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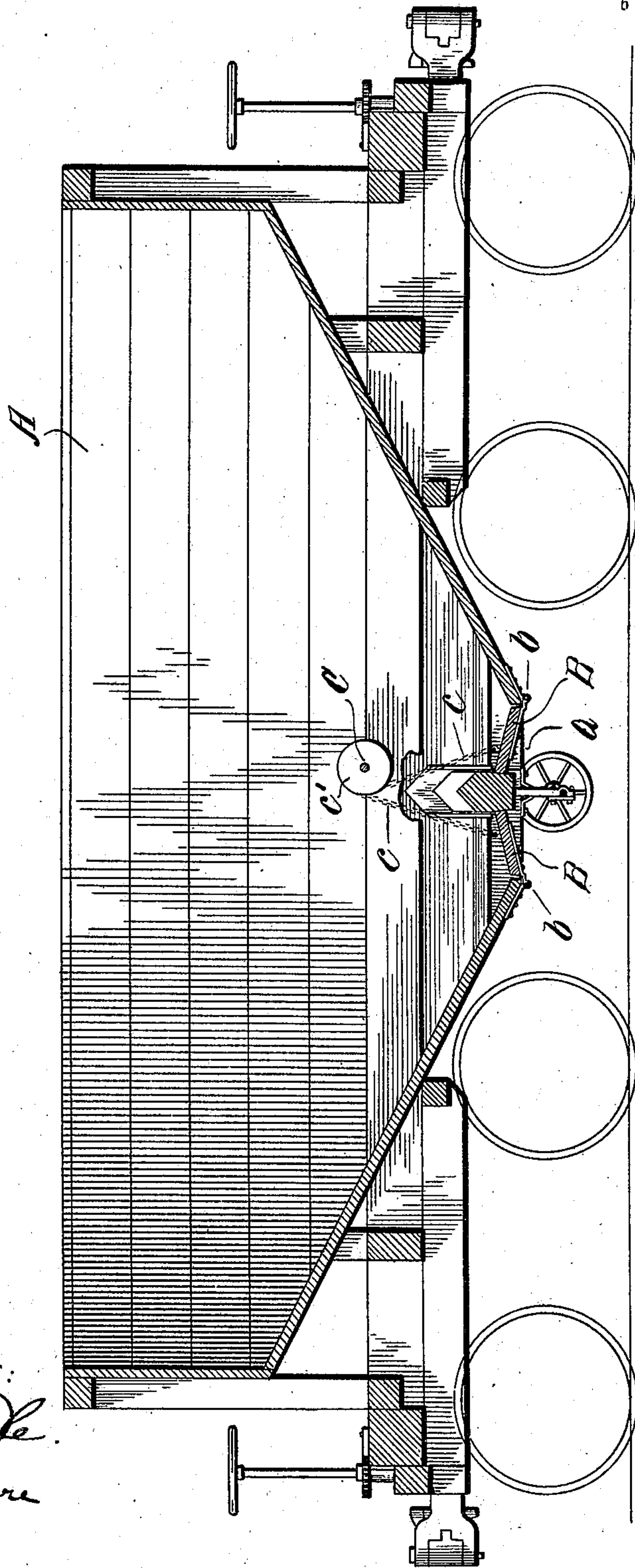
PATENTED MAR. 26, 1907.

W. L. COUGHTRY.

DISCHARGING DOOR FOR DUMPING CARS AND OTHER RECEPTACLES.

APPLICATION FILED DEC. 27, 1906.

5 SHEETS—SHEET 1.



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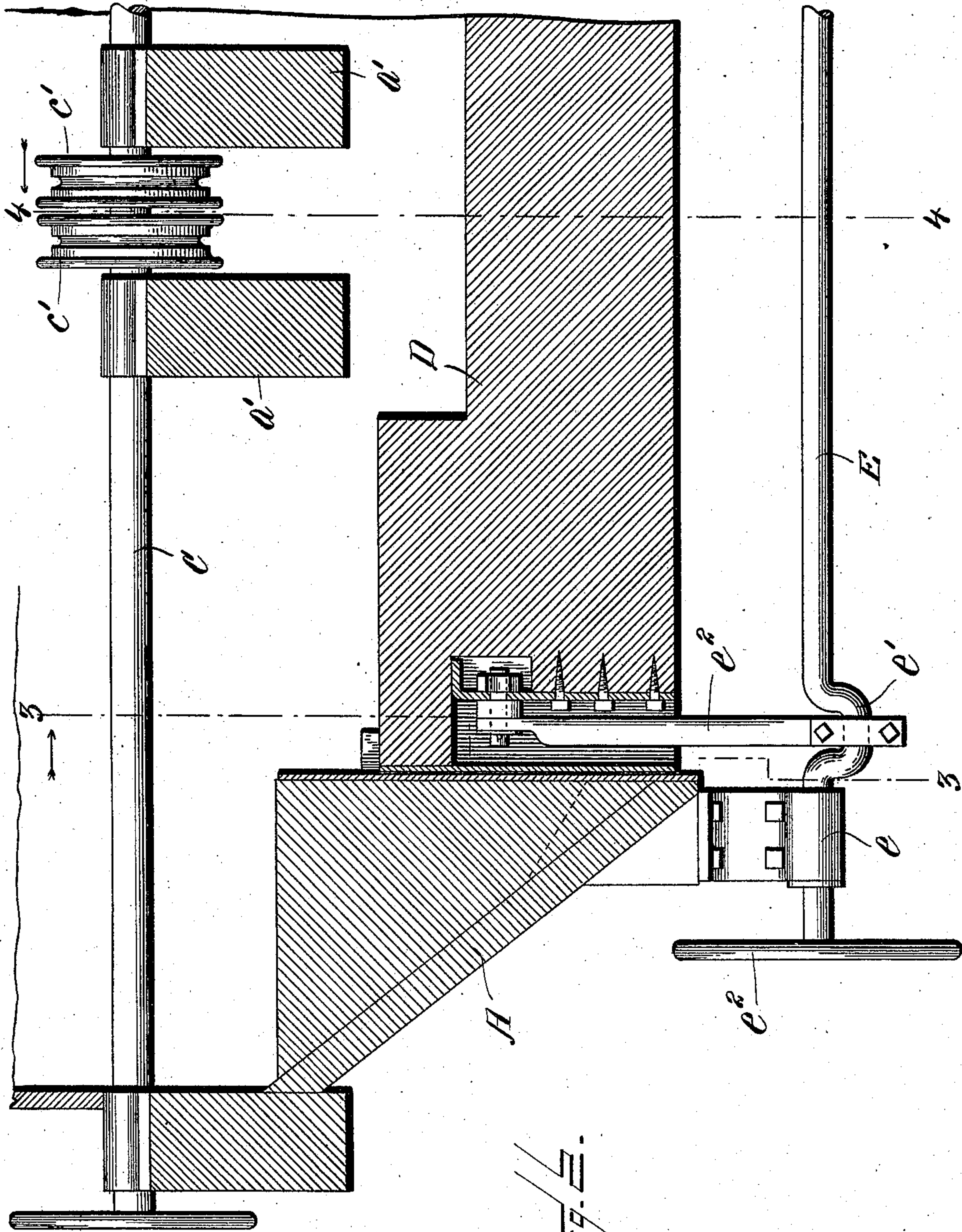
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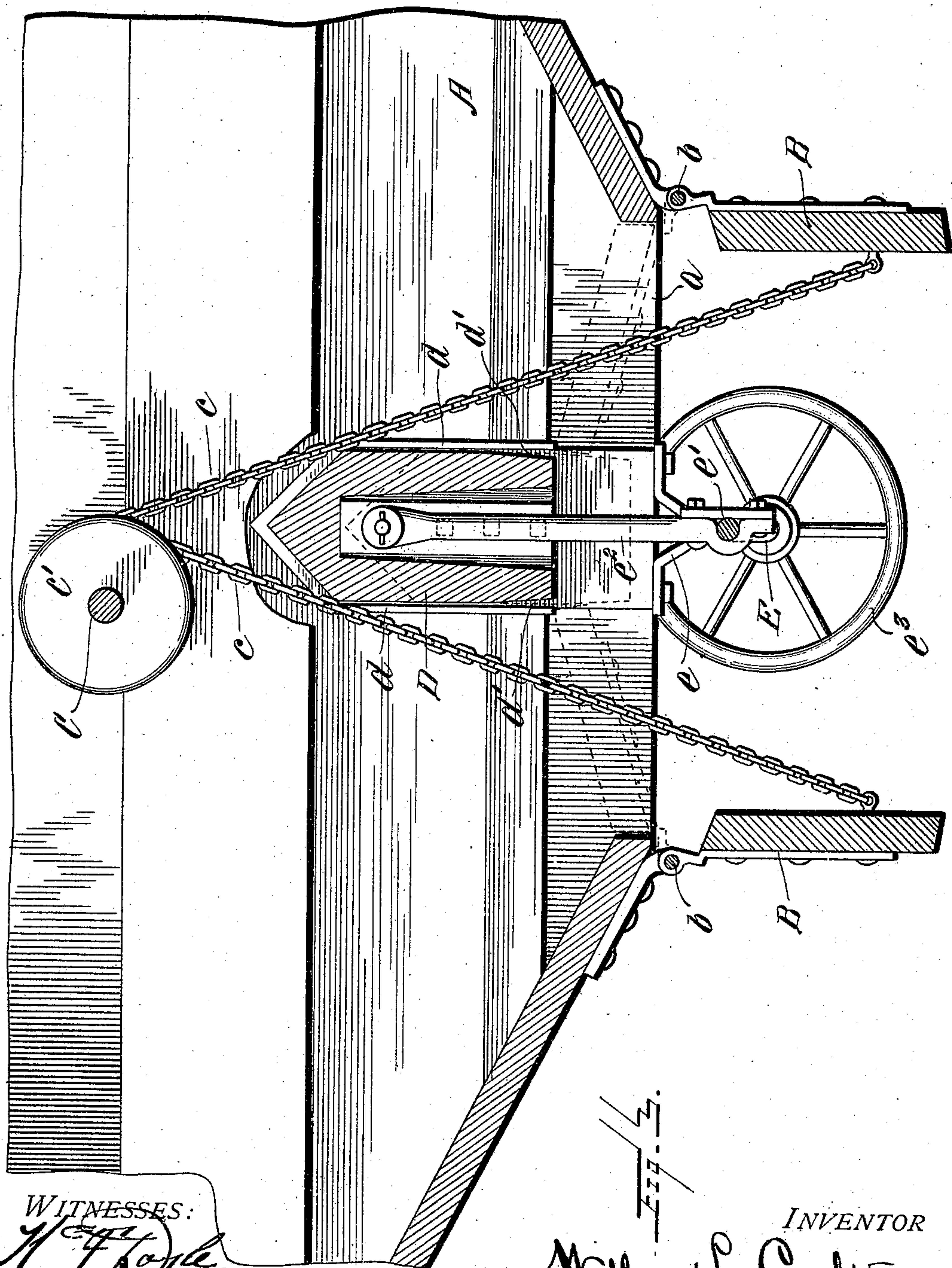
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5 SHEETS—SHEET 3.



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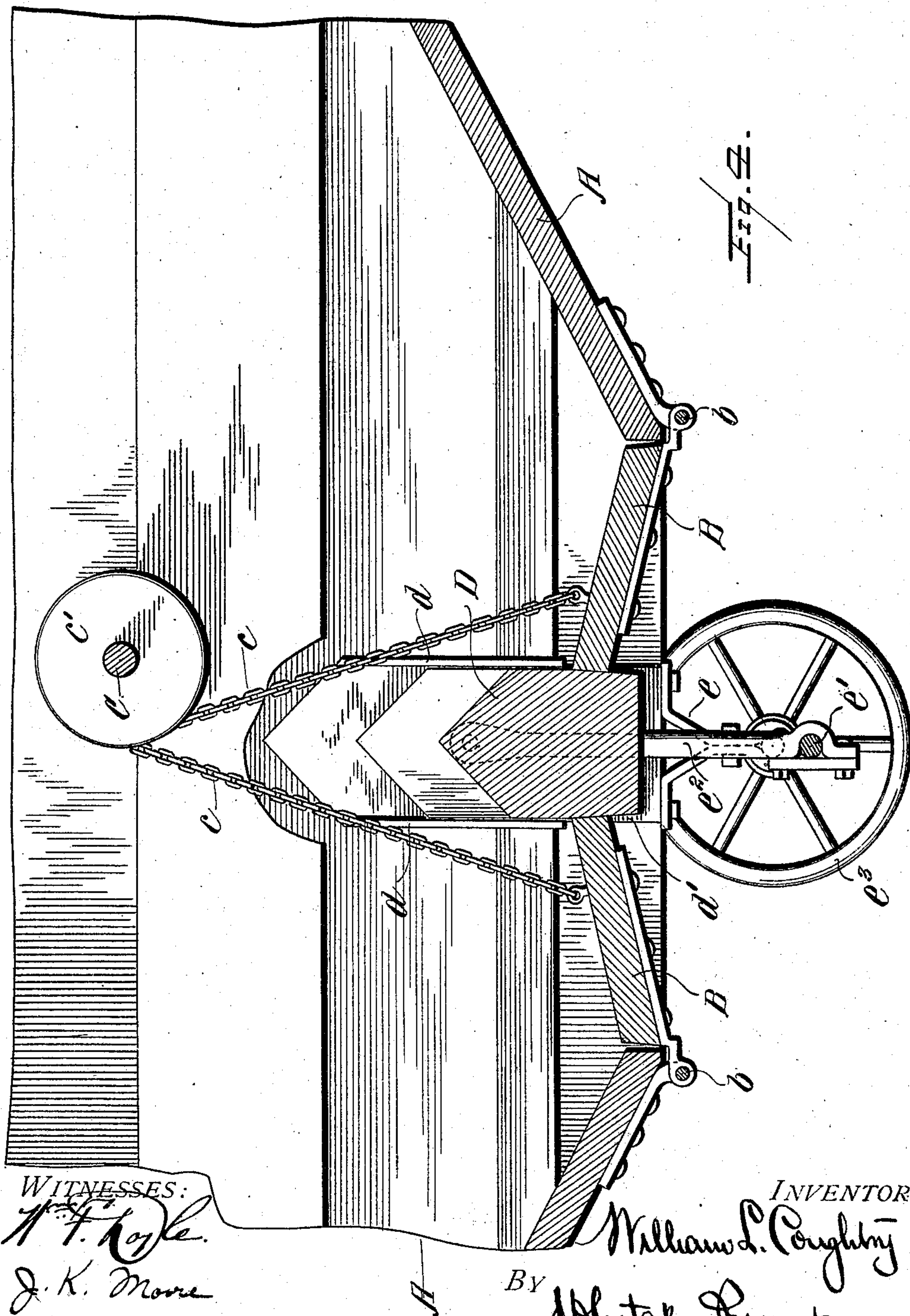
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5 SHEETS—SHEET 4.



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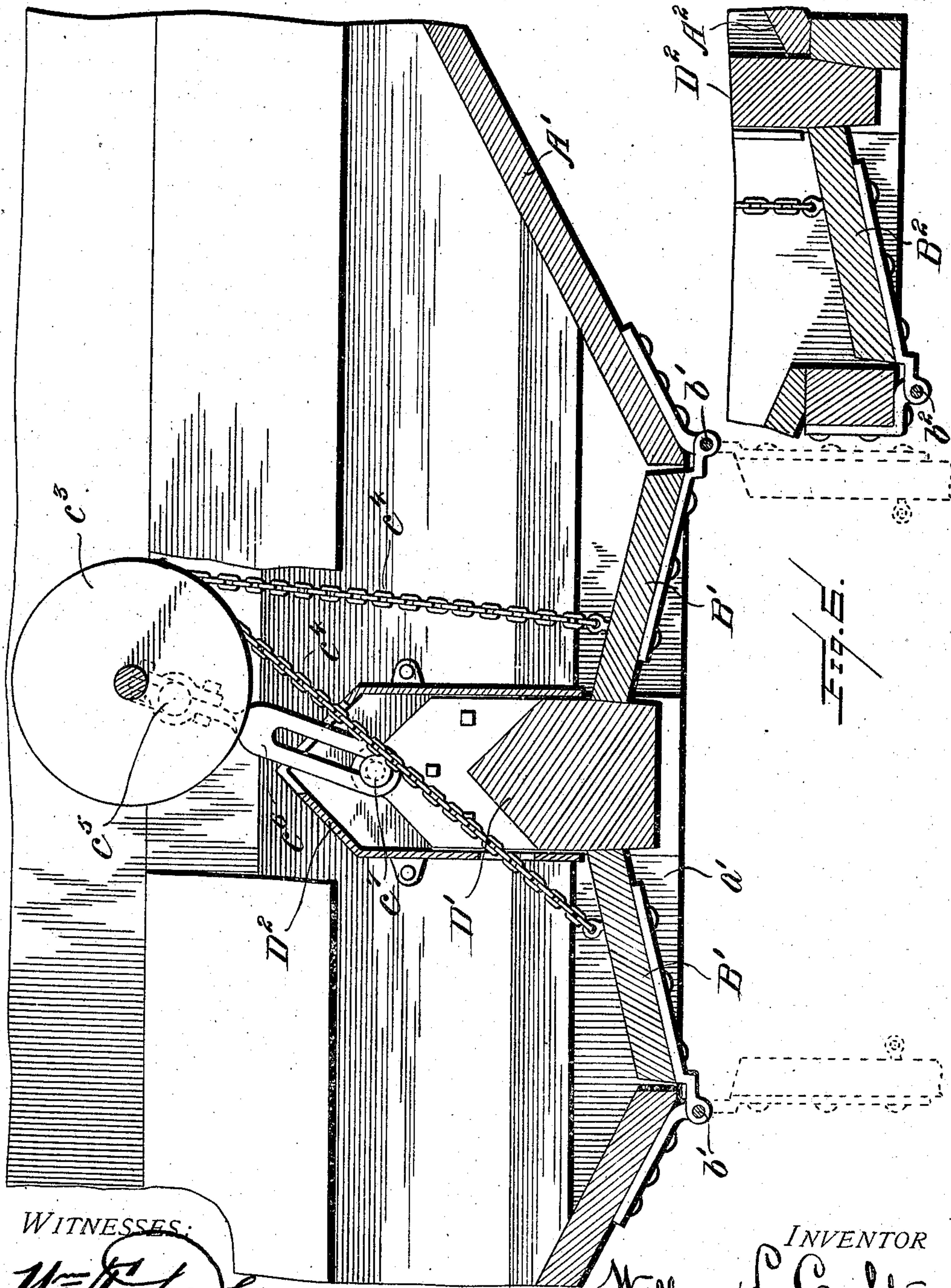
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5 SHEETS—SHEET 5.



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DISCHARGING-DOOR FOR DUMPING-CARS AND OTHER RECEPTACLES.

No. 848,159.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed December 27, 1906. Serial No. 349,733.

To all whom it may concern:

Be it known that I, WILLIAM L. COUGHTRY, a citizen of the United States, residing at Slingerlands, in the county of Albany and State of New York, have invented certain new and useful Improvements in Discharging-Doors for Dumping-Cars and other Receptacles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

My invention relates to mechanism for locking and operating discharging-doors of dumping-cars and other hopper-like receptacles, and consists particularly of mechanism for sustaining the dumping-doors in their closed position and for releasing and for closing said doors.

In the forms of dumping-car now in general use which employ doors for discharging the contents of the car the devices which lift the doors into closed position, usually chains or link-and-crank connections, must support the weight of such portion of the load as rests upon the doors when the car is loaded. As a result of these constructions the doors frequently sag, so as to partly open and discharge some of the contents of the car, and in some cases the strain is so great as to break the supporting devices.

The object of my invention is to provide a construction in which the doors practically sustain themselves and the load upon them when in closed position and relieve the mechanism for elevating the doors into closed position of all strain. I accomplish this result by lifting a door higher than the closed position and placing a wedge or block in position to be engaged by the outer edge of the door, so as to hold it above a horizontal position, and thus lock it. Ordinarily I employ two doors hinged to opposite sides of the door-opening, and in such case the two doors are raised above the closed position and the wedge or locking-block is dropped between their adjacent edges, so as to sustain them above a horizontal plane connecting their hinge connections. In either case the effect

produced is similar to that of an arch, in which the wedge or locking-block corresponds to the keystone, and the resulting construction enables the doors to support any load they may be subjected to without having any strain transferred to the devices for operating the doors or the locking-block. To release the doors, it is simply necessary to raise the block, when the doors swing downward through the door-opening and discharge the contents of the car or hopper.

My invention also contemplates mechanism for operating and controlling the doors and the locking block or wedge and is applicable not only to dumping-cars, but to any other hopper-like receptacles with which it may be found convenient or desirable to use it.

In the accompanying drawings I have illustrated my invention in connection with a dumping-car provided with a discharge-aperture having two doors hinged to opposite sides of said aperture; but it is equally applicable to constructions in which a single door is employed.

In the drawings, Figure 1 represents a longitudinal sectional view of a dumping-car having my invention embodied therein. Fig. 2 is a partial transverse sectional view drawn to an enlarged scale. Fig. 3 is a partial longitudinal sectional view on line 3 3 of Fig. 2. Fig. 4 is a similar sectional view on line 4 4 of Fig. 2. Fig. 5 is a view similar to Fig. 4, showing slightly-modified forms of mechanism for operating the doors and the locking-block. Fig. 6 is a detail view showing the application of my invention to a single door.

In the drawings, A represents a so-called "gondola car" provided with a hopper-shaped bottom having a rectangular discharge-opening *a* at its lowest point. B B represent two doors having a combined width slightly less than that of the said opening and hinged at opposite sides thereof at *b b*, so that the doors may be simultaneously swung through the opening without striking each other.

C represents a shaft extending transversely through the car-body, mounted in suitable bearings and provided with chains or other flexible connections *c*, extending to and secured to the doors B B, so that the doors may be raised by rotating said shaft in a direction to wind up said chains. I prefer to provide the shaft C with drums *c' c'*, as shown, upon which the chains are wound, as

fewer revolutions of the shaft are necessary to lift the doors into closed position; but the drums are not essential. The shaft C is provided at one or both sides of the car with operating means, such as a hand-wheel c^2 .

D represents the locking-block, disposed, preferably, transversely across the car and parallel with the adjacent edges of the doors. This block is preferably a piece of timber arranged in vertical guides d d , which loosely engage its ends and simply prevent it from becoming accidentally displaced. The upper part of the block D is preferably made of inverted-V shape in cross-section to facilitate its being raised through the contents of the car when the latter is loaded. In the present instance I have shown the block cut away in the center on its upper side to accommodate the central longitudinal beams a' with which the car is provided and which provide central supports for shaft C; but this would not be necessary in a car or receptacle not provided with such beams. The lower portions of the block, which engage the edges of the doors, are preferably oppositely beveled or tapered downwardly and inwardly, as shown at d' d' , to facilitate the withdrawal of the block when the doors are supporting the load.

In order to lock the doors in closed position, the block D is first raised out of the path of the doors and the latter are raised by means of the shaft C and connections c into closed position, with their inner edges above the plane of the hinges b and slightly higher than necessary, in order to leave sufficient space for the block D to fall into place between them. The block is then allowed to drop to its lowest position and the doors are released, permitting them to fall until their edges engage the block, when they will be positively prevented from opening, as the combined width of the doors and block is greater than that of the door-aperture. The doors and block thus form practically an arch of which the said block is the keystone, and in such position they will support any load which will not break the doors themselves or their hinges without transmitting any strain upon the chains c , which may remain slack. The strain which is exerted upon the block is also transverse and horizontal, as the engagement between the doors and said block practically supports the block also.

The locking-block D may be raised and lowered by means separate from that which controls the doors, as illustrated in Figs. 1 to 4, inclusive. In these figures I have shown a shaft E swung beneath the car in suitable hangers e and provided with cranks e' , connected by links e^2 to the block D, said shaft E being provided at one or both sides of the car with operating means, such as a hand-wheel e^3 . By rotating the shaft E the

block D may be raised or lowered, as desired, and will remain in either its highest or lowest position, as the cranks will then be in line vertically with the shaft and the pivotal connections of the links with the block D, or, in other words, on dead-center.

In order to release the doors when they are locked in closed position, it is only necessary to lift the block D out of engagement with the doors, when they will fall through the aperture a and discharge the contents of the car, if it is loaded.

I do not limit myself to any particular mechanism for operating the doors or the block D or either of them, as such mechanism may be greatly varied to suit the ideas of different constructors and to conform to the requirements or structure of different kinds of cars or other receptacles or hoppers.

In Fig. 5 I have shown mechanism for simultaneously operating the doors and block by a single shaft. In this construction, C' represents the shaft, which passes through the car above the doors and is provided with a drum or drums c^3 , carrying chains or flexible connections c^4 , leading to the doors, (here lettered B' .) The shaft is also provided with cranks c^5 , to which are connected links c^6 , the lower ends of which are slotted and engage studs or pins c^7 on the locking-block, (here lettered D' .) In using this mechanism, when it is desired to close and lock the doors the shaft C' is rotated by a suitable device, such as a hand-wheel, to wind up the chains and elevate the doors and simultaneously lift the block D' by means of the links and cranks before described. When the cranks c^5 pass their highest position and begin to descend, the block D' will begin to descend, while the continued revolution of the shaft causes the doors to rise. When the doors come into contact with the block D' , they will raise it, the pins or studs c^7 rising in the slotted links until the doors clear the block, when the block D' will drop into place by gravity, and on releasing the shaft C' slightly the doors will settle into engagement with the block D' and be firmly locked. To release the doors, the shaft C' will be rotated in a direction to unwind the chains c^4 , thus lifting the block D' out of engagement with the doors and slacking the chains, so that when the doors are free they are permitted to fall and discharge the contents of the car.

In Fig. 6 I have illustrated in a detail sketch a construction having only one door in which my invention is embodied. In this figure, A^2 represents the hopper-bottom of a car or other receptacle, and a^2 the discharge-aperture, provided with a door B^2 , hinged at b^2 . D^2 represents the locking-block, which is arranged to drop into place between the outer edge of the door and the edge of the opening a^2 opposite the hinges b^2 , thereby

sustaining it in position with its outer edge slightly above the plane of the hinges, and I may employ this construction in some instances where the use of double doors is not desirable or convenient, the principle of operation being the same in both cases. In Fig. 6 I have illustrated in dotted lines chains or connections extending to the door B² and to the block D² for raising the same by any suitable means.

In some instances I prefer to provide a cover for the wedge or locking-block, giving room within it for the movement of the block to lock or unlock the door or doors and preventing the contents of the hopper or car from coming into contact with the block. Thus in Fig. 5 I have shown a cover or hood or casing D², extending over the block D' and protecting it from the contents of the car while affording room within the cover D² to permit the block to be raised to release the door.

While I have shown and described my preferred form of my invention herein, in which the locking-block is movable vertically, I do not limit myself to this construction, as the block might be movable horizontally or in other directions, and, further, while I have shown and described a construction in which the block is moved upward to release the door or doors and downward into locking position, I may so construct the parts that the block will be moved downward to release the doors and upward into locking position without departing from my invention. I may also hinge the wedge or locking-block to the car or hopper body in some cases and cause it to move into and out of operative relation to the door or doors by suitable mechanism similar to that herein shown and described.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a receptacle provided with a discharge-aperture, of a door of less width than said aperture hinged at one side thereof, and adapted to swing through said aperture, and a movable locking-block constructed to engage the edge of said door opposite to the hinged portion, the combined widths of the door and block being greater than the width of said aperture, substantially as described.

2. The combination with a receptacle provided with a discharge-aperture, of a pair of doors hinged to opposite edges of said aperture, and a movable locking-block adapted to be interposed between the adjacent edges of said doors, substantially as described.

3. The combination with a receptacle provided with a horizontally-disposed discharge-aperture, of a pair of doors adapted to swing entirely through said aperture and hinged at opposite edges of the same, and a vertically-movable locking-block adapted to be interposed between the adjacent edges of said

doors, the combined widths of said doors and block being greater than the width of said aperture, substantially as described.

4. The combination with a receptacle provided with a discharge-aperture, of a pair of doors hinged to opposite edges of said aperture, a vertically-movable locking-block, located substantially centrally with respect to said aperture, and adapted to engage the adjacent edges of said doors, and mechanism for raising said locking-block to release said doors, substantially as described.

5. The combination with a receptacle provided with a discharge-aperture, of a pair of doors hinged to opposite edges thereof and having a combined width less than the width of said aperture, means for raising said doors, a vertically-movable locking-block, located substantially centrally with respect to said aperture, extending transversely thereof, and adapted to be interposed between the adjacent edges of said doors, and means for raising said block, substantially as described.

6. The combination with a receptacle provided with a discharge-aperture, disposed substantially horizontally, of a pair of doors hinged to opposite edges of said aperture, and having a combined width less than the width of said aperture, a vertically-movable locking-block disposed transversely of said aperture and adapted to be interposed between the adjacent edges of said doors, when in closed position, mechanism for raising said doors, and mechanism for raising and lowering said locking-block, substantially as described.

7. The combination with a receptacle provided with a discharge-aperture, disposed substantially horizontally, of a pair of doors hinged to opposite edges of said aperture, and having a combined width less than the width of said aperture, a vertically-movable locking-block disposed transversely of said aperture and adapted to be interposed between the adjacent edges of said doors, when in closed position, mechanism for simultaneously operating said doors and said locking-block, substantially as described.

8. The combination with a receptacle provided with a discharge-aperture, disposed substantially horizontally, of a pair of doors hinged to opposite edges of said aperture, and having a combined width less than the width of said aperture, a vertically-movable locking-block disposed transversely of said aperture and adapted to be interposed between the adjacent edges of said doors, when in closed position, a single hand-operated device and operative connections from said device to said doors and to said block for operating the same, substantially as described.

9. The combination with a receptacle provided with a discharge-aperture, disposed substantially horizontally, of a pair of doors hinged to opposite edges of said aperture,

and having a combined width less than the width of said aperture, a vertically-movable locking-block disposed transversely of said aperture and adapted to be interposed between the adjacent edges of said doors, when in closed position, an operating-shaft, connections from said shaft to said doors for elevating the same, and connections providing lost motion from said shaft to said locking-block, substantially as described.

10. The combination with a receptacle having a horizontally-disposed discharge-aperture, of a pair of doors hinged to opposite sides of said aperture, and having a combined width less than that of said aperture to permit them to swing therethrough, and a vertically-movable locking-block extending transversely across said aperture and adapted to be interposed between the adjacent edges of said doors to hold them in closed position, the door-engaging portions of said block being tapered to facilitate the withdrawal of the block to release said doors, substantially as described.

11. In a dumping-car, the combination with the car-body having a horizontally-disposed discharge-aperture in its bottom, of a pair of doors, hinged to opposite edges of said aperture and having a combined width less than the width of the said aperture, and a vertical locking-block mounted in guides in said car-body and extending transversely across said aperture, and adapted to be interposed between the adjacent edges of said doors, and mechanism carried by said car-body and connected with said locking-block for raising said block out of engagement with the doors, substantially as described.

12. In a dumping-car, the combination with the car-body having a horizontally-disposed discharge-aperture in its bottom, of a pair of doors hinged to opposite edges of said aperture and having a combined width less than the width of the said aperture, and a vertical locking-block mounted in guides in said car-body and extending transversely

across said aperture, and adapted to be interposed between the adjacent edges of said doors, mechanism carried by said car-body and connected with said block for raising said block out of engagement with said doors, and mechanism carried by said car-body for elevating said doors into position to permit the insertion of said block between them, substantially as described.

13. In a dumping-car, the combination with the car-body having a horizontally-disposed discharge-aperture in its bottom, of a pair of doors, hinged to opposite edges of said aperture and having a combined width less than the width of the said aperture, and a vertical locking-block mounted in guides in said car-body and extending transversely across said aperture, and adapted to be interposed between the adjacent edges of said doors, and a shaft extending transversely of the car-body and provided with cranks, and links connecting said cranks to the locking-block, substantially as described.

14. In a dumping-car, the combination with the car-body having a horizontally-disposed discharge-aperture in its bottom, of a pair of doors hinged to opposite edges of said aperture and having a combined width less than the width of the said aperture, and a vertical locking-block mounted in guides in said car-body and extending transversely across said aperture, and adapted to be interposed between the adjacent edges of said doors, a shaft extending transversely of the car-body and provided with cranks, links connecting said cranks to said locking-block, and means for elevating said doors into position to permit the insertion of the said locking-block between them, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM L. COUGHTRY.

Witnesses:

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WM. LLOYD COUGHTRY, Jr.