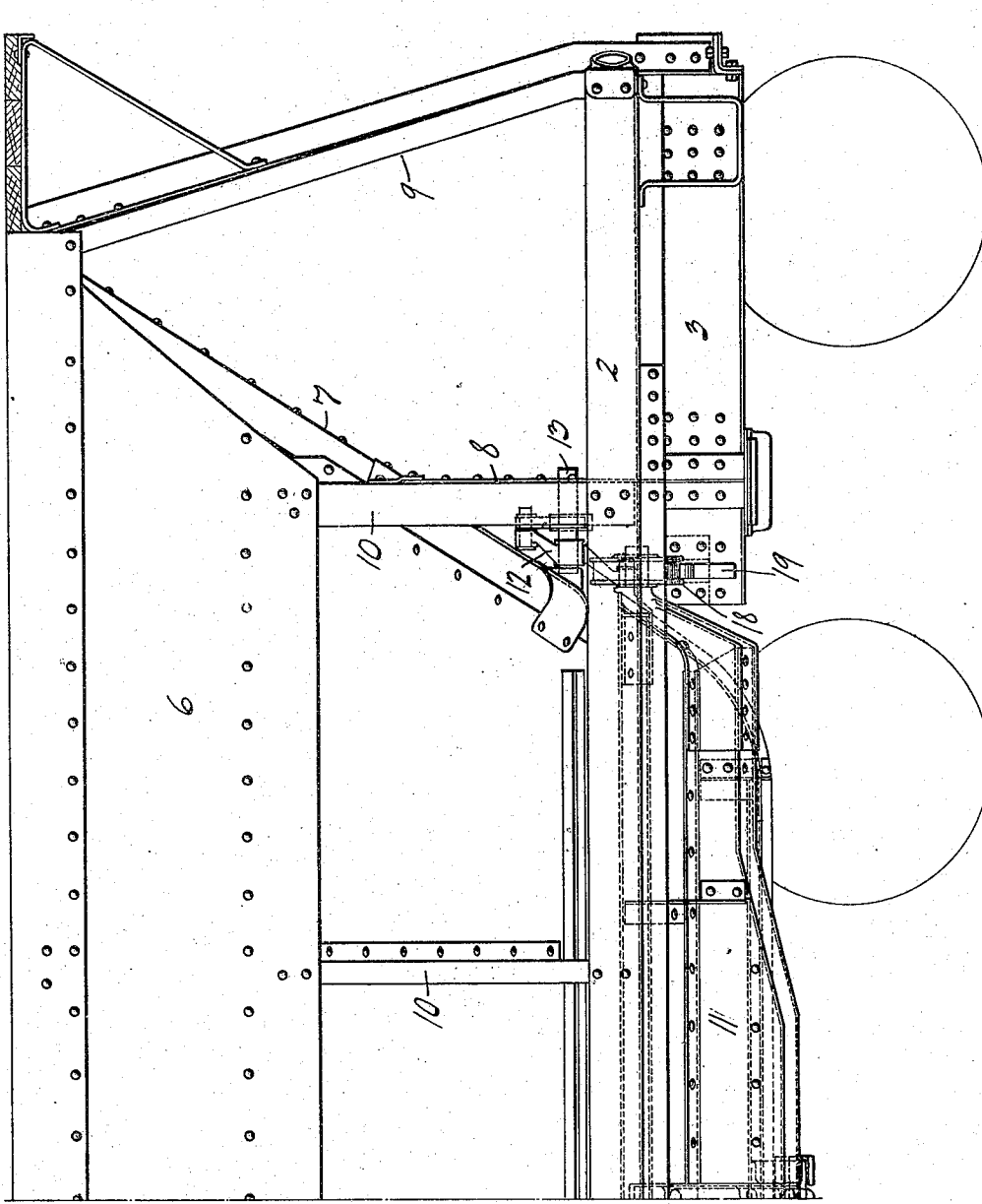


939,588.



WITNESSES

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Fig. 1.

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DUMP CAR.

APPLICATION FILED JUNE 24, 1909.

Patented Nov. 9, 1909.

6 SHEETS—SHEET 2.

939,588.

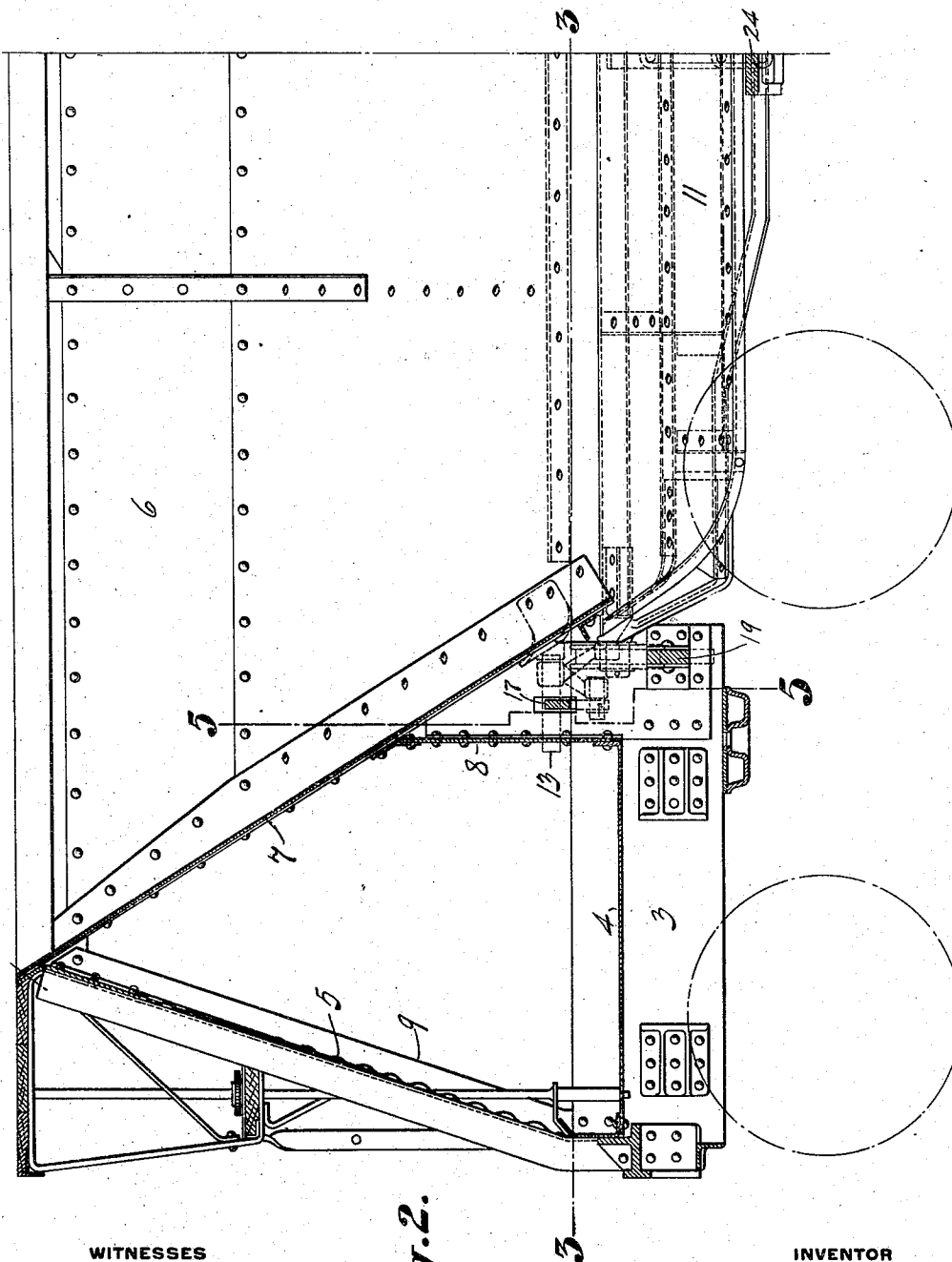


Fig. 2.

WITNESSES

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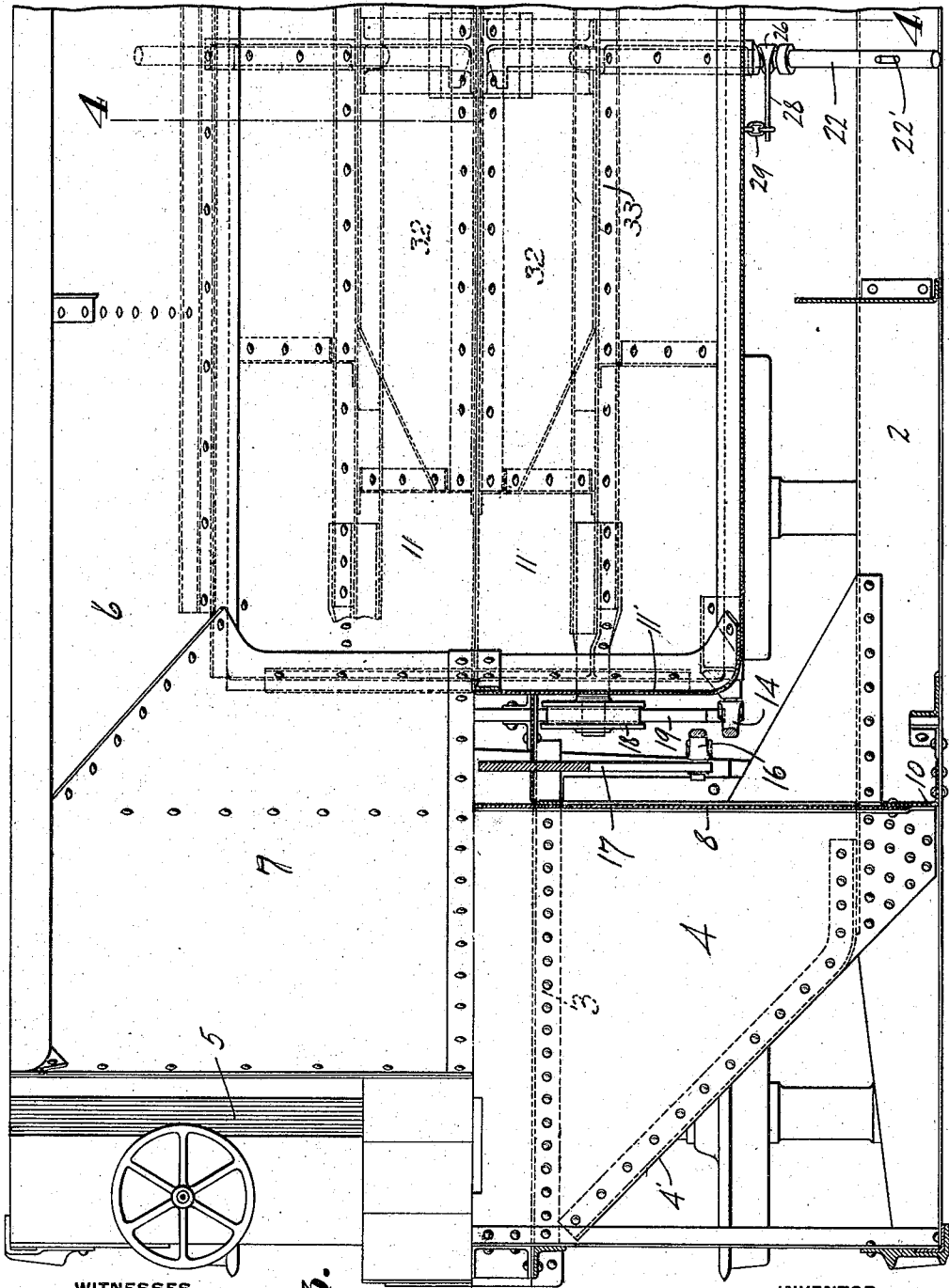
C. H. CLARK.
DUMP CAR.

APPLICATION FILED JUNE 24, 1909.

Patented Nov. 9, 1909.

6 SHEETS—SHEET 3.

939,588.



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Fig. 3.

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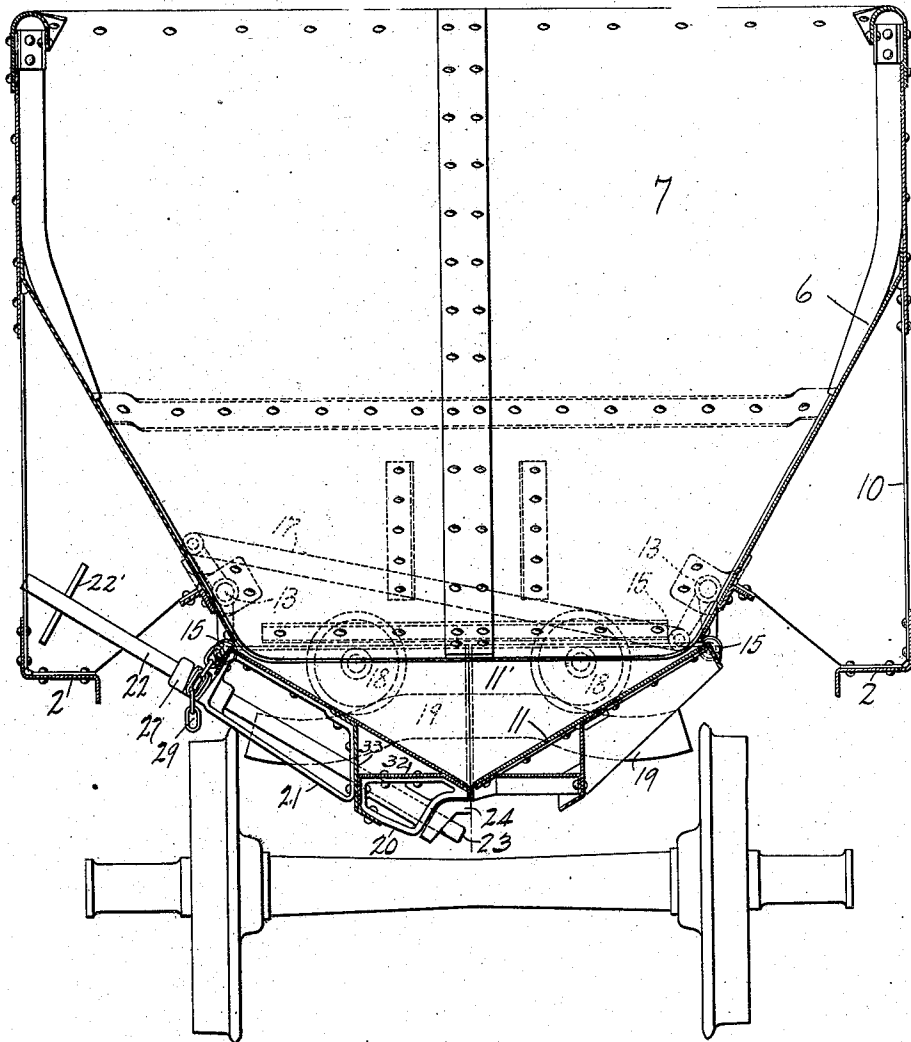
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Patented Nov. 9, 1909.

6 SHEETS—SHEET 4.

939,588.

Fig. 4.



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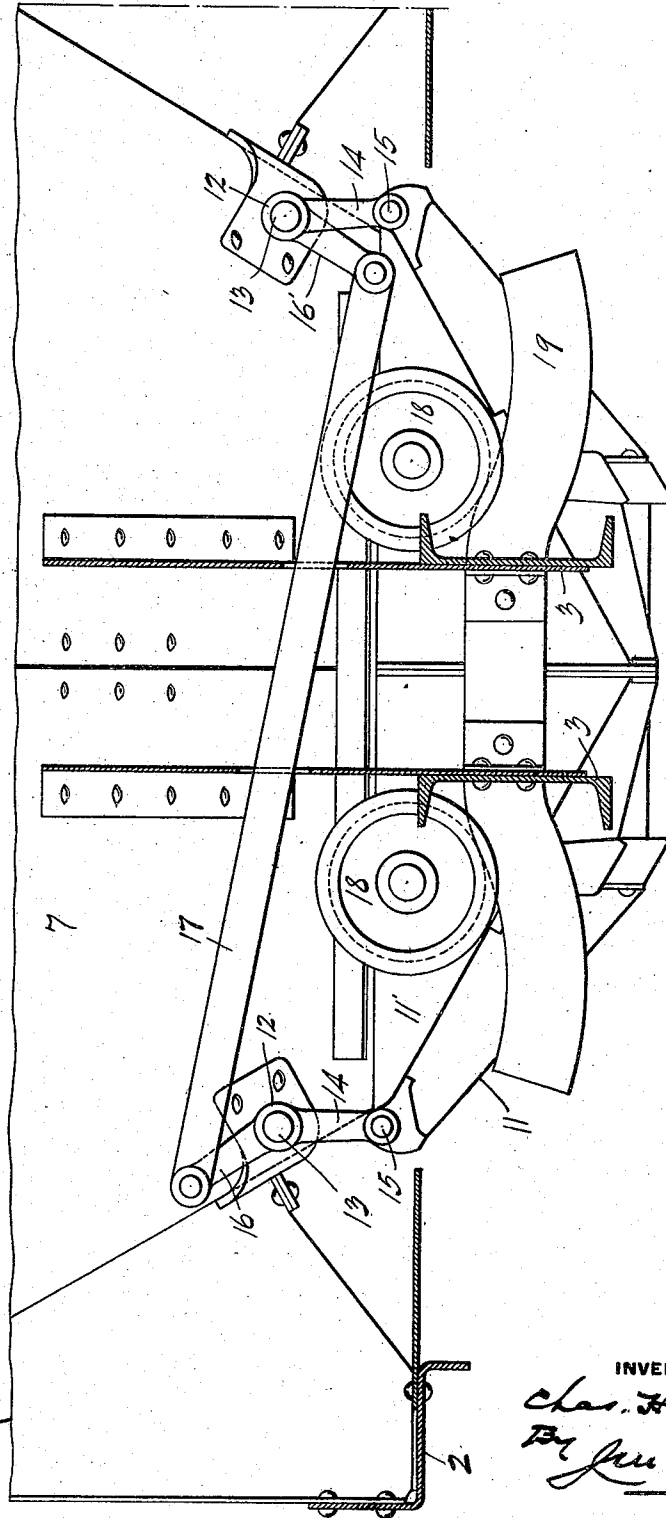
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6 SHEETS—SHEET 5.

939,588.

Fig. 5.



WITNESSES

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APPLICATION FILED JUNE 24, 1909.

Patented Nov. 9, 1909.

6 SHEETS—SHEET 6.

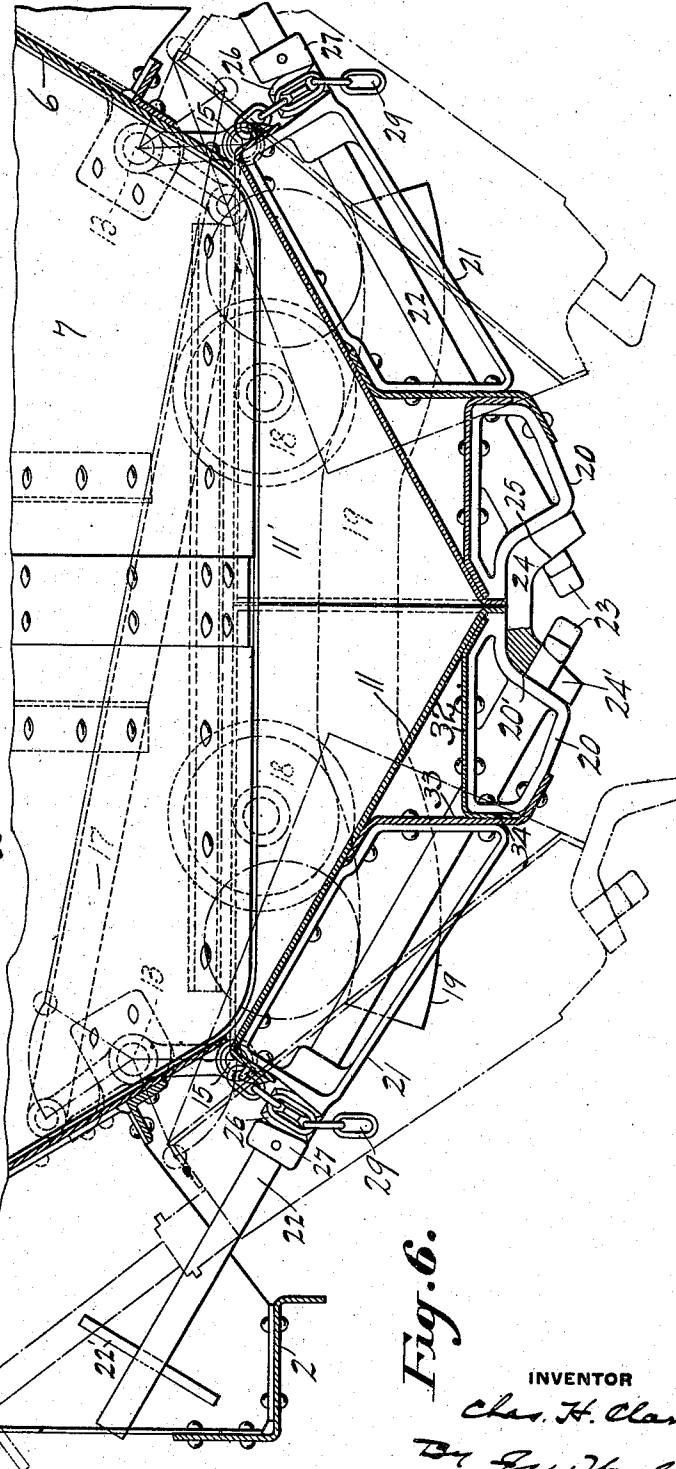


Fig. 6.

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UNITED STATES PATENT OFFICE.

CHARLES H. CLARK, OF CRAFTON, PENNSYLVANIA.

DUMP-CAR.

939,588.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed June 24, 1909. Serial No. 504,047.

To all whom it may concern:

Be it known that I, CHARLES H. CLARK, a resident of Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification.

Repairs for dump cars usually pertain either to the doors themselves or to the door-operating or door-holding mechanisms. Under the present practices, it is necessary to lay up the whole car whenever any of these parts have to be repaired or renewed.

One object of this invention is to provide an interchangeable door which is complete in itself as to its operating and holding devices and which may be readily applied to and removed from the car, so that in the event of disorder or breakdown of a door, the latter is simply removed and a spare door substituted, with substantially no interruption in the use of the car, the disabled door, after being repaired, taking the place of the door substituted for it and ready to be used whenever another spare door is required.

In the development of the foregoing object, it becomes a further purpose of the invention to provide operating and holding mechanisms mounted on and movable with the door, the parts being entirely out of the way of the discharging load. When the doors are arranged in pairs which close together, as they usually are, it is necessary, or at least highly desirable, to have these mechanisms cooperate so that the doors may be operated from either side of the car, and a further feature of the invention is a connection between the doors for securing this action.

The invention is preferably embodied on a door which moves bodily and which is adapted to rotate on its moving supports, with guiding means connecting the door, preferably at its outer edge, with the car body or hopper for regulating the angular position of the door with reference to the load, the arrangement in this regard being such that the force of the load in the direction in which the door opens is sufficient to overcome the friction between the load and the door. This condition is maintained throughout the movement of the door to full open position by varying the angle of direction of travel conversely with the increas-

ing angle of slope of the door, with the result that the door opens with a positive movement controlled in such manner that when it reaches its limit of travel it comes to a stop without appreciable jar or shock.

An objection to inclined doors heretofore proposed is their tendency to warp under the weight of the load; this tendency increasing as the car becomes older, thus rendering it impossible to tightly close them and unavoidable waste results. In the present invention this is overcome by so reinforcing the door that it always retains its original shape, the doors closing tight under all conditions. And in this connection the location of the securing means at the center of the lower edge of the door always insures tight closing.

Another characteristic of the invention is an underframe devoid of center sills, and through which frame all of the draft forces are transmitted, the hopper being wholly free of such forces and preferably so arranged as to be supported entirely by the bolsters.

The invention also includes an improved arrangement of the longitudinal and cross sills at the ends of the frame; also means for deflecting material from the frame which spills over the ends of the hopper.

In the accompanying drawings, Figure 1 is a side elevation of half of a car constructed in accordance with the invention, and Fig. 2 is a vertical longitudinal section of the same, taken through the center of the car. Fig. 3 is a view partly in top plan and partly in sectional plan, the portion in section being on line 3—3 of Fig. 2. Fig. 4 is a cross-section on the broken line 4—4 of Fig. 3. Fig. 5 is a sectional end elevation on line 5—5 of Fig. 2. Fig. 6 is a vertical cross-section taken through the center of the car, showing the doors closed in full lines and open in dotted lines. Figs. 7 and 8 are details of a modified form of locking mechanism.

Referring to the drawings, 2 are the longitudinal side sills through which all of the draft forces are transmitted. The ends of the sills are connected together and to the draft sills 3 by a cross sill or girder 4, the latter cut away diagonally at the corners of the frame, as indicated at 4', to save material and avoid excessive unutilized floor space which would only serve as an undesirable lodgment for material being handled by

the car. It will be noted that the under-frame is somewhat longer than the top of the hopper, and to prevent material spilling over from lodging on the frame, a sheet 5 of corrugated metal or other suitable material extends from the top of the hopper to the end of the frame. Any overflow at the ends of the hopper is thus directed to the ground. The hopper, consisting of the sides 6 and inwardly sloping ends 7, is carried wholly by bolsters 8, though suitably braced at the ends of the car frame as indicated at 9, and with vertical stays 10 connecting sides 6 with beams 2.

The inclined bodily movable doors 11 extend longitudinally of the car, each being supported at its ends and midway its longitudinal edges by wheels or rollers 18 which travel on transverse track bars 19 supported by draft beams 3. The upper edges of these bars drop slightly toward their outer extremities and are curved or rounded as shown to cooperate with the door-guiding mechanism in varying the inclination of the door while traveling from closed to open position, and vice versa. As above indicated, the wheels are so located at the door ends as to carry the load, the guiding means, presently to be described, simply serving to control the changing inclination of the door during its travel. The trunnions upon which wheels 18 are mounted thus constitute a center of rotation for each door, as will be understood.

The guiding means for each door consists of a pair of bell-crank levers 14 which are mounted in stub shafts 13, secured to the hopper and bolster 8. Arms 14 of the levers which hang substantially vertical when the doors are closed, are connected by the trunnion-forming pins 15 with the outer edges of the doors, so that as the doors move outward bodily to open position, as in dotted lines in Fig. 6, lever arms 14 move outward and upward, imparting similar movement to the outer portions of the doors. During this movement, wheels 18 roll outward and downward over track bars 19. When the doors are closed, their inclination is such as to break the friction between the surfaces thereof and the load, this condition creating a decided tendency to open. But the outward and downward movement of the door supports in connection with the increased inclination of the doors through the action of the guiding mechanism which causes them to rotate on their rolling supports, decreases the moving tendency so that they reach full open position without shock or jar.

A characteristic of the invention is the connection between the two doors whereby they move in unison. This is effected by the other arms of the bell-cranks, arm 16 of one door being disposed upwardly and arms 16' of the other door downwardly, with link 17

connecting them, so that movement of either door is imparted to the other. It is apparent, however, that the movement of each door when opening will be as above described irrespective of the connection which causes them to operate together, so that the latter may be omitted without in any way affecting the individual movement of either of the doors.

To remove either door from the car, it is only necessary to disconnect it at 15 from guide-arms 14, which may be readily done and a spare door substituted without taking the car out of service for any appreciable length of time. The removed door can then be repaired and substituted for any other door that may be damaged. To remove both doors and their connecting means it is only necessary to take out the four fulcrum pins 13—two at each end of the car, said pins being removably fitted. This use of interchangeable doors and the facility with which they may be put in place and removed is an important feature of the design as thereby the car is kept in practically continuous service.

In connection with the foregoing, a further characteristic of the invention is the location of the door operating and holding devices directly thereon. In those designs in which the operating and holding devices, or some of them, are mounted on the car, any disorder requiring shop repairs necessitates withdrawing the car from use until the repairs are completed. With the present invention a distinct advantage is thus had over cars of such former design.

In the present embodiment of the door-operating and holding means, brackets 20 and 21 are secured to the under or outer side of each door in a line extending transversely thereof and preferably at the door center, and rotatable in each set of brackets is a shaft 22, capable of slight longitudinal play, and at its inner extremity formed with hook 23. This hooked extremity projects from the rounded face 20' of bracket 20, which face extends backwardly from the lower longitudinal edge of the door and is curved downwardly and cooperates with the like face of the bracket 20 secured to the other door to form a space in which fits the latch-link 24 of irregular form, the downward extremities of the latch being slotted at 24' to pass the extremities of the shafts 22, and also to pass hooks 23 when the shafts are turned to place the hooks in the planes of the slots 24'. The inner faces of the slotted extremities of latch 24 are sloping or of wedge form, as indicated at 25, and like formation of the faces of the hooks 23 provide a wedging action when the shafts are turned. Curves 20' and the shape of link 24 are such that when the doors are released by disengaging either of the hooks 23, the link

remains clamped to and moves with the other door, as shown in dotted lines in Fig. 6, out of the way of the discharging load. The means for moving shaft 22 longitudinally to secure the wedging hold on the latch consists of a wedge-shaped sleeve 26 turning on shaft 22 between the upper extremity of bracket 21 and collar 27 on the shaft. When sleeve 26 is turned by means of its extended arm 28, the shaft is moved upwardly, and the wedging action at latch 24 results. The shaft may be thus held by passing one of the links of chain 29 over the extremity of arm 28, as shown in Fig. 3. The shaft 22 may be extended outwardly and provided with cross pin 22' to facilitate turning thereof; and this extension of the shaft affords leverage for moving the doors to closed position, and if desired, the leverage may be increased by applying a piece of pipe to the end of the shaft.

The latch or door-locking mechanism may be variously embodied. In the adaptation shown in Figs. 7 and 8, link 24 is dispensed with, and shafts 22 are provided with hooked extremities 30 of such form as to directly interlock, the same being disengaged by the turning of either shaft, as will be understood.

Each of doors 11 is stiffened longitudinally of its under side backwardly from its free or lower edge. In the present adaptation the stiffening means consists of a girder formed of horizontal member 32 extending backwardly from the closing edge of the door and meeting vertical member 33 depending from the inclined door plate between its upper and lower edges. These girder members at their juncture may be extended downward at 34 and form a backing for the outer end bracket 20, with the lower end of bracket 21 secured to member 33, as shown. Members 32 and 33, together with the door-plate constitute a triangular box girder, with said member resisting the vertical and horizontal forces resulting from carrying a load on an inclined door. With the door plate thus reinforced its original form is permanently maintained; it cannot sag or become warped by the load and will always close tightly. And with the securing means at the center of the doors, their lower edges are drawn into close engagement from one end to the other and no waste can result.

I claim:—

1. Doors for a dump car, and devices on the doors for holding them closed and operative at either side of the car for releasing the doors.

2. Doors for a dump car opening toward opposite sides thereof, and devices on the doors for holding them closed and operative at either side of the car for releasing the doors.

3. The combination with a dump car, of

interchangeable doors removably mounted thereon, and means carried wholly by the doors for holding them closed.

4. The combination with a dump car, of interchangeable doors mounted thereon, and door-operating and holding means mounted wholly on the doors.

5. An inclined bodily movable door for a dump car, rolling supports located on the door to sustain the load, devices on which the supports roll and shaped to lower the supports as the door moves from closed position, the door rotatable vertically on the supports, and guide devices connected to the door for determining and controlling the rotation of the door as it moves bodily.

6. An inclined bodily movable door for a dump car, rolling supports located on the door to sustain the load and on which the door rotates, devices on which the supports roll and shaped to lower the supports as the door moves from open position, and guide devices connected to the door and operating to increase the inclination thereof as it opens.

7. An inclined bodily movable door for a dump car, rolling supports located on the door to sustain the load and on which the door rotates, devices on which the supports roll and shaped to lower the supports as the door moves to open position, and pivotally supported guide devices connected to the upper portion of the door and operating to rotate the door and increase its inclination as it opens.

8. Doors for a dump car closing together and movable outwardly when opening, and releasing and operating means for the doors carried thereby.

9. Doors for a dump car mounted for outward bodily movement when opening, and operating means for the doors mounted thereon.

10. Doors for a dump car mounted for outward bodily movement when opening with means raising the outer portions of the doors during such movement, and operating means for the doors mounted thereon and movable therewith.

11. Doors for a dump car supported at their ends to move toward and from closed position, and operating means for the doors mounted thereon and movable therewith.

12. A door for a dump car inclined when closed and mounted to increase its inclination when opening, means carried by the door for holding it closed, and operating means for the door mounted thereon and movable therewith.

13. A pair of doors for a dump car, and cooperating devices mounted on the doors for holding them closed and operative interchangeably for releasing them.

14. A pair of doors for a dump car, rotatable shafts carried by the doors and disposed transversely thereof, and means at the

inner ends of the shafts operated by rotating either shaft for either holding the doors closed or for releasing them.

15. A pair of doors for a dump car, shafts 5 rotatably mounted on the under sides of the doors and extending transversely thereof with means for turning them, and projections at the inner ends of the shafts cooperating to either lock the doors in closed position or to release them.

16. A pair of doors for a dump car, shafts 10 journaled on the under sides of the doors and extending transversely thereof with means for rotating them, and projections at the inner ends of the shafts operating in one position to lock the doors and in another position to release them.

17. A pair of doors for a dump car, shafts 20 rotatably mounted on the doors and extending transversely thereof, means at the inner ends of the shafts operated by rotating the latter to either lock or release the doors, the shafts movable longitudinally for making effective their door-locking position, and 25 wedge devices for moving the shafts longitudinally.

18. A pair of doors for a dump car, shafts 30 journaled to rotate on the doors and extending transversely thereof with projections at the inner ends of the shafts, and a latch device engaged by the projections and operated by the rotation of the shafts to either hold the doors locked or to release them.

19. A pair of doors for a dump car, bell 35 cranks each having a fixed fulcrum with one arm of each pivotally connected to each door, and a connection between the other arms whereby the doors move in unison.

20. A pair of doors for a dump car, the 40 outer portions of the doors mounted to move upwardly and outwardly when opening, bell-cranks having fixed fulcrums with one arm connected to the doors respectively, and a link connecting the other arms, whereby the 45 doors move in unison.

21. Doors for a dump car movable away

from each other when opening, rolling supports for the doors on which the doors rotate, bell-cranks each having an arm connected to one of the doors, and means connecting the 50 other arms whereby the doors move in unison.

22. Doors for a dump car, supporting means for the doors at the ends thereof, 55 means mounted on the doors between their ends for holding them closed and for releasing them, and means connecting the doors for causing them to move in unison.

23. Inclined bottom doors for a dump car closing together at the center thereof, rolling supports at the door-ends secured there- 60 to between their longitudinal edges, tracks on which the rolling supports bear, bell-cranks having fixed horizontal axes above the doors with one arm of each connected to 65 the doors, a link connecting the other arms of the bell-cranks, and door-securing and door-operating means mounted on and movable with the doors.

24. In a car, an underframe extended be- 70 yond the ends of the hopper, and an inclined sheet for deflecting material overflowing the hopper end.

25. In a car, an underframe extending be- 75 yond the ends of the hopper, and means for deflecting from the underframe material overflowing the hopper.

26. An inclined door for a dump car reinforced by a triangular box girder.

27. An inclined door for a dump car, a 80 girder member extending backwardly from the free edge of the door, and another girder member extending downwardly from the door and joining the first mentioned girder member.

In testimony whereof I affix my signature 85 in presence of two witnesses.

CHARLES H. CLARK.

Witnesses:

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ALEX. S. MABON.