

J. WHITFORD & J. A. MILLS.

MEANS FOR LOADING SKIPS OR OTHER VEHICLES IN MINE SHAFTS AND THE LIKE.

APPLICATION FILED JAN. 25, 1910.

Patented Aug. 22, 1911.

2 SHEETS—SHEET 1.

1,001,106.

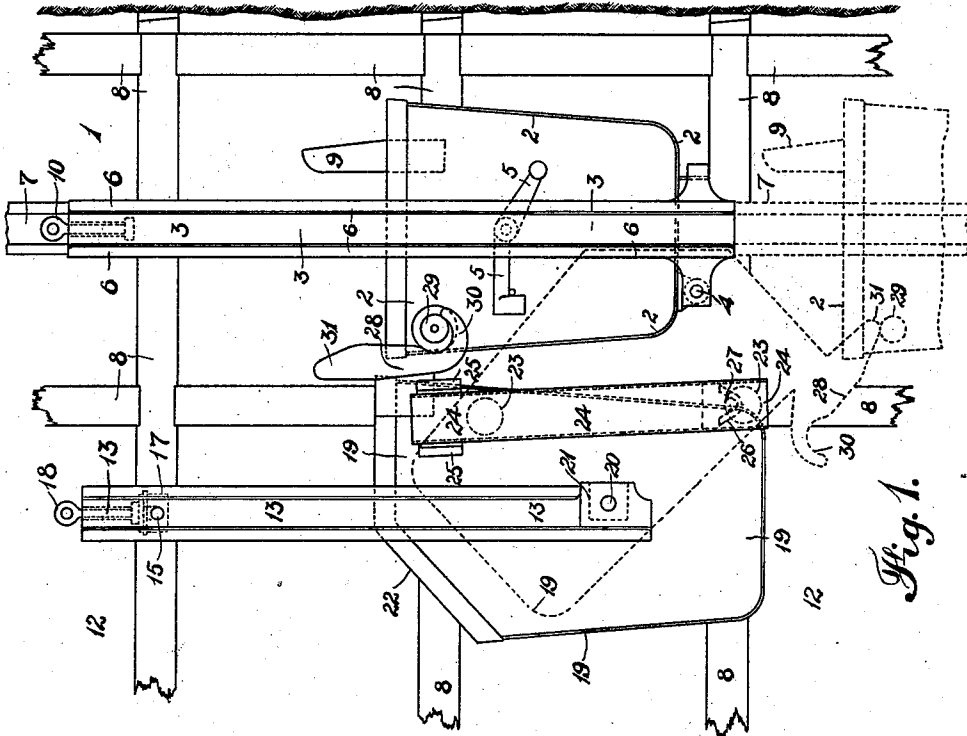


Fig. 1.

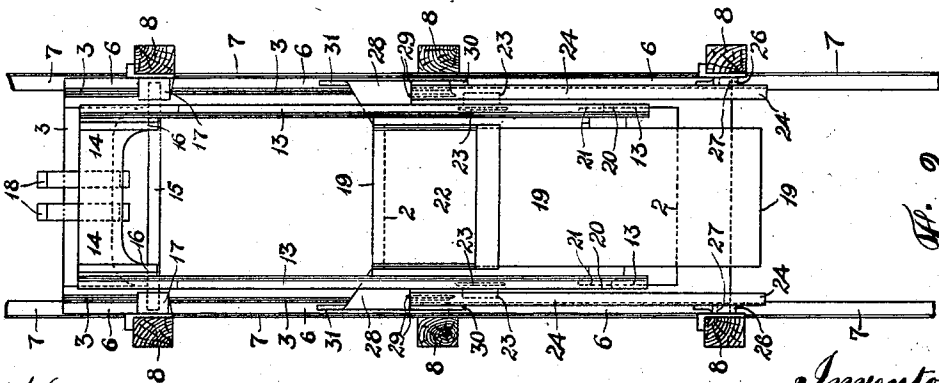


Fig. 2.

Witnesses:
Chas. Overdale
A. Thompson

Inventors:
John Whitford
James A. Mills

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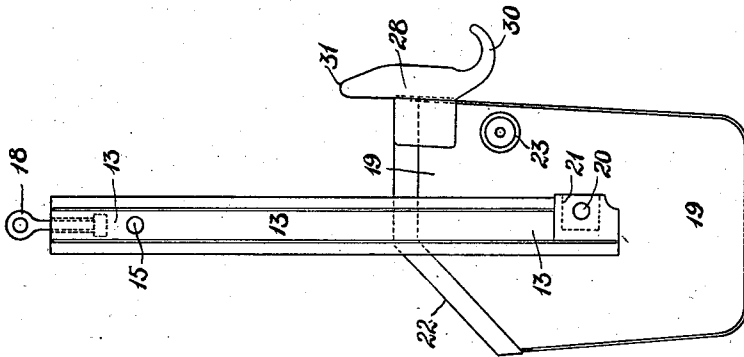


Fig. 3.

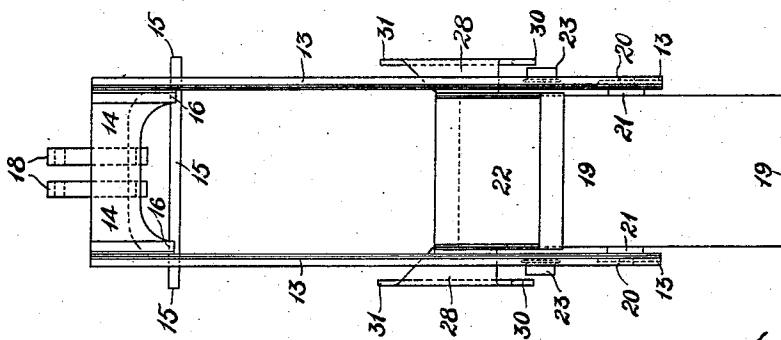


Fig. 4.

Witnesses:
Chas. Overdale
A. Thompson

Inventors:
John. Whitford
Joseph A. Mills

UNITED STATES PATENT OFFICE.

JOHN WHITFORD AND JOSEPH AMOS MILLS, OF JOHANNESBURG, TRANSVAAL.

MEANS FOR LOADING SKIPS OR OTHER VEHICLES IN MINE-SHAFTS AND THE LIKE.

1,001,106.

Specification of Letters Patent. Patented Aug. 22, 1911.

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To all whom it may concern:

Be it known that we, JOHN WHITFORD and JOSEPH AMOS MILLS, subjects of the King of Great Britain, and residents of Johannesburg, Transvaal, have invented certain new and useful Improvements in Means for Loading Skips or other Vehicles in Mine-Shafts and the Like, of which the following is a specification.

10 This invention relates to means or devices primarily designed for loading skips, buckets or other similar vehicles employed for hoisting purposes in the shafts of mines and the like. It may however be utilized
15 for receiving material at any pre-determined fixed loading point or station and transferring the same, either in measured or unmeasured quantities, to a hoisting vehicle traversing a shaft or hoist-way.

20 For the purpose of delivering ore—usually in measured quantities—from a loading box to a skip or like vehicle traversing a mine shaft, hand-actuated means are customarily provided for receiving and thereafter dis-
25 charging or delivering the ore into the skip or the like after the latter has been brought or placed in the requisite loading position.

Now our present invention has for its object to provide simple and efficient automatic means or devices for the purpose specified, and to largely eliminate the possibility of the arrangement or device sustaining damage in the event of the skip or vehicle engaging or coming into contact with it
30 when traversing the shaft or hoist-way at a high rate of speed.

According to our invention, the means or device comprises a pair of suspension links or members, which at or in proximity to
40 their upper extremities are hung or pivotally suspended in a space, chamber or compartment adjacent to the loading box and intermediate the latter and the mine shaft or other hoist-way. Between the lower ex-
45 tremities of the aforementioned suspension links is pivotally supported a receptacle which serves for receiving the ore or other material from the loading box or its equivalent and for automatically delivering it in
50 the manner hereinafter explained into the skip or other vehicle traversing the shaft or hoist-way. The aforesaid receptacle may be of equal size or capacity to the skip it is intended to load, so that it can, if de-
55 sired, be employed as a means for measuring the load delivered to the skip. The recep-

tacle is pivoted between the suspension links nearer the side contiguous to the shaft, or in such a way that the center of gravity of the skip, either loaded or unloaded, when 60 in an upright position, lies in a vertical plane which passes through the point of suspension of the links and on the side of the pivots of the receptacle remote from the shaft or nearest the loading box. As a 65 result of this construction, the receptacle remains in a stable condition until it is engaged by the descending skip or vehicle. Means are preferably provided for guiding the receptacle as it is being inverted or 70 downwardly inclined to discharge its contents into the skip, and also as it is being returned to its normal and loading position. These means may conveniently comprise a pair of wheels fixed to the receptacle at or 75 near the top, and near the side adjacent to the shaft, and channel irons or equivalent guides fixed in suitable positions in which said wheels engage. These means also operate to limit the movement of the recep- 80 tacle in either direction, or when it is inverted or downwardly inclined, and also in the direction of the loading box to bring it to rest in its normal loading position. To the sides of the receptacle at the top are 85 fitted plate extensions which are adapted to be engaged by wheels provided in suitable positions on the sides of the skip to actuate or tilt the receptacle on the descent of the skip to discharge the contents therein. 90 The aforesaid extensions are preferably so constructed that they serve also, upon re-engagement therewith of the wheels fixed to the skip, to return said receptacle to its normal loading position. 95

Our invention will be more fully described by aid of the accompanying drawings, in which—

Figure 1 represents the arrangement in elevation; and Fig. 2 a view at right angles 100 to Fig. 1 as seen from the left hand or loading box side. Fig. 3 is a side elevation of the loading receptacle 19, and its suspension links 13, and Fig. 4 is an elevation at right angles to Fig. 3, as seen from the loading 105 box side.

1 in Fig. 1 represents the shaft or hoist-way in which the skip, bucket or other similar vehicle 2 ascends and descends.

3 represents the bridle or bail in the lower 110 end of which the vehicle 2 is hinged or pivoted, as indicated at 4.

5 is any suitable means for locking the body 2 of the vehicle to the bridle or bail 3.

6 are the angle iron shoes fixed to the bridle or bail 3 for slidingly engaging the runners or guides 7—see Fig. 2—which are fixed to the shaft timbers 8.

9 in Fig. 1 represents part of the means for automatically dumping the contents of the skip or vehicle 2 after release of the locking means 5, and 10 is the eye-piece for connecting the hauling rope to the upper end of the bail or bridle 3.

The aforementioned parts may be of the construction shown in the drawings or any other preferred construction.

12 represents the space, chamber or compartment adjacent to the loading box (not shown) and intermediate said box and the mine shaft or other hoist-way 1, into which it opens or with which it communicates.

13 represents the suspension links which may as shown comprise angle irons riveted or otherwise suitably fixed on the inside to a back plate. The links 13 at their upper ends are connected by means of a transverse member 14—see Figs. 2, 3 and 4.

15 represents a shaft which fits recesses 16 formed in the ends of transverse member 14, passes through holes formed in the suspension links 13 and is rotatably supported in bearings 17 fixed to the timbers 8. Shaft 15 forms the pivot about which the suspension links 13 are hung or suspended at or in proximity to their upper ends.

18 represent eye-pieces for making connection between the hoisting rope and the suspension links 13 for lowering the latter and with them the loading receptacle down or raising the same up the shaft 1.

19 represents the loading receptacle which is pivoted between the lower extremities of the suspension links 13.

20 are the trunnions or pivots supporting receptacle 19 between the lower ends of links 13; and 21 are bearing blocks or plates fixed to the lower ends of the links, for the pivots or trunnions 20.

The receptacle 19, on the loading box side is constructed, as indicated at 22, to receive the ore or other material delivered to it from the loading box—not shown. Trunnions 20 are positioned on the sides of receptacle 19 at a point some distance below the center thereof and nearer the side adjacent to the shaft 1, so that, as previously explained, the center of gravity of the skip, either loaded or unloaded when in an upright position, lies in a vertical plane which passes through the center of shaft 15 and on that side of the pivots or trunnions 20 nearest the loading box.

23 are guide-wheels rotatably affixed to the sides of receptacle 19 near the top and between the links 13 and the shaft 1; and 24 are the channel iron guides in which the

wheels 23 are adapted to traverse when the receptacle 19 is moved in either direction. The guiding channels 24 are, as shown, slightly inclined in the direction of the loading box from their lower to their upper ends, so as to allow for the movement of receptacle 19 about the movable or swinging center 20.

25 in Fig. 1 represent angle iron members for fixing the upper ends of the channel guides 24 to the timbers 8.

26 (see Fig. 2) are bearings fixed to timbers 8 into which project projections 27 provided on the lower ends of the channel guides 24, for supporting said channel guides.

28 are plate extensions which, as shown in Fig. 2, are fixed to two opposite sides of the receptacle 19 and extend into the shaft 1 into the path of the vehicle 2. The plate extensions 28 are shaped or bent downwardly, as shown in Fig. 2, to be engaged by wheels 29—which constitute the tilting device for receptacle 19—fixed to two opposite sides of the vehicle 2. The plate extensions 28 are shaped in their lower portions, as indicated at 30, to be engaged by the wheels 29 as the vehicle descends the shaft, and in their upper portions, as indicated at 31, to be engaged by the wheels 29 on the ascent of the vehicle 2.

In Fig. 1 of the drawings we show the receptacle 19 in full lines in its vertical and stable position, in which position it receives the ore or other material from the loading box; and in dotted lines in its lowermost position or the position in which it remains after discharging its contents into the vehicle 2, until the latter, by re-ascending the shaft, returns it to its normal and stable position.

The action of the device will now be apparent, and may be briefly described as follows:—On the descent of the vehicle 2, wheels 29 engage the curved projections 30 of the plate extensions 28, whereupon receptacle 19 swings or moves in the direction of the loading box about the upper ends of the suspension links 13. The continued downward movement of the vehicle 2 then rotates receptacle 19 about its trunnions or pivots 20 and in conjunction with guide wheels 23 traversing guides 24 constrains the lip of said receptacle to move in a curved path until said receptacle is so inclined, or caused to assume such a tipping angle as to cause the whole of its contents to be discharged into the descending skip or vehicle 2. The receptacle 19 thereupon remains in its inclined and lowermost position until vehicle 2 re-ascends the shaft, whereupon wheels 29 engage the inclined portions 31 of the plate extensions and move the receptacle 19 back through the path into its normal and stable position for reloading. This

cycle of operations is repeated at each ascent and descent of vehicle 2.

What we claim as our invention and desire to secure by Letters Patent is:—

5 1. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the
10 shaft or hoist-way, a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that it remains in a stable condition in its normal, vertical and loading position, means provided on said receptacle to be engaged by the ascending and descending vehicle to discharge the contents of said receptacle into said vehicle on the descent
15 of the latter and to return the receptacle to its normal and stable position on the ascent of the vehicle, as set forth.

2. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said
20 compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side
25 of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, as set forth.

3. In a device of the character described the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft or hoist-way, of a pair of suspension links
30 pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, means provided on said receptacle to be engaged by the descending and ascending vehicle to discharge the contents of said receptacle into said vehicle on the descent of the latter and to return the receptacle to its normal loading and stable
35 position on the ascent of the vehicle, as set forth.

4. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adja-

cent to and in communication with the shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way
40 that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, plate extensions affixed to the receptacle, said extensions projecting into the path of the vehicle, and tilting means provided on the vehicle for engaging said
45 plate extensions to discharge the contents of said receptacle into said vehicle on the descent of the latter and to return the receptacle to its loading and stable position on the ascent of the vehicle, as set forth.

5. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft
50 or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading
55 position, plate extensions affixed to the receptacle, said extensions projecting into the path of the vehicle and being shaped in their lower portions to be engaged by wheels fixed to the vehicle on the descent of the latter, and shaped in their upper portions to be engaged by the wheels fixed to the vehicle on the ascent of the latter, and wheels fixed to the sides of the vehicle to engage the plate extensions, as set forth.

6. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft
60 or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading
65 position, means for guiding the receptacle as it is being inverted or downwardly inclined to discharge its contents and also as it is being returned to its loading position, said means serving also for bringing the re-

ceptacle to rest in its extreme positions, as set forth.

7. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, means for guiding the receptacle as it is being inverted or downwardly inclined to discharge its contents and also as it is being returned to its loading position, said means serving also for bringing the receptacle to rest in its extreme positions or in its inclined position and also in its loading and stable position, and means provided on said receptacle to be engaged by the descending and ascending vehicle to discharge the contents of said receptacle into said vehicle on the descent of the latter and to return the receptacle to its normal loading and stable position on the ascent of the vehicle, as set forth.

8. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, guides fixed in the afore-said compartment and wheels fixed to the receptacle for traversing said guides to guide the receptacle as it is being downwardly inclined to discharge its contents, and also as it is being returned to its loading position, said means serving also for bringing the receptacle to rest in its extreme positions, as set forth.

9. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the

shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, guides fixed in the afore-said compartment and wheels fixed to the receptacle for traversing said guides to guide the receptacle as it is being downwardly inclined to discharge its contents and also as it is being returned to its loading position, said means serving also for bringing the receptacle to rest in its extreme positions, plate extensions affixed to the receptacle, said extensions projecting into the path of the vehicle, and a tilting means provided on the vehicle for engaging said plate extensions to discharge the contents of said receptacle into said vehicle on the descent of the latter and to return the receptacle to its loading and stable position on the ascent of the vehicle, as set forth.

10. In a device of the character described, the combination with a mine shaft or hoist-way and a vehicle adapted to traverse said shaft or hoist-way, of a compartment adjacent to and in communication with the shaft or hoist-way, of a pair of suspension links pivoted at their upper ends in said compartment, a loading receptacle pivoted between the lower ends of said links in such a way that the center of gravity of said receptacle lies in a plane which passes through the suspension link pivots and on the side of the loading receptacle pivots remote from the shaft or hoist-way, so that the receptacle is in a stable condition in its vertical and loading position, plate extensions affixed to the receptacle, said extensions projecting into the path of the vehicle and being shaped in their lower portions to be engaged by wheels fixed to the vehicle on the descent of the latter, and shaped in their upper portions to be engaged by the wheels fixed to the vehicle on the ascent of the latter, and wheels fixed to the sides of the vehicle to engage the plate extensions, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN WHITFORD.
JOSEPH AMOS MILLS.

Witnesses:

CHAS. OVENDALE,
MAUD POPE.