E. O'TOOLE.

CONTINUOUS MINE HOIST.

APPLICATION FILED MAR. 16, 1914.

1,165,017.

Patented Dec. 21, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

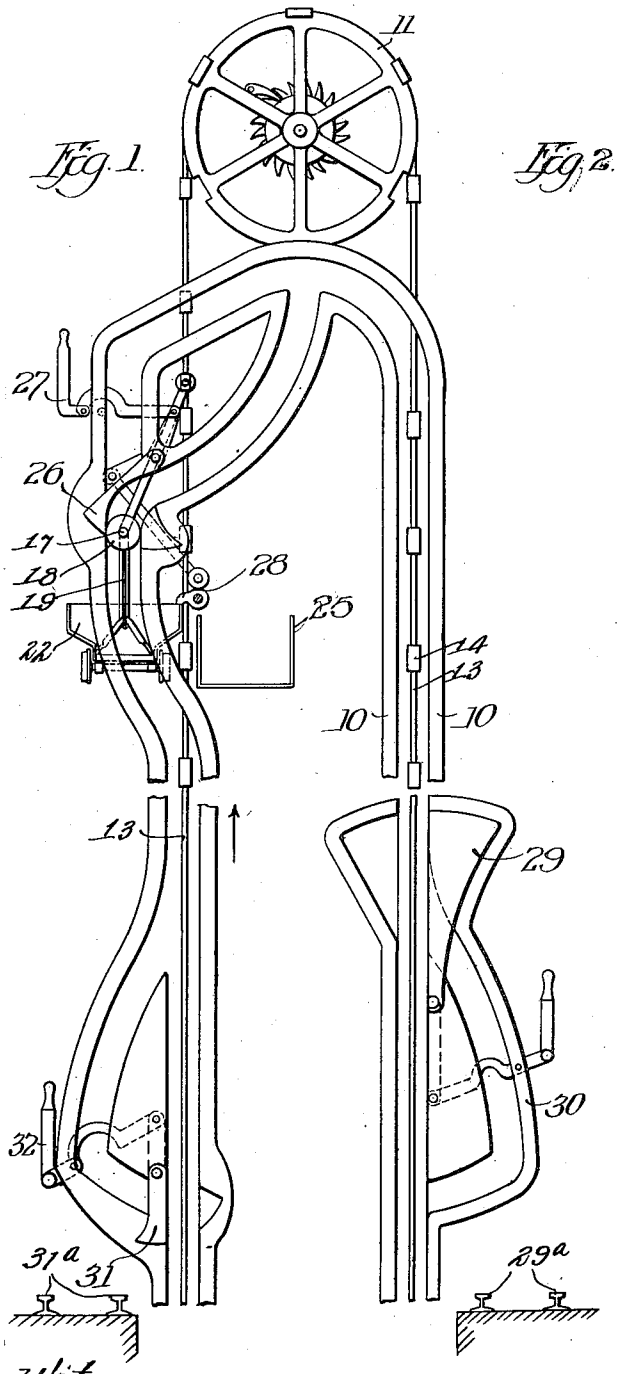
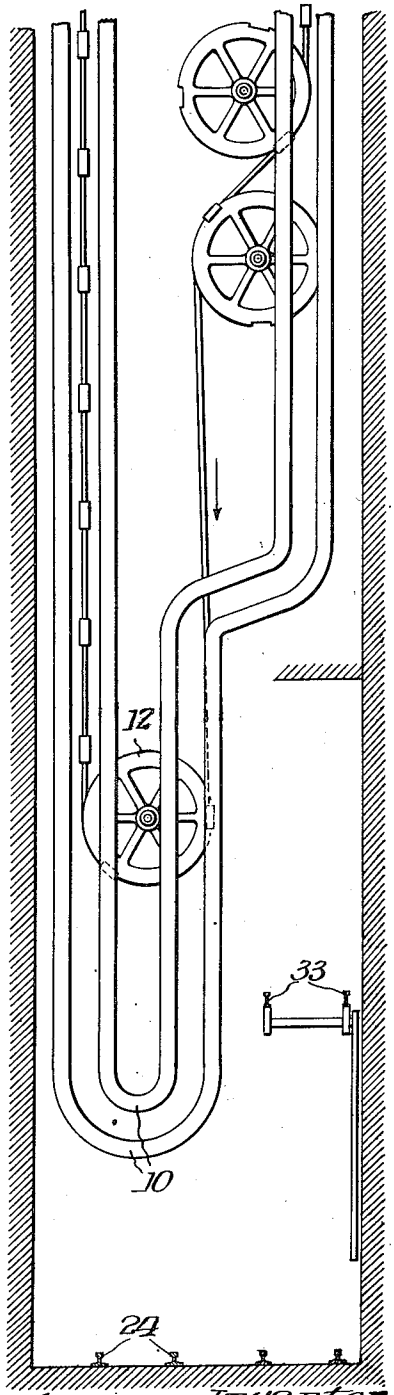


Fig. 2.



Witnesses:

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2 SHEETS—SHEET 2.

Fig. 4.

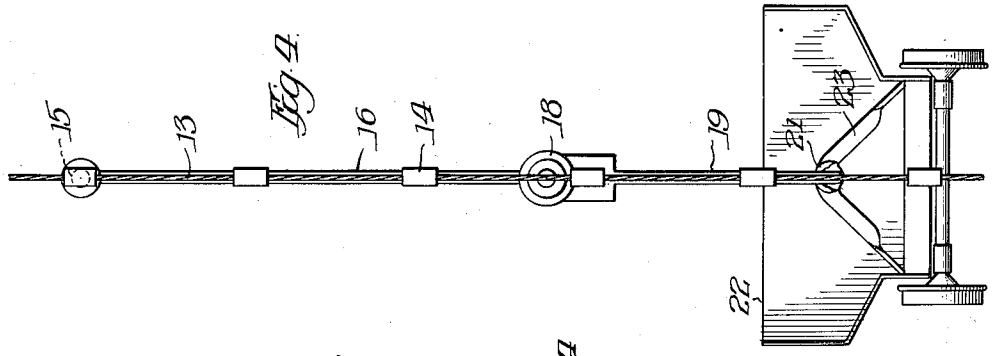
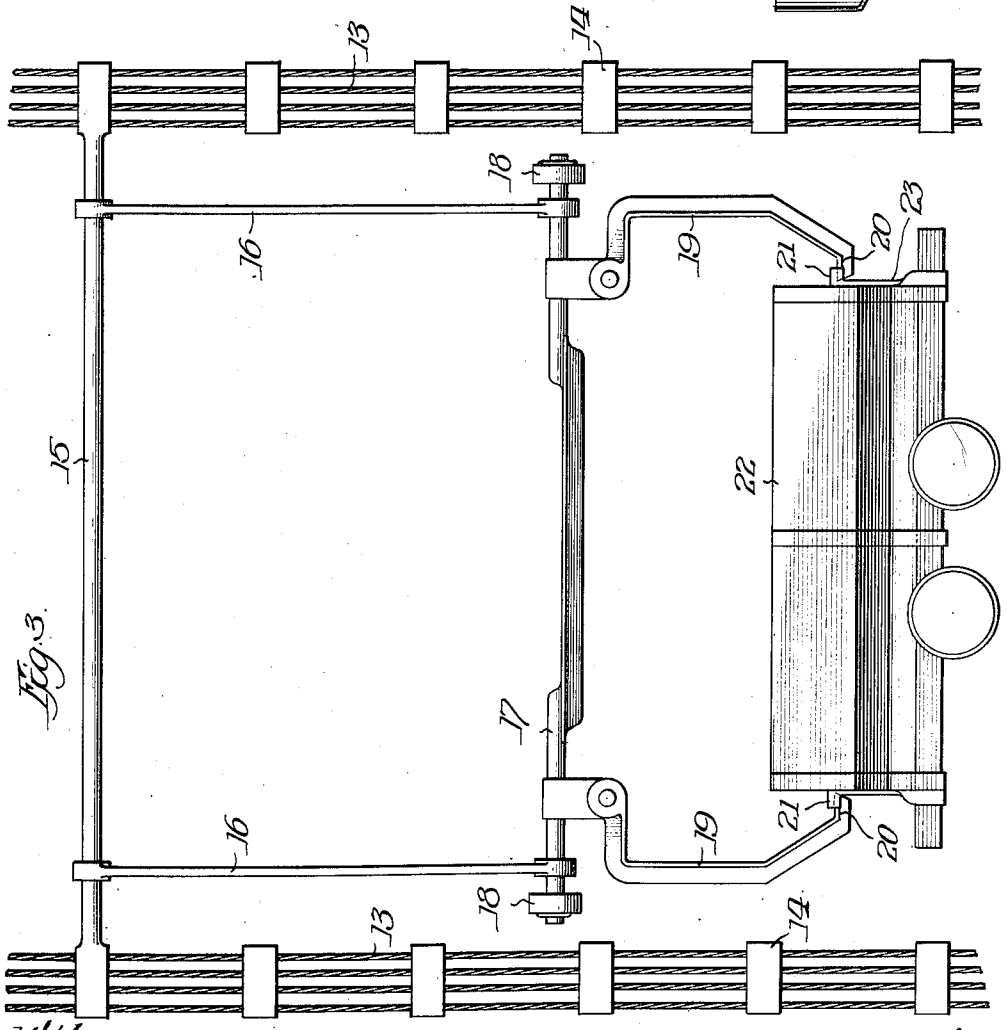


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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CONTINUOUS MINE-HOIST.

1,165,017. Specification of Letters Patent. Patented Dec. 21, 1915.

Application filed March 16, 1914. Serial No. 824,978.

To all whom it may concern:

Be it known that I, EDWARD O'TOOLE, a citizen of the United States, and resident of Gary, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Continuous Mine-Hoists, of which the following is a specification.

My invention relates to mining and has particular reference to a novel mine hoist adapted for continuous operation.

It is desirable to provide a hoist for mines so arranged that the hoisting element may operate continuously, thus avoiding the delays incident to starting and stopping. Furthermore, a continuously operating hoisting element avoids the danger of personal injury to the workmen due to careless or accidental starting of the hoist and eliminates an operator for starting and stopping the hoist. In order to produce an automatic device of this character it is necessary to provide means for picking up loaded cars at the bottom of the shaft, lifting them to the entrance and discharging them, all without attention on the part of the workmen. Such construction contemplates means for automatically picking up a car at the bottom of the shaft, means for lifting such car, means for automatically dumping the car, means for depositing a full or empty car at the top of the shaft, and means for picking up an empty car at the top of the shaft. Furthermore, by my arrangement the use of a cage or platform carried by the hoisting element is eliminated; the shaft bottom arrangement eliminates the necessity for an auxiliary hoist; permits caging of the mine material from each side of the shaft and reduces the cost of shaft bottoms of equal tonnage by a large percentage.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a side elevation of the top arrangement of a hoisting device constructed in accordance with my invention; Fig. 2 is a similar elevation of the bottom portion of the same arrangement; Fig. 3 is an enlarged side elevation of the hoisting element, the hooks being shown in engagement with the car, and Fig. 4 is a side elevation of the construction shown in Fig. 3.

Referring more particularly to the drawings it will be seen that within a shaft is mounted a plurality of vertically extending guides 10, having, as shown in Fig. 1, a series of switches associated therewith, a pair of upper sprockets 11, and a pair of lower sprockets 12, serving to support and cause the travel of a pair of endless conveyer elements 13. These elements, as shown in Fig. 3, may consist of a plurality of cables connected at intervals by means of the bands or clamps 14. As a means for connecting the two conveyer elements I provide a cross bar 15, having a pair of depending links 16, to the lower ends of which is pivoted a guide bar 17, having anti-friction rolls 18, on the ends thereof, these rolls being adapted to enter between the guides 10. Depending from the bar 17, are two hooked members 19, mounted for oscillation in a vertical plane. The squared or hooked lower ends of the members 19, are so located as to normally project beneath the lugs or hooks 21, secured to a car 22, the hooked members 19 being guided into engagement with the lugs 21, by means of the curved members 23, as best shown in Fig. 4.

It will be understood that a car such as shown at 22, normally depends between the conveyer elements 13 and is adapted for limited swinging or sidewise movement because of the pivotal connection to the conveyer elements. This permits the deflection of the car engaging portions of the lifting element whereby to engage or disengage a car or dump the same as required.

Referring to Fig. 2 it will be seen that I provide a track 24 on which loaded cars to be hoisted are directed. The conveying element will be guided down the shaft and as the depending hooked members 19, extend below the lowest point of the guides 10, a car resting on the track 24, will be picked up by the automatic engagement of the projections on the car and the arms 19, the car will be carried up the shaft, and if it is to be dumped into the chute 25, the switch 26, will be thrown into the position shown in Fig. 1, by means of the hand lever 27. This actuation projects a stop 28 into the path of the side of the car and as the car is further lifted it will be tilted and its contents dumped into the chute 25. If, however, the car is not to be dumped but is merely to be deposited at the top of the shaft, the switch 26 is not thrown and the car will travel along the guides 10, over the top and down to the switch 29, which will be thrown to direct the car sidewise by means of the guides 30. The car will thus be deposited upon the track 29[a] and the lifting hooks au-

tomatically disconnected. If an empty car is to be picked up at the top of the shaft, the switch 31 is thrown by means of the handle 32, and any car located in position upon the track 31ª will be engaged by the lifting hooks on the lower ends of the arms or members 19 and carried around the guides over the top and down to the bottom of the shaft where it will be deposited upon the track 33, from which it may be directed into the mine.

It will be understood that suitable means are provided for constantly moving the conveying element in a clockwise direction as viewed in Fig. 1.

It will be obvious that modifications may be made in the construction shown and such modifications as are within the scope of my claims I consider within the spirit of my invention.

I claim:

1. In a hoisting device of the class described, the combination with a shaft having car tracks and a plurality of containers adapted to run on said car tracks, of an endless hoisting element in said shaft, endless guides at the sides of said hoisting element, depending arms pivoted on said hoisting element and arranged to engage with said endless guides, said arms having hooks adapted to engage and support said containers on the endless hoisting element, auxiliary side guides at intervals in the length of said endless guides, and switches coacting with said endless guides and the auxiliary guides, said switches being adapted to cause the container to be automatically engaged by and disengaged from said depending arms in transferring the containers to and from said car tracks.

2. In a hoisting device of the class described, the combination with a shaft having car tracks and containers to run on said tracks, of an endless, constantly moving hoisting element in said shaft, said hoisting element having at least one set of depending arms pivoted thereto, guides at the sides of said hoisting element, said depending arms being arranged to engage with and disengage from the containers on said tracks, and switches on said guides coacting therewith to automatically cause engagement and disengagement of said containers and the depending arms on said hoisting element.

3. In a hoisting device of the class described, the combination with a shaft having car tracks and containers to run on said tracks, of an endless, constantly moving hoisting element in said shaft, said hoisting element having a plurality of sets of arms pivoted thereto, guides at the sides of said hoisting element, said arms being arranged to engage with and disengage from the containers on said tracks, and switches on said guides coacting therewith to automatically cause engagement and disengagement of said containers and the arms on said hoisting element.

4. In a hoisting device of the class described, the combination with a shaft having car tracks and containers to run on said tracks, of an endless, constantly moving hoisting element in said shaft, guides at the sides of said hoisting element, arms pivoted to said hoisting element having hooks adapted to engage with containers positioned on said tracks, a switch arranged to coact with said guides to cause engagement of the hooks with the containers and a switch coacting with said guides to cause disengagement of said arms and the container carried thereby whereby said container is deposited on a track in said shaft.

5. In a hoisting device of the class described, the combination with a shaft having car tracks and containers to run on said tracks, of an endless, constantly moving hoisting element in said shaft, guides at the sides of said hoisting element, arms pivoted to said hoisting element having hooks adapted to engage with containers positioned on said tracks, a switch arranged to coact with said guides to cause engagement of said hooks with the containers, a second switch coacting with said guides to cause disengagement of said arms, and the containers carried thereby, whereby the container is deposited on a track in said shaft, another switch coacting with said guides and a movable stop arranged to engage the containers, said switch and stop coacting to tilt and dump containers suspended from said arms during upward travel of said containers in said shaft.

6. In a hoisting device of the class described, the combination with a shaft having car tracks and containers to run on said tracks, of an endless, constantly moving hoisting element, arms pivoted to said hoisting element having hooks adapted to engage with containers positioned on said tracks, a switch arranged to coact with said guides to cause engagement of the hooks with the cars or containers, a switch coacting with said guides to cause disengagement of said arms, and the containers carried thereby, whereby the container is deposited on a track in said shaft, a third switch coacting with said guides, and a movable stop to engage the containers, said third switch and stop coacting to tilt and dump containers suspended from said arms.

EDWARD O'TOOLE.

Witnesses:
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J. E. Flexner.