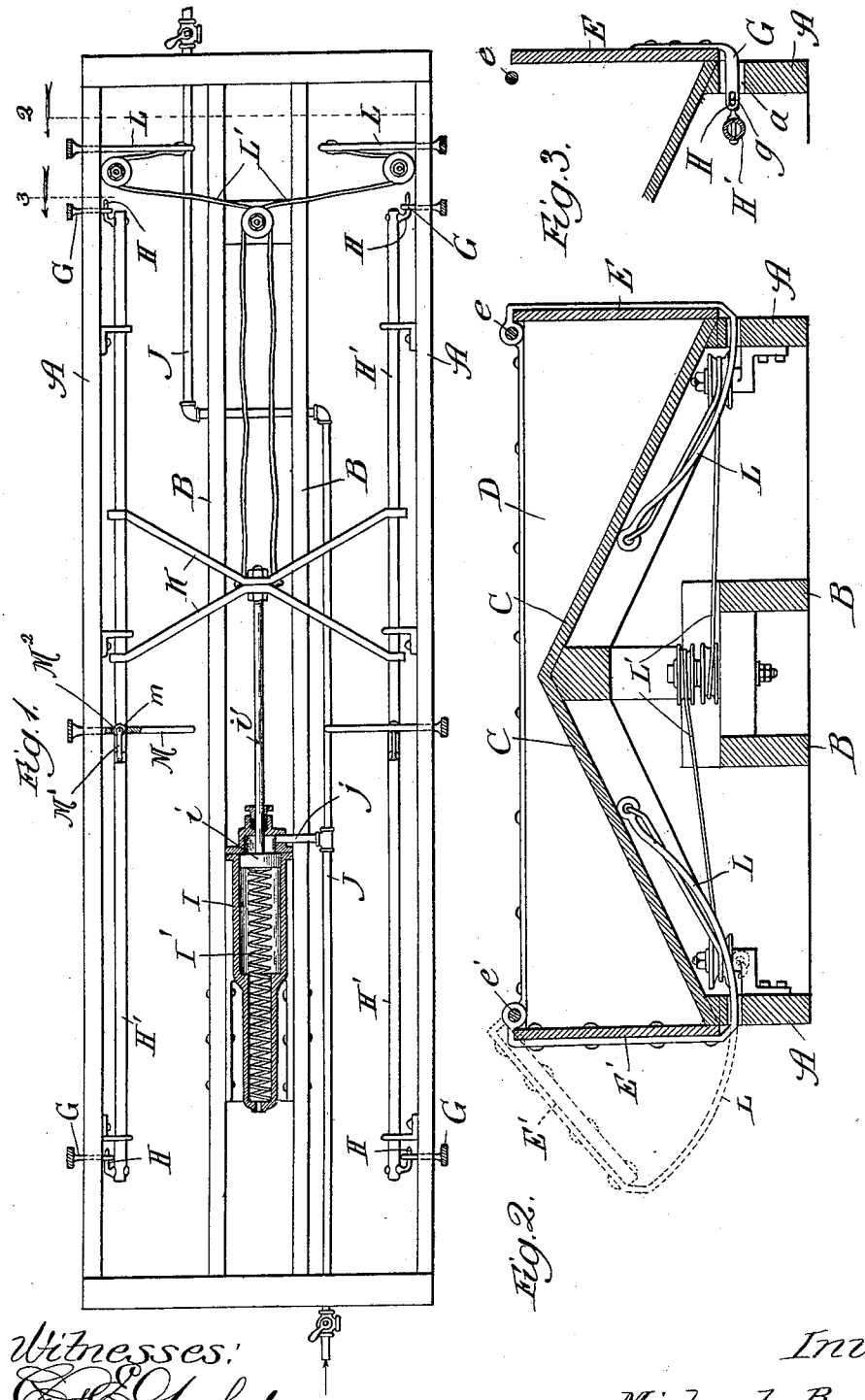
No. 626,748. Patented June 13, 1899.

M. BROSNAN.

HOPPER CAR.

(Application filed June 29, 1898.)

(No Model.)



Witnesses:
Chas. E. Gaylord.
Lutie S. Ilsley

Inventor:
Michael Brosnan.
By Banning & Banning & Sheridan,
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MICHAEL BROSNAN, OF CHICAGO, ILLINOIS.

HOPPER-CAR.

SPECIFICATION forming part of Letters Patent No. 626,748, dated June 13, 1899.

Application filed June 29, 1898. Serial No. 684,726. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL BROSNAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hopper-Cars, of which the following is a specification.

My invention relates to that class of cars which are used on railroads, tramways, and the like for the purpose of transporting sand, gravel, rock, coal, and similar materials and which are constructed so as to economically discharge the load thereon.

The invention relates particularly to the mechanism by which the load is held in the car and its discharge effected.

The object of my invention is to provide a simple, economical, and efficient hopper-car with means by which the door or doors through which the load is discharged may be automatically operated.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of a hopper-car constructed in accordance with my improvements, looking at it from the bottom; Fig. 2, a transverse sectional elevation taken on line 2 of Fig. 1; and Fig. 3, a transverse sectional elevation of a portion of the car, taken on line 3 of Fig. 1, looking in the direction of the arrow.

In the art to which this invention relates it is well known that the unloading of hopper-cars, especially long trains, is laborious and expensive, in that at least two men must be used to each car to open the doors for the purpose of discharging the load, which necessarily consumes considerable time. The principal object of my invention therefore is to remove these objections and place the unloading of the car or cars within the control of the engineer or other train-hand, so that one or all of the cars, as desired, may be unloaded at the same time automatically and efficiently, all of which will be more fully hereinafter described.

In illustrating and describing my invention I have only illustrated and will describe that which I consider to be new, taken in connection with so much that is old as is necessary to disclose the invention and enable those skilled in the art to practice the same, leaving out of consideration old and well-known methods, which, if described here, would only tend to confusion and ambiguity.

In constructing a car in accordance with my improvements I make a car-body in which the usual side sills A and center sills B may be employed upon which to build the platform and support the mechanisms. Upon these sills the inclined hopper-bottom C is arranged and longitudinally with the car, so that when cut transversely it has the appearance of a wide inverted **V**, with its apex arranged near the top and longitudinal center of the car. From the drawings it will be seen that the load, when one is contained therein, may be discharged to one or both sides of the car, in accordance with the manner in which the car is loaded.

To confine the load, I make the car in a gondola manner, with end boards D and side doors E E′. The side doors are preferably hinged to the car at the upper portion of the body on rods *e* and *e′*, so that the weight of gravity tends to close the doors and enables them to be locked and held in such position, as will be more fully hereinafter described.

In order to lock the doors in their closed position, I provide the doors with angle-irons or bars G, one or more of which may be arranged on the free lateral edge of each door, so that they may pass through openings *a* in the side sills and into the space below the bottom of the car. These angle-irons or "locking-bars," as I prefer to term them, are provided with perforations *g*, into which locking pins or bolts H on the slide-bars H′ may be passed, as shown clearly in Figs. 1 and 3, and thus hold the doors in their locked position.

In order to unlock and open the doors automatically and by the aid of a prime mover, preferably operated by fluid-pressure, which may be under the control of the engineer or other operator on the train, I provide a fluid-pressure cylinder I, in which a movable piston *i* is arranged, having its piston-rod *i′* projecting out of one end of the cylinder. This piston is supplied with fluid-pressure, either steam or air, by means of the service-pipe J, which has a branch *j* communicating with the fluid-pressure cylinder between the piston and the cylinder-head. A coil-spring I′ is inserted, preferably, in the cylinder-casing, between one end thereof and the piston, so as to normally hold the piston at one limit of motion, and thus keep the parts in their locked

position, as shown in Fig. 1. The piston-rod is connected with the slide-bars by means of the cross-bars K, so that as the piston is moved in one direction, preferably by the action of fluid-pressure, the locking mechanism is operated to unlock the door.

To open the doors of the car by the movement of the piston-rod, the doors are provided with curved bars or rods L, as shown in Fig. 2, and which project through the side sills of the car, as shown in Fig. 2, and are connected at one end by means of a cable L′ with the piston-rod, so that when the locking mechanism is released by the operations of the piston the further movement of the piston pulls the cables taut and opens the doors, thus permitting the load to be discharged automatically. From the drawings it will be seen that the cable or rope L′ is loose—that is, not taut—which arrangement permits the slide-bars to be first operated and unlock the doors, so that the continuing movement of the piston opens the doors without tending to destroy any of the parts.

As soon as the doors are opened it is unnecessary to retain the fluid-pressure in the cylinder, and in order to prevent the sliding bars from going into the locking position when the fluid-pressure is exhausted until the proper time, or, in other words, to hold them in their unlocked position until the doors are closed, the doors are preferably provided with a second set of inwardly-projecting curved bars M, so that the rolls M^2, arranged on studs or projections M′ on the sliding bars may contact these retaining-bars and hold the sliding bar in its unlocked position until the door is closed, when the rolls will enter perforations *m* in the bars and permit the door to be locked.

While I have described my invention with more or less minuteness and as being embodied in certain precise forms, I do not desire to be limited thereto unduly, or any more than is pointed out in the claims. On the contrary, I contemplate all proper changes in form, construction, and arrangement, the omission of immaterial elements, and the substitution of equivalents as circumstances may suggest or necessity render expedient.

I claim—

1. In a car of the class described, the combination of a car-body provided with an inverted-**V**-shaped bottom portion having its apex arranged lengthwise with the car, swinging doors arranged to hold the load in the car in position, means for holding and locking such doors in their closed position, a fluid-pressure cylinder arranged on the car underneath the bottom portion and adapted to be connected with a source of fluid-pressure supply, a movable piston in such cylinder connected with the locking mechanism and with the door, whereby the movements of the piston unlock and open the door, substantially as described.

2. In a car of the class described, the combination of a car-body provided with an inclined bottom portion extending longitudinally of the car so that the incline extends transversely thereof, a swinging door arranged to be closed by the aid of gravity, one or more bars or rods attached to the free lateral edge of the door and arranged to pass under the bottom of the car, bars slidingly mounted on the car and arranged to engage with the bars on the door to hold and lock the door in its closed position, a fluid-pressure cylinder arranged underneath the bottom portion of the car and adapted to be connected with a source of fluid-pressure supply, a movable piston in such cylinder connected with the sliding bars and with the door, whereby its movements operate the sliding bars to disengage the same from and open the door, substantially as described.

3. In a car of the class described, the combination of a car-body provided with an inverted-**V**-shaped bottom portion arranged longitudinally with the car, a swinging door or doors on each side of the car arranged to be closed by the aid of gravity and hold a load in position, one or more rods or bars connected with the free lateral edges of the doors and arranged to pass under the bottom portion of the car, at least one bar on each side having a perforation therein, a sliding bar provided with projections arranged to engage the perforation in the bar or bars on the door and hold and lock the same in its closed position, a fluid-pressure cylinder arranged underneath the bottom portion of the car and adapted to be connected with a source of fluid-pressure supply, a movable piston in such cylinder connected with the sliding bar and with the door, whereby its operations unlock and open the door, substantially as described.

4. In a car of the class described, the combination of a car-body provided with an inverted-**V**-shaped bottom portion extending longitudinally with the car, a swinging door or doors on each side of the car arranged to be closed by the aid of gravity and hold the load in position, one or more bars or rods attached to the free lateral edge of the door and arranged to pass under the bottom of the car, at least one of such bars having a perforation therein, a sliding bar at each side of the car arranged to engage the perforation and lock the door in its closed position, a projection on each slide-bar adapted to engage with one of the door-bars to hold the slide-bars in their unlocked position, a fluid-pressure cylinder arranged underneath the bottom of the car and adapted to be connected with a source of fluid-supply, a movable cylinder in such piston provided with a projecting piston-rod, and means connecting the piston-rod with the sliding bar or bars and with the door, whereby the operations of the piston unlock and open the door, substantially as described.

MICHAEL BROSNAN.

Witnesses:
THOMAS F. SHERIDAN,
J. G. BROSNAN.