

S. OTIS.

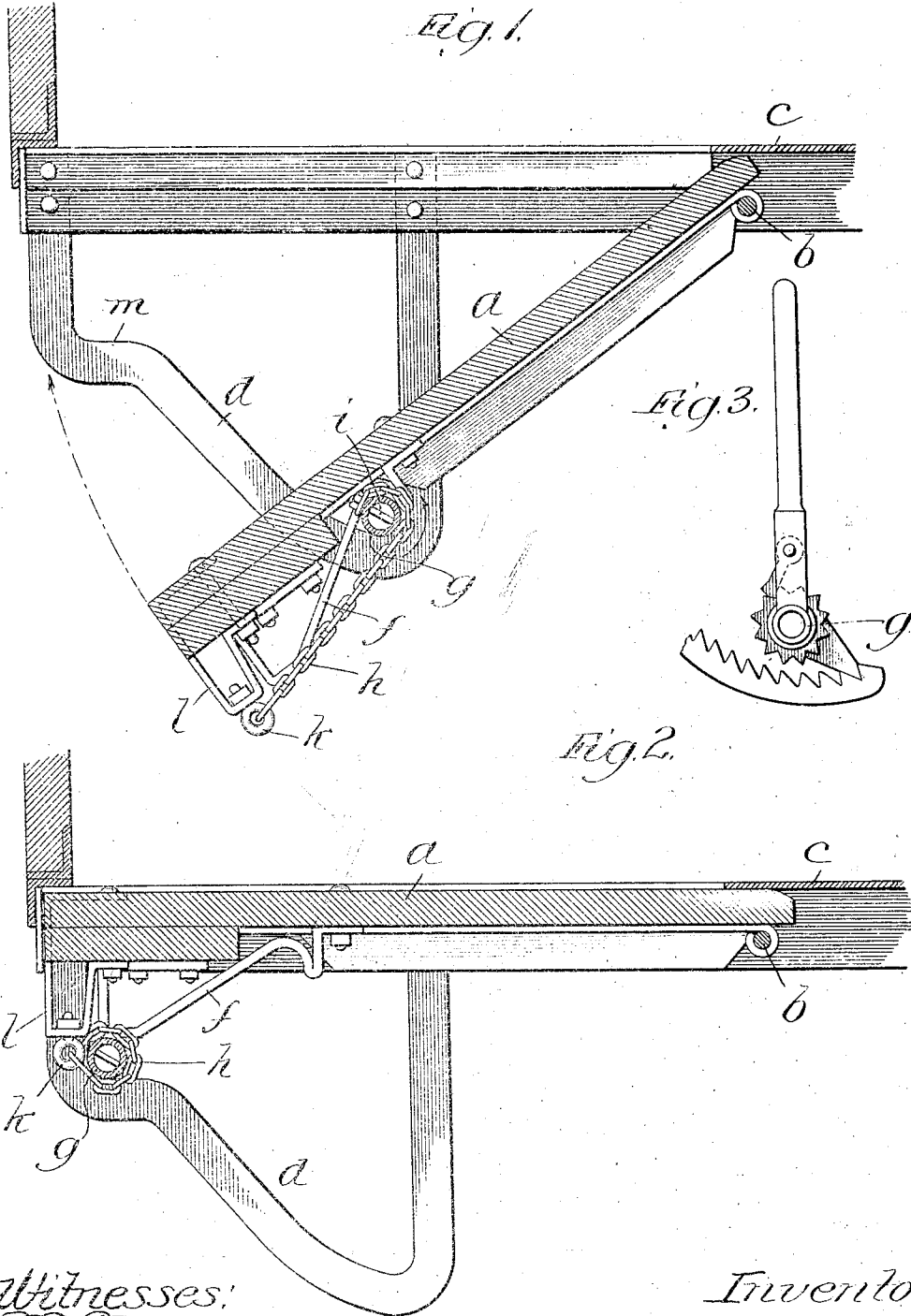
DOOR OPERATING MECHANISM FOR DUMP CARS.

APPLICATION FILED MAR. 11, 1907. RENEWED SEPT. 29, 1908.

939,298.

Patented Nov. 9, 1909.

2 SHEETS—SHEET 1.



Witnesses:

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Inventor:

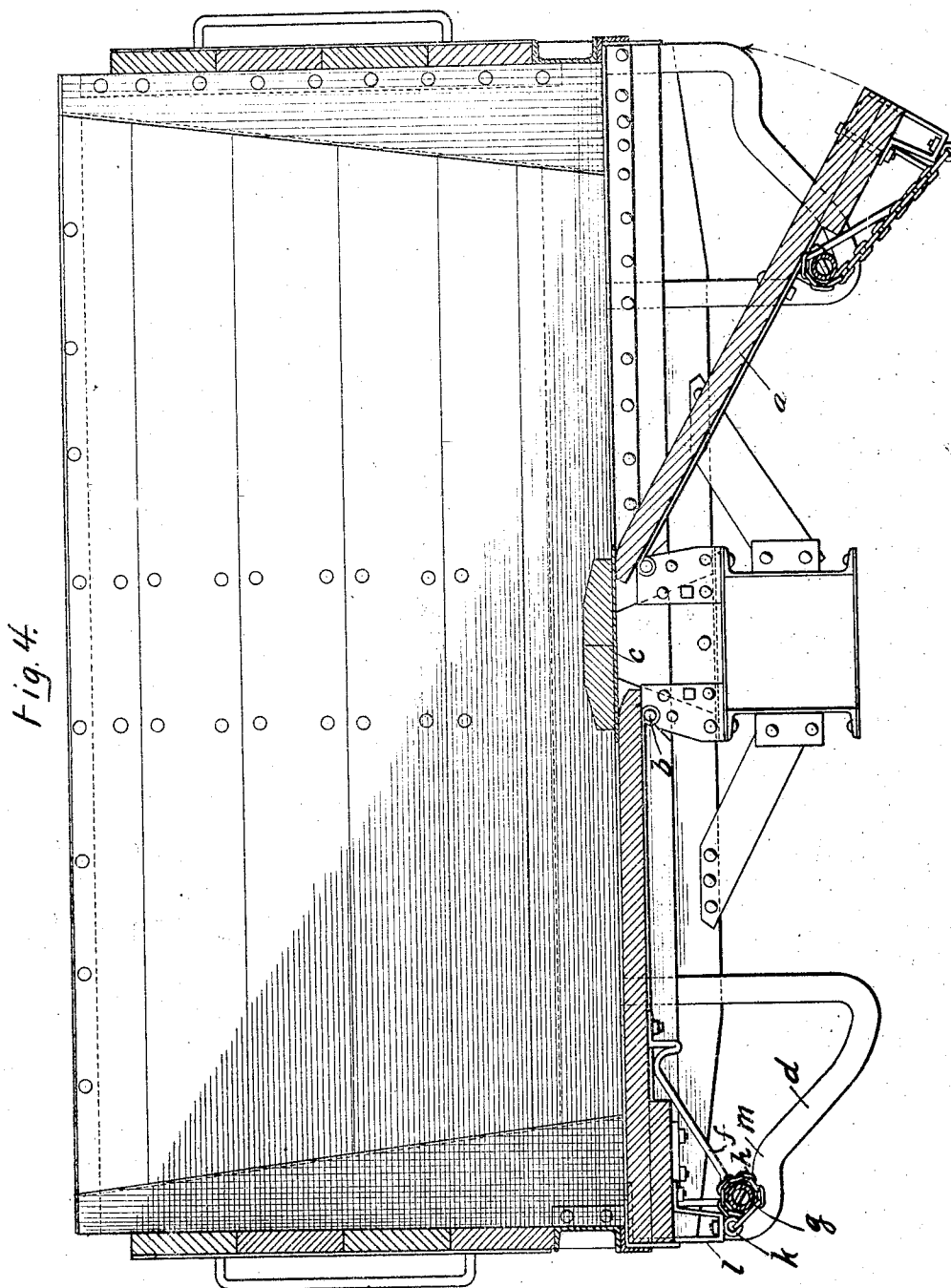
Spencer Otis,

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WITNESSES:

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DOOR-OPERATING MECHANISM FOR DUMP-CARS.

939,295.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed March 11, 1907, Serial No. 361,703. Renewed September 29, 1908. Serial No. 425,302.

To all whom it may concern:

Be it known that I, SPENCER OTIS, 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 Door-Operating Mechanism for Dump-Cars, of which the following is a specification.

The object of my invention is to provide new and improved means for operating the drop doors of dump cars.

The precise nature of my invention will be clearly apparent from the following description and claims, taken in connection with the drawing forming part of this application.

In the accompanying drawings—Figure 1 is a cross sectional view, showing a single dump door and its operating mechanism, the door being in open position. Fig. 2 is a view similar to Fig. 1, but showing the door closed. Fig. 3 is a detail of means for rotating the shaft. Fig. 4 is a transverse section of a car having my invention applied thereto.

My invention is applied to that class of cars in which dump doors hinged at or adjacent the longitudinal median line of the car are supported and operated from closed to open position and vice versa by means of a displaceable shaft or longitudinal sill. This shaft rests upon inclined tracks beneath the floor level, and occupies a position between said tracks and the hinged floor sections or dump doors. Preferably, the lower sides of the doors are also provided with cooperating inclined tracks. The shaft or displaceable sill, being located between the inclined tracks on the doors and those fixed to the car underframe, operates when moved from the center toward the side of the car to raise the doors, and when moved in the opposite direction permits the doors to drop to open position.

My invention pertains to the means for imparting the outward and inward movement to the shaft or movable sill.

With the exception of the door operating mechanism, the structure illustrated in the drawings is similar to that already in use. The hinged floor section or dump door *a* is hinged near the center of the car at *b*, *c*, representing a longitudinal floor plate. The usual inclined track *d* is provided at each edge of each door, these tracks being se-

cured at their upper part to the transverse members *e* of the car frame. Upon the lower side of the door I also provide an inclined track *f*. Co-acting with the tracks *d* and *f* is a reciprocating shaft *g*. It will be apparent that if the shaft *g* is moved outwardly it will travel upwardly upon the track *d* and elevate the door, the movement imparted to the door being increased by the inclination of the track *f*. In some forms of car heretofore in use the reciprocating movement has been imparted to the shaft *g* by mounting thereon spur gears which mesh with rack teeth upon the stationary track member *d*. In other forms of cars the reciprocating movement is imparted to the shaft *g* by a crank arm, and in still other forms a chain fixed at one end to a stationary part of the car and at the other end to the shaft *g* imparts the desired movement to the shaft when the latter is rotated. In all of the above described forms the means for reciprocating the shaft acts between the movable shaft and a fixed part of the car. In my improved operating device, however, the chain *h* is not attached at any point to a fixed part of the car, one end being secured to the shaft *g* and the other end to the door, preferably to the under side of the door adjacent its outer edge. In the construction illustrated, the chain is connected to the shaft by means of a bolt *i* and to the door by means of an eye-bolt *k*, secured to the downwardly projecting reinforcing strip *l* upon the outer edge of the door.

Suitable means of any of the forms now in use are provided for rotating the shaft *g*. It will be seen that if the shaft *g* be rotated in a direction to wind the chain thereon, said shaft will be caused to travel outward and upward along the track *d* from the position shown in Fig. 1, where it rests at the bottom of said track, to the position shown in Fig. 2, where it rests upon the horizontal portion *m* of said track.

It is apparent that my invention is not limited to the precise structure above described and illustrated in the drawings, but embraces broadly the idea of reciprocating a door operating shaft by means operating between said shaft and the door, and having no connection to a fixed part of the car.

What I claim is:

1. In a dump car, a door, an operating shaft adapted to support the door at all

times, means to rotate said shaft, and means cooperating with said shaft and with the door to cause the said shaft to reciprocate bodily when rotated.

5 2. In a dump car, a door, an operating shaft adapted to support the door at all times, means to rotate said shaft, and a flexible member connected to said shaft and to the door, whereby when the shaft is rotated
10 the flexible member winds thereon and imparts bodily movement thereto.

3. In a dump car, a door, an operating shaft adapted to support the door at all times, means to rotate said shaft, and a
15 chain connected to said shaft and to the door, whereby when the shaft is rotated the chain winds thereon and imparts bodily movement thereto.

4. In a dump car, a door, an operating shaft adapted to support the door at all times, a support for said shaft, and means
20 cooperating with said shaft and with the door to cause said shaft to reciprocate bodily on said support when rotated.

5. In a dump car, a door, an operating shaft adapted to support the door at all times, an inclined support for said shaft, and means cooperating with said shaft and with
25 the door to cause said shaft to reciprocate bodily on said support when rotated.

6. In a dump car, a door, an inclined support, a shaft cooperating at all times with said door and said support, and means operatively connected to said door and said shaft,
30 whereby when said shaft is rotated it is caused to reciprocate bodily on said support.

7. In a dump car, a door having an inclined track on the under side thereof, an inclined support secured to the car frame, a
40 shaft cooperating with said track and said support, and means operatively connected to said door and said shaft, whereby when the shaft is rotated it is caused to reciprocate bodily on said support.

8. In a dump car, a hinged door, an inclined track beneath the floor level of said car, a shaft between said track and door, said shaft being movable along said track to
45 open and close said door, means for rotating said shaft, and a chain connected at its ends to said shaft and door respectively.

9. In a dump car, a hinged floor section, a track beneath the floor level, said track sloping downwardly toward the hinged side
50 of said door, a rotatable and bodily movable shaft between said track and door, means for rotating said shaft, and a chain secured at its ends to said shaft and to said door ad-

jacent its free edge respectively, whereby the rotation of the shaft causes the chain to
60 wind thereon and to move said shaft up the inclined track to close the door.

10. In a dump car, a hinged dump door, an inclined track beneath said door and extending downwardly from the free edge of
65 said door, a supporting shaft between said track and door and movable along said track to govern the position of said door, a chain attached at one end to said shaft and at the other end to said door adjacent its free edge,
70 and means for rotating said shaft.

11. In a dump car, a hinged dump door, an inclined track beneath said door and extending downwardly from the free edge of
75 said door, a supporting shaft between said track and door and movable along said track to govern the position of said door, a projection extending downwardly from the free edge of said door, a chain attached at its
80 ends to said shaft and projection respectively, and means for rotating said shaft.

12. In a dump car, a hinged dump door, an inclined track fixed to the under side of said door, an oppositely inclined track
85 fixed to the car underframe, a sill movable transversely of the car, said sill resting upon the fixed track, and in its outward movement having a wedging action between said tracks, whereby the door is moved from its
90 extreme open to its closed position, a chain fixed at its ends to said shaft and door respectively, and means for rotating said shaft.

13. In a dump car, a hinged floor section, an inwardly and downwardly inclined track
95 secured to the car underframe beneath the floor, a movable shaft or sill supported on said track and adapted to reciprocate transversely of the car to operate the door between its extreme open and closed positions,
100 a chain secured at one end adjacent the outer edge of the door and at the other end to the shaft, and means to rotate said shaft, the winding and unwinding of the chain on the shaft respectively causing and permitting
105 said shaft to roll on the track, and the length of the chain being so proportioned that when the shaft is in its extreme inner and lower position the chain will be partially wound on said shaft, the chain leaving the shaft at
110 the lower side thereof.

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Witnesses:

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