

May 22, 1934.

J. P. ANDERSON

1,959,975

DOOR OPERATING MECHANISM

Filed Nov. 23, 1927

4 Sheets-Sheet 1

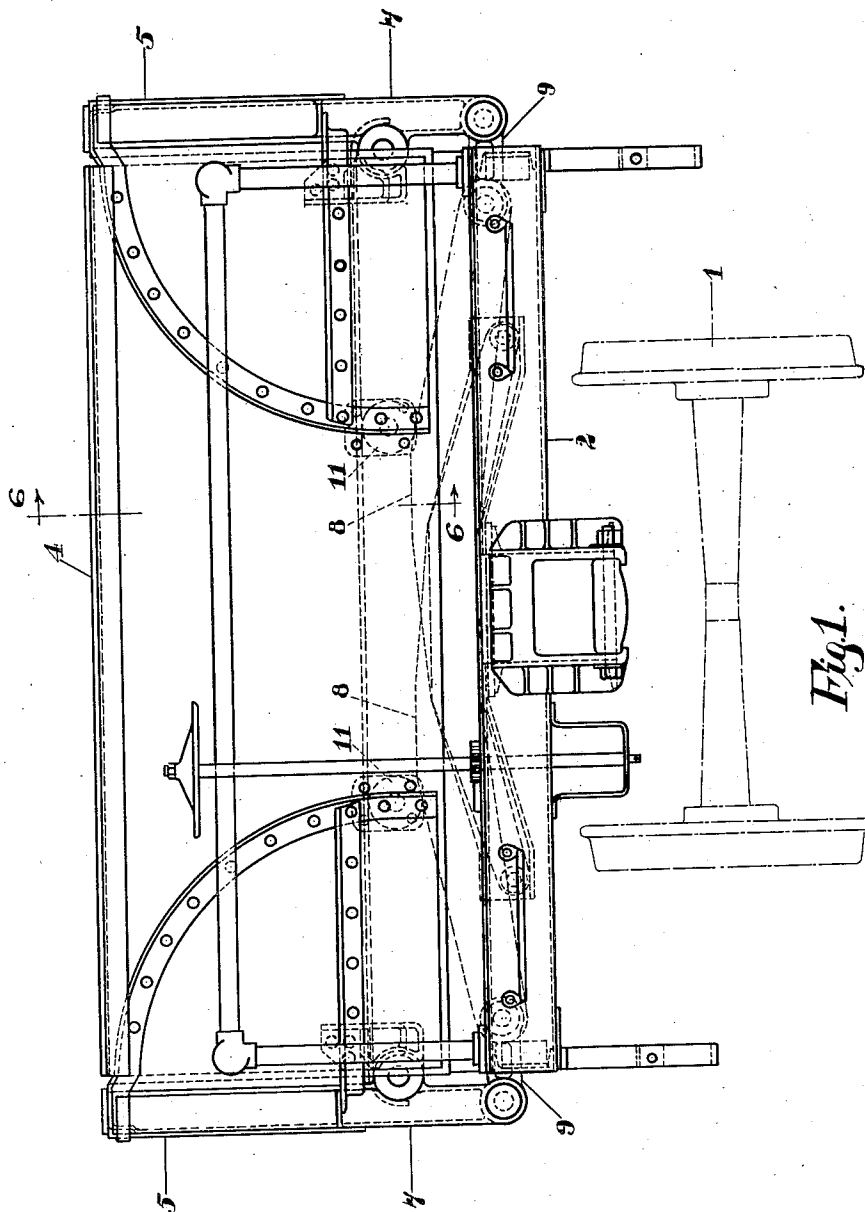


Fig. 1.

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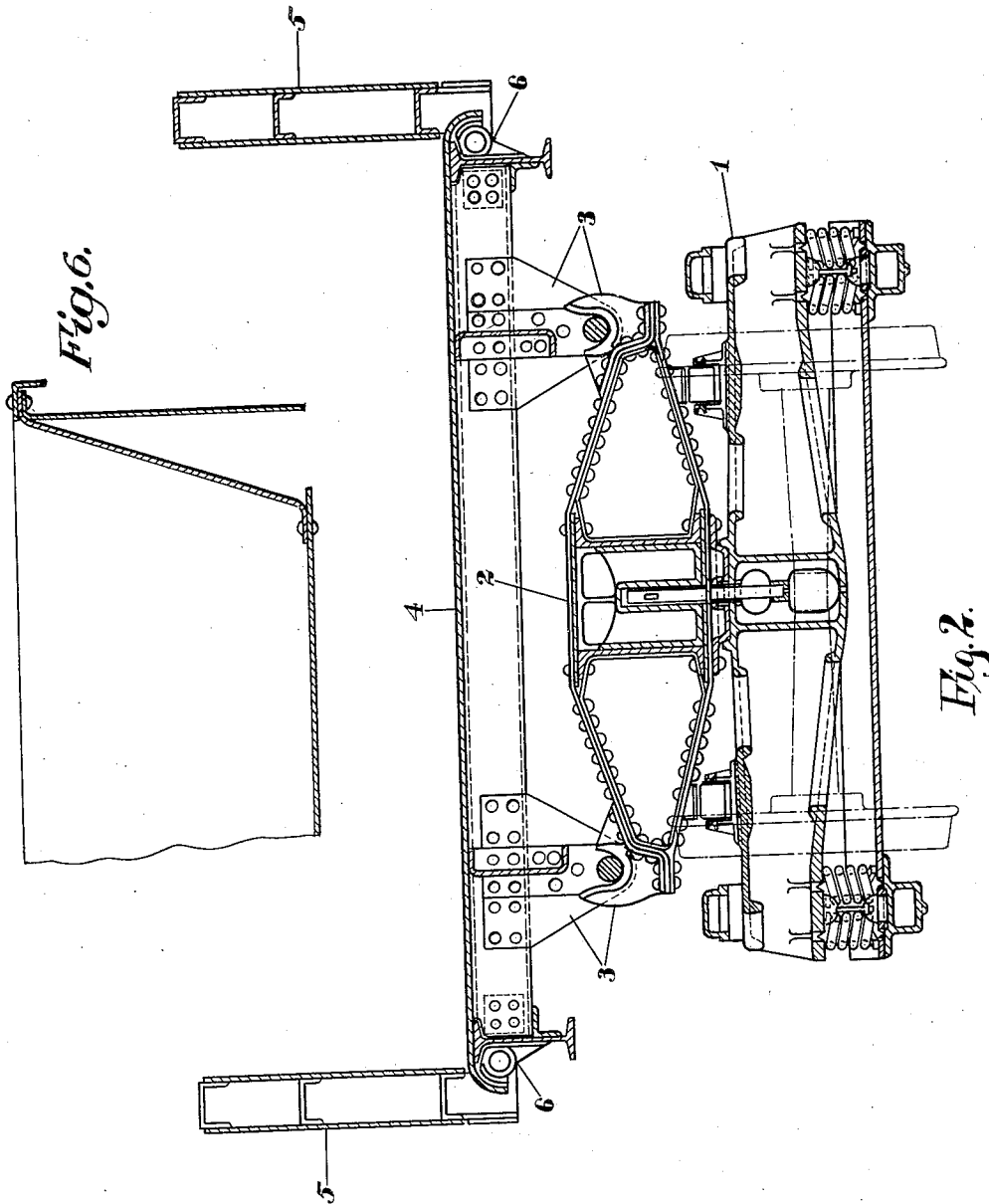
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4 Sheets-Sheet 3

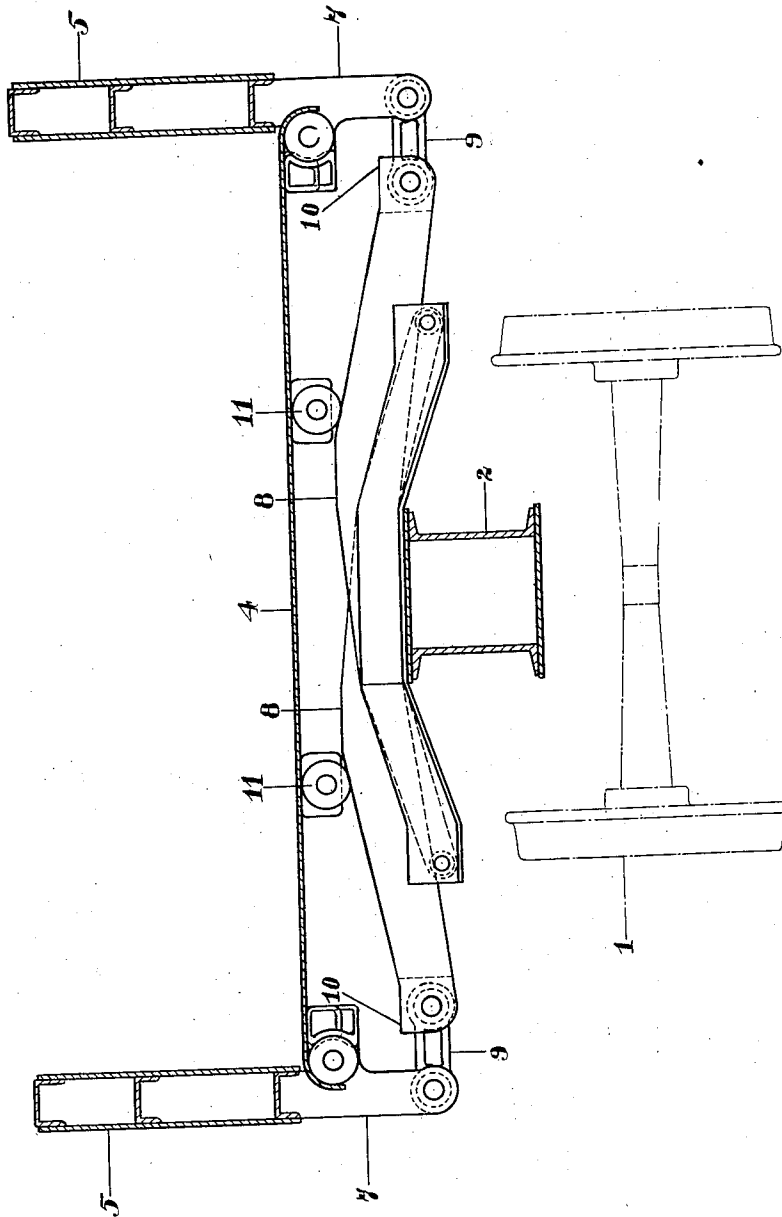


Fig. 3.

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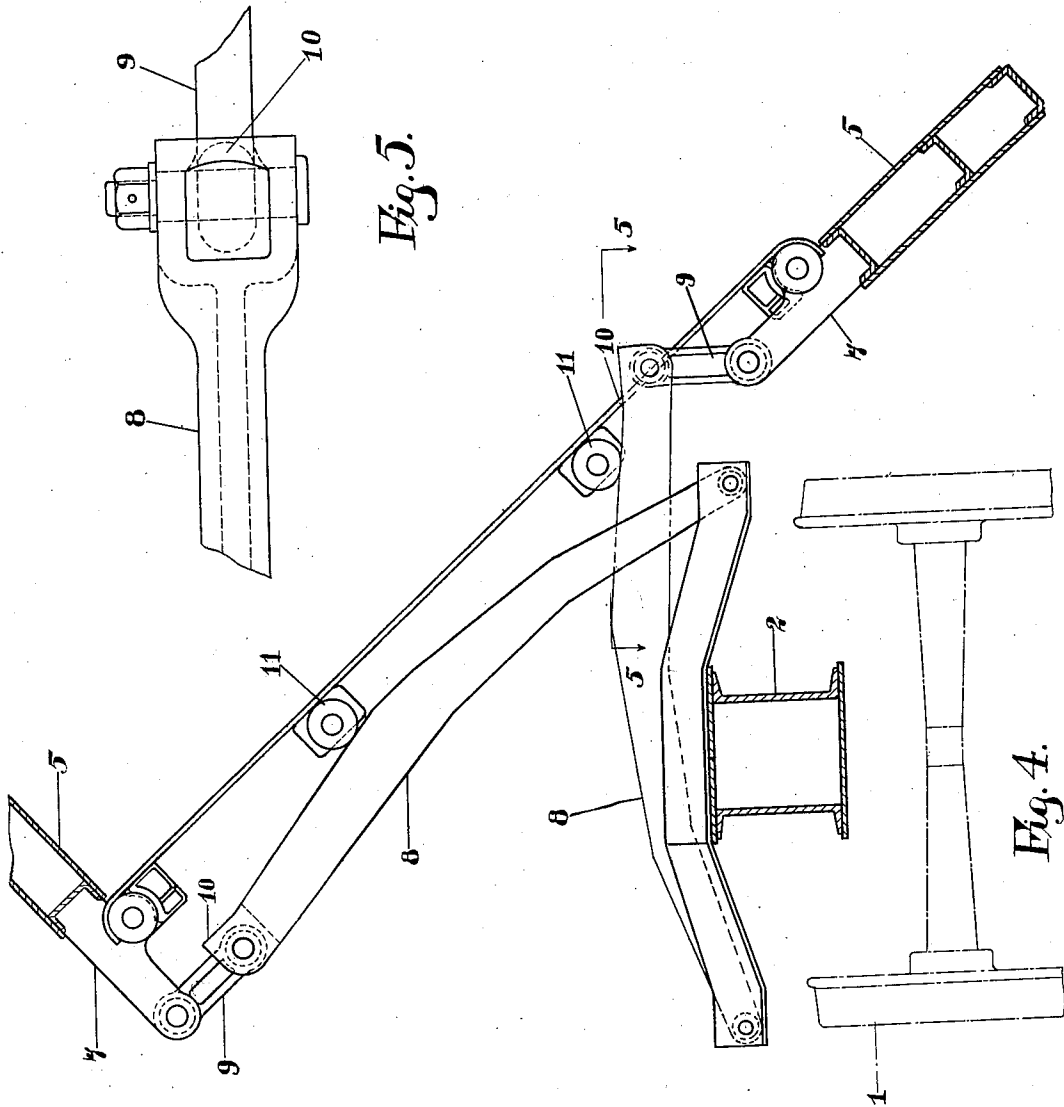


Fig. 5.

Fig. 4.

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UNITED STATES PATENT OFFICE

1,959,975

DOOR OPERATING MECHANISM

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mesne assignments, to Koppel Industrial Car
and Equipment Company, McKees Rocks, Pa.,
a corporation of Pennsylvania

Application November 23, 1927, Serial No. 235,216

3 Claims. (Cl. 105—276)

The object of my invention is to provide a dump car with a door operating and controlling mechanism which will lock the doors with the body horizontal and permit the opening of the discharging door with the tilting of the body and close and lock said door with the return of the body to a horizontal position.

Another object being to maintain the door on the rising side of the car body closed while permitting the descending door to be opened as the car body is tilted.

A further object of my invention is to provide a dump car body with a door operating mechanism which will permit the discharging door to be stopped in an opening position, by the application of an exterior force, and allow the body to continue its dumping movement. Furthermore, such a mechanism will exercise positive closing and locking control of said door, upon return of the body to a horizontal position.

Fig. 1 is an end view of a dump car with the body in a horizontal position and the doors closed; Fig. 2 is a section through the car and shows the trunnion bearings supporting the car body; Fig. 3 is a section through the car body showing the door operating mechanism; Fig. 4 is a section through the car with the body tilted and the discharging door opened; Fig. 5 is a section along the line 5—5 of Fig. 4; Fig. 6 is a section taken along the line 6—6 of Fig. 1 showing a portion of the car and the provision for movement of the door operating levers.

Referring now in detail to the drawings where like reference characters refer to like parts, reference character 1 is a car truck with the car underframe 2 supported thereon. Trunnion bearings 3 at the sides of said underframe supporting a car body 4 which is tiltable about either side thereof. The doors 5 are attached to the sides of the car body by hinges 6 so as to swing outwardly and downwardly when the car body is tilted towards their respective sides. At spaced intervals along the door are downward depending arms 7, the lower ends of which are connected to the door operating mechanism. Portions of the downward depending member 7 may be utilized to form a hinge for the door, as shown by the drawings, or independent hinges such as indicated by reference character 6 may be used. At intervals along the underframe are door operating members 8 which extend across the underframe. These members 8 are connected at one end to the underframe and at the opposite end to the downward depending door members 7 by means of a connecting member 9. A stop 10 on the member 8

engages a portion of the member 9 to prevent the downward movement of the arms on the rising side during the tilting of the car body. Beneath the car body and secured thereto are roller members 11 which are adapted to cooperate with the door operating members 8 to limit the opening of the car doors and to effect the closing of the doors with the return of the tilted body to a horizontal position.

When the car is in a normal carrying and transporting position the car body is rigidly supported by the trunnion bearings 3 on the car underframe. The body rollers 11 are held tight against the door operating members 8 by the weight of the car body and prevent any movement of these door operating members and consequently the doors 5 are held tightly closed. The body tilting means consists of telescoping pressure actuated pistons contained in cylinders along each side of the car underframe. It will not be necessary to describe or show these cylinders in the present invention as any of the various types known to the prior art, that are suitable, may be used.

Assuming the body to be dumped to the right-hand side of the car underframe, the following actions will take place: the left-hand body actuating pistons will rise and tilt the car body; with the rising of the left-hand side of the car body, stops 10 of the members 8 and the body rollers 11 on that side of the car will maintain their respective positions to the members 8 attached to the left-hand door and will prevent any movement of these members, thus holding the rising or left-hand door tightly closed. On the right-hand side of the car the body rollers describe an arc in an upward direction away from the door operating means 8 attached to the right-hand door, leaving these members 8 free to rise. The force of gravity and the weight of the lading coming in contact with the right-hand door will cause it to open and thus discharge the lading.

It will be here noted that the only forces acting on the door to cause it to open are the weight of the lading and the force of gravity. The rollers 11 provide a limiting action to the opening of the door proportionate to the angle of tilt assumed by the car body. The roller members 11 will pass out of contact with the upper surfaces of the door operating arms 8 with the tilting of the body so that while the amount the door may open is limited by the angle of tilt assumed by the car body there is no action by the members 8 to force the car door open. As the door begins to swing open on its hinges 6 the downward depending arm 7, describe their path of travel and transmit

their motion to the connecting links 9 which, in turn, impart their motion to the door operating members 8 causing them to rise. Thus it will be seen the members 8 are actuated only by the movement of the opening door and its downward depending arms 7, the advantage of such an arrangement being readily appreciated when a quantity of material is lying along the tracks where the car is dumping. As the discharge door descends with the tilting of the car and strikes any accumulation deposited along the sides of the tracks, the door will stop by reason of its contact with such accumulation and allow the car body to continue to tilt. If this were not true and the door were forced to continue to open, one of two things would happen, either the door would be badly twisted or broken, or else the door operating mechanism would be twisted out of shape or damaged beyond repair.

With the return of the tilted body to a horizontal position, the body rollers come into contact with the door operating members forcing them downward toward the underframe, these members in turn transmit their motion to the members 9 to close and lock the door when the body has resumed its horizontal position. The door operating members on the opposite side of the car remain inactive during this return of the car body to the horizontal position.

With the above description it should be clearly understood that when the door is being opened the members 8 are nothing more than connecting members. They transmit the force of the opening door to the limiting action of the rollers when the body is tilted in one direction, and transmit the closing action of the rollers to the doors when the body is tilting in the opposite direction. When the body begins to tilt the body rollers engaging the members 8 connected to the opening door, begin to move out of contact with these members. When the body is completely dumped these rollers are in such a position that the door may be closed by exterior force and the resultant movement of the members 8 will not cause contact of these members with the rollers. Upon return of the body to a horizontal position, the rollers cooperate with the arms 8 and force the discharge door closed.

Should it be desired to tilt the body to the left-hand side of the underframe, a corresponding opposite action between the door operating members and the doors will take place.

Throughout the specification no particular form of body has been described nor has the lo-

cation of the door operating arm beneath the body been definitely fixed. In some cases it may be desirable to have the door operating arms or members 8 placed beyond the body so that in their upward movement during the opening of their attached door the arms will not come into engagement with the floor. In other cases it may be desirable to have the arms placed inwardly of the end of the body as shown in Fig. 1 in which case it will be desirable to stop the floor off short behind the slope sheet 12 so that the arms 8 may move upwardly between the end sheet of the body and the slope sheet 12. It being understood that the slope sheet 12 is the usual sheet placed inside the ends of the body so as to facilitate discharge of the lading as the body is tilted.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a dump car, an underframe, a dump body mounted on trunnions near each side of said frame, doors pivotally mounted at the sides of said body, transverse members connected near each side of said frame and extending to the opposite door, downward depending arms on said door, links connecting said transverse members and downward depending arms, attachments on said body cooperating with said transverse members to control the vertical movement of said members, said links and attachments cooperating with said transverse members and downward depending arms to lock the doors in a closed position with the dump body horizontal and to permit closing of the lower door when the body is in a tilted position.

2. In a dump car, an underframe, a dump body, doors pivotally mounted at the sides of said body, transverse members connected near each side of said underframe and to the opposite doors, attachments on said body cooperating with said members to limit the opening but not the closing of the discharging door of the tilting body.

3. In a dump car, an underframe, a dump body, doors pivotally mounted at the sides of said body, transverse members connected near each side of said underframe and to the doors at the opposite side, attachments on said body cooperating with said members to lock the doors closed with the body horizontal, to maintain the upper door closed as the body is tilted and to limit the opening but not the closing of the discharging door by such tilting.

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