Nov. 1, 1927. 1,647,876

S. H. McCRARY

AUTOMATIC DROP BOTTOM MINE CAR.

Filed Feb. 27, 1926 2 Sheets-Sheet 1

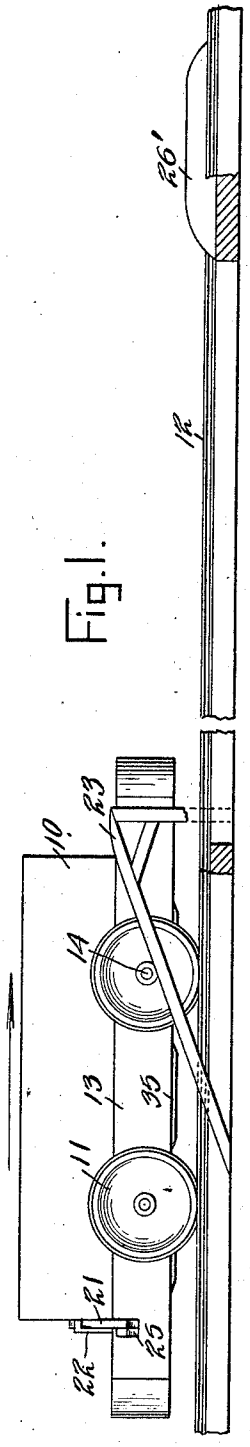


Fig. 1.

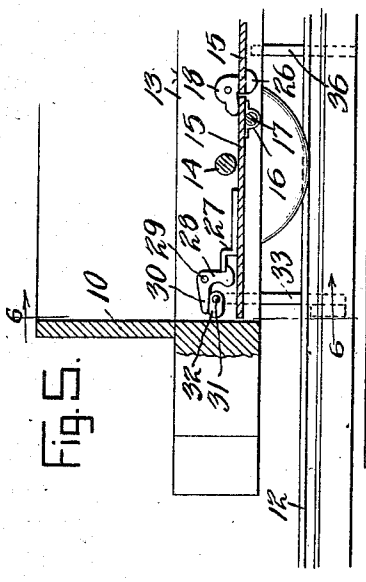


Fig. 5.

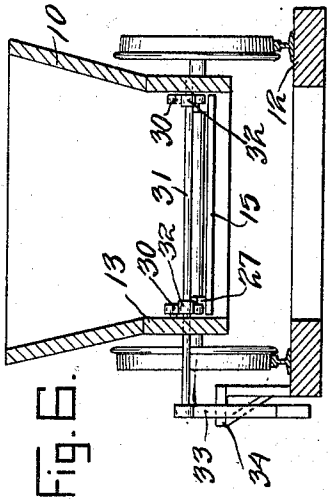


Fig. 6.

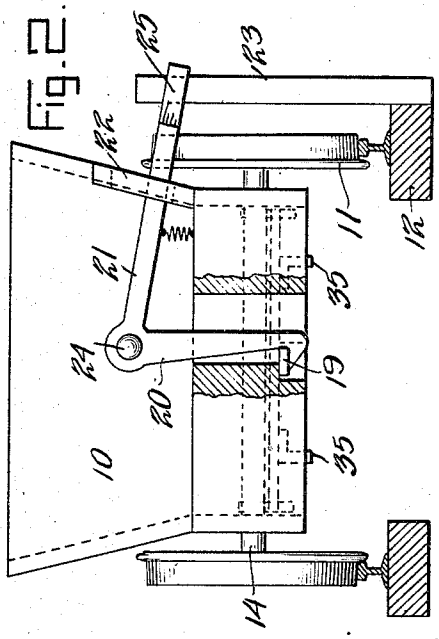


Fig. 2.

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Fig. 3.

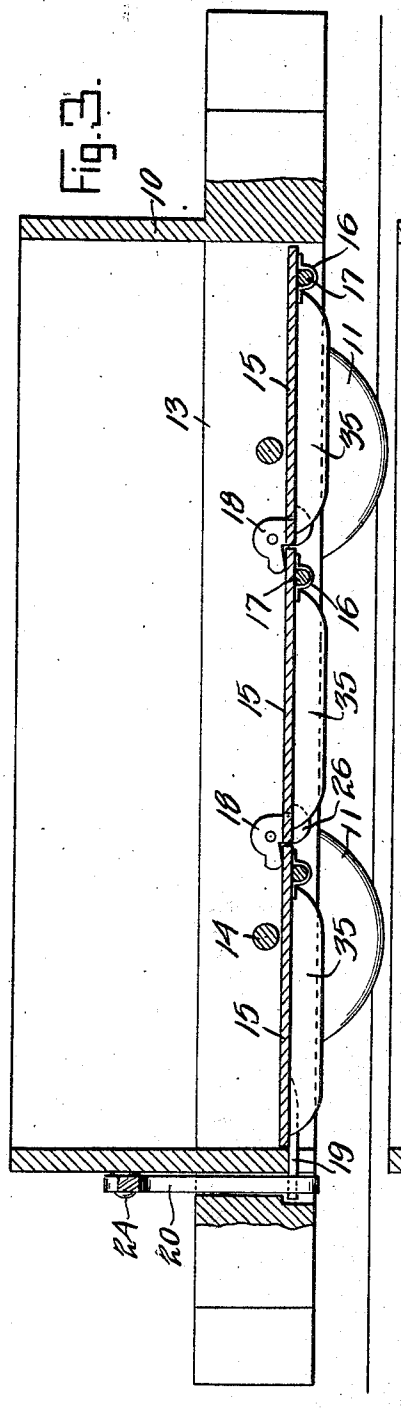
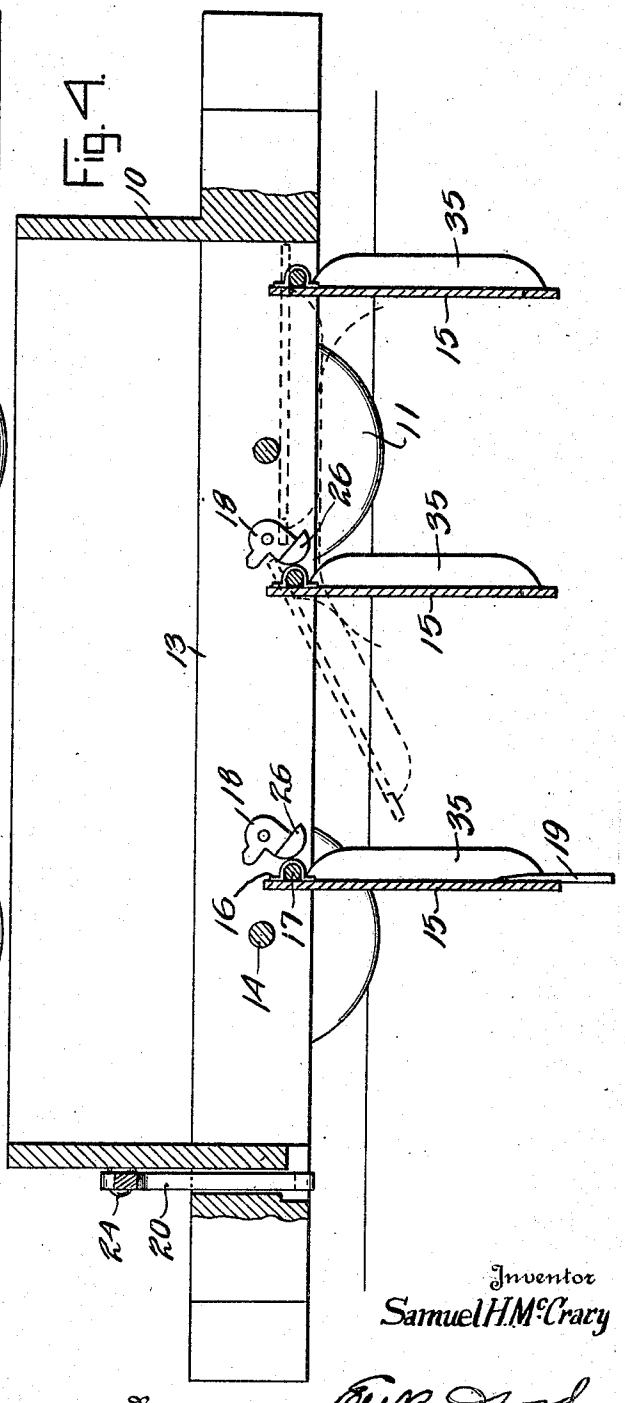


Fig. 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC DROP-BOTTOM MINE CAR.

Application filed February 27, 1926. Serial No. 91,255.

My said invention relates to improvements in mine cars from which coal or other ore may be automatically discharged and consists in various improvements in the details of construction and arrangement of parts, whereby various advantages are secured in the operation of the car to discharge its contents, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a side elevation of a mine car illustrating the application of my invention,

Figure 2, an end elevation with a portion broken away to expose the releasing lever,

Figure 3, a longitudinal section with the discharge doors in closed position,

Figure 4, a similar section with the doors open,

Figure 5, a fragmentary longitudinal section illustrating a modified form of releasing mechanism, and,

Figure 6, a section on the line 6—6 of Figure 5.

In the drawings reference character 10 indicates the body of a mine car having wheels 11 adapted to run upon a track 12. Side members 13 extend longitudinally of the car and form bearings for axles 14, upon which the wheels are mounted.

The car 10 is provided with a bottom assembly comprising one or more discharge doors 15 pivotally mounted by means of brackets or strap hangers 16 upon transversely and longitudinally disposed shafts 17. Said shafts 17 are mounted in the side members 13 adjacent the lower edge thereof so that the doors 15 when disposed in horizontal position will constitute a continuous bottom for the car, but which when released will permit the contents of the car to discharge therefrom by gravity. For the purpose of illustration I have shown three discharge doors, however, any number may be employed and means is provided for maintaining these doors in the closed position.

The doors 15 are adapted to be held in closed position by means of latches, or locks 18 mounted on the side members 13, one adjacent the front edge of the door at each side of the car and the said doors are preferably notched at their outer corners to permit the operation of the said latching elements when the latching elements are forced into operative position by the rear edge of the adjacent door maintaining them in the position shown in Figure 3. The rear door is provided with a centrally disposed rearwardly extending tongue 19, which is adapted to be engaged by the short arm 20 of an operating lever, the long arm 21 of which extends through a bracket 22 and out to the side of the car for operation by an inclined operating element 23 mounted on the track 12. The operating lever is pivoted at 24 and is adapted to be rocked on said pivot by the arm 21 riding upward on the operating element as the car is moved along the track. The outer end of the longer arm 21 of the operating lever is preferably provided with a weight 25 in order to normally hold the lever in position for holding the doors closed.

The latches or locking elements 18 are provided with rearwardly extending operating arms and are also preferably provided with thickened or weighted portions 26 in order that they may be normally maintained in full released position. In order to prevent the latches from contacting the side members of the car they are further provided with bosses or spacing elements which may be formed either integrally with or separately from the latches.

In the operation of the device the car loaded with coal or other ore is moved along the track in the direction of the arrow shown in Figure 1 until the operating arm 21 engages and rides up the inclined operating element 23, whereupon the short arm of the operating lever will be moved from beneath the tongue 19 of the rear door 15, permitting said door to drop to substantially vertical position. At the same time the forward edge of the door will force the rearwardly extending arms of the locks 18 upwardly to release the next succeeding door and other rearwardly located doors will be released in the same manner and permit the load to be discharged. Further movement of the car along the track will bring the forward door into engagement with the closing block 26 in the center of the track which will successively raise the doors to horizontal position

holding each door in this position until the forward edge of each succeeding door acts as a lever to move the latch into engagement beneath the rear edge of the preceding door to pull the same in closed position. The door at the rear end of the car having the tongue 19 will pass last over the closing block and the short arm 20 of the operating lever will engage said tongue and hold the door in horizontal position.

Instead of the means for releasing the rear door of the car I may use other desired releasing mechanism such as I have shown in Figures 5 and 6. Said mechanism comprises a pair of latching elements or hooks 27 fastened one at each side of the rear door, for co-operation with co-operating latches or locks 28 pivoted at 29 having rearwardly extending arms 30. A shaft 31 extends transversely and horizontal through the side members 13 and beneath the rearwardly extending arms 29, and cams 32 are mounted one under each arm for rocking the latches 28 upon their pivots to move them out of engagement with the latching elements or hooks 27. The shaft 31 projects outwardly at one side of the car to a position beyond the other parts of the car and a depending lever 33 is fixed thereon. An operating element 34 is mounted on the track in upright position in the path of movement of the lever 33 so that said lever will be rocked to substantially horizontal position when passing over the same, and thus cause the major portion of the cams to engage the rearwardly extending arms 29 of the latches and elevate them to release the rear door.

A second operating element 36 is provided for rocking the lever 33 and the associated cams 32 to retract the latches and permit the doors to swing to closed position whereupon the lever is moved downward under the action of gravity and latches 28 engage the hooks 27 and hold the door closed. This operating element is placed at a point along the track so that it will engage the lever 33 at the moment the door is slightly below its normal locked position and will swing the latches out of the path of the door and beneath the door to maintain it in closed position.

In order to reinforce the doors 15 I preferably provide a pair of braces or angle irons 35 mounted longitudinally of the car beneath each door and the depending portions of said braces or angle irons co-operate with the closing block 26′ for centering the door during the closing operation.

Bumpers and draw bars of any desired type may be used and it will be obvious to those skilled in the art that various changes may be made in the device without departing from the spirit of my invention, and I, therefore, do not limit myself to what is shown in the drawings and described in the specification, but only as set forth in the appending claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. Releasing means for the dumping doors of a mine car comprising a latch mounted in a position to engage the rear edge of a door when the same is in horizontal position, said latch being adapted to be actuated by another door for releasing the first door and for securing the same in closed position, a latch for holding the second door in closed position, a shaft mounted adjacent said latch and a cam fixed on said shaft and adapted when the shaft is rocked to operate the latch to release the door, substantially as set forth.

2. The combination with a mine car bottom assembly operable to permit the discharge of the contents of the car, and comprising a plurality of doors pivoted adjacent their forward edges transversely of the body, of a plurality of latches mounted adjacent each side of the body and adjacent each door in position to engage the rear edges of the doors when they are in substantially horizontal position, each succeeding door being adapted to actuate the latches adjacent its forward edge for releasing the preceding door and for moving said latches into engagement therewith, for securing the door in closed position, latching mechanism for holding the door at the rear end of the car in closed position, a shaft tranversely and horizontally mounted adjacent said latching mechanism, cams on said shaft for releasing said latching mechanism, a lever depending from said shaft, a track, and an upstanding operating element adjacent said track for rocking said depending lever to operate the cams and release the rear door and a closure block mounted on said track for swinging said doors to closed position, substantially as set forth.

3. The structure set forth in claim 2 and a second upstanding operating element for oscillating said cams to permit the door to be closed, substantially as set forth.

4. In a dumping car, a pivotally mounted dumping door, a latch for holding said door in closed position said latch having a forwardly extending arm, a shaft mounted adjacent said latch and projecting outwardly beyond the side of the car, and a cam fixed on said shaft and arranged to operate the latch to move it to position to release the door when the shaft is oscillated, substantially as set forth.

5. The combination in a dumping car of a pivotally mounted dumping door, a latch for holding said door in closed position said latch having a forwardly extending arm, a shaft mounted adjacent said latch and projecting outwardly beyond the side of the car, a cam fixed on said shaft and arranged to operate

the latch to move it to position to release the door when the shaft is oscillated, a track, and a pair of upright elements mounted in spaced relation along said track, one of which upright elements being arranged in position to perform the dumping operation and the other being arranged in position for locking the door in closed position, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Knoxville, Tennessee, this 24th day of February, A. D. nineteen hundred and twenty-six.

SAMUEL H. McCRARY.