

No. 654,270.

Patented July 24, 1900.

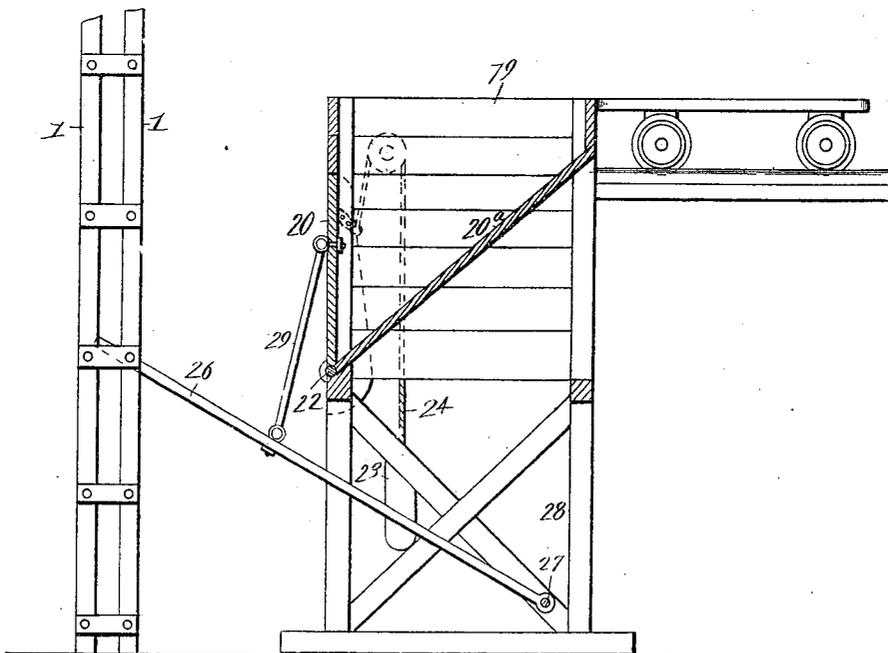
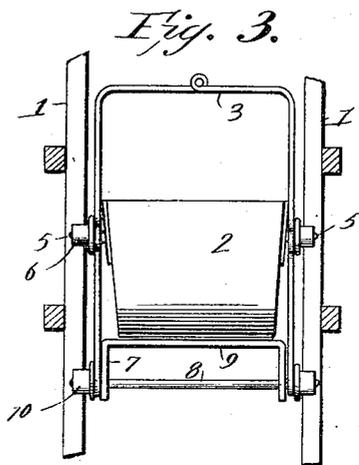
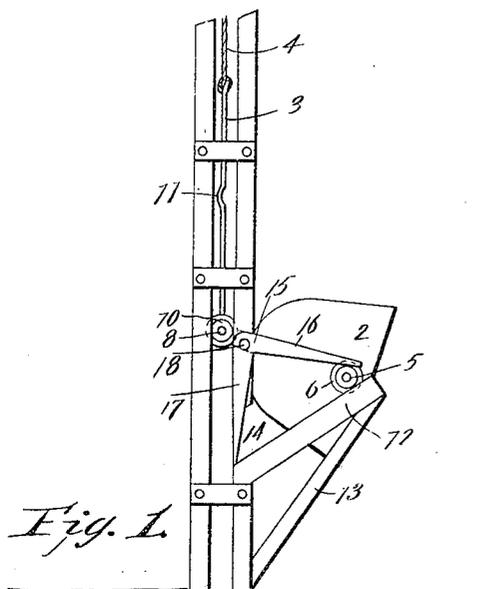
J. F. MCKAY.

APPARATUS FOR LOADING OR UNLOADING MINE CAGES OR BUCKETS.

(No Model.)

(Application filed Apr. 24, 1900.)

2 Sheets—Sheet 1.



Witnesses
C. H. Walker
J. F. Kelly

By *Fip* Attorneys.

J. F. McKay Inventor

C. H. Snowles.

No. 654,270.

Patented July 24, 1900.

J. F. McKay.

APPARATUS FOR LOADING OR UNLOADING MINE CAGES OR BUCKETS.

(Application filed Apr. 24, 1900.)

(No Model.)

2 Sheets—Sheet 2.

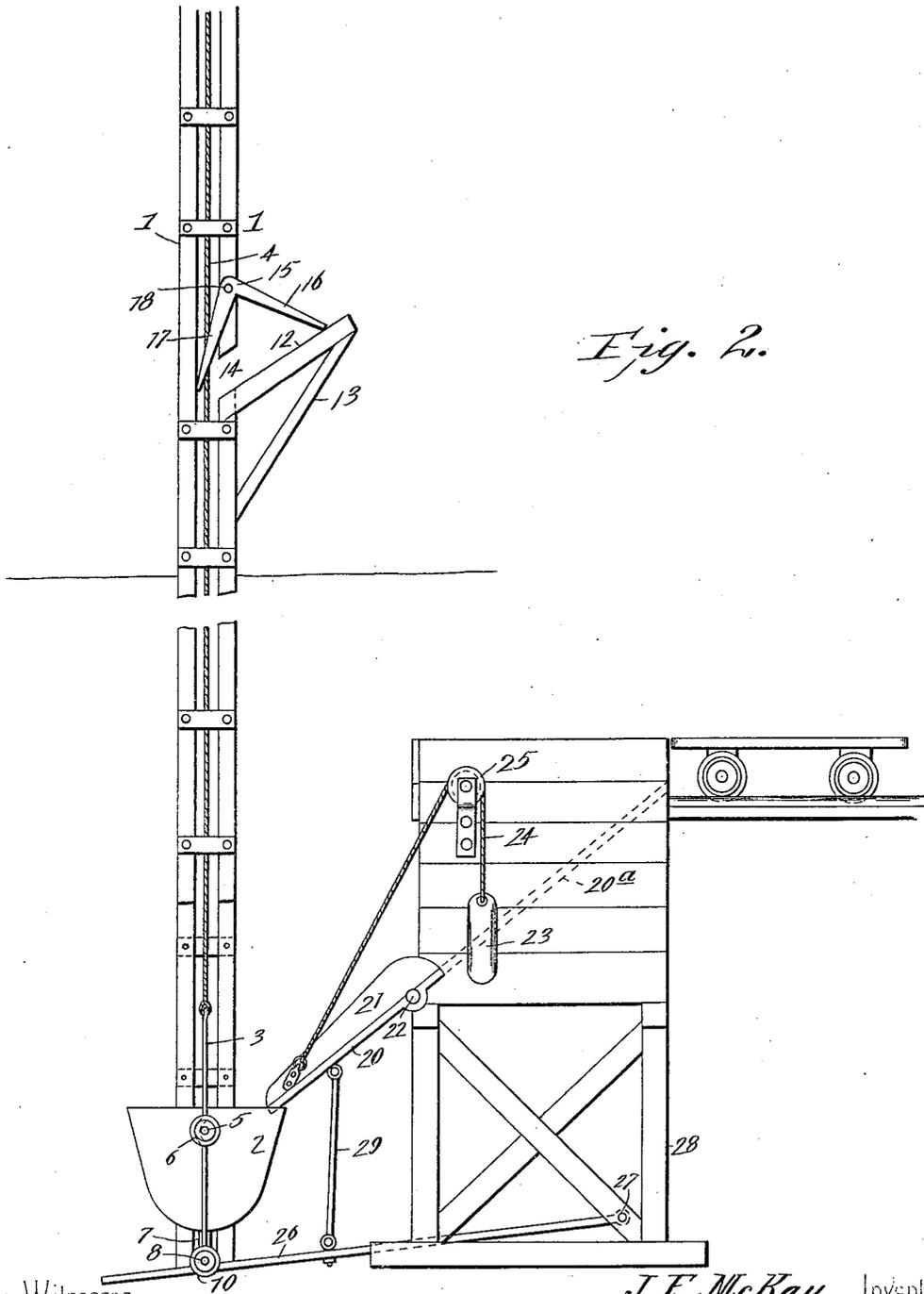


Fig. 2.

Witnesses
L. H. Walker
J. F. Riley

By *Fris* Attorneys.

J. F. McKay Inventor

C. A. Snow

UNITED STATES PATENT OFFICE.

JOHN F. MCKAY, OF PROSPERITY, MISSOURI, ASSIGNOR OF ONE-HALF TO JOHN RAYMOND AND CLAUD D. RAYMOND, OF WEBB CITY, MISSOURI.

APPARATUS FOR LOADING OR UNLOADING MINE CAGES OR BUCKETS.

SPECIFICATION forming part of Letters Patent No. 654,270, dated July 24, 1900.

Application filed April 24, 1900. Serial No. 14,138. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. MCKAY, a citizen of the United States, residing at Prosperity, in the county of Jasper and State of Missouri, have invented a new and useful Apparatus for Loading or Unloading Mine Cages or Buckets, of which the following is a specification.

The invention relates to improvements in apparatus for loading and unloading mine cages or buckets.

The object of the present invention is to improve the construction of the mechanism employed for loading and unloading mine cages and buckets and to provide a simple and comparatively-inexpensive one adapted when the bucket descends to load the same automatically and capable of automatically tilting the bucket as the same reaches the limit of its upward movement, whereby the expense of handling coal or other products of a mine is reduced to a minimum and the danger incident to hoisting and lowering buckets greatly lessened.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is an elevation, partly in section, of an apparatus for automatically lowering and dumping a mine car, bucket, or cage constructed in accordance with this invention, the bucket being in position for discharging its contents. Fig. 2 is a side elevation of the same, the bucket being at the bottom of the mine-shaft in position for receiving its load. Fig. 3 is a detail sectional view illustrating the manner of mounting the bucket in the guides.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 1 designate vertical guides or ways designed to be located at opposite sides of the center of a mine-shaft in the usual manner and receiving upper and lower rollers or wheels of a bucket or cage 2, which is provided with a bail 3 and which is connected with a hoisting rope or cable 4 in the usual manner. The bucket is provided at opposite

sides of its upper portion with upper pivots or journals 5, which receive the upper rollers or wheels 6, and it has arms 7 depending from its bottom and provided with openings for the reception of a transverse rod 8. The arms are preferably formed integral with a transverse bottom bar 9, and the ends of the rod are extended outward beyond the arms and form an axle for a pair of lower rollers or wheels 10. The bail 3 is connected with the rod 8 at the outer faces of the arms 7 and is provided near the centers of its sides with bends 11 to enable it to clear the journals 5 and at the same time to lie centrally of the bucket to prevent any lateral pressure and to avoid the bucket binding in the guides or ways. The bucket is adapted to swing outward on the transverse rod 8, which forms a pintle, and inclined side tracks or rails 12 extend from the upper portion of the guides or ways to receive the upper wheels 6, as illustrated in Fig. 1 of the accompanying drawings, when the bucket reaches the limit of its upward movement. The inclined side tracks or rails 12, which are supported by braces 13, extend from side openings 14 of the ways, and pivoted switches 15 are mounted adjacent to the side openings 14 to cause the upper rollers or wheels to move laterally through the openings 14 and to be supported by the side tracks or rails 12. These pivoted switches are substantially V-shaped, being composed of upper arms 16 and lower arms 17, arranged at an angle to each other. The pivot 18 is arranged at the angle of the switch, and the lower depending arm, which is lighter than the upper outwardly-extending arm, is disposed across the guide or way, as clearly shown in Fig. 2 of the accompanying drawings, when the switch is in its normal position, whereby it is adapted to switch the upper rollers or wheels upon the side tracks or rails. The further upward movement of the bucket causes the upper rollers or wheels to engage the outwardly-extending arms 16, which are lifted sufficiently to throw the lower arms 17 outward to a vertical position to close the side openings temporarily, as illustrated in Fig. 2 of the accompanying drawings. The depending arms 17 of the pivoted switches when arranged in a vertical

position cause the lower rollers or wheels to move vertically in the guides or ways past the side openings of the same to elevate the bottom of the bucket, and thereby invert the latter to discharge the contents of the same. The bucket is arranged in a slightly-inclined position, as shown in Fig. 2, and when the bail and the hoisting rope or cable are lowered the rollers or wheels move downward and the upper rollers or wheels are drawn inward into the vertical guides or ways.

The bucket is filled from a hopper 19, having an inclined bottom 20^a and located below the level at which the mining operations are carried on, so that a car or a tub may be conveniently dumped to discharge its contents into the hopper. The hopper is provided at its front, adjacent to the shaft, with a hinged gate or section 20, having sides or wings 21, located on the exterior of the hopper when the gate or door is closed and adapted to form a chute when the same is open, whereby the contents of the hopper will be discharged into the bucket. The pintle or pivot 22 of the gate 20 is located at the lower edge of the inclined bottom, so that the said gate when swung downward to the position illustrated in Fig. 2 of the accompanying drawings is adapted to form a continuation of the said bottom.

The gate or door is normally held in a vertical or closed position by a weight 23, attached to one end of the rope 24 or other flexible connection, which passes over a pulley 25 and which is secured to the gate near the upper edge thereof, and it is preferable to employ a pair of such weights, which are located at opposite sides of the hopper on the exterior thereof.

The automatic opening of the gate is effected by means of a lever 26, fulcrumed at one end 27 on the framework 28, which supports the hopper, and having its other end arranged in the path of the bucket, as shown in Fig. 1, and connected at a point intermediate of its ends with the gate by a link 29, pivoted or hinged to the said gate and to the lever by any suitable means. When the bucket descends, the transverse rod or axle 8 engages the lever, which is arranged in an inclined position when the gate is closed and which is swung downward by the weight of the bucket to the position illustrated in Fig. 2. This brings the hinged gate in position for discharging the contents of the hopper into the bucket, and the capacity of the hopper should be substantially the same as that of the bucket, so that none of the contents will be wasted. As soon as the bucket rises with its load the weights 23 automatically close the gate and swing the lever upward to the inclined position shown in Fig. 1.

It will be seen that the apparatus is exceedingly simple and inexpensive in construction and that it is absolutely automatic in its operation both as to the filling and dumping of

the bucket or cage and that no attendants are required for such operation. It will also be apparent that the only person required for operating the bucket is the one having control of the engine or other motor, which may be stationed either at the mouth of the shaft or a considerable distance therefrom. Furthermore, it will be clear that the miners may discharge the contents of their cars or tubs into the hopper, and that the apparatus obviates the necessity of having the men hook tubs or buckets on the hoisting rope or cable. Also the bucket is held perfectly steady at the center of the shaft, and accidents are thereby reduced to a minimum. Also it will be apparent that as the upper outwardly-extending arm 16 is heavier than the depending arm 17 the pivoted switch will operate automatically and will assume the position shown in Fig. 2 as soon as the bucket descends.

What is claimed is—

1. In an apparatus of the class described, the combination of a vertical guide or way having a side track and provided thereat with an opening, a bucket or cage having upper and lower devices engaging the guide or way, and a pivoted switch mounted adjacent to the said side track and provided with arms, one of the arms being arranged normally across the guide or way to direct or switch the upper device of the bucket upon the side track, and the other arm being arranged to be engaged by the said upper device to close the switch and cause the lower device of the bucket to be carried upward to invert the bucket, substantially as described.

2. In an apparatus of the class described, the combination of the vertical guides or ways provided with inclined side tracks and having openings thereat, a pivoted switch having arms 16 and 17 arranged at an angle to each other, one of the arms being disposed normally across the adjacent guide or way, and the other arm being extended outward, and a bucket provided with upper and lower rollers or wheels, the upper wheels or rollers being adapted to be switched upon the side tracks and to engage the arm 16 to close the switch, substantially as described.

3. In an apparatus of the class described, the combination of vertical guides having side tracks, a pivoted switch, a bucket provided with upper journals, arms depending from the bottom of the bucket, a rod mounted on the arms and extended beyond the same to form journals, wheels or rollers mounted upon the said journals, and a bail connected with the said rod and provided at opposite sides with bends to clear the upper journals, substantially as described.

4. In an apparatus of the class described, the combination with a bucket, of a hopper having an inclined bottom and provided with a hinged gate adapted to form a chute, a weight connected with and adapted to hold the gate normally closed, a lever located be-

neath the gate and arranged in the path of
the bucket and adapted to be depressed by
the same, and a link connecting the lever
with the gate, whereby the latter will be
5 opened when the lever is depressed by the
bucket, substantially as described.

In testimony that I claim the foregoing as

my own, I have hereto affixed my signature in
the presence of two witnesses.

JOHN F. MCKAY.

Witnesses:

J. W. KIEFF,
W. F. COOK.