June 16, 1936. H. W. SANFORD 2,044,638

DROP BOTTOM MINE CAR

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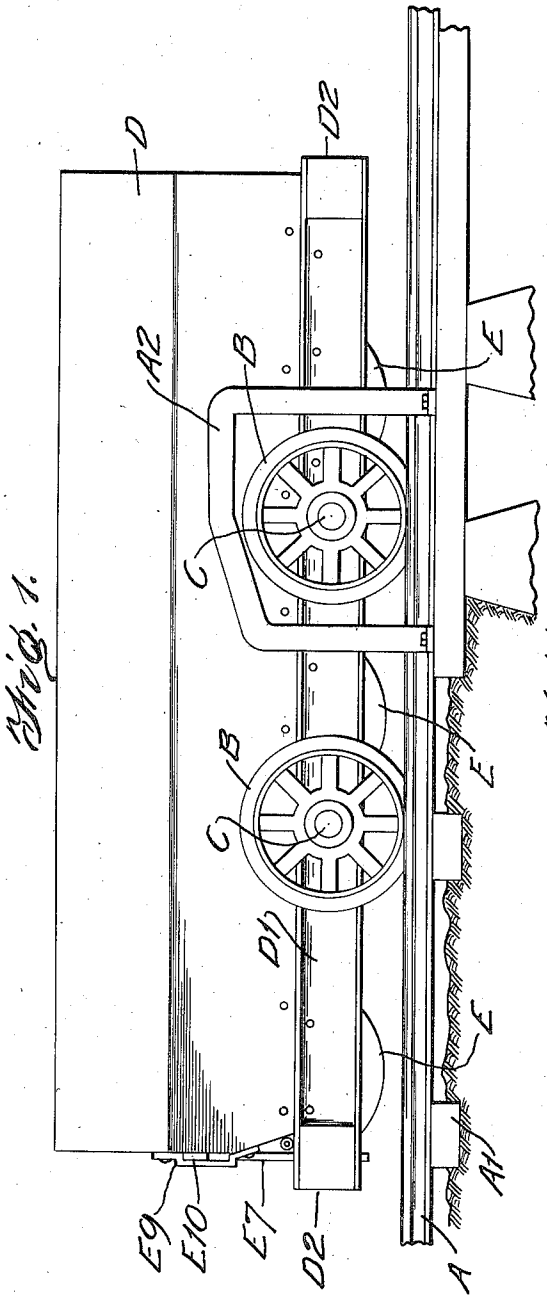


Fig. 1.

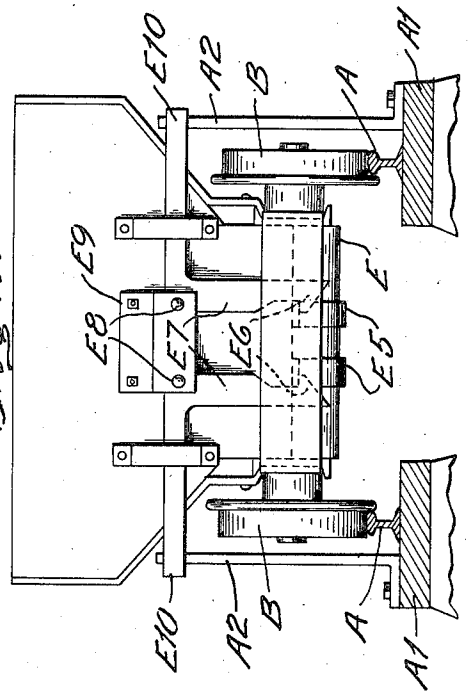


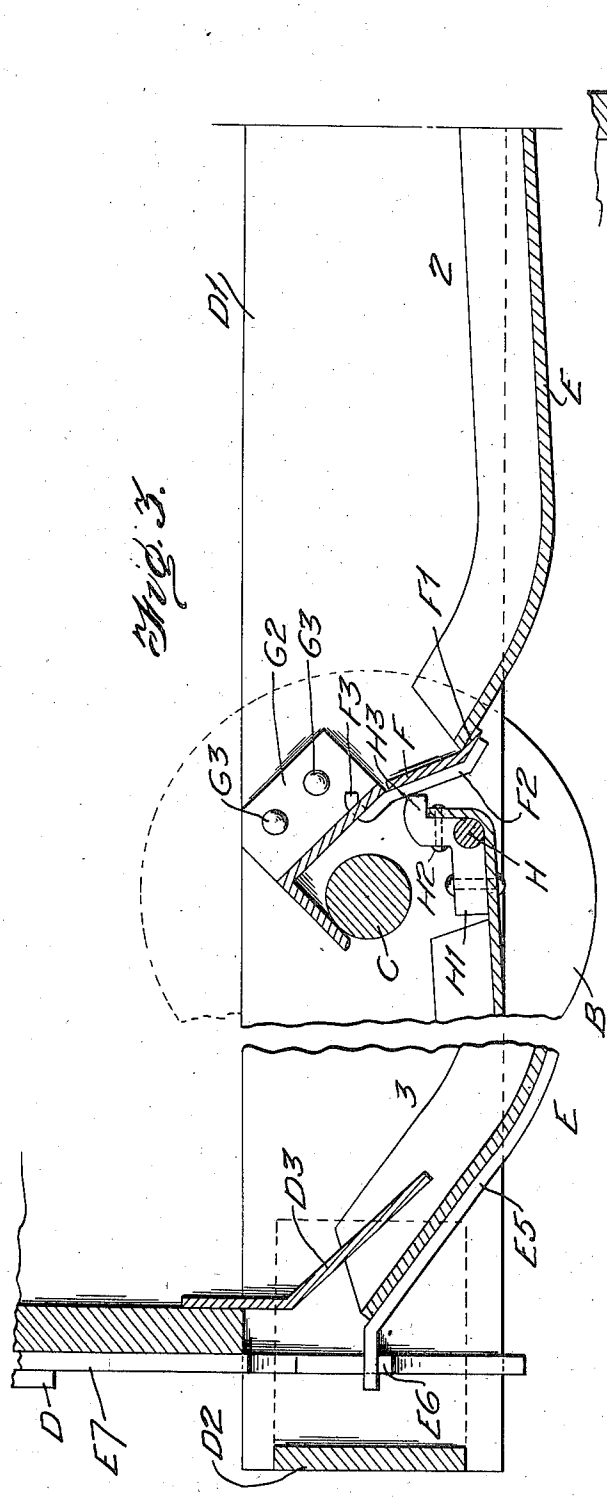
Fig. 2.

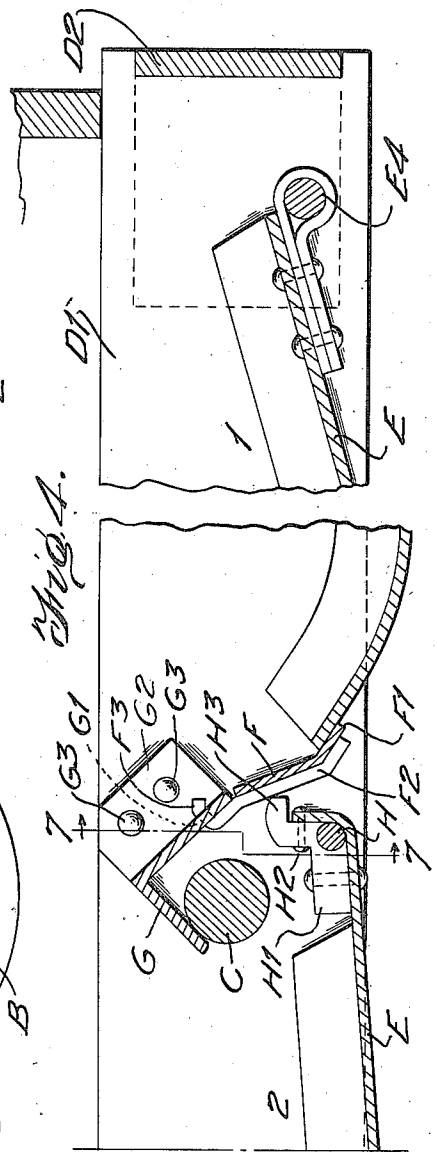
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DROP BOTTOM MINE CAR

Filed Dec. 8, 1931 4 Sheets-Sheet 2





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DROP BOTTOM MINE CAR

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Fig. 6.

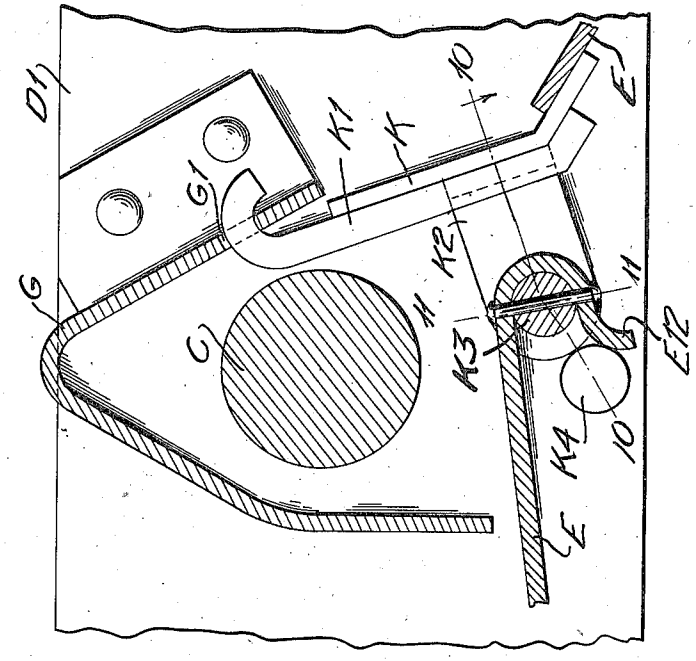
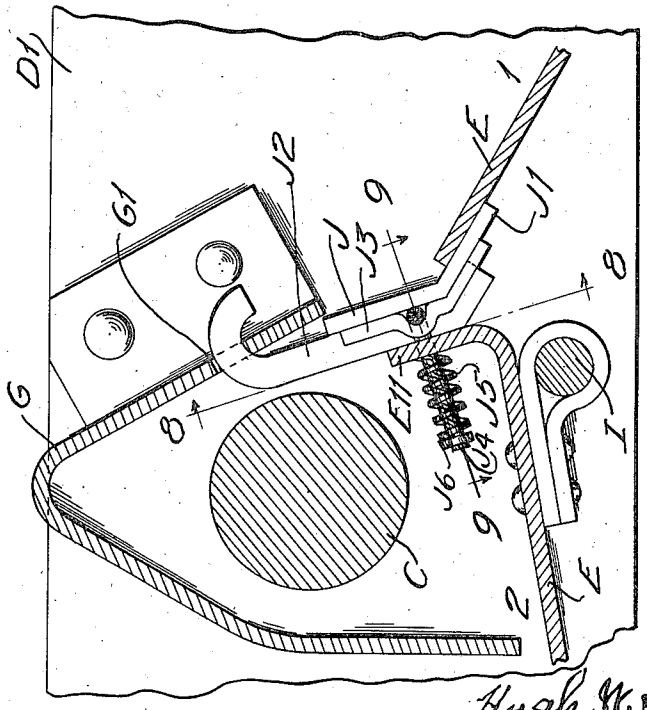


Fig. 5.



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Fig. 9.

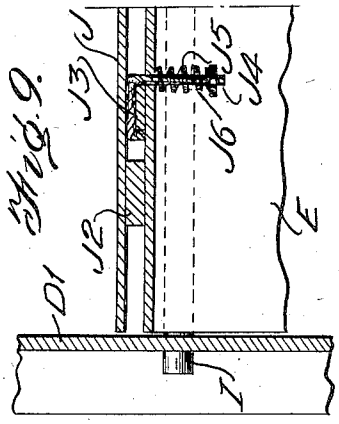


Fig. 11.

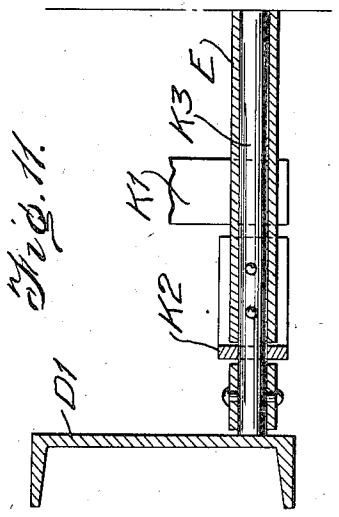


Fig. 8.

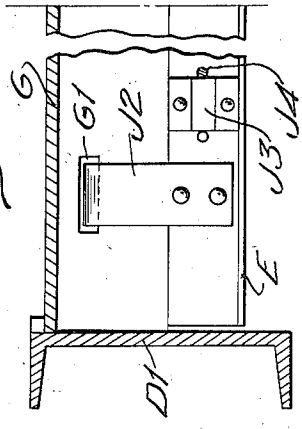


Fig. 10.

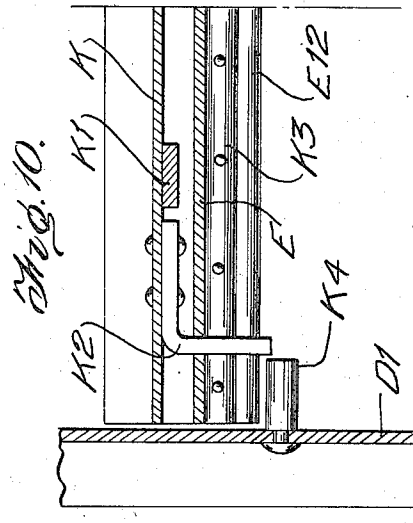
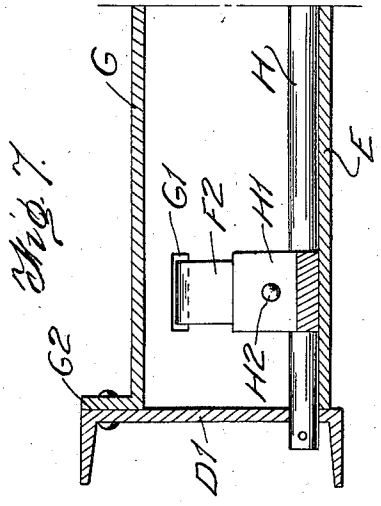


Fig. 7.



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UNITED STATES PATENT OFFICE

2,044,638

DROP BOTTOM MINE CAR

Hugh W. Sanford, Knoxville, Tenn.

Application December 8, 1931, Serial No. 579,763

38 Claims. (Cl. 105—253)

This invention relates to an improvement in drop bottom cars, in which a plurality of doors are arranged between the ends of the cars and in a low position in order to increase the lading to the maximum degree.

In cars of this character which have been employed heretofore, the latching means for the drop bottom doors have permitted the release of the doors successively from the rear to the front of the car, and the rear door must drop to a pendant position before the next successive door is released. This makes it necessary that the car should be over the coal bin before the doors can be released, and this releasing action is not successively from the front to the rear of the car when the car reaches the coal bin, as is desirable.

It is the object of my present invention to provide an improved manner of latching the doors for releasing them from rear to front upon slight movement of the doors so that they will drop successively from the front to the rear of the car when the car reaches the coal bin, and for this purpose, the leverage between the doors is so compounded that the movement of the rear or middle door through an arc of approximately 10° or 12°, which is usually approximately to the cross ties, is sufficient to permit the release of the next forward door, which therefore permits the doors to drop successively from the front to the rear of the car when they reach the coal bin.

In the accompanying drawings:

Fig. 1 is a side elevation of a mine car showing the invention applied thereto;

Fig. 2 is an end elevation thereof;

Fig. 3 is a vertical sectional view through the rear portion of the car;

Fig. 4 is a similar view through the forward portion of the car;

Fig. 5 is a sectional view of a slightly modified form of latching means;

Fig. 6 is a similar view showing another modification of the latching means;

Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 4;

Fig. 8 is a similar view on the line 8—8 of Fig. 5;

Fig. 9 is a partial horizontal section on the line 9—9 of Fig. 5;

Fig. 10 is a similar view on the line 10—10 of Fig. 6; and

Fig. 11 is a detail section on the line 11—11 of Fig. 6.

Referring to Fig. 1, A represents the track rails, which are supported upon cross ties A1 and which receive the car wheels B mounted on the axles C.

The body of the car is designated generally D and is provided with side sills D1 and end sills D2.

The drop bottom doors are designated generally E and are shown as three in number and arranged lengthwise of the car between the side sills D1. The doors E are separately marked 1, 2, 3 successively from front to rear of the car. The door 1 is hinged at its forward edge on a hinge rod E4 carried by the side sills D1. The rear edge of the door 1 is supported by a pendulum F, which has a downwardly and forwardly projecting lip F1, which engages under the rear edge of the door 1 to support said rear edge. A pendulum hinge F2 supports the pendulum F, as shown in Figs. 4 and 7, and has a hook-shaped upper end F3, which is hooked into a slot G1 in a hood plate G. The hood G extends transversely between the side sills D1 over the axles C and the latching mechanism between the doors 1 and 2, to protect the same. Flanges G2 are formed on opposite ends of the hood G and are secured by rivets G3 to the side sills D1.

A rigid hinge rod H is provided for hingedly supporting the door 2, as shown in Figs. 4 and 7, and which hinge rod extends transversely between the side sills D1, being supported thereby. Brackets H1 are fixed to the hinge rod H and are secured by rivets H2 to the door 2. These brackets H1 are provided with forwardly extending noses H3 which engage the rear side of the pendulum hinge F2 to swing the pendulum F on its hinge support.

The latching means between the doors 2 and 3 is the same in structure as that between the doors 1 and 2, and the corresponding elements in Fig. 3 are designated by corresponding reference characters.

A flange D3 projects over the free edge of the door 3 to protect the door releasing mechanism for the door 3. The door 3 is provided with rearwardly projecting tongues E5, which are in position to be engaged by hooks E6, carried by bell crank levers E7 pivoted as at E8 to a bracket E9 on the rear end of the car body D. The horizontal arms E10 are in position to engage cam members A2 for releasing the hooks E6 from the tongues E5 and permitting the door 3 to drop.

When the door 3 has been released by its latching means, it turns on its hinge rod H and, since it is relatively close to the ties, the latter will prevent a dropping of the door to more than approximately 12° before the car reaches

the coal bin. However, the relation between pendulums F and the noses H3 causes a compounding of the release action or leverage between the rear and forward doors, so that a movement of the rear door through less than 12° is sufficient to cause a release of the forward door. This permits the forward door to drop when the car reaches the coal bin before the rear door, but the forward door is released by the releasing of the rear door, this being accomplished so quickly by the compounding leverage action of the mechanism, that the forward door is released before the rear door has fallen to any substantial distance.

This permits the doors to be released successively from the front to the rear of the car, even where a considerable lap is provided between the lip F1 and the rear edge of the door E supported thereby. This lap is usually approximately three-quarters of an inch, although it might be greater, while yet accomplishing a release of the doors successively in the 1—2—3 order.

With this construction, the axles are entirely free from all entanglements. This permits the use of a drop axle construction without interfering with the door mechanism. If desired, a movable axle construction may be used by which the car axles may be taken out of the car without disturbing any of the other features.

The hoods G over the axles C prevent coal from interfering with the action of the releasing mechanism, where this mechanism is housed beneath the hoods and the axles.

Suitable adjusting means may be provided to bring the parts into proper position after the car is assembled.

In the modification shown in Figs. 5, 8, and 9, the rear door E is hingedly supported on a hinge rod I, and said rear door E is provided with an upstanding flange E11 at its forward edge.

A pendulum J has an oblique lip J.1 which engages under the rear edge of the forward door E, this pendulum J being supported by a hinge J.2 which hooks into a slot G.1 in the hood G. Brackets J.3 are secured to the back face of the pendulum J, and flexible members J.4 are connected with the brackets and extend through openings in the flange E.11 of the rear door.

Springs J.5 are sleeved over the flexible members J.4, and are interposed between abutments J.6 on the flexible members and the back face of the flange E.11. This provides a flexible connection between the rear door and the pendulum which regulates the release of the forward door.

In the form shown in Figs. 6, 10, and 11, the pendulum K is supported by the pendulum hinge K.1 from the hood G, as above described. Brackets K.2 are secured to the back face of the pendulum K and extend outwardly therefrom carrying a door hinge rod K.3, over which a loop E.12 of the rear door E extends to form a hinge support for the rear door, and which hinge support is carried by the pendulum and moves therewith. Stops K.4 are carried by the side sills D.1 and project inwardly to limit the rearward swinging movement of the pendulum K.

The edge of the loop E.12 engages the stops K.4, so that as the door E drops, it engages the stops pulling the pendulum K out from under the right-hand door. The hinge-rod K.3 passes above the stops in the swinging of the pendulum. The stops K.4 also prevent the pendulum K from moving into a position where it will not support the right-hand door when the left-hand door is raised into its closed position.

In this form of the invention, the pendulum K is held in position by the car axle and can not slip out of its support in the hood unless the axle is removed. In this form of the invention, the pendulum may be taken loose and the door releasing mechanism removed from the car without cutting any rivets or bolts, and merely by removing the axle, so that the hook part of the pendulum will come out of the slots in the hood.

In this form of the invention, in which the rear door is hingedly supported by the pendulum, the dropping of the rear door and its engagement with the stops K.4 causes the hinge thereof to swing rearwardly, which action combined with the compounding of the leverage on the pendulum gives the proper door release in 1—2—3 order. The higher up on the pendulum that the rear door is hingedly supported, this compounding action will be evidenced.

By this compounding of the leverage in the door releasing or latching means, I am able to get a very satisfactory lap on the forward door on the lip of the pendulum hinge, which permits the doors of the usual low mine car in practical operation to drop in the 1—2—3 order. At the same time, the forward door is supported not from the axle in the form illustrated, but by a hinge-rod which is located beneath the axle. This construction has an advantage in that it permits the use of a very flat door and one that has a large capacity in that the door does not take up so much of the lading body space.

The free edges of the doors are released successively in 3—2—1 order, in which order they begin to drop, but instead of fully dropping for discharge of the coal, the doors are supported above the track until the forward door is over the tipple opening and is then free to drop completely for full discharge, and the other doors then follow the same action in succession. By the reference in the claims to the successive "dropping" in 1—2—3 order, or successively from front to rear of the car, or the like, is intended the dropping in the 1—2—3 order before the car reaches a place where the doors can fall below the level of the top of the cross-ties onto pendent positions, ordinarily lower than the track-rails, for discharge of the coal.

I claim as my invention:

1. In a dumping car, the combination of side sills, an axle above the horizontal plane of the bottoms of the side sills, forward and rearward drop bottom dumping doors, the forward door normally having an open space at the rear end thereof when closed but unlatched, a pivotal support for the rearward door below the center of the axle and above the lower edge of the side sills, hinging means for the forward door protected by and disposed above the lowest portion of the side sills, a latch for the forward door and actuated by movement of the rearward door, said latch extending from side to side of said forward door and closing the space at the rear edge thereof, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rearward door has dropped through an angle of approximately twelve degrees.

2. In a mine car, the combination of side sills, an axle above the horizontal plane of the bottoms of the side sills, forward and rearward drop bottom dumping doors, the forward door normally having an open space at the rear end thereof when closed but unlatched, a fixed pivotal support for the rearward door below the center of the

axle and above the lower edge of the side sills, hinging means for the forward door protected by and disposed above the lowest portion of the side sills, a latch for the forward door and actuated by movement of the rearward door, said latch extending from side to side of said forward door and closing the space at the rear edge thereof, and means for compounding the action between the rearward door and the latch for causing dropping of the forward door before the edge of the rearward door has dropped through an angle of approximately twelve degrees.

3. In a mine car, the combination of frame structure, an axle, forward and rearward drop bottom dumping doors, the forward door normally having an open space at the rear end thereof when closed but unlatched, a pivotal support for the rearward door extending from side to side of the frame structure and located below the top of the axle and above the lower edge of the frame structure, a latch for the forward door, said latch extending from side to side of said forward door and closing the space at the rear edge thereof, means connected with the rearward door for actuating the latch and having compound action for causing a dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

4. In a mine car, the combination of frame structure, an axle, forward and rearward drop bottom dumping doors, the forward door normally having an open space at the rear end thereof when closed but unlatched, a rigid hinge rod carried by the frame structure above the lower edge thereof and extending from side to side of the frame structure for pivotally supporting the rearward door and disposed below the axle, a swinging pendulum in position to support the rear edge of the forward door, said pendulum extending from side to side of the forward door and having lateral area sufficient to close the space at the rear edge of the forward door, and means connected with and actuated by movement of the rearward door and having compound leverage action on the swinging pendulum for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

5. In a mine car, the combination of frame structure, an axle, a hood extending over the axle, forward and rearward drop bottom dumping doors, a swinging pendulum suspended from the hood in position to support the rearward edge of the forward door, a rigid hinge rod carried by the frame structure for pivotally supporting the rearward door, means connected with the rearward door and acting on the pendulum at a point substantially above the point of support for the forward door, to release said forward door when the rearward door moves in an arc less than twelve degrees.

6. In a mine car, the combination of frame structure having side sills, an axle, forward and rearward drop bottom dumping doors, a pivot for the rearward door extending from side to side of the frame structure below the top of the axle and above the lower edge of the side sills, hinge means for the rearward door mounted on said pivot and having its lowest portion lying in the section below the horizontal plane of the center of the pivot and above the horizontal plane at the lowest portions of the side sills in protected position, and a pendulum supported latch for the forward door actuated by movement of the rearward door, said latch extending from side to side of the forward door.

7. In a mine car, the combination of frame structure having side sills, wheels and axles, forward and rearward drop bottom dumping doors having the free edges thereof spaced apart a substantial distance in closed positions, a pivot for the rearward door extending from side to side of the frame structure below the tops of the axles and above the lower edges of the side sills, hinge means for the rearward door mounted on said pivot and having its lowest portion lying in the section below the horizontal plane of the center of the pivot and above the horizontal plane of the lowest portions of the side sills, and a pendulum supported latch for the forward door actuated by movement of the rearward door, said latch extending from side to side of the car in position to approximately close the space between the adjacent edges of the doors.

8. In a mine car, the combination of frame structure having side sills, an axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, a pivotal support for the rearward door below the top of the axle and above the lower edge of the side sills in protected position, a latch for the forward door and actuated by movement of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of appoximately twelve degrees.

9. In a mine car, the combination of frame structure having side sills, axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, pendulum means supported by means other than the axle and located above the lower edge of the side sills for pivotally supporting the rearward door, and a latch for the forward door and actuated by movement of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof.

10. In a mine car, the combination of frame structure having side sills, wheels and axles, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, pendulum means supported by means other than an axle and located above the lower edge of the side sills for pivotally supporting the rearward door, a latch for the forward door actuated by movement of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof, and transverse protecting and shielding means located above the latch in position to prevent lading from falling between the latch and the adjacent axle.

11. In a mine car, the combination of frame structure having side sills, an axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, means other than the axle and located above the lower edge of the side sills for pivot-

ally supporting the rearward door, a latch for the forward door and actuated by movement of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has moved through an arc of approximately twelve degrees.

12. In a mine car, the combination of frame structure, wheels and axles, a hood extending transversely of the frame structure over an axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, means located forwardly of the axle for pivotally supporting the rearward door, a latch for the forward door and actuated by movement of the forward end of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space between the free edge thereof and the hood, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has moved through an arc of approximately twelve degrees.

13. In a mine car, the combination of frame structure having side sills, wheels and axles, a hood extending transversely of the frame structure over an axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, a hinge rod located forwardly of the axle and above the lower edge of the side sills for pivotally supporting the rearward door, a latch for the forward door and actuated by movement of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space between the free edge thereof and the hood, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

14. In a mine car, the combination of frame structure, wheels and axles, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, a support for the rearward door other than an axle and extending from side to side of the frame structure, a latch for the forward door and actuated by movement of the forward end of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof, pendulum means supported by means other than the axle for pivotally supporting said latch, and means for compounding the action between the rearward door and the latch for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

15. In a mine car, the combination of frame structure, an axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, a support for the rearward door other than an axle and extending from side to side of the frame structure, a latch for the forward door and actuated by movement of the forward end of the rearward door, said latch extending approximately from side to side of the forward door and approximately closing the space at the free edge thereof, means located forwardly of the axle for pivotally supporting said latch, and means for compounding the action between the rearward door and the latch for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

16. In a mine car, the combination of a frame structure, an axle, a hood arranged over the axle, forward and rearward drop bottom dumping doors, the forward door normally having a transverse open space at the free edge thereof when closed but unlatched, a longitudinally swinging support for the rearward edge of the forward door supported other than by the axle, said support extending from side to side of the forward door and approximately closing the space at the free edge thereof, and said swinging support approximately closing the space between the forward door and the hood, and means connected with the rearward door for holding the swinging support in a position under the edge of the forward door.

17. In a mine car, the combination of a frame structure, an axle, a hood arranged over the axle, forward and rearward drop-bottom dumping doors, a swinging support for the rearward edge of the forward door supported other than by the axle and approximately closing the space between the forward door and the hood, and a flange carried by the rearward door for holding the swinging support in a position under the edge of the forward door.

18. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a swinging support for the rearward edge of the forward door, a flange carried by the rearward door, and means operatively connecting the flange with the swinging support for moving the swinging support away from engagement with the forward door upon dropping of the rearward door.

19. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a swinging support for the rearward edge of the forward door, a flange carried by the rearward door, and flexible means operatively connecting the flange with the swinging support, for causing release movement of the swinging support.

20. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a rigid hinge for the rearward door, a swinging support for the rear edge of the forward door, a flange carried by the rearward door, flexible means connected with the swinging support and extending through the flange, and resilient means interposed between the flexible means and the flange.

21. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a swinging support for the rearward edge of the forward door, a flange carried by the rearward door, and means operatively connecting the flange with the swinging support for moving the swinging support away from engagement with the forward door upon dropping of the rearward door and compounding the action between the rearward and forward doors for causing dropping of the forward door before

the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

22. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a swinging support for the rearward edge of the forward door, a flange carried by the rearward door, and flexible means operatively connecting the flange with the swinging support for causing release movement of the swinging support and compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

23. In a mine car, the combination of a frame structure, an axle, forward and rearward drop bottom dumping doors, a rigid hinge for the rearward door, a swinging support for the rear edge of the forward door, a flange carried by the rearward door, flexible means connected with the swinging support and extending through the flange, and resilient means interposed between the flexible means and the flange and compounding the action between the rearward and forward doors for causing dropping of the forward door before the rear edge of the rearward door has dropped through an arc of approximately twelve degrees.

24. In a mine car, the combination with an axle, of forward and rearward drop bottom dumping doors with adjacent edges thereof arranged out of contact with each other, a swinging member independently supporting adjacent edges of the forward and rearward doors, and means other than the axle for supporting said swinging member.

25. In a mine car, the combination with frame structure and axles, of forward and rearward drop bottom dumping-doors with adjacent edges thereof arranged out of contact with each other, a swinging member arranged between and independently supporting adjacent edges of the forward and rearward doors, and means other than the axle and carried by the frame structure adapted to support said swinging member.

26. In a dumping-car, the combination with an axle, of forward and rearward drop bottom dumping doors with adjacent edges thereof arranged out of contact with each other, a swinging support for the rear edge of the forward door, and carried other than by the axle, and means carried by said swinging support and forming a hinged support for the rearward door.

27. In a mine car, the combination of forward and rearward drop bottom dumping doors with adjacent edges thereof arranged out of contact with each other, a swinging support for the rear edge of the forward door, a bracket carried by said swinging support, and a rod carried by the bracket and forming a hinged support for the rearward door.

28. In a dumping car, the combination of side sills, an axle above the horizontal plane of the bottoms of the side sills, forward and rearward drop bottom dumping doors, a pendulum support for the rearward door causing bodily longitudinal movement of said door when released, said pendulum support being permanently disposed below the center of the axle and entirely above the lower edges of the side sills in all positions of the rearward door, a latch for the forward door actuated by movement of the rearward door, and means for compounding the action between the rearward and forward doors for causing dropping of the forward door before the rearward door has dropped through an angle of approximately twelve degrees.

29. In a mine car, the combination of side sills, an axle above the horizontal plane of the bottoms of the side sills, forward and rearward drop bottom dumping doors, a swinging pendulum support for the rearward door below the center of the axle and above the lower edges of the side sills, hinging means for the forward door, a latch for the forward door actuated by movement of the rearward door, and means for compounding the action between the rearward door and the latch for causing dropping of the forward door before the edge of the rearward door has dropped through an arc of approximately twelve degrees.

30. In a mine car having frame structure with longitudinal side sills, and axles, the combination of forward and rearward drop bottom dumping doors between the side sills, the forward edge of the rearward door and the rearward edge of the forward door being spaced apart when the doors are in closed positions, a pivotal support for the rearward door extending from side sill to side sill and located below the top of a car axle, and above the lower edge of the frame structure, pivotal latching and supporting means for the rearward edge of the forward door actuated by a movement of the rearward door and being in a supporting position when the rearward door is closed, said means extending from side sill to side sill, and approximately closing the space between the rearward edge of the forward door and the forward edge of the rearward door when said doors are in closed positions, and leverage means between the rearward and forward doors for causing dropping of the forward door before the rearward edge of the rearward door has dropped through an arc of approximately twelve degrees.

31. In a mine car, the combination with side sills, an axle, an angular form member extending between the side sills, and having the opposite ends thereof rigidly fixed directly to the side sills, of forward and rearward drop bottom dumping doors, and swinging means carried by an edge of said angular form member and supporting the rearward edge of the forward door and the forward edge of the rearward door.

32. In a mine car, the combination with side sills, an axle, and an angular form member extending between the side sills and having the opposite ends thereof rigidly fixed directly to the side sills, of forward and rearward drop bottom dumping doors, and swinging means carried by an edge of said angular form member and supporting the rearward edge of the forward door and the forward edge of the rearward door, with no part of said swinging means projecting below the lower edges of the side sills.

33. In a mine car, the combination of side sills, wheels and axles, supporting means carried by the side sills, forward and rearward drop bottom dumping doors arranged with adjacent edges thereof spaced a substantial distance apart when the doors are in closed positions, swinging means carried by the supporting means and supporting the rearward edge of the forward door and the forward edge of the rearward door, and transverse protecting and shielding means located above the swinging means in position to prevent lading from falling between the swinging means and the adjacent axle.

34. In a mine car, the combination of side sills, wheels and axles, forward and rearward drop bottom dumping doors arranged with ad-

jacent edges thereof spaced a substantial distance apart when the doors are in closed positions, rigid supporting means other than an axle and carried by the side sills, pivoted swinging means carried by the rigid supporting means and supporting the rearward edge of the forward door and the forward edge of the rearward door, and a transverse structure arranged in position to prevent lading from falling between the swinging means and the adjacent axle.

35. In a mine-car, the combination with side sills, and an axle, of forward and rearward drop bottom dumping doors, rigid supporting means carried by the side sills, and pivoted swinging means carried by the rigid supporting means and supporting the rearward edge of the forward door and the forward edge of the rearward door, the rigid supporting means including a portion extending in position to prevent lading from falling between the pivoted means and the axle.

36. In a drop bottom car, the combination of car wheels, a lading body frame structure including side sills located between the car wheels and extending longitudinally of the lading body, axles having journals approximately in a horizontal plane cutting the side sills, forward and rearward drop bottom dumping doors pivotally supported at their forward ends, said rearward door having pivot means therefor at its forward end rotatably supporting said rearward door, said pivot means extending transversely across the frame structure and when the rearward door is closed being located in a horizontal plane below the horizontal plane of the axes of the car wheels and above the horizontal plane of the bottoms of the side sills in position for protection of the pivot means by the side sills, latch means for the free edge of the forward door, one or more approximately cam-like extensions rigidly secured to the pivot means and rotating therewith when the rearward door drops, said extension or extensions bearing against the latch means for causing support of the free edge of the forward door when the rearward door is in closed position and releasing the forward door for dropping clear of the pivot means when said pivot means rotates on the dropping of the rearward door, one of the axles being located in close association with the pivot means of the rearward door, and a protective housing above said car axle and above said pivot means and extending transversely from one side sill to the other side sill in position to prevent the lading in the car from occupying the space between said car axle and said pivot means.

37. In a drop bottom car, the combination of car wheels, a lading body frame structure including side sills located between the car wheels, axles having journals approximately in a horizontal plane cutting the side sills, forward and rearward drop bottom dumping doors pivotally supported at their forward ends, said rearward door having pivot means therefor at its forward end rotatably supporting said rearward door, said pivot means being arranged so that when the rearward door is closed said pivot means is located below the horizontal plane of the axes of the car wheels and above the horizontal plane of the bottoms of the side sills in position for protection of the pivot means by the side sills, one or more extensions rigidly secured to the pivot means and rotating therewith when the rearward door drops, means actuated by said extension or extensions and supporting the mid-portion of the free edge of the forward door by direct contact therewith when the rearward door is in closed position and releasing the forward door for dropping clear of the pivot means when said pivot means rotates on dropping of the rearward door, one of said axles being located in close association with the pivot means of the rearward door, and a protective housing above said car axle and above said pivot means and extending transversely across the frame structure in position to prevent the lading in the car from occupying the space between said car axle and said pivot means.

38. In a drop bottom car, the combination of car wheels, a lading body frame structure including side sills located between the car wheels, axles having journals approximately in a horizontal plane cutting the side sills, forward and rearward drop bottom dumping doors pivotally supported at their forward ends, said rearward door having pivot means therefor at its forward end rotatably supporting said rearward door, said pivot means extending transversely from side sill to side sill and carried thereby, and when the rearward door is closed being located below the horizontal plane of the axes of the car wheels, latch means for the free edge of the forward door, and one or more approximately cam-like projecting arms rigidly secured to the pivot means and rotating therewith when the rearward door drops, said arms being constructed and arranged to hold the latch means in latching position causing support of the free edge of the forward door when the rearward door is in closed position and releasing the forward door for dropping clear of the pivot means when said pivot means rotates on the dropping of the rearward door.

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