C. G. BAUMGARTNER.

ORE POCKET DOOR.

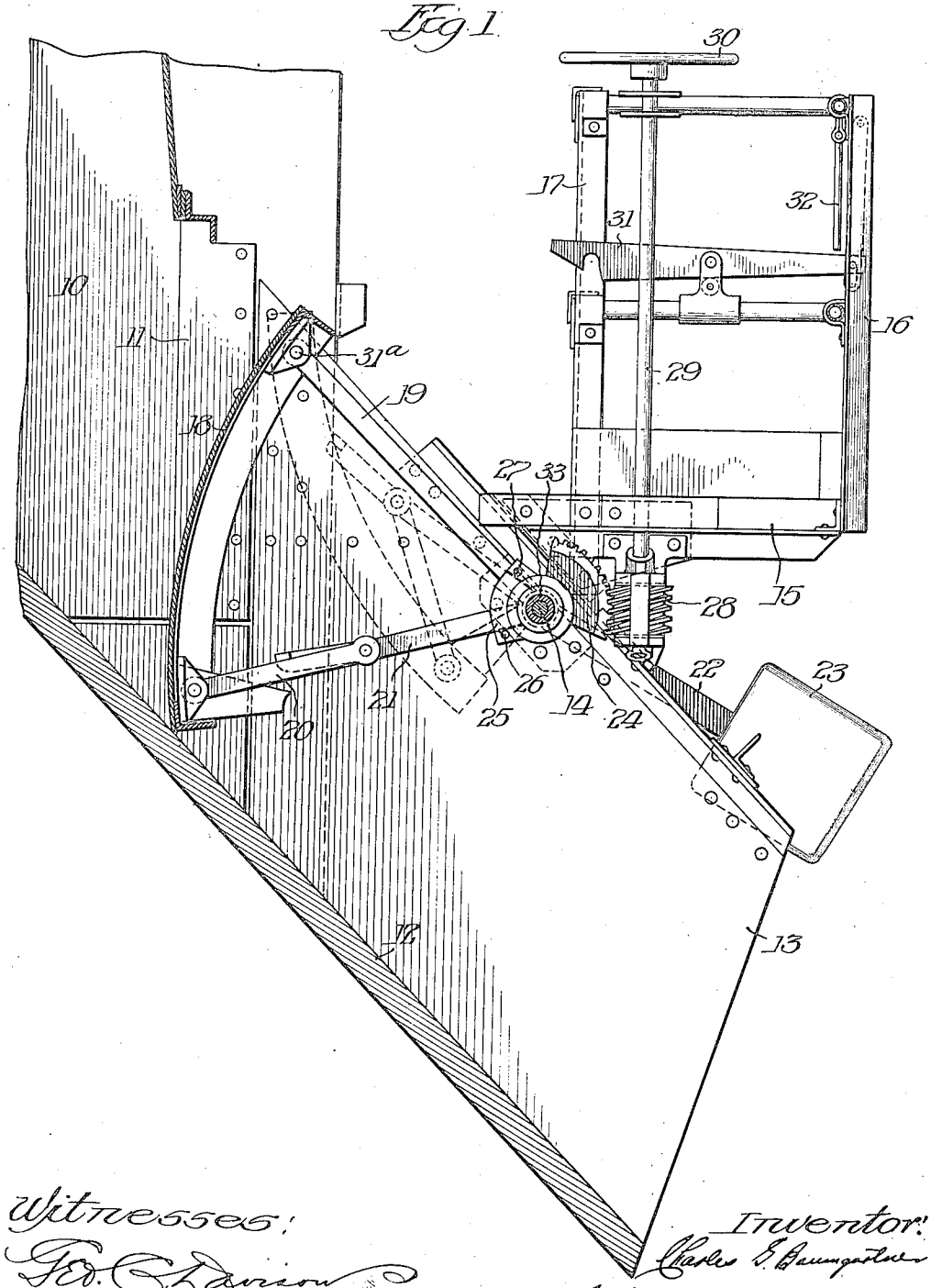
APPLICATION FILED JUNE 19, 1914.

1,140,436.

Patented May 25, 1915.

3 SHEETS—SHEET 1.

Fig. 1.



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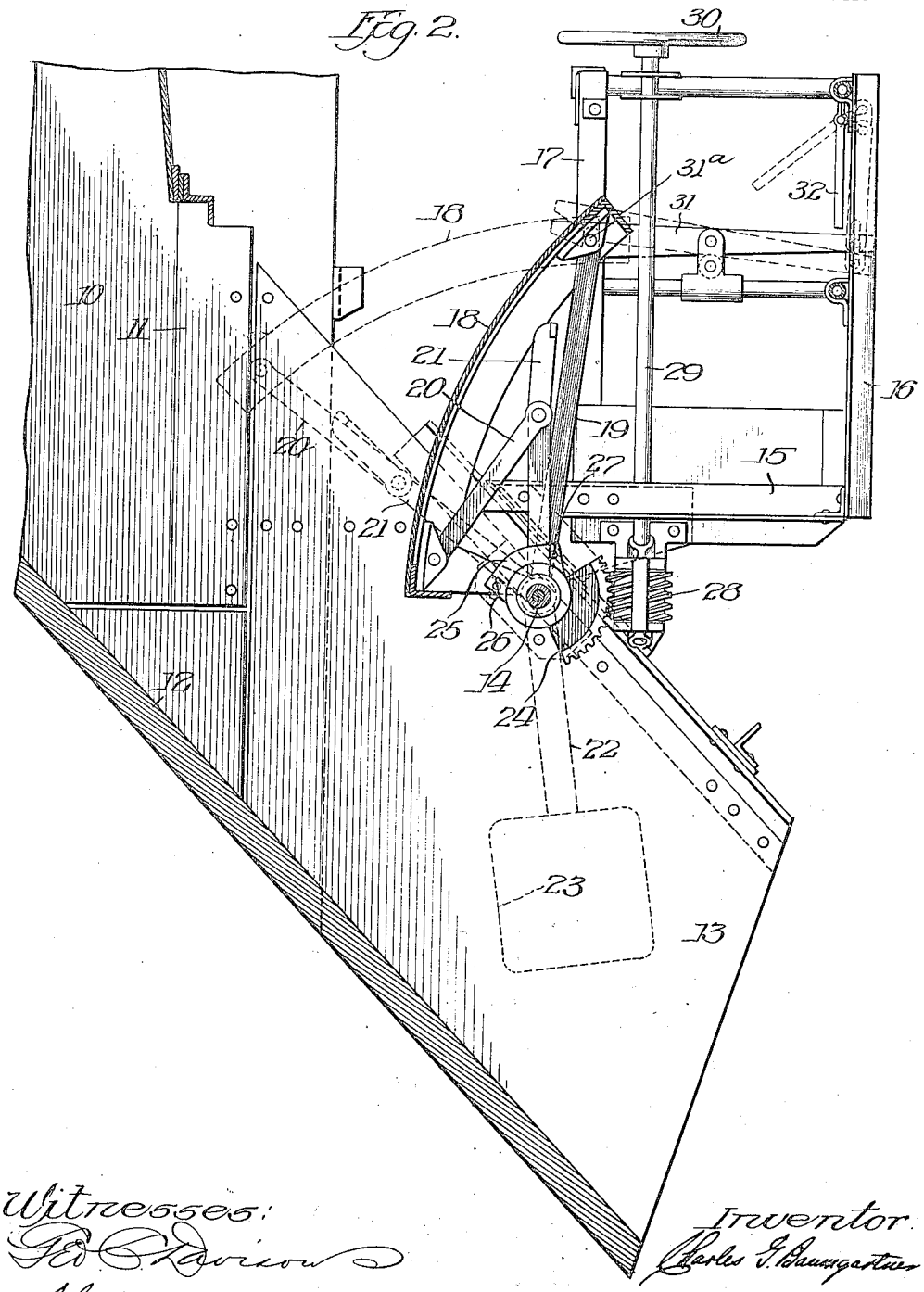
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3 SHEETS—SHEET 2.

Fig. 2.



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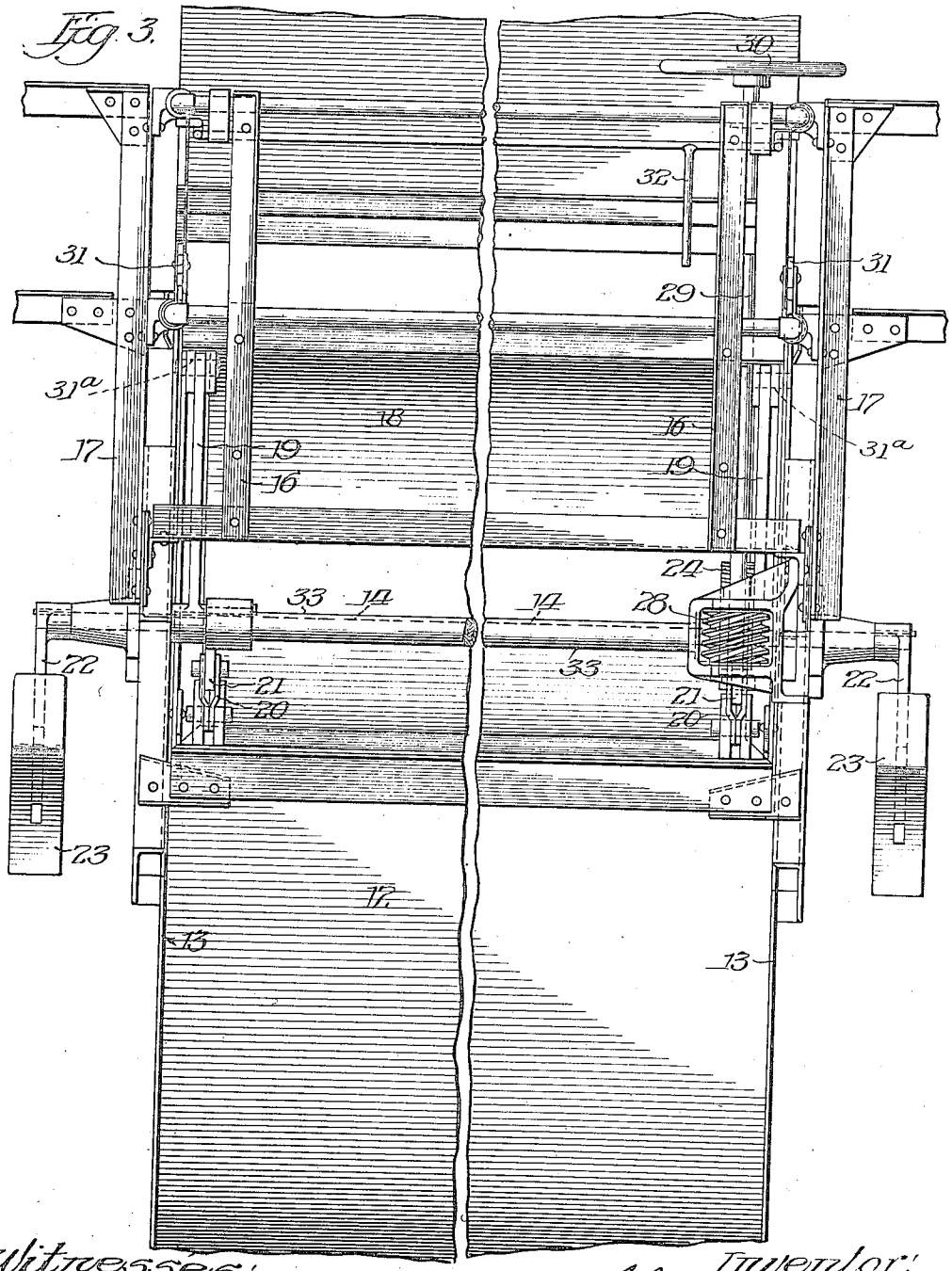
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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ORE-POCKET DOOR.

1,140,436. Specification of Letters Patent. Patented May 25, 1915.

Application filed June 19, 1914. Serial No. 846,142.

To all whom it may concern:

Be it known that I, CHARLES G. BAUMGARTNER, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ore-Pocket Doors, of which the following is a specification.

My invention relates to apparatus for handling granular or similar materials and has particular reference to a novel door for closing the discharge aperture in an ore bin.

As is well known, it is customary to store, temporarily or otherwise, large quantities of ore or similar granular materials in bins usually elevated above the point of discharge. The bins to which the present improvement is intended to be applied are those to which ore is supplied and from which the ore is delivered by gravity directly into the vessels or cars for shipment.

A requisite in a door or closure for such bins is that such a device may be readily operated against a heavy pressure such as is occasioned by a mass of ore pressing thereagainst. This is easily accomplished by the breaking of a knuckle joint in a link permitting the door to swing outwardly against the pressure of the flowing material. However, it frequently occurs that the bin is not to be completely emptied and that the door should be closed during the flow of the material. This could not be accomplished with a door which merely swung as sufficient force could not be exerted to overcome the force of the material. I have therefore devised a door, arcuate in outline and adapted for free rotation on a shaft, the connection to the shaft being by means of a rigid link and a breakable link, the last named link permitting the door to swing outwardly while the rigid link permits the door to swing bodily, both movements being in an arcuate path. A counter-weight is provided and the weight thereof is so proportioned to the weight of the door that when the door is in normal position it overbalances the counter-weight and remains in such position. However, when one of the links is broken and the door is permitted to swing inward toward the shaft the preponderance of weight is then with the counterweight and the door is swung open.

In order to close the door when it is in its open position, the broken link is straightened out thus bringing the door into its normal or primary position, at which time the weight of the door overcomes the counter-weight and swings into position by its own weight. This may be accomplished even though a stream of ore is flowing through the opening in view of the fact that the closing movement of the door is in an arcuate path and not entirely opposed to the line of motion of the material. In fact the material assists in closing the door.

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

Figure 1 is a section through an ore pocket and the discharge chute therefrom, showing my novel door and operating mechanism, the first position of the door when released being shown in dotted lines; Fig. 2 is a similar view showing in full lines the door in its normal open position and in dotted lines the position it will assume just prior to beginning the closing movement, and, Fig. 3 is a front elevation of the construction shown in the preceding figures.

Referring more particularly to the drawings, it will be seen that the bin 10, is provided with an opening 11, within which a chute 12 is secured. The chute has side walls 13, within which a horizontal shaft 14, is mounted. Superposed on the chute is a platform 15, having railings 16, 17. A door member 18, arcute in form, is provided in order to close the opening 11 in the bin. This door is connected to the shaft 14, by means of a rigid link 19, and two links 20, 21, having a knuckle joint connection, the link 21, being keyed to a hollow shaft 33, which surrounds and turns upon shaft 14. The links 19 are keyed to the shaft 14. Also secured to the shaft 14 and rotatable therewith is an arm 22, to the end of which a counterweight 23, is secured. Freely rotatable on the hub of the link 21, is a member provided on one side with a sector 24, having gear teeth on its periphery and on the other face with a sector 25, having stops

26, 27, made integral therewith, to limit the rotation of the sector about the hub of 21, by contacting with the link 21. The degree of angular motion allowed between the stops 26, 27, is slightly greater than the angular travel of the arms 19, about the shaft 14, in order that when the door is released in either the opening or closing operation, the link 21 will not strike the stops and bring a shock on the mechanism. Movement is imparted to the member carrying the two sectors by means of a worm 28, secured to a vertical shaft 29, surmounted by the hand-wheel 30, located so as to be available to an operator on the platform.

Assuming the parts to be in the position of Fig. 1, that is, the closed position, if the operator desires to open the door, the hand-wheel 30 is rotated thus moving the sector 25, in a clockwise direction. The coöperation of the stop 26 thereon with the link 21, breaks the strut by means of which the lower edge of the door is held. This permits the door to swing into the dotted line position of Fig. 1, under the impulse of the material flowing down the chute. When the parts reach the dotted line position the weight of the door is shifted inward toward its pivot and the counter-weight 23 has the preponderance of weight. This causes the bodily swinging of the door around the shaft 14 into the full line position of Fig. 2. When the parts reach such position, the door is caught by engagement of the latch 31 with a pin 31^a, and positively held.

If the door is to be closed the hand-wheel is rotated in an opposite direction causing a movement of the sector 25, in a counter-clockwise direction and through contacting of the stop 27 with the link 21, the two links are straightened and the lower edge of the door 18 is forced away from the shaft and into the normal position of the door. In this position the weight of the door is greater than that of the counter-weight and the door has a tendency to rotate about the shaft 14. When the latch 31 is released by actuating the lever 32, the door is permitted to swing in its arcuate path and to assume the full line position shown on Fig. 1.

I have described but one set of the links and counter-weights but it will be apparent that the links and counter-weights are provided on each side of the door and that each is a duplicate of the other.

Many advantages are present in a device such as herein described. The structural work is much less complicated, the hanging counter-weights are eliminated, the door is in equilibrium either closed or open and the operation may be completed from one position on a railed platform. The door may be closed during the flow of material.

The construction is capable of considerable modification and such changes as are within the scope of my claims I consider within the spirit of my invention.

I claim:

1. In a device of the class described, the combination of a wall having an opening therein, a closure for said opening, actuating means for said closure, said means including a pivoted members having an arcuate portion, a rigid link, a pair of links having a knuckle joint connection, both said link and said pair of links being secured to said closure and mounted for actuation by said arcuate member, and means for actuating said arcuate member and said links for opening and closing said door, substantially as described.

2. In a device of the class described, the combination of a wall having an opening, a segmental closure for said opening, a shaft, a rigid link connecting said shaft and said closure, a broken link also connecting said shaft and closure, means for operating said broken link, and means for effecting the movement of the closure, substantially as described.

3. In a device of the class described, the combination of a wall having an opening, a closure for said opening, a shaft, links connecting said door and shaft, one of said links being rigid and the other link having a knuckle joint, a counter-weight for said closure, and means for actuating said jointed link, substantially as described.

4. In a device of the class described, the combination of a door member, a shaft, links connecting said door to said shaft, the lower link having a joint therein, a counter-weight pivoted on said shaft and acting on said door, and means for breaking the joint in said lower link and allowing said door to swing on the outer end of the upper link as a pivot, substantially as described.

5. In a device of the class described, the combination of a door, a shaft, a rigid link connecting the upper edge of said door to said shaft, and a jointed link connecting the lower edge of the door to the shaft, a counter-weight pivoted on said shaft and acting upon said door through said links, the counter-weight being insufficient to cause movement of the door when said lower link is extended but of sufficient weight to lift the door when said lower link is broken and the lower edge of the door swung toward the shaft, substantially as described.

6. In a device of the class described, the combination of a door, a shaft, a rigid and a jointed link connecting said door to said shaft, manually operable means for breaking the joint in one of said links to permit the opening of the door and for straightening out said link to permit the closing of the door, substantially as described.

7. In a device of the class described, the

combination of a door, a shaft, a rigid and a jointed link connecting said door to said shaft, a counter-weight acting upon said door through said links, and manually operable means for shortening or lengthening said jointed link thereby permitting the action of the counter-weight on the door to open or close the same, substantially as described.

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