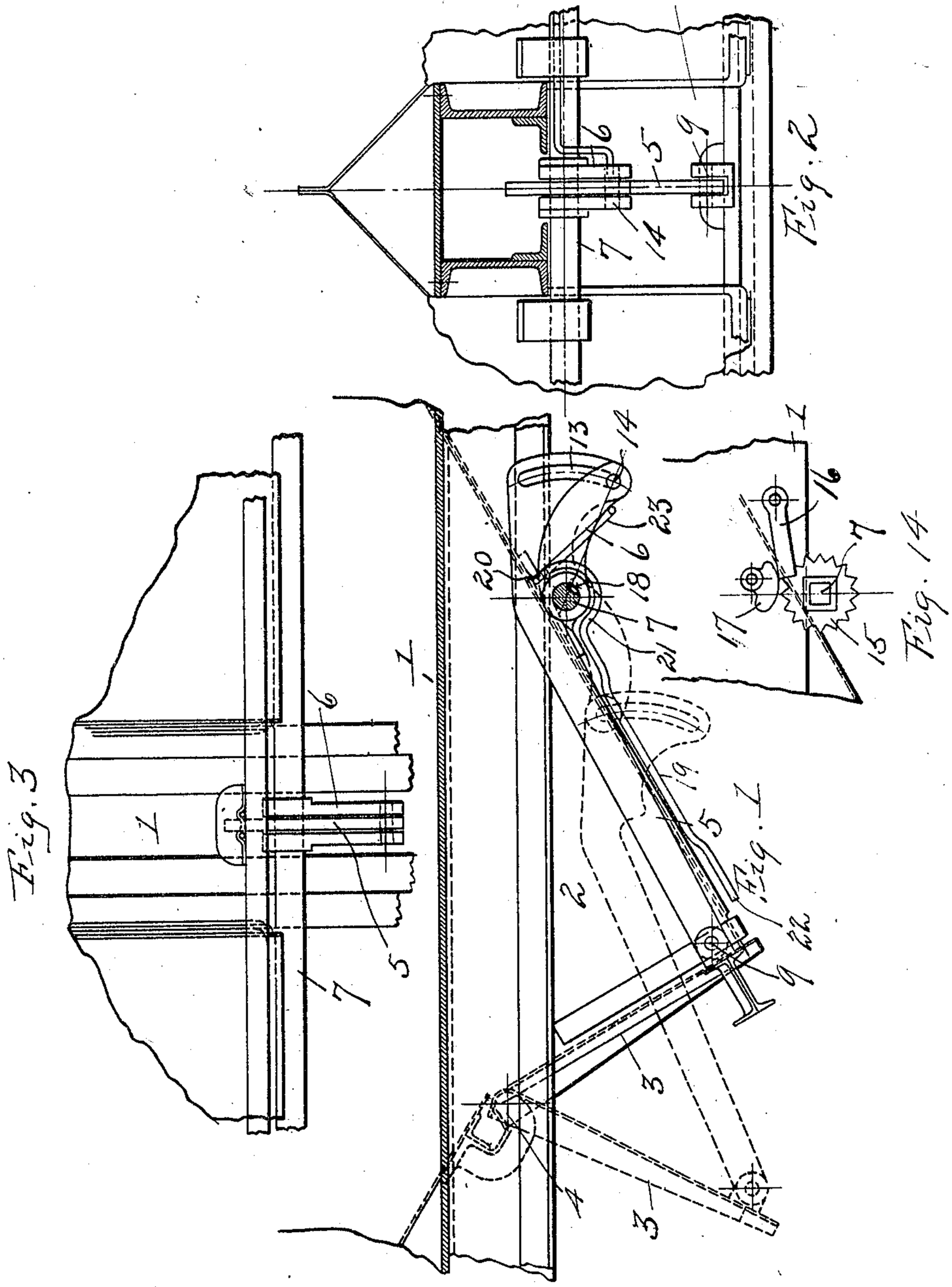
No. 837,137. PATENTED NOV. 27, 1906.

B. H. SMITH.

DOOR OPERATING MECHANISM FOR DROP BOTTOM CARS.

APPLICATION FILED SEPT. 5, 1906.

2 SHEETS—SHEET 1.



Witnesses

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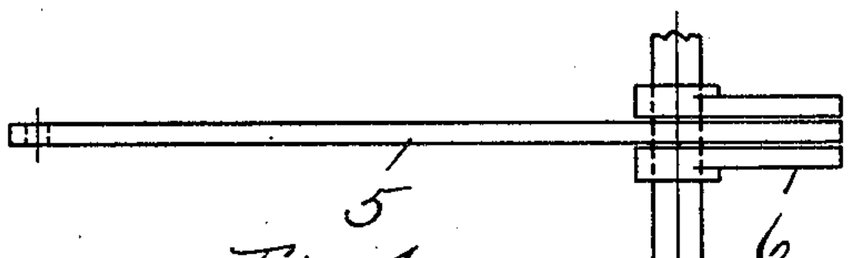

Fig. 4.

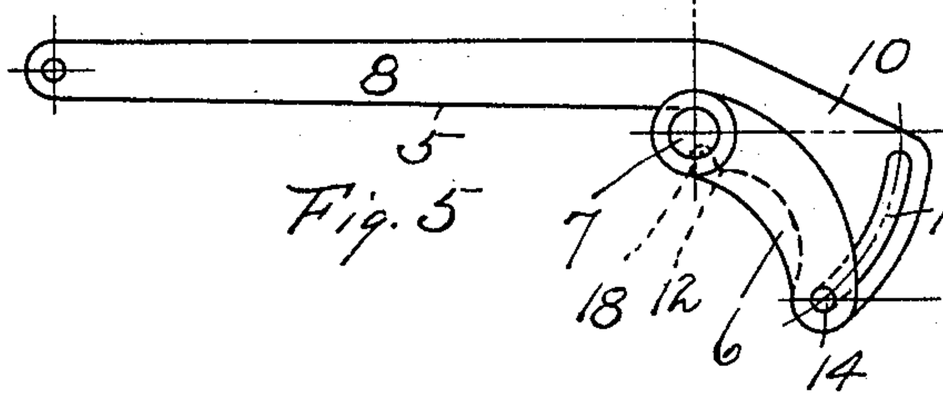

Fig. 5

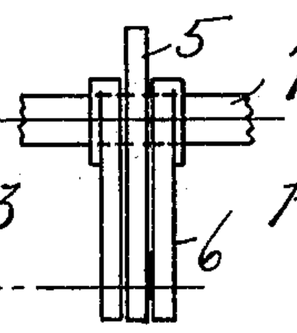

Fig. 6

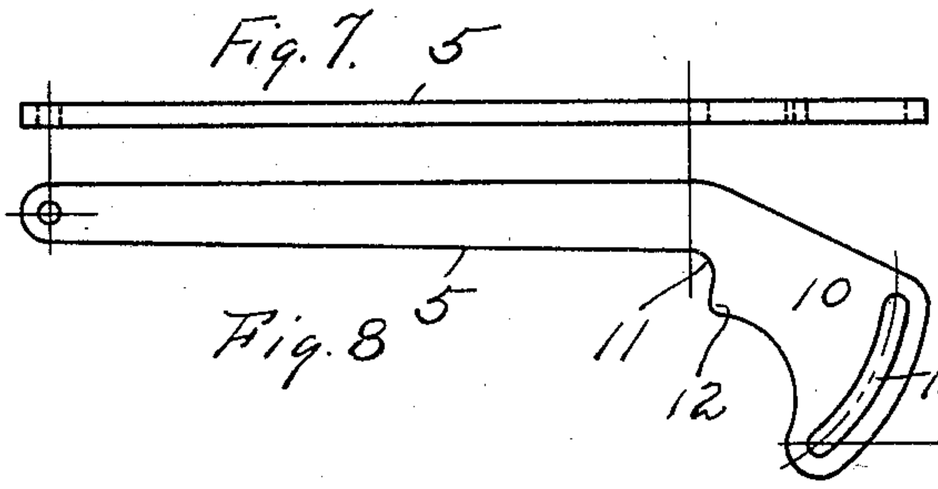

Fig. 7.

Fig. 8

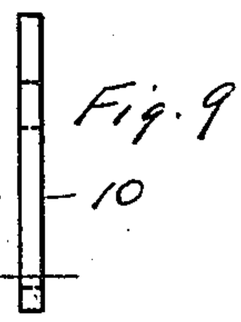

Fig. 9

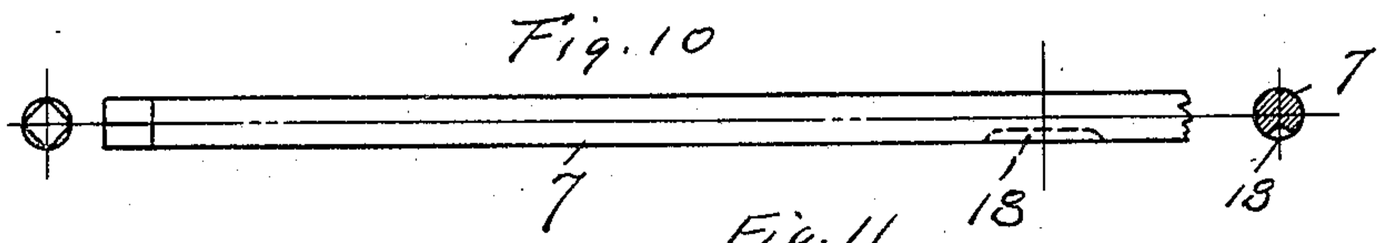

Fig. 10

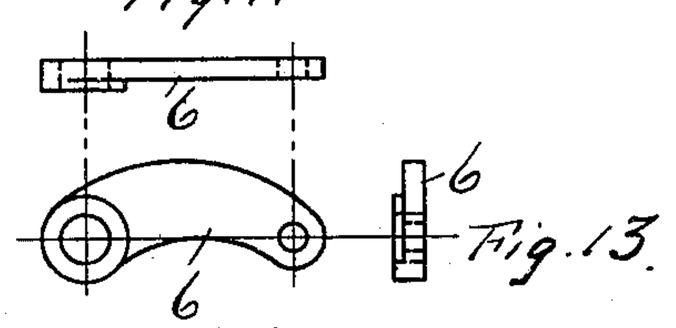

Fig. 11

Fig. 13.

Fig. 12

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UNITED STATES PATENT OFFICE.

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DOOR-OPERATING MECHANISM FOR DROP-BOTTOM CARS.

No. 837,137. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed September 5, 1906. Serial No. 333,369.

To all whom it may concern:

Be it known that I, BLANDON H. SMITH, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Door-Operating Mechanism for Drop-Bottom Cars, of which the following is a specification.

This invention relates to railway rolling-stock, and particularly to dumping-cars of the drop-bottom and hopper types.

To this end the invention contemplates a simple and practical construction of door-operating mechanism for drop-bottom cars, providing positive and reliable means for opening and closing the hopper-door and also for securely fastening the same in its closed position.

An important requirement of door-operating mechanism for drop-bottom cars is that of reliable, positive, and strong means for holding the door securely locked and positively preventing the opening thereof through accidental causes, such as vibration of the car-body while in motion. To secure this necessary result is one of the important objects of the present invention, and the construction designed possesses special utility in that connection.

A further and general object of the invention is to provide an operating mechanism embodying few parts, while at the same time having a free and easy operation in opening and closing the hopper-door.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involved in carrying out the foregoing objects are necessarily susceptible to structural change without departing from the spirit or scope of the invention; but a preferred embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a fragment of a dumping-hopper-bottom car, showing the drop-door equipped with the improved door-operating mechanism. Fig. 2 is a projected end elevation of the construction shown in Fig. 1. Fig. 3 is a detail plan view of the construction shown in Fig. 2. Figs. 4, 5, and 6 are a series of plan, side, and end elevations showing the operative relation between the camming-arm and the door-actuating link. Figs. 7, 8, and 9 are similar detail views of the door-actuating link. Fig. 10 is an elevation and projected end view of the operating--shaft. Figs. 11, 12, and 13 are a series of detail views of one of the camming-links associated with the door-actuating link. Fig. 14 is a detail elevation of the supplemental locking device, which may be associated with one end of the operating-shaft.

Like references designate corresponding parts in the several figures of the drawings.

The improved operating mechanism contemplated by the present invention is specially designed for use in connection with that type of cars termed "drop-bottom" cars, which include the class of modern-style cars termed "hopper-bottom" cars. In the application of the invention to cars of this type no change whatever is required in the car structure nor in the relation of any of the usual parts thereof, so for illustrative purposes there is shown in the drawings a fragment of the body portion 1 of a drop-bottom or hopper-bottom car provided with the usual discharging hopper or chute 2, the delivery-opening of which is designed to be covered and uncovered by the drop-door 3, hinged at its upper edge, as at 4, in the usual manner at the upper edge of the delivery-opening of the hopper or chute.

The improved door-operating mechanism associated with the car elements referred to is designed to be arranged as an entirety centrally beneath the car-bottom at one side of the plane of the discharging hopper or chute 1, and said mechanism includes in its general organization a door-actuating link 5, a camming-arm 6, and an operating-shaft 7. A distinctive feature of the invention resides in the peculiar form and relation of these several elements, and, referring to the drawings, it will be observed that the door-actuating link 5 is provided with a main straight shank

portion 8, pivotally connected at one end, as at 9, to the swinging portion of the drop-door 3 of the car-bottom. At the end opposite its pivotal connection the main shank portion of the door-actuating link is formed with an obliquely-deflected head 10, formed at one side of the angle between the same and the main shank portion with a laterally-offset supporting-shoulder 11 and at one corner of said shoulder with a projecting guard-lug 12. In addition to this element the said head 10 is provided in the wide end thereof with a transversely-disposed arcuate play-slot 13, receiving therein the adjusting-pin 14, carried by the free end of the curved camming-arm 6, mounted fast on the operating-shaft 7. In order to secure an effective action, a pair of the camming-arms 6 are preferably employed, the same being arranged, respectively, upon opposite sides of the head 10, and the operating-shaft 7, to which said arms are attached, extends transversely beneath the car-bottom and projects to the sides thereof. One end of the shaft is equipped with the usual operating-crank and the short end of the shaft may be fitted with a ratchet catch-wheel 15, adapted to be engaged by the pivotal locking-pawl 16, a point of which may be held secured in engagement with the wheel 15 through the medium of a pivotal cam-button 17, mounted in the side of the car-body.

As plainly indicated by the position of parts shown in Figs. 1 and 5 of the drawings, when the drop-door is closed the laterally-offset supporting-shoulder 11 of the door-actuating lever extends partially about and hangs directly upon the operating-shaft, thereby effectually bracing and supporting the door in its closed position. To open the door, it is simply necessary to release the supplemental locking means 15 16 17 and turn the shaft 7 in the direction which will carry the adjusting-pin 14 to the upper end of the slot 13 in the link-head, and in this movement a catch-notch 18 in the operating-shaft takes over the guard-lug 12 of the link-head, and thereby serves to check the strain imposed on the door incident to the release thereof, thereby easing up the opening of the door and preventing such a sudden opening as would tend to wrench, strain, or break the operating mechanism.

Another feature of the invention resides in the employment of an auxiliary unlocking or release device which facilitates the opening of the door and insures the safety of the operating mechanism when moved with a load upon the car. The auxiliary unlocking or release device essentially consists of a release-lever 19, pivotally hung beneath the hopper-floor by a suitable pivotal support or supports, as at 20, and arched or bent about the plane of the operating-shaft 7, as at 21, so that the long arm of the lever normally extends at an inclination following that of the hopper bottom or floor. This long arm of the lever is formed at its free end with a handle portion 22, while the short arm of the lever (designated by the number 23 and disposed at the opposite side of the pivotal point 20) is angularly bent so as to engage beneath the camming-arm 6. By reason of this construction and mounting of release-lever a slight pull upon the handle end 22 thereof will cause the short engaging arm 23 to lift the camming-arm 6 and gradually facilitate the opening of the door when the shaft 7 is turned without undue strains or shocks.

From the foregoing it is thought that the construction, action, and advantages of the herein-described mechanism will be readily apparent without further description.

I claim—

1. In a dumping-car, the combination with the car-body and the drop-door thereof, of the door-operating mechanism comprising an operating-shaft, a swinging arm carried by said shaft, a door-actuating link pivotally connected at one end with the door and at its other end having a sliding connection with the arm, said link being further provided at an intermediate point with a supporting-shoulder adapted to engage over the operating-shaft.

2. In a dumping-car, the combination with the car-body and the drop-door thereof, of the door-operating mechanism comprising an operating-shaft having a catch-notch, a swinging arm carried by the shaft and a door-actuating link pivotally connected at one end with the door and at its other end having a sliding connection with the free end of the arm, said link being further provided at an intermediate point with a guard-lug adapted to be engaged with the catch-notch of the shaft during the turning of the latter.

3. In a dumping-car, the combination with the car-body and the drop-door therefor, and the door-operating mechanism comprising an operating-shaft having a catch-notch therein, a door-actuating link pivotally connected at one end with the door and provided at its other end with a head having an arcuate slot therein, said link being further provided at an intermediate point with a supporting-shoulder engaging over the shaft and with a guard-lug adapted to be engaged by the catch-notch of the shaft, and a swinging camming-arm carried by the shaft and having an adjusting-pin working in the slot of said link-head.

4. In a dumping-car, the combination with a car-body and the drop-door thereof, of the door-operating mechanism comprising an operating-shaft, a swinging arm carried by the

shaft, a door-actuating link pivotally connected at one end with the door and at its other end having a sliding connection with the free end of the arm, and an auxiliary release-lever pivotally hung beneath the hopper-floor and having a short engaging arm arranged to engage beneath said swinging arm.

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

BLANDON H. SMITH.

Witnesses:
GILBERT L. ADAMS,
NORMAN E. GEE.