

G. O. BRADLEY.

CAR DUMP.

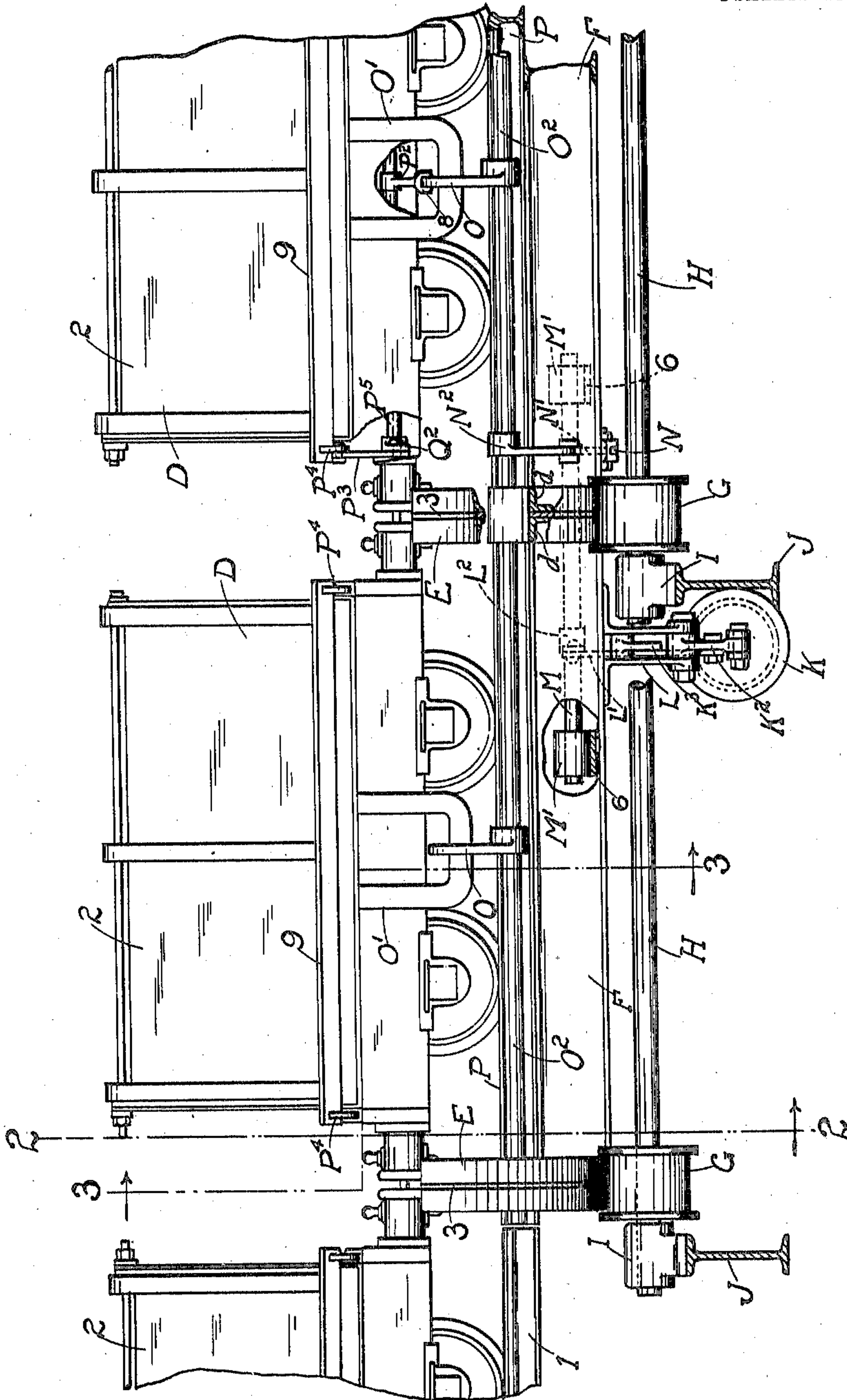
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4 SHEETS—SHEET 1.

FIG. 1—



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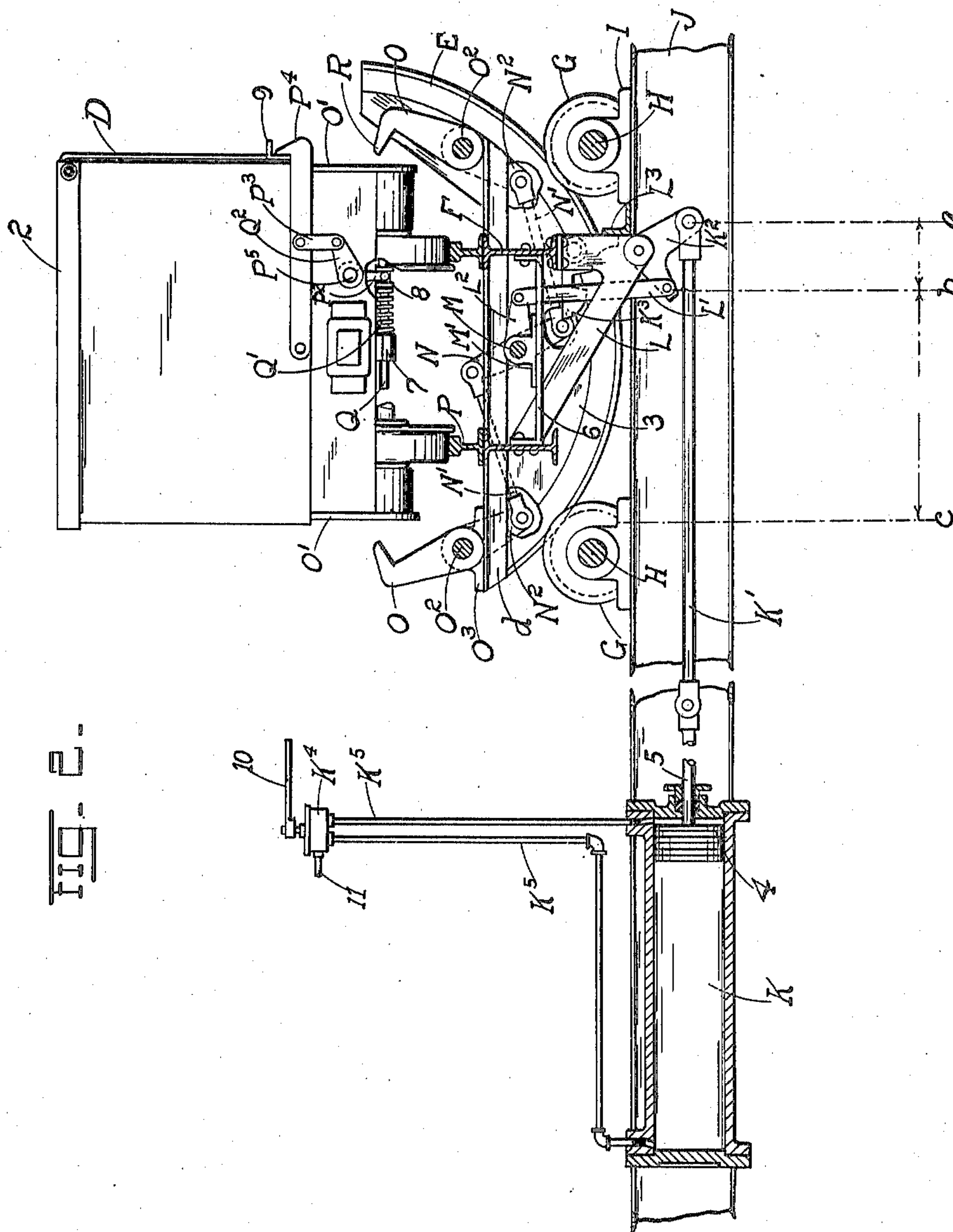
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4 SHEETS—SHEET 2.



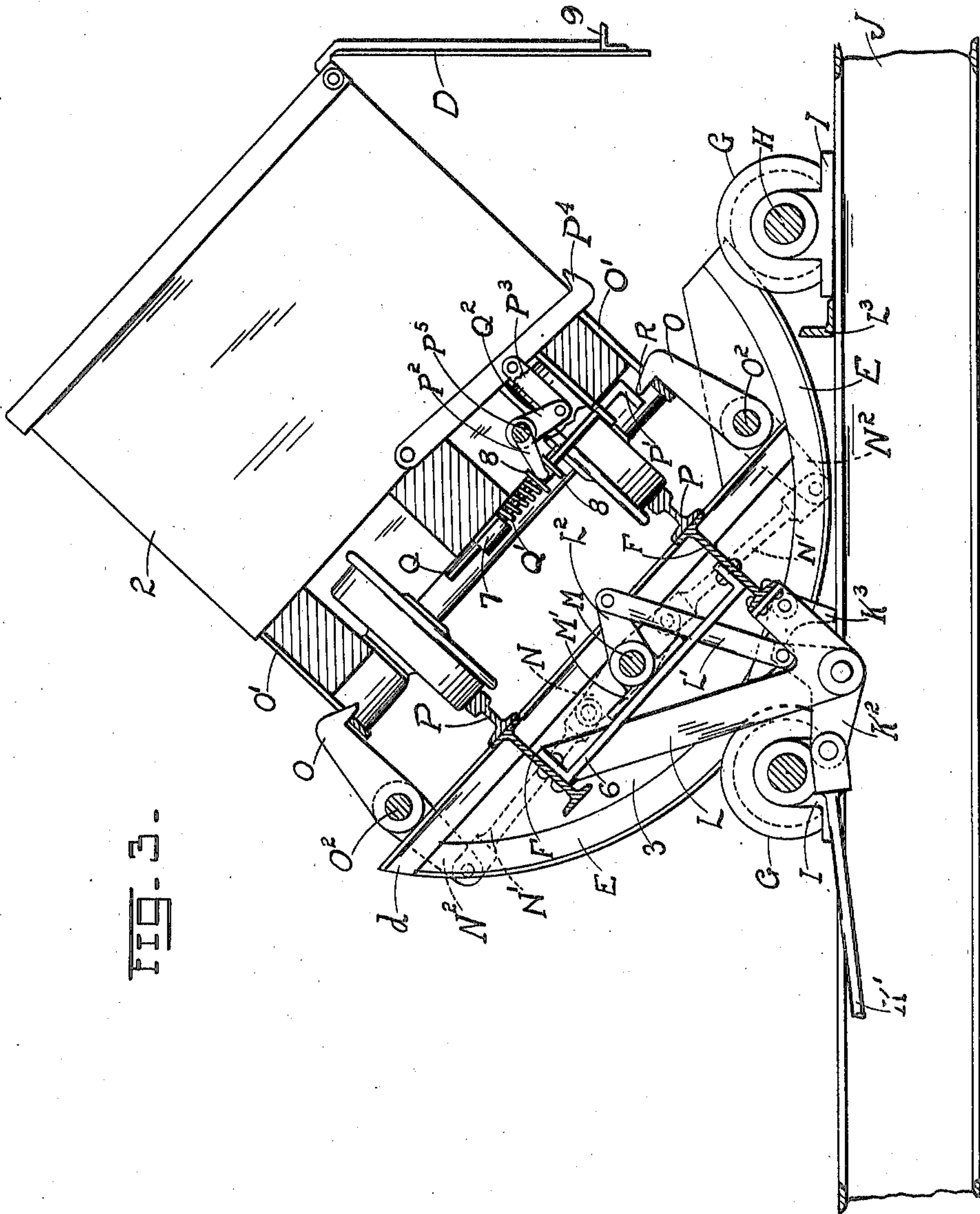
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

FIG. 5.

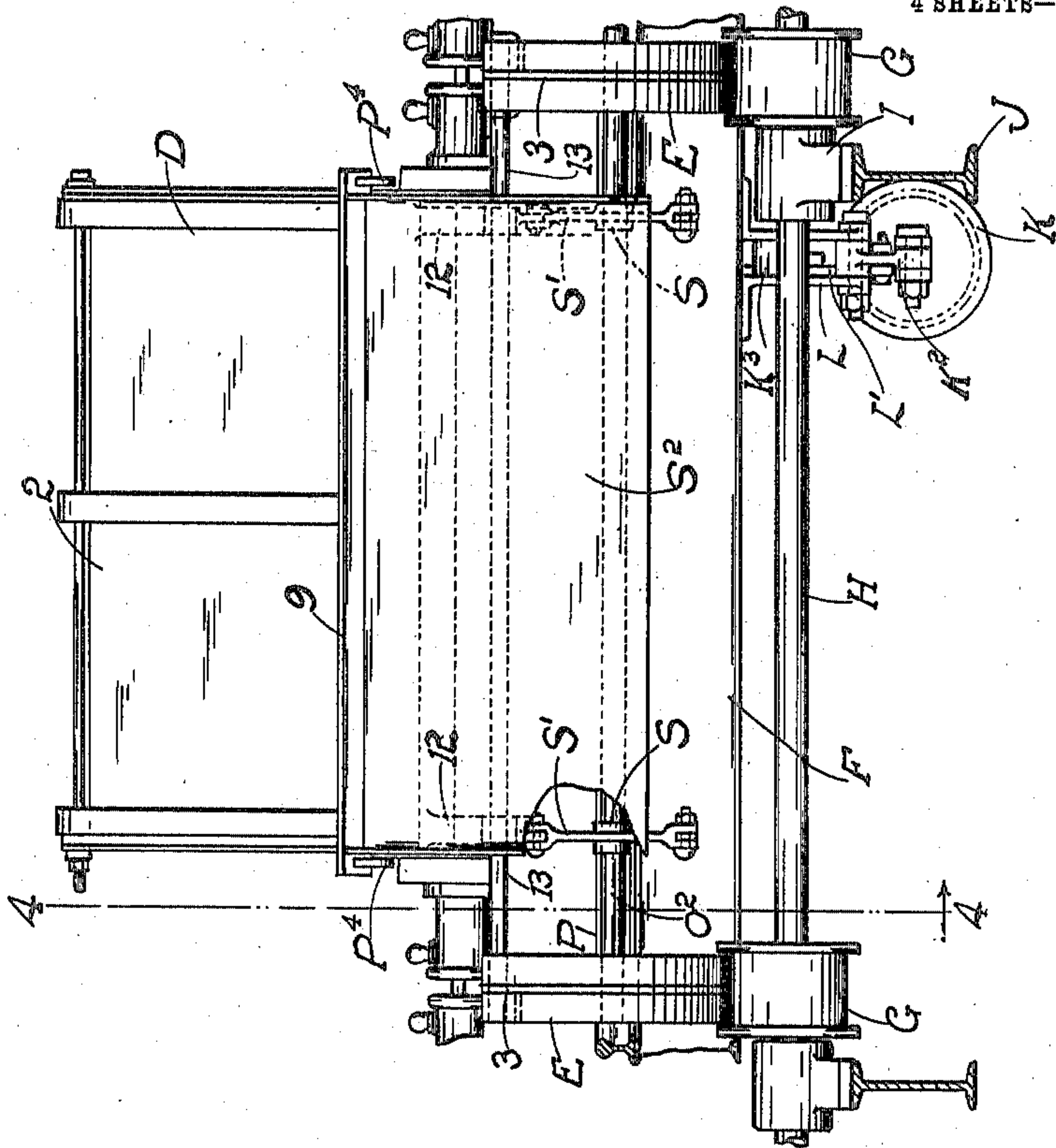
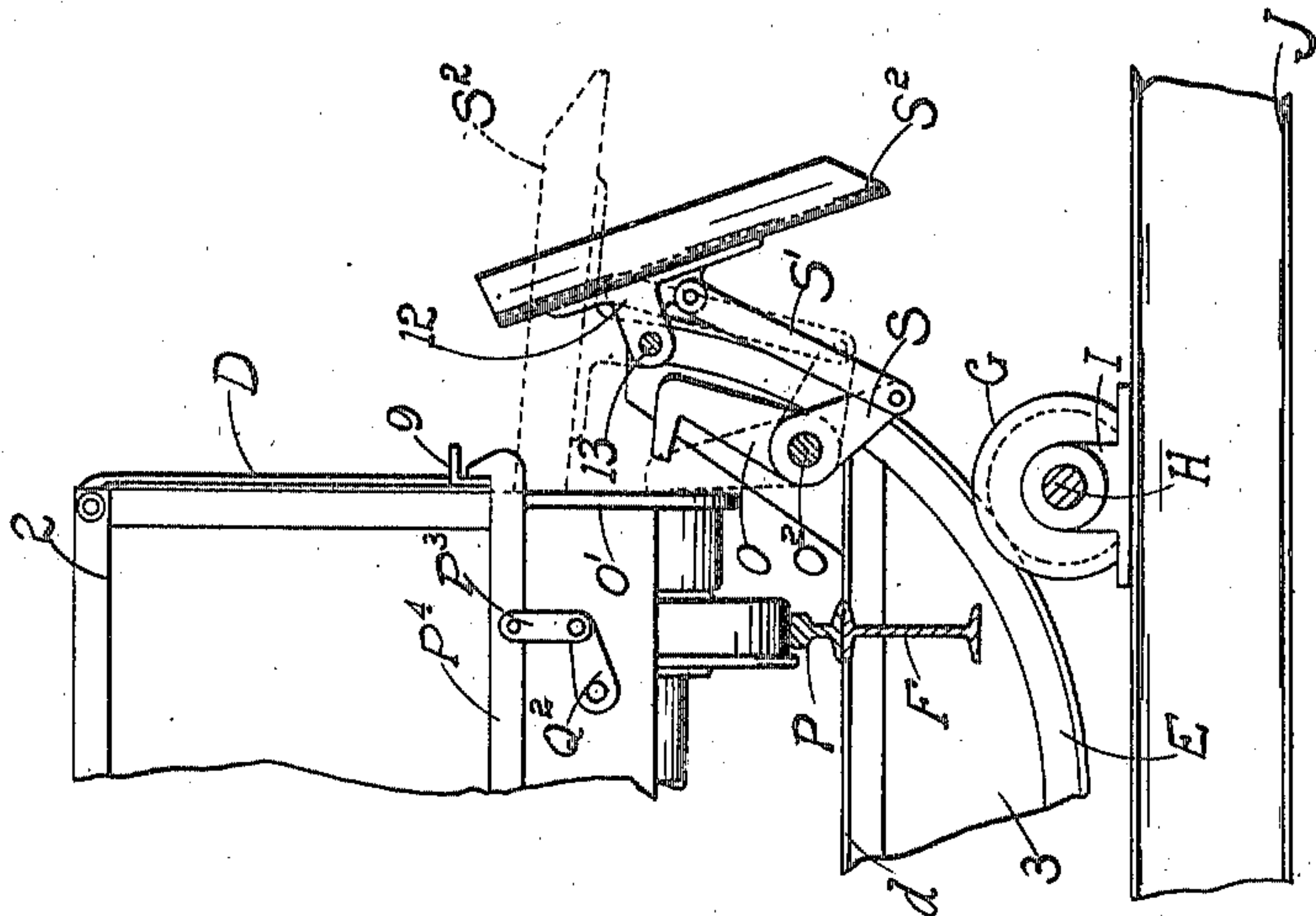


FIG. 4.



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CAR-DUMP.

948,038.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE O. BRADLEY, citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Car-Dumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in car-dumps; and it consists in the novel construction and arrangement of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the main dumping frame or tippie with cars in position thereon ready for dumping, also showing a portion of the main track leading to the dumping frame; Fig. 2 is a combined end elevation and vertical cross-section on the line 2—2 of Fig. 1, the operating cylinder being in section; Fig. 3 is a combined end elevation and vertical cross-section on the line 3—3 of Fig. 1, with cars rocked to dumping position; Fig. 4 is a combined end elevation and vertical cross-section (with parts broken) on the line 4—4 of Fig. 5 showing the apron attachment by which the ore or other contents of the car may be discharged to a convenient distance from the side of the car; and Fig. 5 is a side elevation of Fig. 4 with part of the apron broken away.

The object of my invention is to provide suitable mechanism for the dumping of cars (and notably cars handling ore, rock, coal and the like) which will dispense with the necessity of any overhead construction thereby permitting where desirable, the use of trolley wires or other means of traction without interference.

A further object is to permit the dumping of one or more cars without the necessity of uncoupling the same from adjacent cars.

A further object is to utilize compressed air, steam, water or any equivalent fluid as the driving means for actuating the dumping mechanism, the latter being coupled to the piston of a single cylinder utilizing such driving fluid, thereby not only simplifying the general construction of the apparatus, but insuring therefor a perfect and reliable automatic action under perfect control of the operator.

A further object is to provide means for

controlling the distance to which the material may be dumped or discharged from the side of the car, and in fine to provide the dump with other features, the advantages of which will be readily apparent from a detailed description of the invention, which is as follows:—

Referring to the drawings, and for the present to Figs. 1 to 3 inclusive, 1 represents the rails of the track or tramway over which the cars 2 are hauled, said rails leading up to the rails P of the oscillating or rocking dumping frame or tippie. Said dumping frame may be constructed in any mechanical manner with a view of securing strength and rigidity, but preferably as shown in the drawings, that is to say, it is composed of curved members or rockers E connected longitudinally by I-beams F, to which the rails P are secured, the ends of the I-beams being secured or riveted to the transverse plates or sheets 3 to which the angle-beams composing the rockers E are fastened. The edges of the plates 3 are surmounted by structural members or angle bars d as shown, these being horizontally disposed for a normal position or receiving position of the dumping frame (Fig. 2) the rockers E extending upward beyond the said plates 3 on one side of the frame for such normal position. The dumping frame rests on rollers G which are secured to the roller shafts H mounted in bearings I resting on the main beams J which latter form a part of the building or bin construction.

Disposed adjacent to one of the main beams J is an operating cylinder K in which operates a piston 4, the piston rod 5 of which is connected through the connecting rod K' to the end of one arm of a bell-crank lever K² pivoted at the bottom of and between the angle-brackets L one leg of each of which is riveted to the web of one of the I-beams F, the other leg being riveted to the bottom flange of the opposite beam F, as shown. Loosely pivoted between the vertical members of the brackets L is a locking-pawl K³ in the shape of an angle-piece, the locking end being the heavier and when released being free to engage the end of the adjacent arm of the bell-crank K² when the latter is swung up to it. The locking arm of the pawl is however, normally held in a horizontal position by the stop L³ when the dumping frame is in normal position and before the same is tilted (Fig. 2), but the

moment it is tilted and the pawl K^3 is released from the stop L^3 the locking arm of the pawl drops into engagement with the end of the adjacent arm of the bell-crank K^2 when the latter has been partially swung upward to actuate the gripping or holding dogs O by which the cars are clamped to the dumping frame during the discharging operation as presently to be seen (Fig. 3).

Mounted in bearings M' on the transversely disposed plates 6 carried between the I-beams F of the dumping frame is a rock-shaft or tumbling shaft M to which is secured the tippie-arm N (extending in two directions from the shaft). The opposite ends of said tippie-arm are pivotally coupled to the inner ends of the links N' whose outer ends are pivoted to the adjacent ends of the arms N^2 keyed to the dog-shafts O^2 which are mounted in bearings O^3 on the dumping frame. The links N' pass through the I-beams F with ample clearance. Keyed to the tumbling-shaft M between the bearings M' , M' , is an arm L^2 to which is pivotally connected one end of a link L' the opposite end thereof being pivotally connected to the adjacent arm of the bell-crank K^2 . Each dog is adapted to engage a stirrup O' depending from the center of the side of the car as shown.

Mounted at the bottom of the car behind one of the stirrups O' and in the path of travel of the nose R of one of the dogs O , is a reciprocating latching plunger-rod Q mounted in a bearing 7, the outer end of the plunger terminating in a head P' which the nose R of the dog engages. On the rod Q are collars 8 which serve to confine the end of an arm P^2 mounted at the center of the shaft P^5 . To the opposite projecting ends of the shaft P^5 are secured arms Q^2 which are pivotally connected through the medium of links P^3 to the latches P^4 the free ends of which for a closed position of the hinged door B engage the angle-bar 9 carried by said door. Interposed between the bearing 7 and adjacent collar 8 and encircling the latching plunger rod Q is an expanding spring Q' which normally tends to force the rod Q outwardly and thus, through the connections P^2 , Q^2 and P^3 to elevate the free ends of the latches P^4 into engagement with the gate or door D .

Leading from opposite ends of the operating cylinder K are pipes K^6 alternately serving as supply and exhaust pipes, the upper ends thereof terminating in the valve-casing K^4 in which the control-valve is actuated by the lever 10, the supply of the motor fluid (steam, compressed air, water, or equivalent fluid) being furnished by a pipe 11 leading from any suitable source (not shown). By turning the control valve to one position motor fluid will be admitted to one side of the piston 4, and by turning to

another position, said fluid will enter on the opposite side of the piston, driving it first in one direction and then the other, all as well understood in the art, such driving mechanism being herein shown only conventionally, as any means for reciprocating the piston 4 might be utilized in the present connection.

Referring now to the parts thus far described, the operation of the dumping apparatus may be described as follows:— Assuming the dumping frame to be in its normal horizontal position, with the rails P thereof in continuation of the track-rails 1 (Figs. 1, 2) and with two cars resting on the dumping frame as shown; assuming too that the piston 4 of the operating cylinder K is at the end of its inner stroke; thereupon the operator turns the control valve sufficiently to admit the motor fluid behind the piston to drive it forward or outward. With the travel of the piston represented by the distance $a-b$ (Fig. 2) the bell-crank K^2 will be rocked to bring the end of its inner arm in position to be engaged by the locking arm of the pawl K^3 , a positive locking taking place the moment the tippie or rocking frame has been oscillated sufficiently to disengage the vertical arm of the pawl from the stop L^3 . A further draft on the connecting rod K' by the continued travel of the piston in the same direction will effect the disengagement as is obvious. In the travel of the piston through the distance $a-b$, by reason of the intermediate connections L' , L^2 between the bell-crank K^2 and tumbling shaft M , the latter will be rocked, thus oscillating the tippie-arm N in a direction (contrary to the hands of a clock, Fig. 2) to push on the links N' and thus, through the arm connections N^2 rock the dog-shafts O^2 in proper direction to cause the dogs O to grip the stirrups O' , thus clamping the cars to the frame before any material oscillation or rocking of the latter can take place. In this gripping movement or oscillation of the dogs, the nose R of one of the dogs is forced against the terminal head P' of the reciprocating rod Q , thereby forcing the latter inwardly against the resiliency of the spring Q' , the inward movement of the rod oscillating the arm P^2 , which in turn rocks the shaft P^5 in proper direction to depress the arms Q^2 , and links P^3 , thereby withdrawing the latches P^4 from engagement with the hinged door D . The latter is thus free to swing open as the car tilts. With the travel of the piston through the space represented by $b-c$ (Fig. 2) the dump is thrown into the position shown in Fig. 3, the gate or door D swinging open and the contents of the car or cars discharging. When the ore has all been dumped from the car, the operator reverses the controlling lever forcing the piston

through the travel $c-b$, when the dumping frame is brought back to normal position, the vertical leg of the locking pawl K^3 striking the stop L^3 and releasing the crank-lever K^2 ; and when the piston has passed through its final travel $b-a$, the dogs O are again disengaged from their stirrups and oscillated to their original position shown in Fig. 2, the spring Q' forcing the rod Q outwardly which causes the latches P^4 to reengage the edge of the gravitating gate or door D . The tippie or dumping frame while herein accommodating two cars, may be built for one, two or more cars, as obvious. It will be seen that the curve of the rocker E of the dump has a true radius from the center of the draw-heads or couplings between the cars, so that both car and dumping frame rotate about the axis of the draw-heads. This arrangement permits the dumping of a car on the tippie without the necessity of uncoupling the same from the car on the main track, the ordinary link and pin coupler between the cars allowing for the necessary tilting of a car to discharge its contents. Any kind of coupler however, may be improvised whose draw-head will allow for the rotation necessarily imparted to a car to dump the same.

Where it becomes desirable to discharge the material some distance away from the car, as where for example the ore is charged into a furnace, the attachment shown in Figs. 4 and 5 is resorted to, and may be described as follows:—The dog-shaft O^2 has secured thereon at points opposite the ends of the car, arms S from which extend the links S' , the latter being in turn pivotally connected to the opposite ends of an apron S^2 . Disposed along the bottom of the apron to one side (toward the car) of the longitudinal center thereof are lugs or ears 12 which loosely engage a rod 13 mounted between the upper extensions of the rockers E , E . The ends of the apron are turned up to confine the material on the main body of the apron. When the dogs are forced into engagement with the car stirrups O' preparatory to dumping, the rocking of the dog-shaft O^2 to effect said engagement forces the parts S, S' upwardly, thus causing the apron to assume the dotted position shown in Fig. 4 before the car is tilted. When tilted, the gate D swings open and the ore runs over the apron as obvious from the drawings. The apron attachment is omitted from Figs. 1, 2, 3 as it would obscure the other parts. Besides, not being necessary in all cases, but only in special connections such as charging furnaces and the like, its illustration in separate views simplifies the description. In Figs. 4 and 5 parts already fully illustrated in Figs. 1, 2 and 3 have been omitted for the sake of clearness, so as to bring out the apron feature more conspicuously.

Such features of construction as may be shown in the drawings, but to which no reference is herein made, are well known in the art and require no detailed description.

Having described my invention what I claim is:—

1. In combination with a suitable stationary track or tramway, a tippie or dumping frame in the path of said tramway, said tramway and tippie being adapted to support a series of coupled cars, and means for oscillating the tippie about the axis of the drawheads of the couplers whereby the uncoupling of the cars is dispensed with during the dumping of the cars on the tippie.

2. In combination with an oscillating frame having means for the support of a car, an operating cylinder provided with a reciprocating piston, gripping devices on the frame for clutching the car to the frame, intermediate connections between said piston and gripping devices for forcing the latter into engagement with the car for a predetermined travel of the piston, and oscillating the frame and car to dumping position with a further travel of the piston in the same direction, said connections restoring the car to normal position with the travel of the piston in reverse direction and then disengaging the gripping devices.

3. In combination with an oscillating frame having means for the support of a car, a gate on the car, a latch for the gate, an operating cylinder provided with a reciprocating piston, gripping devices on the frame for clutching the car to the frame, latch-controlling devices interposed between the gate-latch and the gripping devices aforesaid, intermediate connections between the piston and gripping devices for forcing the latter into engagement with the car and disengaging the latch with a predetermined travel of the piston, and oscillating the frame and car to dumping position with a further travel of the piston in the same direction.

4. In combination with an oscillating frame having means for the support of a car, an operating cylinder provided with a reciprocating piston, gripping devices on the frame for clutching the car to the frame, an apron carried by the frame and normally positioned out of operative connection with the car, intermediate connections between the gripping devices and apron for positioning the apron relatively to the car to catch the contents thereof during dumping, intermediate connections between the piston and gripping devices for throwing the latter into engagement with the car and shifting the apron to discharging position with a predetermined travel of the piston, and oscillating the frame and car to dumping position with a further travel of the piston in the same direction.

5. In combination with a tippie or dump-

ing frame having rockers, means for supporting thereon a car coupled to a car located adjacent to the frame, the latter being rotatable about the axis of the drawheads
 5 connecting the cars, an operating cylinder, a reciprocating piston therefor, a bell-crank pivoted to the frame and connected with the piston, a locking pawl for engaging the bell-crank, a tumbling shaft on the frame, a tip-
 10 ple arm on the shaft, a pair of dog-shafts rotatable in their bearings on the frame, arms on the dog-shafts, intermediate link connections between the arms and tippie-arm, dogs on the shafts, stirrups on the car adapted to
 15 be engaged by the dogs upon a predetermined travel of the piston in one direction, said piston rocking the frame and car thereon to dumping position upon the travel of the piston for the balance of its stroke in the
 20 same direction.

6. In combination with a frame oscillating about a fixed axis, and supporting a car, a gate hinged to one side of the car, hinged
 25 latches normally engaging the free edge of the gate, a spring-controlled latching plunger rod reciprocatingly mounted on the car, a rock-shaft on the car, an arm secured to the rock-shaft, collars on the rod between
 30 which the free end of the arm operates, arm and link connections between the rock-shaft and latches, and means on the frame for forcing the plunger-rod from its normal position and disengaging the latches and simultaneously clutching the car to the frame
 35 preparatory to oscillating the frame and its car to dumping position.

7. In combination with a car discharging from the side and rotatable about a fixed axis, a gate for releasing the contents to be
 40 discharged, a movable apron normally removed from the car for an upright position of the latter, and means for moving the apron into position to catch the contents released by the gate as the car is about to be
 45 rotated to dumping position.

8. In combination with a frame rotatable about a fixed axis, and adapted to support a car, means for clamping the car to the frame preparatory to the oscillation of the latter
 50 to tilt the car to dumping position, a movable apron normally removed from the car for an upright position of the latter, and

means responsive to the clamping means for shifting the apron to proper position to catch the contents of the car as the latter 55 are being dumped.

9. In combination with a stationary tramway, a tippie or dumping frame having rockers, means for supporting thereon a series of cars, in coupled relation with the cars 60 on the tramway, the frame being rotatable about the axis of the drawheads coupling the several cars, an operating cylinder, a reciprocating piston therefor, a bell-crank pivoted to the frame and coupled to the piston, a pivoted locking pawl for engaging the bell-crank, a stationary stop for the pawl, a tumbling shaft on the frame, a tip-
 65 ple arm on the shaft, a pair of rotatable dog-shafts disposed on opposite sides of the frame, arms on the shafts, link connections between the arms and tippie arm, oscillating dogs on the dog-shafts, stirrups on the car adapted to be gripped by the dogs upon a
 70 predetermined travel of the piston, in one direction, said piston rocking the frame and its car to dumping position upon further travel of the piston in the same direction, a gate normally closing the side through which the car discharges, and means responsive to
 75 the piston and dogs for releasing the gate for the dumping operation.

10. In combination with a rotatable dumping frame provided with means for supporting a car, means on the frame for engaging 85 the car and holding the same fast to the frame for the dumping position of the car, and motor-fluid operated devices for actuating said car-holding means and rotating the frame.

11. In combination with a car rotatable about an axis and having a gate for the release of the material, a swinging apron normally out of contact with the car, and means 95 for moving the apron against the car to direct the material discharged therefrom to a suitable point removed from the car.

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

GEORGE O. BRADLEY.

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