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Patented Dec. 27, 1898.

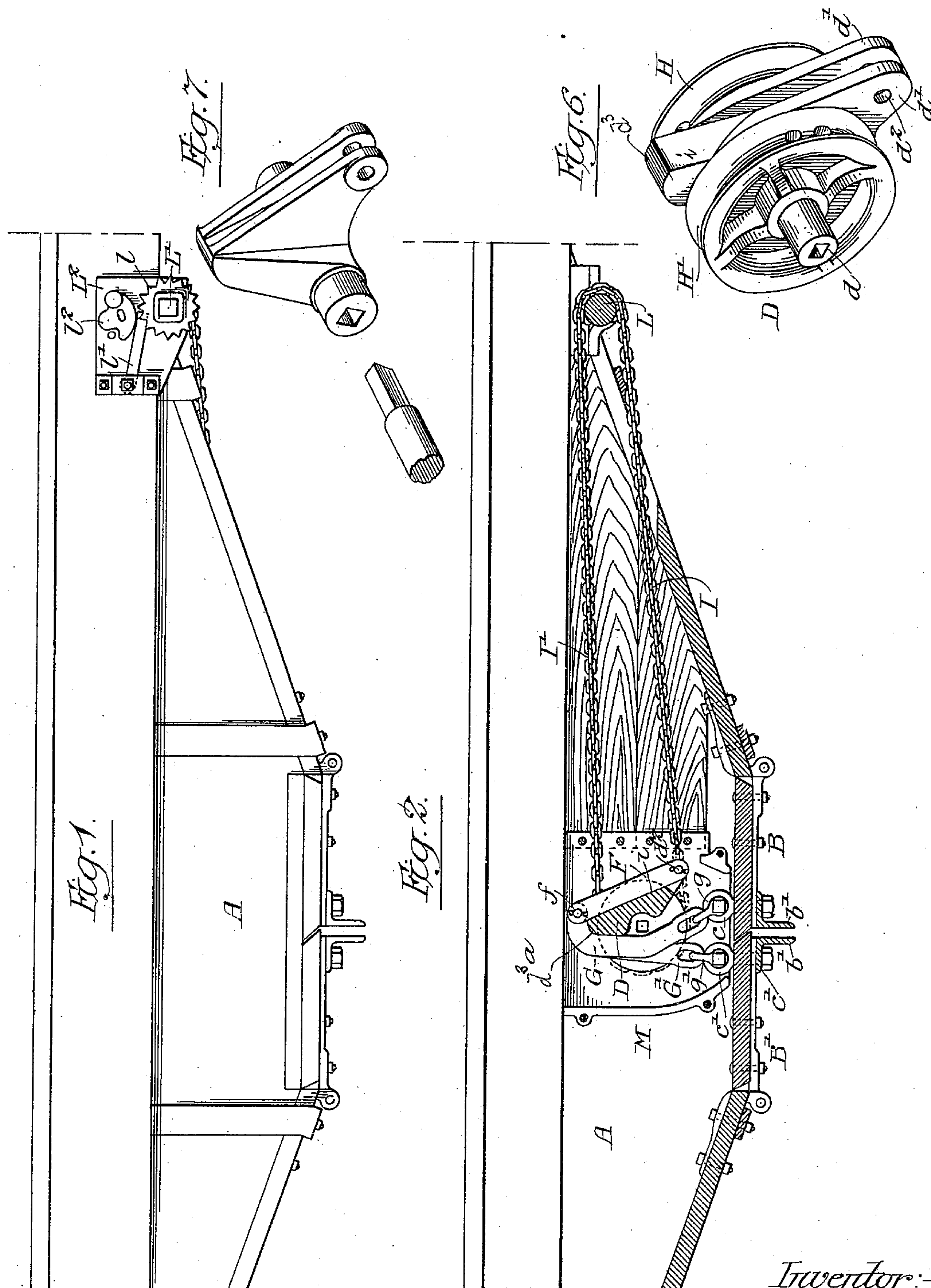
J. SIMONTON.

MECHANISM FOR OPERATING DOORS OF HOPPER BOTTOM CARS.

(Application filed June 8, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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Inventor:
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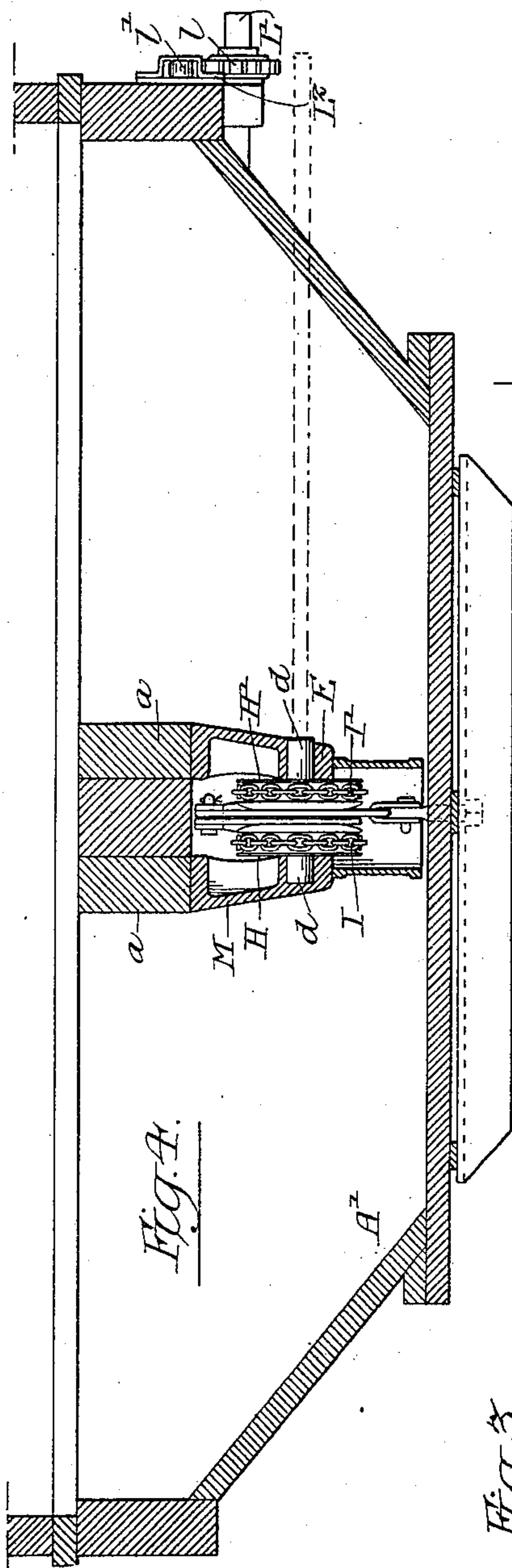


Fig. 4.

Fig. 5.

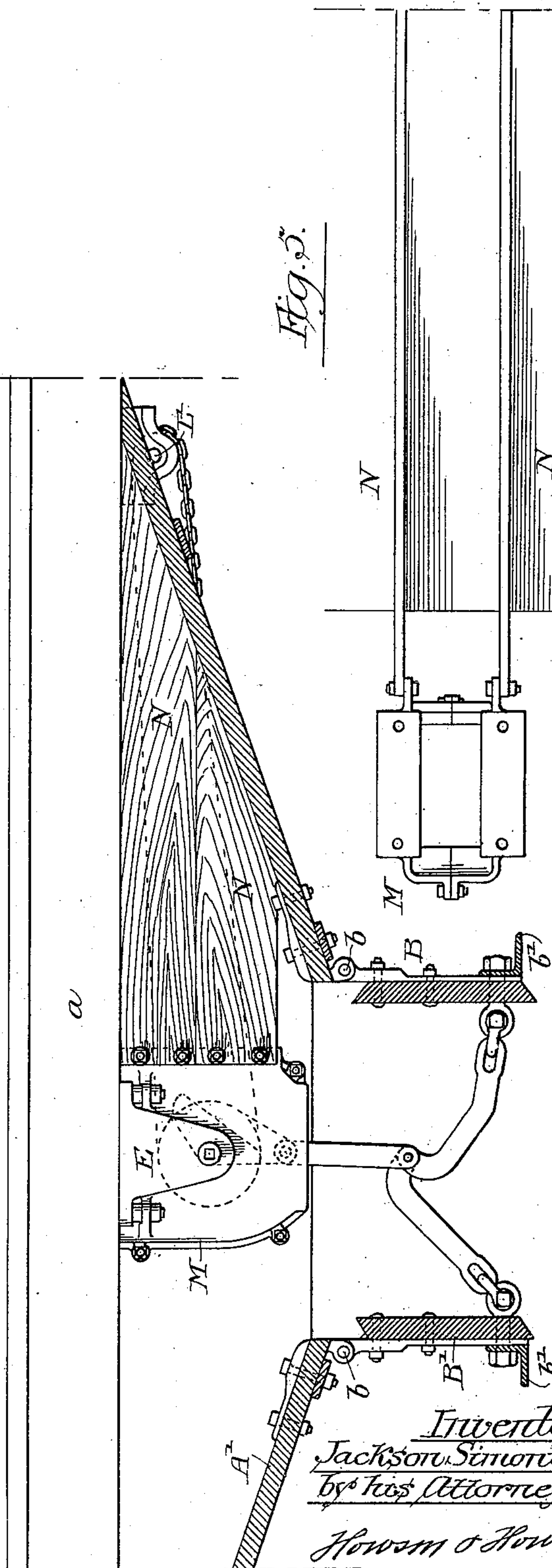


Fig. 5.

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UNITED STATES PATENT OFFICE.

JACKSON SIMONTON, OF ALTOONA, PENNSYLVANIA.

MECHANISM FOR OPERATING DOORS OF HOPPER-BOTTOM CARS.

SPECIFICATION forming part of Letters Patent No. 616,811, dated December 27, 1898.

Application filed June 8, 1898. Serial No. 682,877. (No model.)

To all whom it may concern:

Be it known that I, JACKSON SIMONTON, a citizen of the United States, and a resident of Altoona, Pennsylvania, have invented certain Improvements in Mechanism for Operating the Doors of Hopper-Bottom Cars, of which the following is a specification.

My invention relates to certain improvements in hopper-bottom railway-cars having pivoted doors.

One object of my invention is to protect the operating mechanism from the load of coal or other material within the car, and a further object is to so arrange the mechanism that the doors will be positively opened and positively closed, so that the load of material, even if it is frozen in winter, will not prevent the operation of the mechanism. It will be noticed that the mechanism is entirely below the longitudinal sills and is protected to some extent by these sills as well as the inclosing casing.

In the accompanying drawings, Figure 1 is a side view of sufficient of a hopper-bottom car to illustrate my invention. Fig. 2 is a longitudinal sectional view showing the doors closed. Fig. 3 is a longitudinal sectional view showing the doors opened. Fig. 4 is a transverse sectional view. Fig. 5 is a plan view of the inclosing casing. Fig. 6 is a perspective view of the operating-wheel, and Fig. 7 is a view of a modification used when the chain and chain-wheels are dispensed with.

A is the frame of an ordinary hopper-bottom car provided with longitudinal sills *a a*, Figs. 2 and 4. The inclined bottom section *A'* has doors *B B'*, hinged at *b b* at each side. These doors when closed assume the position shown in Fig. 2 and when open assume the position shown in Fig. 3. The doors are formed so that one will overlap the other, and at the edge of each door are angle stiffening-bars *b'*.

D is a lever, and when in the form shown in Figs. 2 and 6 it is what may be termed a "combined sheave-lever." This lever has trunnions *d d*, mounted in bearings E, hung from the longitudinal sills *a a*. The lever has a movement on its trunnions from the position shown in full lines in Fig. 2 to the position shown in dotted lines in Fig. 3. The

lever has two arms *d'* in the present instance and an abutment *d³*. To the arms is pivoted a link F at *d²*, and connected to this link at *f* are two connecting-bars G G', hooked at their upper ends, so as to pass over the abutment *d³*. The bar G is connected to an eyebolt *c* on the door B by a short link *g*, and the bar G' is connected to an eyebolt *c'* on the door B' by a short link *g'*, so that while the doors have freedom to swing on their pivots they are positively opened or closed by the action of the mechanism above described.

It will be noticed on referring to Fig. 2 that the lever D has a plain surface *i*, against which the link F rests when the doors are in a closed position, so that when the lever is moved to the position shown in Fig. 2 it throws the point *f* where the link is connected to the connecting-bars above the fulcrum of the lever and to one side of the center, so that the hooked portion of the bars will rest on the abutment *d³*. Thus the weight of the doors and the load is taken not solely by the pins, but directly by the lever holding the doors rigidly against the pressure; but when the lever is turned to the position shown in Fig. 3 the link and the connecting-bars are suspended from the lever, and the coupling is such that the two doors are forced open and held in the open position by the connecting-bars; but on simply turning the lever the doors are quickly brought up into the closed position.

In order to operate the lever from one end, I construct it in the manner shown in Fig. 6 by providing it with two sheave-wheels H H' and to which are adapted two chains I I'. One of these chains is adapted to one wheel, and the other chain is adapted to the other wheel. Both chains are fastened to their respective wheels, one running over the top of one sheave and the other passing around under the other sheave. Both of these chains are fastened to a worm-wheel L, mounted on a shaft L', extending to one side of the car and provided with a ratchet-wheel *l*, which is engaged by a pawl *l'*, hung to a plate L² on the side of the car. The shaft has a head to which is adapted any suitable crank by which the shaft can be turned. The pawl may be locked in this position by an ordinary locking-lever *l²*. By turning the shaft L' in one

direction the lower chain turns the lever D and opens the doors through the medium of the connecting mechanism, and by turning the shaft L' in the opposite direction the upper chain draws the doors closed.

I make the trunnions of the lever preferably hollow and shaped so as to be adapted to receive a shaft. When the shaft is in place, the lever D can be turned directly by the shaft. This construction may be used in the case of emergency if the chain mechanism should get out of order or where it is impossible to use the chain and the connecting mechanism. In some classes of cars, however—such, for instance, as freight-cars—it is not desirable to use the chain and the operating-shaft. In this event I prefer to make the lever as shown in Fig. 7, dispensing with the chain-sheaves and operate it directly by a shaft on which the lever is mounted.

In order to protect the above-described mechanism from the coal or other material carried by the car, I inclose the lever, links, and connecting-bars by a casing M, which is made in two halves, as shown in Fig. 5, and bolted together and having lugs at each side secured to the bearings E, and secured to flanges on one edge of the casing M are planks N N, which extend from the under side of the longitudinal sills *a a* to the inclined bed of the car, so as to completely inclose the chain, as well as the other operating mechanism, and protect it from the material carried.

It will be noticed that the chain-worm L and its shaft are outside of the hopper and are therefore easily accessible.

It will be seen by the above description that when the doors are closed and the car is in transit the whole strain on the doors due to the load is transmitted through the connecting-bars G G' to the abutment *d*³ of the lever D, on which they then hang, the link merely keeping the bars against the lever. In this condition the fulcrum *f* stands almost directly above the trunnions of the lever and the weight is transferred through them to the frame of the car.

It will be noticed that I can adjust the eye-bolts *c c'* so as to take up any lost motion or allow for any warping, and it will be understood that while I have shown the two doors operated by the mechanism one door may be operated by simply dispensing with one of the connecting-bars.

This mechanism can be used not only in connection with railway rolling-stock, but in stationary hoppers for material, such as coal, where it is desirable to positively open and close the door or doors.

I claim as my invention—

1. The combination of a hopper, a pivoted door, a lever having an arm and an abutment, a connecting-bar attached to the door, a link pivoted to the bar and to the arm of the lever, the whole being so arranged that the lever will support the door, when closed, directly through the bar, substantially as described.

2. The combination of a hopper, a pivoted door, a lever having an arm and an abutment, a connecting-bar having a hooked upper end and connected at its lower end to the door, a link connecting the hooked end of the bar to the arm of the lever, the parts being so arranged that the hooked portion of the bar will rest above the abutment when the door is closed, substantially as described.

3. The combination of a hopper, doors, bars connected thereto, a link having one end attached to the bars, and a lever to which the other end of the link is attached, said lever having an abutment against which the bars rest when the doors are closed, so that the lever takes the strain on the doors, due to the load, direct from the bars, substantially as described.

4. The combination of a hopper, hinged doors, a lever, a link connected to the lever and bars connected to the link and to the doors, the pivot of the lever being in such relation to the doors that when the doors are closed the connection between the link and bars is above the lever-pivot, and when the doors are open the connection is below the pivot, substantially as described.

5. The combination of a hopper, doors therefor, a lever, an arm, and an abutment thereon, said lever having a plain surface between the arm and the abutment, a link pivoted to the arm and adapted to rest against the plain surface when the doors are closed, bars connected to the link and to the doors, substantially as described.

6. The combination in a dumping-car, of the two pivoted doors, a lever having sheaves at each side, a link attached to the lever, two bars connected to the link, one bar being connected to one door and the other bar being connected to the other door, with two chains one adapted to pass over the top of one sheave and the other adapted to pass under the other sheave, both chains connected to their respective sheaves, with means for operating the sheaves so as to open and close the doors, substantially as described.

7. The combination in a hopper-bottom car, of the two pivoted doors, a lever having trunnions, bearings hung from the sills of the car, said lever having a central flat surface and arms, two sheaves, one at each side of the central flat portion, operating chains or ropes adapted to the sheaves, a link pivoted to the arms of the lever and adapted to rest against the flat surface of the said lever, bars pivoted to the link one of said bars being connected to one door and the other being connected to the other door, substantially as described.

8. The combination of a lever having two sheaves, arms having a flat surface between the sheaves, two doors, a link connected to the arms and resting against the flat portion thereof and bars connected to the link, one of said bars being connected to one door and the other being connected to the other door, an operating-shaft, a worm-wheel thereon,

and two chains adapted to the worm-wheel, one chain extending over and secured to one sheave of the lever and the other chain passing under and secured to the other sheave of the lever, substantially as described.

9. The combination in a hopper-bottom car, of the central sills, the inclined hopper-bottom, pivoted doors, a lever, links and bars connecting the lever to the doors, an operating chain or rope extending from the lever to an operating-shaft, an inclosing casing secured under the central sills and inclosing the

lever and its connecting-link, and planks extending from said inclosing casing under the sills and inclosing the operating chain or rope, substantially as set forth. 15

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACKSON SIMONTON.

Witnesses:

NATHANIEL L. BAKER,
ARNOLD STUCKI.