(No Model.) 3 Sheets—Sheet 1.

J. E. SIMONS.

DROP DOOR FOR CARS.

No. 553,792. Patented Jan. 28, 1896.

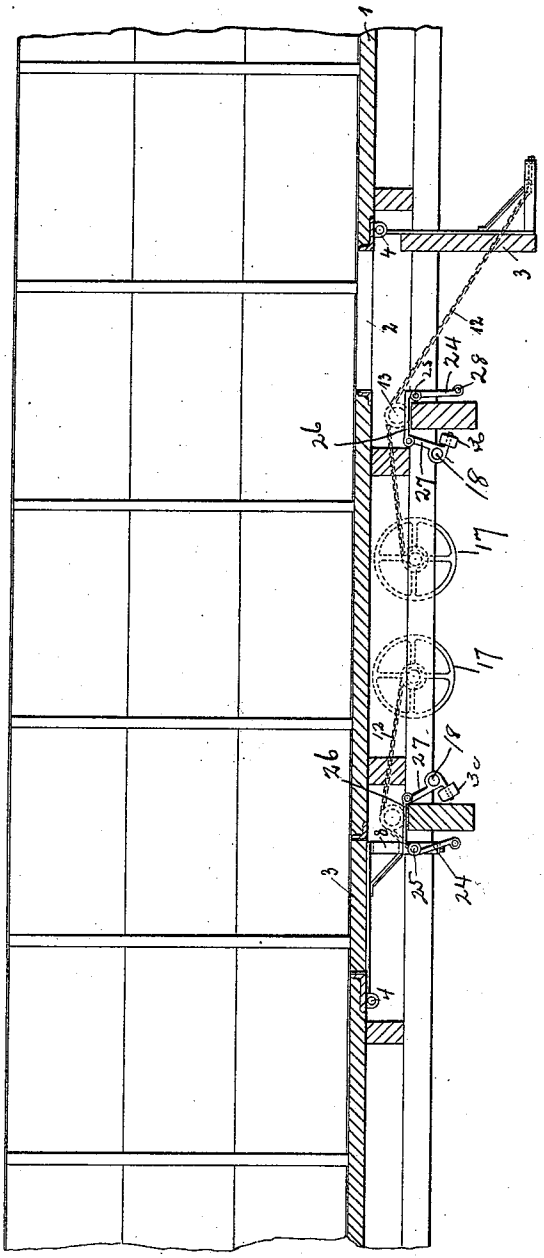

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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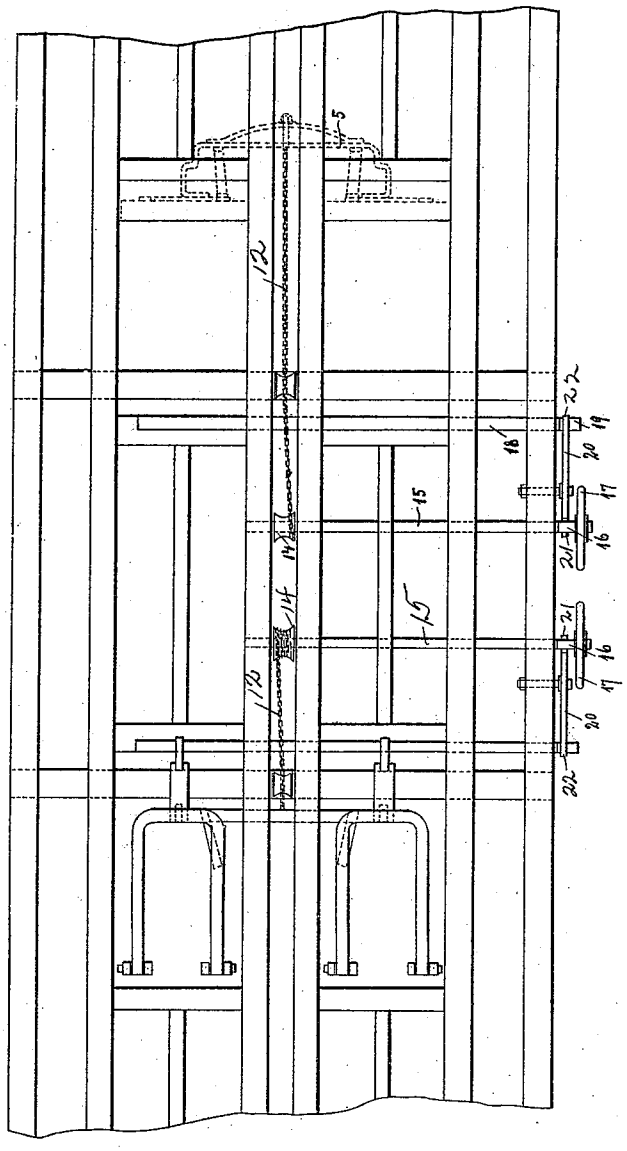

Fig. 2.

(No Model.) 3 Sheets—Sheet 3.

J. E. SIMONS.

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Fig. 3.

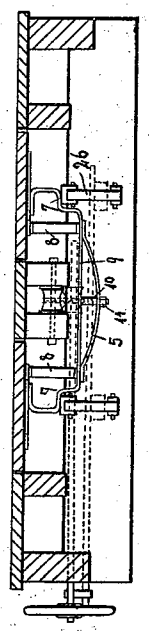


Fig. 5.

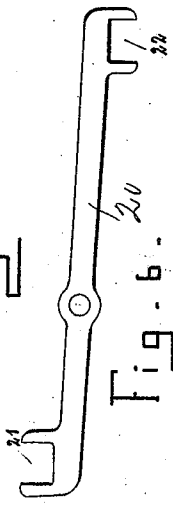


Fig. 6.

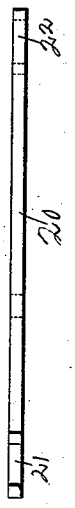
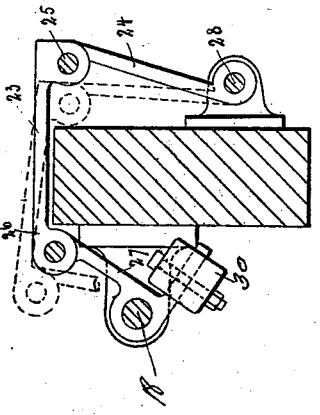


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES E. SIMONS, OF PITTSBURG, PENNSYLVANIA.

DROP-DOOR FOR CARS.

SPECIFICATION forming part of Letters Patent No. 553,792, dated January 28, 1896.

Application filed April 6, 1895. Serial No. 544,808. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. SIMONS, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Drop-Doors for Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in freight-cars, and more particularly to that class that are or may be provided with drop-doors; and the present invention should be considered as an improvement of Letters Patent granted to me February 19, 1895, No. 534,854.

The object of the invention is to provide novel means whereby drop-doors of the above-referred-to class may be raised and lowered by mechanism arranged below the floor of the car and controlled from any suitable point.

A further object of the invention is to arrange the doors so that when the latter are in a closed position they will be flush with the floor of the car; furthermore, to provide means whereby the doors are securely locked and retained in their normal position.

A further object of the invention is to provide drop-doors and mechanism for operating same which will be especially adapted to the ordinary "box" and "gondola" cars in common use which have a plain horizontal floor.

A still further object of the invention is to arrange the mechanism of the doors in such a position as to prevent the mechanism from clogging and binding; furthermore, to construct doors that will be strong, durable, comparatively inexpensive to manufacture, and effectual in their operation.

With the above and other objects in view the invention finally consists in the novel construction, combination and arrangement of parts to be hereinafter more particularly described, and specifically pointed out in the claims.

In describing the invention in detail, reference is had to the accompanying drawings, forming a part of this specification, and wherein like figures of reference indicate similar parts throughout the several views, in which—

Figure 1 is a front elevation of a freight-car partly in section provided with my improved drop-doors. Fig. 2 is a plan view of the same with the floor of the car removed. Fig. 3 is a transverse vertical sectional view. Fig. 4 is a detail view of the latch in side elevation. Fig. 5 is a detail view of the locking-arm in side elevation. Fig. 6 is a top view of the same.

In the drawings, 1 indicates the floor of the car having discharge-openings 2 2, there being preferably a pair of the said openings at or near the front and rear end of the car, each opening being closed by a single door 3, said doors being hinged at 4, each set of doors adapted to close the pair of openings at the end of the car. Each set of doors are connected by means of a frame 5, said frame acting in a double capacity—namely, connecting the set of doors and forming supports 7 7 when the doors are closed. The frame 5 is braced vertically by braces 8 8 and horizontally by a rib 9. Said rib is horizontal in form and is centrally apertured for the reception of the bolt 10, carrying a nut 11. Said bolt also extends through the frame 5 and is attached to the lifting-chain 12, passing over a pulley 13, and around a drum 14 of the winding-shaft 15, which is squared at the end, as shown at 16, a hand-wheel 17 being fixed to the shaft. An operating-rod 18 is arranged underneath the car. Said rod is also squared at its end, as shown at 19, to receive a crank-lever (not shown) by which it is operated. Between the winding-shaft and operating-rod is pivotally secured a locking-lever 20, said lever being forked at its free ends, as shown at 21 and 22, respectively, the forked end 21 extending upwardly and the end 22 extending downwardly, these forked ends being adapted to receive the square portion of the winding-shaft and operating-rod.

The operating-rod carries a latch 23 for each door. Said latch is composed of a pivoted arm 24 extending upwardly and pivotally connected at 25 to a horizontal sliding latch-plate forming a door-support 26, provided with a lever-arm 27, pivotally attached thereto. Said lever-arm is attached to the operating-rod, said lever having a weight 30 to automatically withdraw the latch. The arm 24 is pivotally secured at 28 to the front of the car, and presents an inclined face when in its normal position.

The operation of the device is as follows: For the purposes of illustration, let it be assumed that a set of doors are opened and it is desired to close the same. The hand-wheel is turned, thereby causing the lifting-chain to wind on the drum of the winding-shaft and raise the doors until the latter are flush with the floor of the car. As the door is raised in the manner above described, the door strikes the inclined face of the upwardly-extending arm, thus causing the latch-plate to retract until the door passes the same. At this point the weight arranged to the lever-arm will actuate the operating-rod and cause the latch-plate to extend out beneath the door, thereby locking it in the desired position. The *modus operandi* of the above latch is clearly illustrated in Fig. 4 of the drawings, the dotted lines showing the latch in a retracted position. The doors being closed, the upper and lower sides of the square ends of the winding-shaft and operating-rod will be level. The locking-lever will then be applied, the upwardly-extending forked end clamped over the square end of the winding-shaft, and the opposite forked end of the said lever will fit over and clamp the square end of the operating-rod. The winding-shaft and operating-rod will thus be securely locked against rotary motion.

It will be seen that the locking-lever will retain its position for the reason that the downwardly-extending forked end is heavier, the lever being pivoted a distance from the center, thereby preventing an accidental disengagement.

In order to open the doors the locking-lever is thrown out of engagement with the winding-shaft and operating-rod, a wrench or crank-handle is applied to the square end of the operating-rod, and the latter is slightly turned, thus retracting the latch and disengaging the doors from their supports and allowing the latter to swing open.

It will be seen that the locking-arm serves as a safeguard for the latch; furthermore, retains the operating-rod and winding-shaft in position, and also prevents the chain from becoming loose.

Particular attention is called to the fact that the device may be applied to end or side doors of freight-cars and the like, and that various changes may be made in the details of construction and arrangement of parts without departing from the general spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a freight-car having hinged doors flush with the floor, latches for the doors, a lifting-chain connected with the doors and a winding-shaft, a latch-lever, an operating-rod connected therewith and a locking-lever having its ends oppositely forked and so pivoted that the said ends will engage and disengage the winding-shaft and operating-rod, simultaneously, as and for the purpose described.

2. A freight-car body having hinged doors flush with the floor, a latch-lever, a weighted arm connected with the latch-lever, an operating-rod also connected with the latch-lever, a locking-lever pivoted to the frame and having oppositely-extending forks at the ends to receive the ends of the winding-shaft and operating-rod respectively, and means for releasing the said shaft and rod simultaneously, as and for the purpose described.

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

JAMES E. SIMONS.

Witnesses:
H. E. SEIBERT,
H. C. EVERT.