounted as to fix said movable portion in place or release same as desired, and a closure for said opening, said closure having means associated with said closure adapted to coöperate with said guideways.

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5. A device of the class described comprising in combination a bin having walls and a sloping floor, one of said walls being provided with a discharge opening, a guideway associated with said bin, said guideway

80 having a shiftable portion, a shiftable stop positioned in the path of travel of said portion, a door for aforesaid opening adapted for swinging and vertical movement, said door having members adapted for sliding

85 or rolling movement in said guideway.

ROBERT B. PEARSON.

Witnesses:

W. W. WEED,
H. U. MOORE.