March 18, 1924. 1,487,573

H. INGRAM

MINE CAR LOADING DEVICE

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Fig. 1.

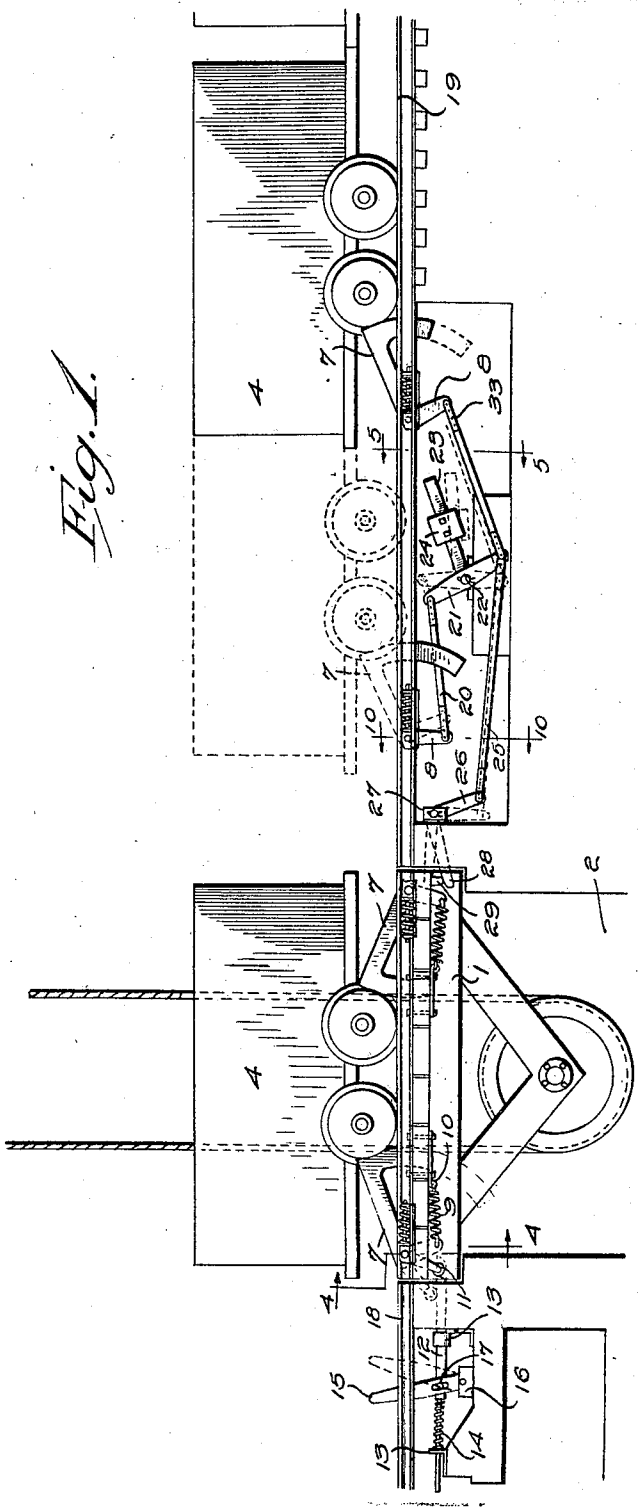
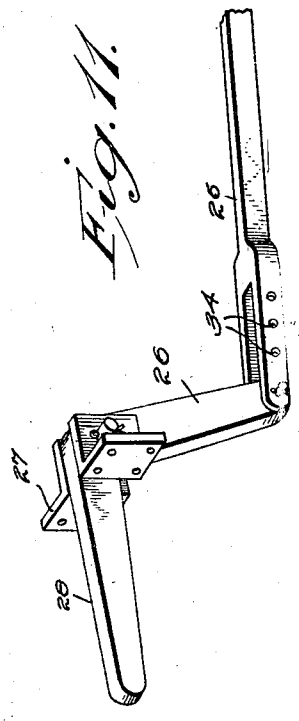


Fig. 11.



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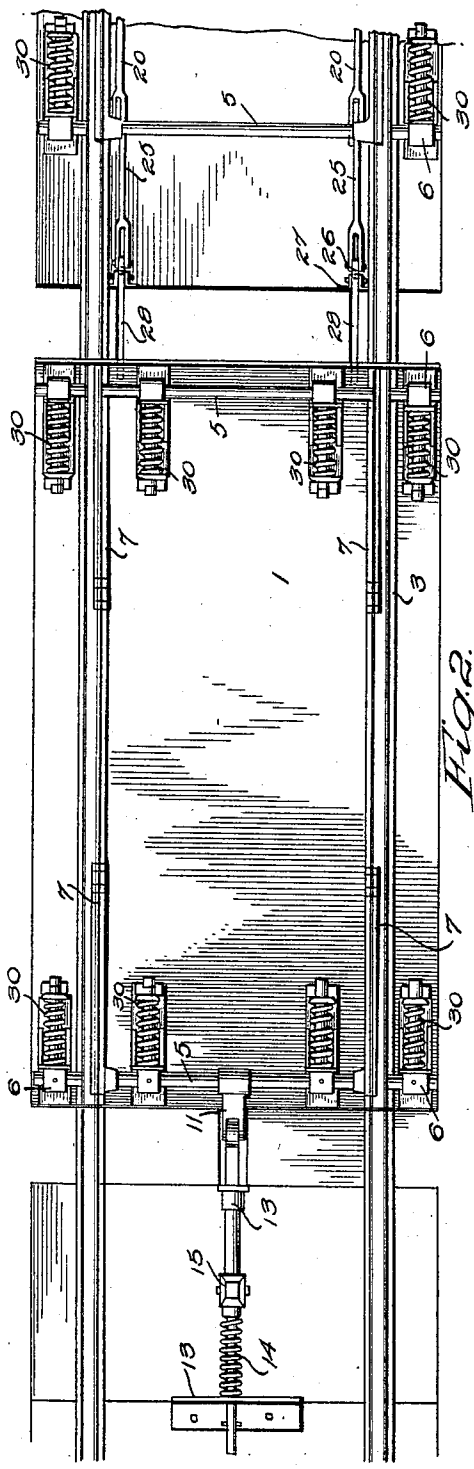


Fig. 2.

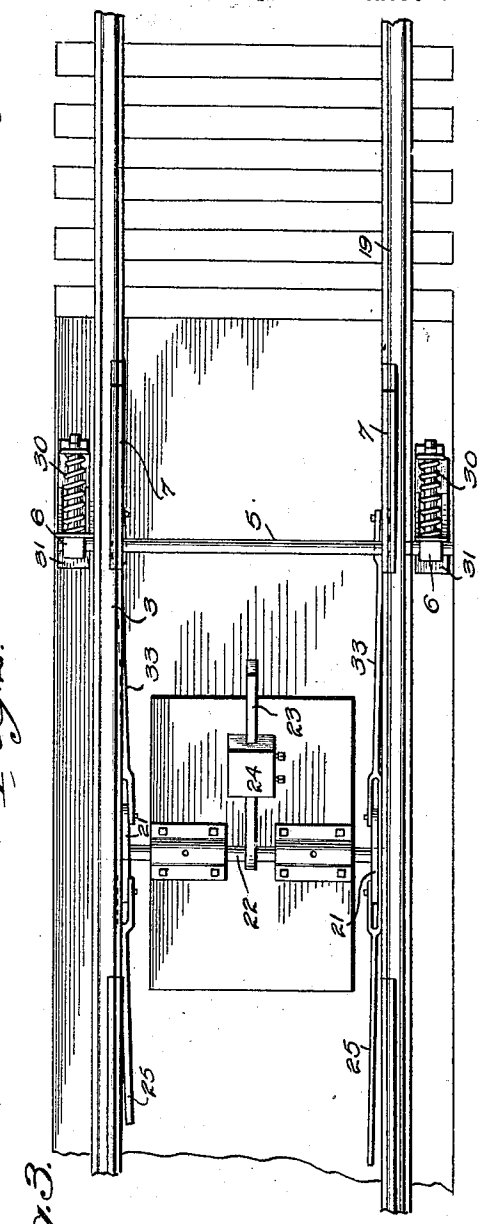


Fig. 3.

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MINE CAR LOADING DEVICE

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Fig. 4.

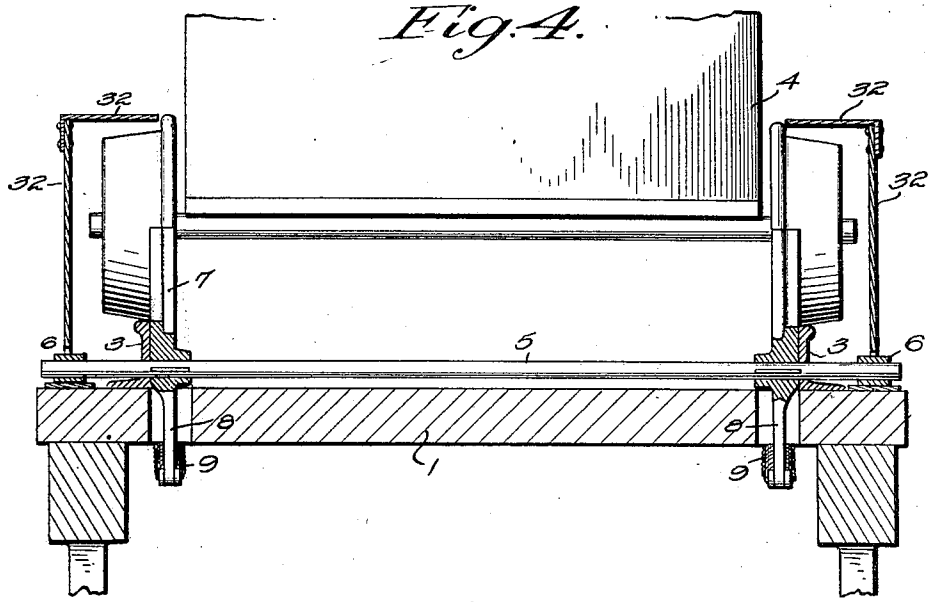


Fig. 5.

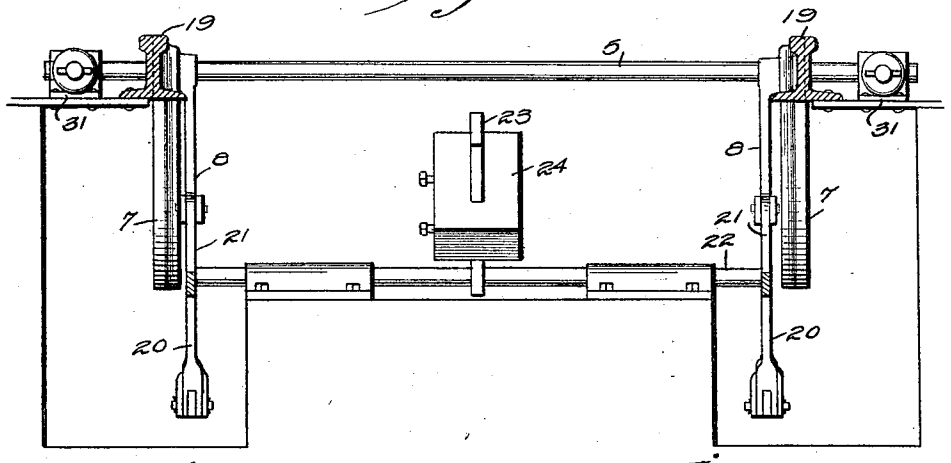


Fig. 6.

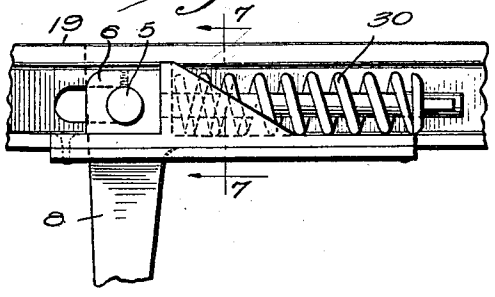
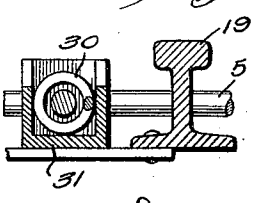


Fig. 7.



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MINE CAR LOADING DEVICE

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Fig. 8.

Fig. 9.

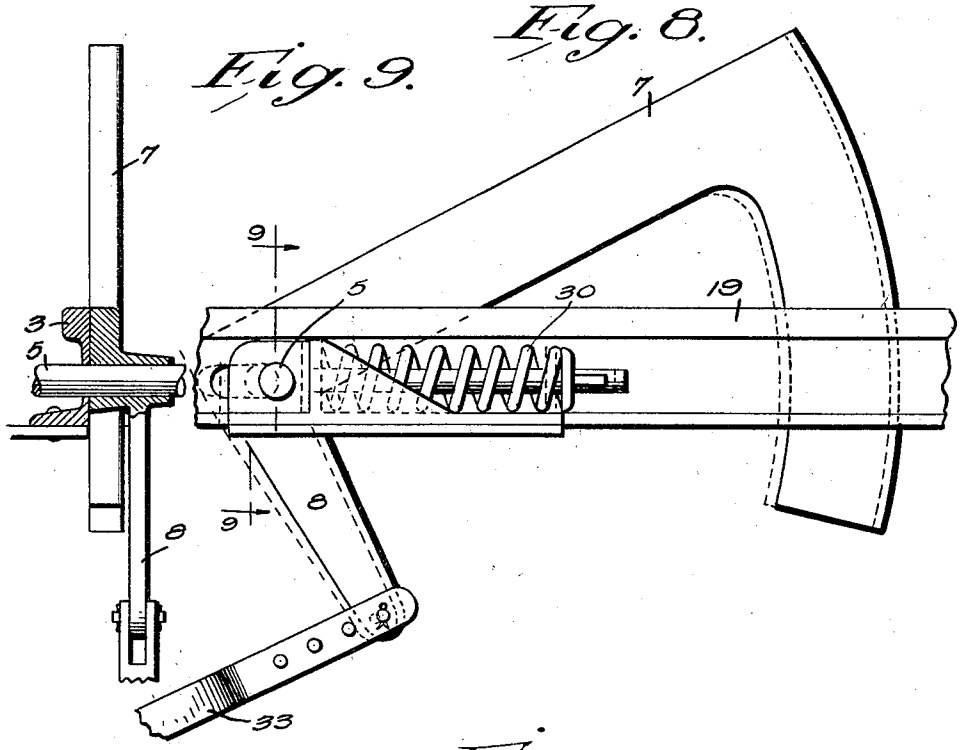
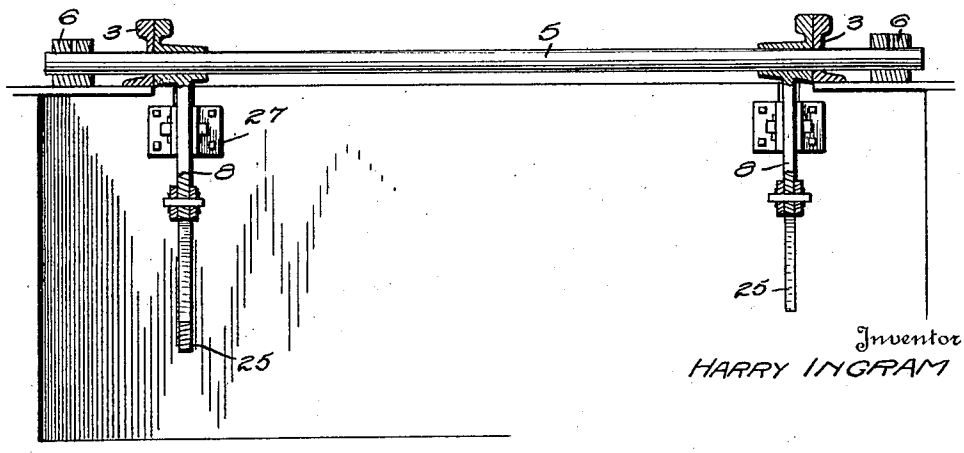


Fig. 10.



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Patented Mar. 18, 1924. 1,487,573

UNITED STATES PATENT OFFICE.

HARRY INGRAM, OF MARION, ILLINOIS.

MINE-CAR-LOADING DEVICE.

Application filed February 9, 1922. Serial No. 535,375.

To all whom it may concern:

Be it known that I, HARRY INGRAM, a citizen of the United States, residing at Marion, in the county of Williamson and State of Illinois, have invented certain new and useful Improvements in Mine-Car-Loading Devices, of which the following is a specification.

This invention relates to mine car loading devices, and more particularly to automatic means operated by the raising and lowering of the cage to lock and release mine cars and permit them to move off and on the cage.

An object of the invention is the provision of means for locking an empty car on a mine cage, while the car is being lowered in the cage, and means for releasing said locking means when the cage reaches the bottom of the shaft to permit the empty car to move from the cage.

A further object is the provision of means actuated by the movement of the empty car to re-set the locking mechanism on the cage.

A further object of the invention is the provision of locking means arranged adjacent the bottom of the shaft to hold a loaded car in position to run on to the cage when the cage reaches the bottom of the shaft.

A further object is the provision of means actuated by the lowering of the cage to release said locking mechanism for the loaded cars.

In the accompanying drawings, I have shown one embodiment of the invention. In this showing:

Figure 1 is a side elevation showing the cage at the bottom of the shaft,

Figure 2 is a plan view of a portion of the apparatus shown in Figure 1,

Figure 3 is a plan view of the right hand end of Figure 1,

Figure 4 is a vertical sectional view on line 4—4 of Figure 1,

Figure 5 is a similar view on line 5—5 of Figure 1,

Figure 6 is a detail view of a portion of one of the locking members,

Figure 7 is a detail sectional view on line 7—7 of Figure 6,

Figure 8 is a side elevation of one of the locking members and associated parts,

Figure 9 is a detail sectional view on line 9—9 of Figure 8,

Figure 10 is a vertical sectional view on line 10—10 of Figure 1, and,

Figure 11 is a detail view of a portion of the releasing mechanism for the loaded cars.

Referring to the drawings, the reference numeral 1 designates a mine cage of ordinary construction which is adapted to be raised and lowered by suitable means in a shaft arranged over a pit 2. The cage is provided with tracks 3 to permit a car 4 to run over the cage. Adjacent each end of the cage, a transverse shaft 5 is mounted in suitable bearings 6. Locking members 7 are mounted on this shaft, the locking members being provided with arms or cranks 8 at one end. A spring 9 is secured to the crank 8, the opposite end of the spring being secured to a plate or clip 10, mounted on the cage. An actuating arm 11 is secured to one of the shafts 5 at the side where the car is to be removed.

Suitable releasing means are arranged at the bottom of the shaft. Said releasing means and said actuating member cooperate to release the car from the cage when the cage is lowered. As shown, a rod 12 is slidably mounted in a pair of bearings 13, and is normally retained in operative position by means of a spring 14. This rod, when in normal position, projects into the bottom of the shaft and the actuating member is adapted to engage the top of the rod to turn the shaft 5 and release the locking member 7. The tracks 3 are arranged at an incline, whereby the car will pass off the cage to the left in Figure 1, when the locking member is released. A lever 15 is pivotally mounted on a suitable support 16 and is provided with a slot adapted to receive a pin 17 carried by the rod 12. When the locking member is in operative position, the lever is in the dotted line position shown in Figure 1. The mine is provided with tracks 18 on which the car passes after it leaves the cage, and in passing over these tracks, the lever 15 is moved to the full line position to withdraw the rod 12. The spring 9 then returns the locking member 7 to operative position to lock another car on the cage.

Means are also provided for automatically delivering loaded cars to the cage. As shown, a pair of locking members 7 of substantially the same construction as those

employed on the cage are arranged on a track 19 on the opposite side of the cage. These locking members are suitably spaced from each other to lock a car in a reserve position, or in position to pass on to the cage. The locking members are provided with cranks 8, and are mounted on shafts 5. A pair of arms 20 are connected to the cranks, and these arms are connected to the ends of a lever 21 which is pivoted intermediate its ends, as indicated at 22. An arm 23 is attached to this lever and this arm carries a weight 24 to normally maintain the locking members in operative position. A link 25 is secured to the lever 21, the opposite end of the link being connected to one arm of a bell crank lever 26. This bell crank lever is pivotally mounted in a suitable bracket 27 and is provided with an arm 28, projecting into the bottom of the cage. The cage is provided with an arm 29 adapted to engage the arm 28 of the bell crank lever and depress it.

The locking members may be provided with suitable shock absorbing springs 30 which are mounted in suitable housings 31 and are adapted to cushion the movement of the locking members (see Figures 6 and 7).

The cage may be provided with suitable shields 32 adapted to extend up the outside and over the top of the car wheels. The arms 20 may be provided with a plurality of spaced openings 33 at each end to permit adjustment. Similarly, the link 25 may be provided with a plurality of spaced openings 34.

In operation, with the releasing mechanism at the left of Figure 1, in the dotted line position, the rod 12 extends into the bottom of the cage. As the cage is lowered, the actuating member 11 engages the top of this rod and rides on it, revolving the shaft 5 and releasing the locking member 7. The mine car then is free to move and due to the incline of the track, it passes off the cage on to the tracks 18. In its movement, it strikes the lever 15, moving it to the full line position and retracting the rod 12. The actuating member 11 is then disengaged and the locking member is moved to operative position by the spring 9.

At the same time, the engagement of the trip 29 and the arm 28 of the bell crank lever depresses this arm and moves it from the dotted line position to the full line position. This swings the lever 21 to the full line position and releases the locking mechanism holding the front car, indicated in dotted lines. This car passes on to the cage and is engaged by the locking mechanism at the left of the cage which has, in the meantime, assumed its normal position. When the locking member adjacent the cage to the right is released, the locking member remote from the cage is, at the same time, moved to operative position to prevent more than one car from passing on to the cage.

When the cage is raised, the weight 24 returns the locking members associated therewith to the dotted line position, setting the locking mechanism adjacent the cage in operative position and releasing the remote locking mechanism to permit a car to move to the dotted line position ready to pass on to the cage.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A mine car loader comprising a pair of pivotally mounted locking members arranged adjacent the bottom of a mine cage shaft and spaced from each other, means for normally retaining the adjacent member in locked position and the remote member in released position, a pivoted lever connected to each of said locking members, a bell crank lever having one end operatively connected to said first lever, the other end of said bell crank lever projecting into the path of the cage, and a trip member carried by the cage adapted to depress said arm to release said adjacent locking member and move said remote locking member to operative position.

2. A mine car loader comprising a shaft mounted on a mine cage, a pivoted locking member arranged on said shaft and adapted to project upwardly beyond the surface of the cage and engage a car wheel, a crank arm connected to said shaft, a slidably mounted arm arranged at the bottom of the mine shaft and adapted to engage said crank arm to rotate said shaft and lower said locking member, a spring arranged on said slidable arm to normally retain it in projected position, and a lever secured to said arm and disposed in the path of a mine car leaving said cage to retract said arm and permit said locking member to be returned to its normal position.

3. A device constructed in accordance with claim 2 wherein a spring is secured to said locking member to return it to normal position when said slidable arm is retracted.

4. A mine car loader comprising a pair of pivotally mounted locking members arranged adjacent the bottom of a mine cage shaft and spaced from each other, the member adjacent the shaft being normally disposed in an operative position and the member remote from said shaft being normally disposed in an inoperative position, a crank connected to each of said locking

members and projecting below their pivots, an arm connected to each of said cranks, a pivotally mounted lever connected to the ends of said arms, a weight secured to said pivotally mounted lever to normally retain the adjacent locking member in operative position, a link connected to said lever, and a bell crank lever connected to the end of said crank and disposed in the path of the cage to release said adjacent locking member and set said remote locking member when the cage is lowered in said shaft.

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

HARRY INGRAM.

Witnesses:

JOE F. DOWELL,

MARK WOODLEY.