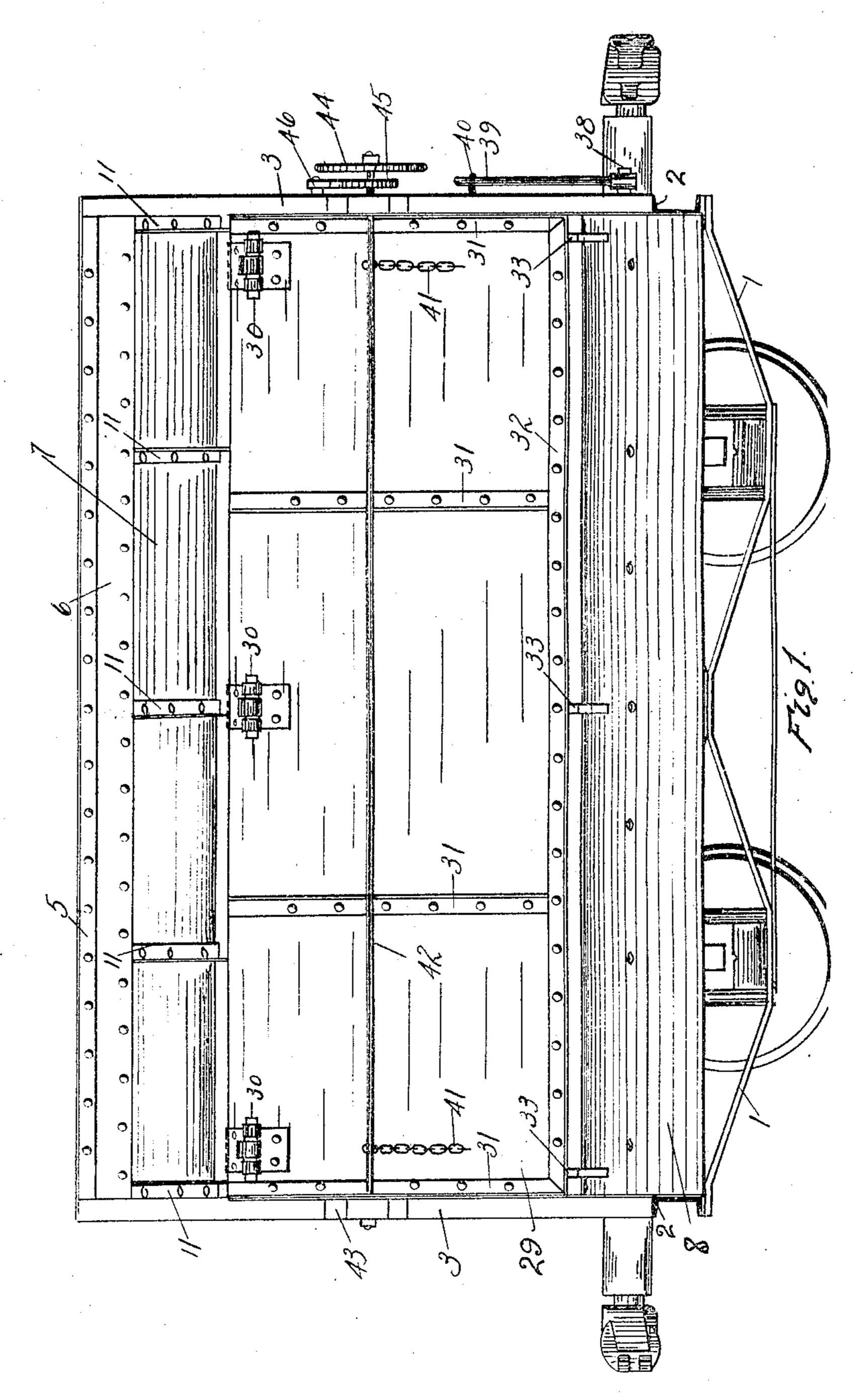
McKINLEY BOYLE & C. E. USTICK.

GRAVITY DUMPING CAR.

APPLICATION FILED JUNE 8, 1904.

3 SHEETS-SHEET 1.



Witnesses. L.V. Sparks W. H. Mein Inventors:
Millia Bryle

By Attorney:

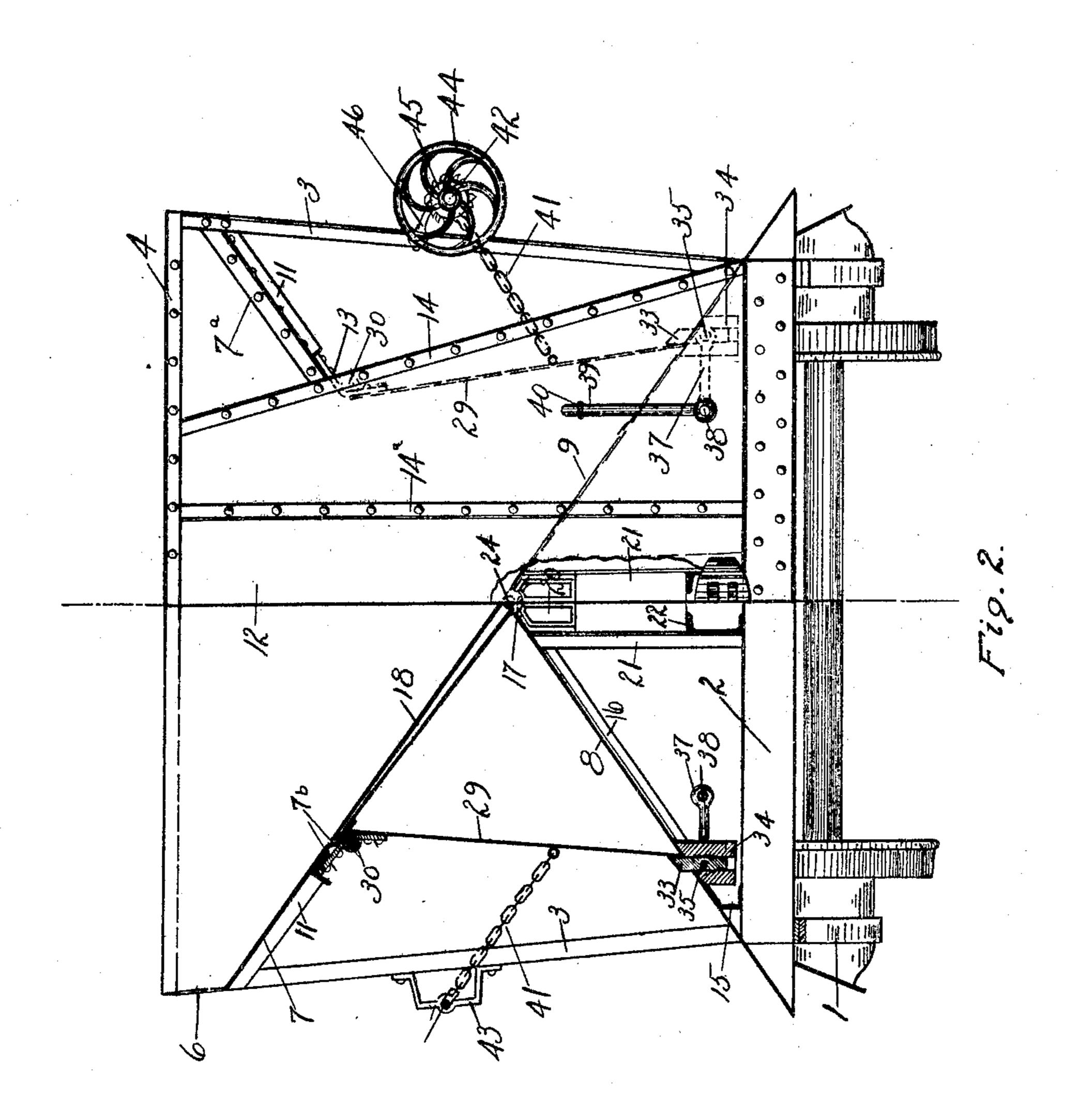
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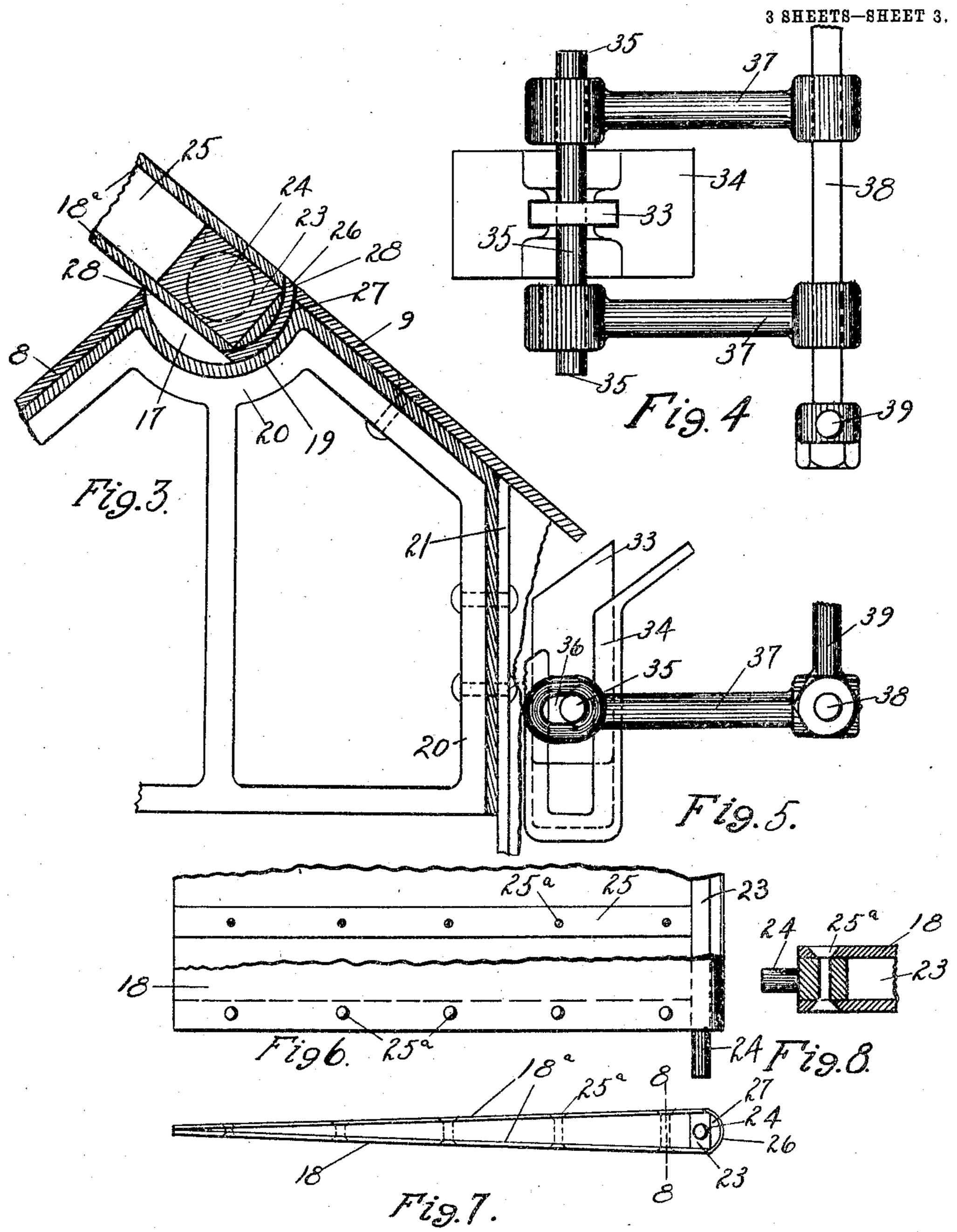
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United States Patent Office.

McKINLEY BOYLE AND CLYDE E. USTICK, OF NEW YORK, N. Y.

GRAVITY DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 794,485, dated July 11, 1905.

Application filed June 8, 1904. Serial No. 211,631.

To all whom it may concern:

Be it known that we, McKinley Boyle and Clyde E. Ustick, citizens of the United States, residing at New York city, county and State of New York, have invented new and useful Improvements in Gravity Dumping-Cars, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to the type of dumping-car in which the load may be dumped or discharged to either of two opposite sides of the car; and the particular objects of the invention are to construct a comparatively simple form of such a car from which the load may be quickly and cleanly discharged and in the construction of which steel or other suitable metal may be entirely used, thereby making a more durable and inexpensive car.

With these and other objects in view our invention consists in the various novel and peculiar arrangements and combinations of the several different parts of the apparatus, all as hereinafter fully described and then pointed out in the claims.

We have illustrated a type of our invention in the accompanying drawings, wherein—

Figure 1 is a side view of a dumping-car embodying our improvements and with the parts adjusted in closed position for retaining the load. Fig. 2 is an end view of the car 35 with one-half thereof in vertical transverse section and with the parts shown in the same relations as Fig. 1 to retain the load. Fig. 3 is an enlarged transverse vertical section showing in detail the peculiar hinge at the 40 lower edge of the swinging central floor-section, which may be set to one side or the other. to cooperate with one or the other of the two inclines of the discharging-floor. Figs. 4 and 5 are enlarged detail views of parts of the 45 releasable locking means for retaining the swinging side doors closed on their respective inclines of the discharging-floor. Fig. 6 is a plan view of an end portion of the central swinging floor-section with one of the sides 50 shown as broken away to show a stay-bar

upon the interior. Fig. 7 is an end view of this adjustable floor-section. Fig. 8 is a somewhat enlarged sectional view of a portion of the adjustable floor-section, the plane of the section being indicated by the line 88, Fig. 7. 55

Referring to the drawings, in which like figures of reference indicate like parts throughout, 1 designates a suitable truck, upon which the bottom frame 2 of the car is mounted and which in turn sustains the car-body. The 60 body comprises four main uprights 3, placed one at each corner and resting upon one of the cross-pieces 2 of the bottom frame and inclined outwardly from the bottom toward the top of the car, but being vertical in rela- 65 tion to the end of the car. These main uprights 3 are secured at the top at each end of the car by suitable angles 4, and they are connected longitudinally by angle-irons 5. The fixed side of the car comprises a short section 7° 6 and a downwardly and inwardly inclined fixed part 7, which extends a suitable distance inwardly upon each side and substantially on the same plane of inclination as the downward inclination of the discharging-floor 8 75 and 9 upon the opposite side of the car, as hereinafter described. The fixed upper part 7, like the part 6, is made of suitable sheetsteel, and the two parts are secured together by a row of rivets, (indicated at 10,) the in-80 clined side 7 being reinforced by the angleirons 11.

The respective ends of the car-body each comprise a sheet-metal body or plate 12, which has its upper and lower ends riveted to the 85 top bar 4 and one of the bottom cross-pieces 2, respectively, and completely covers the end of the car, with the exception of the cut-away places 13 at the side edges thereof, and around one edge of which cut-away part the end 7^a 9° of the side 7 is bent and riveted, while the other inclined edge of the cut-away part 13 is supported and braced by an angle-iron 14, extending from one of the lower corners of the end plate 12 and upwardly and inwardly 95 to a suitable point on the top bar 4. These end plates 12 are also braced by vertical angleirons 14a, which are riveted thereto at suitable intervals.

The discharging-floor of the car comprises 100

two oppositely and downwardly inclined parts 8 and 9, which are alike, and each of the same is made of sheet-steel extending the length of the car-body and from substantially the cen-5 ter line of the car downwardly to a point at the lower side of the car to a suitable point for discharging the material therefrom. A channel-plate 15 extends along underneath the discharging-floor, near the lower end therero of, for supporting the same, and the body of this part is made sufficiently rigid by strengthening ribs or pieces 16, secured to the under side thereof at suitable intervals. The upper ends of the two discharging-floors 8 and 9 15 form an apex, along which longitudinally extends a groove which constitutes the socket or part 17 of the peculiar hinge-joint of the adjustable swinging floor-section 18. (See particularly Fig. 3.) This hinge-socket 17 is 20 formed along the top of a sheet-metal body 19, the sides of which are downwardly and outwardly inclined to conform to the inclination of the discharging floor-section 8 and 9 and extend thence vertically downwardly, and 25 is supported from beneath by a series of yokes or brackets 20, which are shaped to fit beneath the metal body 19, and these yokes are preferably castings to which the sheet-metal body is riveted, the yokes 20 being supported by 30 vertical members 21, between which and the yokes the downward portion of the metal body 19 is interposed, and the three parts are riveted together, as shown in Fig. 3. The upper ends of the vertical angle-irons or supporting 35 members 21 are inclined to fit beneath the discharging-floors 8 and 9, and these supports 21 are each riveted at its lower end to the back of a channel-bar 22, which extends longitudinally of the car centrally thereof and is 40 secured to the bottom frame 2 of the same. This construction provides a very strong and durable piece of mechanism and one in which there are practically no joints or seams over which the material is passed in dumping.

The adjustable swinging floor-section 18, which is hinged at its lower end to the apex of the inclines 8 and 9 of the discharging-floor, is the length of the car-body and is of a suitable width to reach and slightly overlap the 50 lower end of either of the inclined fixed sides 7 at the upper part of the car-body and with each of which sides this section 18 forms practically the same plane when set against such side, the lower coöperating end of each 55 of the sides 7 being formed with an offset or bend 7^a for the purpose of making the two parts practically flush when they are placed together, as indicated in Fig. 2. Thus the swinging adjustable floor-section may be set 60 or placed normally to cooperate with either one or the other of the inclined sides 7 and in the same plane thereof, and under which condition the two said parts are substantially in the same plane with the discharging-floor at 65 the opposite side of the car, and each of said | parts when the car is loaded serves to sustain the load.

The swinging floor-section which is located centrally of the oppositely-inclined discharging-floor is composed of two sheet-steel plates 70 18^a, which are placed together V-shaped and between the diverging ends of which is an iron bar 23, having the ends provided with hingepins 24, which are journaled in suitable sockets at the end of the floor-section 18. Between 75 the two plates 18^a, forming the floor-section 18, is mounted a series of metal bars 25, which extend crosswise of the door and the full width thereof, being suitably shaped to fit between the two plates, and the two plates are riveted, 80 as at 25^a, to these bars.

The hinge-joint of the lower end of the swinging floor-section 18 is constructed in a peculiar manner for the purpose of making the same self-cleaning in dislodging from the 85 hinge-joint any dirt or foreign matter that may accumulate therein for the time being from the contents of the car. The back edge of the swinging section 18 is provided with a curved piece of sheet metal 26, between which 90 and the flat side of the hinge-bar 23 is interposed a filling-piece 27, of metal, and the ends of the back piece 26 are brought out flush with the sides 18° of the section. This back piece 26 has its outer surface formed on an arc the 95 center of which is the center of motion of the hinge-pin 24, the axis of which lies in the plane containing the two edges 28 of the hingesocket extending along the apex of the oppositely-inclined discharging-floors 8 and 9. The 100 ends of the sheet-metal pieces 8 and 9 of the floor which project above the metal body 19 are curved on the same arc as the socket 17 of such body, so that the entire surface of such socket lying between the edges 28 forms a 105 semicircle, and when the section 18 is set to one side or the other its outer surface forms a practically continuous surface with the adjacent inclination of the discharging-floor and makes a flush joint therewith, which joint is 110 dirt-proof, so that none of the contents of the car when loaded or in discharging can find its way into this joint. In case foreign matter should get within the groove or socket of the joint it would accumulate in the space which 115 is formed therein to one side, as indicated in the drawings, and it would at once be dislodged whenever the floor-section is turned into the opposite direction or angle, as in such case the back 27 of the swinging part would 120 scrape such foreign matter from the socket and force it over the adjacent edge 28 thereof.

At each side of the car is a depending door 29, which is hinged at 30 to the under side of the adjacent inclined side 7. These doors are 125 each made of sheet-steel and extend the length of the car-body, being reinforced at suitable intervals with strips or angle-irons 31 and having the lower edge provided with reinforcing angle-irons 32, these angle-irons being all 130

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riveted to the metal sheet to form a rigid structure. The outer or free ends of the depending side doors 29 close inwardly against the adjacent inclination of the discharging-5 floor 8 and 9 to retain the load at that point, and the depth or width of these doors may be varied, though we have shown them of such length that they close inwardly on their respective inclines without passing through verro tical positions and making an acute angle with the inclination of the discharging-floor. This angle may be made less or greater, and the more acute it is the greater will be the capacity of the interior of the car-body at this point. 15 Each of these depending side doors 29 is releasably locked when closed against its respective incline of the discharging-floor by means of a set of latches 33, which extend up through suitable openings in the surface of the incline 20 and work in the guides 34, arranged beneath the incline. (See particularly Figs. 4 and 5.) These latches 33 are each provided with laterally-projecting pins 35, each of which passes through an elongated slot 36 in the end of an 25 arm 37, which is made fast on a rock-shaft 38, which is mounted in suitable bearings beneath the incline of the discharging-floor and extends the length of the car-body, with one end projecting beyond one end of the car-body, 30 where it is provided with a hand-lever 39, having a locking-link 40 for holding the lever in position to maintain the latches in locking position, as shown in Fig. 2. When the swinging side door 29 is closed against its in-35 cline, the rock-shaft 38 is turned, by means of the hand-lever on the exterior of the car, in such a manner as to project the latches 33 and lock the door, and the hand-lever 39 is then itself locked by its link 40, which keeps the 40 door closed securely. When it is desired to open the side door, the hand-lever 39 is manipulated so as to rock the shaft 38 in the opposite direction and withdraw the latches, thereby permitting the door to be opened by 45 the load itself gravitating down the incline, and thus the discharge of the load may be effected, and in this connection it is observed that only one of the side doors at a time acts to retain the load, and this is determined be-50 fore loading the car by the requirement of the load having to be subsequently discharged from one side or the other. In Fig. 2 the arrangement of the various parts is shown when the load is to be discharged at the right-hand 55 side of that figure, so that in this case the floor-section 18 is set to the left-hand side of the car. Under this condition the entire load in the car is sustained by the fixed sides 6 and 7 of the car-body, the floor-section 18, and the 60 swinging door 29 (shown in dotted lines) at the opposite side of the car from where the floor-section 18 is adjusted, and the incline 9, against which the door 29 is closed.

In order to provide for positively swinging

65 the side doors 29 open in dumping or discharg-

ing the load, there are provided the chains 41, each of which is connected to the back of each door 29, with its other end passing around a winding-shaft 42, mounted in suitable brackets 43, secured upon the uprights 3 of the car, 70 one end of the winding-shaft being provided with a hand-wheel 44 secured thereto, the unwinding of the chain by the weight of the door being prevented by means of a ratchetwheel 45, secured upon the shaft 42, and a 75 pawl 46, mounted on a fixed part and engaging the ratchet. To give a balanced action to the door-opening mechanism, we arrange two chains 41 for each door, one chain being near each end thereof, as shown in Fig. 1. After 80 the latches 33 are withdrawn to release the door the hand-wheel 44 may be turned to quickly pull the door open. In the use of this construction of car, the load being sustained by the several respective 85 parts above pointed out, the weight of the load tends to force open the door 29, which is located to the side of the car at which the load is to be discharged, so that upon this side door being released such weight of the load 90 will act to force the door open, and the entire contents of the car may at once gravitate down the several inclined parts and be dumped from the inclined floor. Since, therefore, the weight of the load tends to force open the side 95 door at the discharging side, such weight or

discharging the contents of the car. It will be noted that the discharging-inclines 8 and 9 of the floor, which extend down- 100 wardly in opposite directions toward the respective sides of the car, may be inclined at any desired angle and that when this angle is changed the angle of the inwardly-inclined sides 7 at the upper part of the car are to be 105 placed substantially in the same plane with its cooperating discharging-floor at the opposite side of the car. This construction of the discharging-floor is found to be very efficient to expedite the dumping of the load, and no 110 manipulation of any part of this dischargingfloor is required in order to dump the load. The lower end of the inclines 8 and 9 of the discharging-floor may be extended to any suitable point at the side of the car, though we 115 have shown it as projecting just slightly beyond the running-gear or truck 1, so that the load is dumped or discharged at a suitable distance beyond the side of the car without any of the contents becoming lodged in any parts 120 of the apparatus. The various described parts of the car here-

gravity thereby serves to materially assist in

The various described parts of the car herein set forth are made of suitable metal, so that the use of wood may be wholly dispensed with and a more durable and inexpensive car may 125 thus be made.

We wish to be understood as not limiting our invention to the specific forms of the various parts as herein set forth, as modifications may be made in such parts without, how-130

ever, departing from the spirit of the invention.

Having now described our invention, what we claim, and desire to secure by Letters Pat-5 ent, is—

1. A dumping-car having a dischargingfloor inclined in opposite directions, in combination with an adjustable floor-section having its free end lying away from said dischargingro floor and adapted to be normally set so as to direct the contents sustained thereby to either of said inclinations, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respec-15 tive inclination, and means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

2. A dumping-car having a discharging-20 floor inclined in opposite directions, in combination with an adjustable floor-section hinged at a point between said inclinations of the discharging-floor and having its free end lying away from said discharging-floor and adapted 25 to be normally set so as to direct the contents sustained thereby to either of said inclinations, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respective inclination, and 30 means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

3. A dumping-car having a dischargingfloor inclined in opposite directions, in combi-35 nation with an adjustable swinging floor-section hinged at a point between the said inclinations of the discharging-floor and adapted to be normally set substantially in the plane of either of the inclinations, a side door for 40 each of said inclinations of said dischargingfloor each adapted to close at an angle with its respective inclination, and means for releasably locking said side doors in relation to said inclinations, substantially as and for the pur-45 pose set forth.

4. A dumping - car having a dischargingfloor inclined in opposite directions, in combination with an adjustable floor-section having its free end lying away from said discharging-50 floor and adapted to be normally set so as to direct the contents sustained thereby to either of said inclinations, a depending swinging side door for each of said inclinations of the discharging-floor each adapted to close at an 55 angle with its respective inclination, means for releasably locking said side doors in relation to said inclinations, the said floor-section, the said inclination with which it is set and the said side door closing on said inclination 60 of the discharging-floor, each acting normally to sustain the load, substantially as and for the purpose set forth.

5. A dumping - car having a dischargingfloor inclined in opposite directions, in combi-65 nation with an adjustable floor-section adapted

to be normally set so as to direct the contents sustained thereby to either of said inclinations, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respective inclination, and 70 means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

6. A dumping - car having a dischargingfloor inclined in opposite directions, in combi-75 nation with an adjustable floor-section adapted to be normally set so as to direct the contents sustained thereby to either of said inclinations, a side door for each of said inclinations of said discharging-floor each adapted to close 80 at an angle with its respective inclination, means for releasably locking said side doors in relation to said inclinations, and a downwardly-inclined part extending inwardly from each side of the car-body and in connection 85 with one or the other of which the said swinging floor-section is normally placed, substantially as and for the purpose set forth.

7. A dumping - car having a dischargingfloor inclined downwardly in two opposite di- 90 rections, an adjustable swinging floor-section having its lower end hinged at a point between the upper ends of said inclinations and adapted to be normally set so as to direct the contents sustained thereby to either one or the other 95 of said inclinations, a side door for each of said inclinations of the discharging-floor the same closing at an angle with its respective inclination, and a downwardly-inclined part extending inwardly from each side of the car- 100 body and the said swinging floor-section being adapted to be placed in connection with one or the other of said inclined parts, substantially as and for the purpose set forth.

8. A dumping-car having a discharging- 105 floor comprising two downwardly and oppositely inclined sections each forming with the other at the upper ends thereof an apex, an adjustable swinging floor-section hinged along the line of said apex and adapted to be set 110 substantially in the plane of either of said inclines and having a flush joint therewith, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respective inclination, and 115 means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

9. A dumping-car having a dischargingfloor comprising two downwardly and oppo- 120 sitely inclined sections each forming with the other at the upper ends thereof an apex, a hinge socket or groove extending along said apex and between the upper ends of said inclines, a swinging floor-section hinged by its 125 lower end in the said socket and having the axis of the said hinge in the same plane with the upper ends of said inclines, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle 130

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with its respective inclination, and means for releasably locking said side doors in relation to said inclinations, substantially as and for

the purpose set forth.

10. A dumping-car having a dischargingfloor comprising two downwardly and oppositely inclined sections each forming with the other at the upper ends thereof an apex, a hinge socket or groove extending along said ro apex and being semicircular in shape in crosssection, a swinging floor-section hinged in said socket with the axis of the hinge contained in the same plane as the two edges of the said socket, the back edge of said floor-15 section lying within the hinge-socket being curved to conform to the curvature of said socket, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respective incli-20 nation, and means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

11. A dumping-car having a dischargingfloor comprising two downwardly and oppo-25 sitely inclined sections each forming with the other at the upper ends thereof an apex, a swinging floor-section hinged at its lower end along said apex, the said hinge-joint comprising a socket-plate formed with a longitudinal 30 curve or socket substantially of a semicircular cross-section, the said plate being mounted beneath the said upper ends of the inclines, a set of yokes or brackets arranged beneath said socket-plate for sustaining the same, and a 35 side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respective inclination, and means for releasably locking said side doors in relation to said inclinations, substantially

40 as and for the purpose set forth.

12. A dumping-car having a dischargingfloor comprising two downwardly and oppositely inclined sections each forming with the other at the upper ends thereof an apex, a 45 swinging floor-section hinged at its lower end along said apex, the said hinge-joint comprising a socket-plate formed with a longitudinal curve or socket substantially of a semicircular cross-section, the said plate being mounted 50 beneath the said upper ends of the inclines, a set of yokes or brackets arranged beneath said socket-plate for sustaining the same, channelbars extending longitudinally of said car beneath said inclines, a set of uprights secured 55 to said channel-bars having their upper ends connected with said yokes or brackets for sustaining the same, a side door for each of said inclinations of said discharging-floor each adapted to close at an angle with its respec-60 tive inclination, and means for releasably locking said side doors in relation to said inclinations, substantially as and for the purpose set forth.

13. A dumping-car having a downwardly-65 inclined discharging-floor, a depending swing-

ing side door closing at an angle against said incline and at a point distant from its discharging end to retain the load, and releasable locking means mounted on surface of said incline for holding said depending door closed 79 thereon, substantially as and for the purpose set forth.

14. A dumping-car having a downwardlyinclined discharging-floor, a depending swinging side door closing at an angle against said 75 incline to retain the load, locking means mounted on said incline for holding the door closed thereon and comprising a set of latches located along the incline, a rock-shaft and a fixed arm mounted thereon and connected with 80 each of said latches, and means for rocking said rock-shaft from the exterior of the car to withdraw and project the latches, substantially as and for the purpose set forth.

15. A dumping-car having a downwardly- 85 inclined discharging-floor, a depending swinging side door closing at an angle against said incline to retain the load, locking means mounted on said incline for holding the door closed thereon and comprising a set of latches 9° each provided with a guide or socket mounted upon said incline, a pin extending from each of said latches and an arm connected therewith with lost motion between them, a rock-shaft having said latch-operating arm 95 mounted thereon and means for rocking the rock-shaft from the exterior of the car, substantially as and for the purpose set forth.

16. A dumping-car having a downwardlyinclined discharging-floor, a depending swing- 100 ing side door closing at an angle against said incline to retain the load, releasable locking means mounted on said incline for holding said depending door closed thereon, a winding-shaft mounted on said car and a set of 105 pulling-chains connected therewith and with said side door for drawing the same open when the locking means is released, substantially as and for the purpose set forth.

17. A dumping-car having a downwardly- 110 inclined discharging-floor, a depending swinging side door closing at an angle against said incline to retain the load, releasable locking means mounted on said incline for holding said depending door closed thereon, a wind-115 ing-shaft provided with a hand-wheel and mounted upon the side of said car with means for preventing back rotation thereof, and a set of pulling-chains attached between the said winding-shaft and said side door for 120 drawing the latter open when the locking means is released, substantially as and for the purpose set forth.

18. A dumping-car having a dischargingfloor inclined in opposite directions, in com- 125 bination with an adjustable floor-section adapted to be normally set so as to direct the contents sustained thereby to either of said inclinations, a side door for each of said inclinations of said discharging-floor each adapt- 130

ed to close at an angle with its respective inclination, means for releasably locking said side doors in relation to said inclination, the said swinging floor-section comprising two sheet-metal plates placed together V-shaped with the pointed end thereof serving as the free end the other end the hinged end, a hinge-bar secured between the diverging ends of said plates, and suitable reinforce-bars mounted between said plates, substantially as and for the purpose set forth.

19. A dumping-car having a body adapted to discharge the load from either one or the other of two opposite sides, an adjustable partition mounted within the car-body and adapted to be normally adjusted toward either side at an angle to the vertical plane and normally directing and tending to discharge the load toward the side from which the same is to be discharged, substantially as and for the pur-

pose set forth.

20. A dumping-car comprising a car-body adapted to discharge the contents thereof from either side of the lower part of the body, and adjustable partition disposed across the interior of the car-body and adapted to be normally adjusted toward either side of the interior at an angle to the vertical plane and in a direction normally to partly sustain the load in conjunction with the other side and normally directing and tending to discharge the load toward the side of the lower part of the body from where the load is to be dumped, substantially as and for the purpose set forth.

21. A dumping-car comprising a car-body adapted to discharge the contents thereof from either side of the lower part of the body, and a swinging adjustable partition disposed within the interior of the car-body with its axis of motion lying between the two said discharg-

ing-points and adapted to be normally set at an angle to the vertical toward either side of the interior of the car-body and in a direction normally to partly sustain the load in conjunction with the other side and normally di-45 recting and tending to discharge the same toward the side of the lower part of the body from where the load is to be dumped, substantially as and for the purpose set forth.

22. A dumping-car having its body provided 50 with a depending swinging door or side upon two opposite sides thereof, a discharging floor-section against which the lower edge of each door closes, and an adjustable partition mounted within the car-body and adapted to be nor-sometimed and to side at an angle to the vertical plane and to normally direct the load toward the side from which the same is to be discharged, substantially as and for the purpose set forth.

23. A dumping-car having two inwardly-inclined opposite sides comparatively shallow, a depending swinging door mounted beneath each of said inclined sides, a discharging floor-section against which the lower edge of each 65 door closes, and an adjustable partition mounted within the car-body and adapted to be normally adjusted toward either side at an angle to the vertical plane and to normally direct the load toward the side from which the same 70 is to be discharged, substantially as and for the purpose set forth.

In testimony whereof we have hereunto set our hands in the presence of the two subscrib-

ing witnesses.

McKINLEY BOYLE. CLYDE E. USTICK.

Witnesses:

M. V. McKernan, Joseph Hartstein.