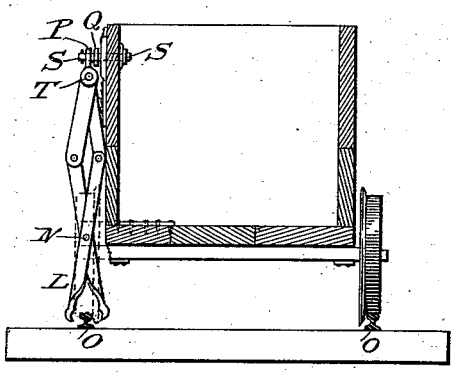
(No Model.) 3 Sheets—Sheet 1.

F. C. KEIGHLEY.

APPLIANCE FOR OPERATING INCLINED PLANES.

No. 382,613. Patented May 8, 1888.

Fig. 3.



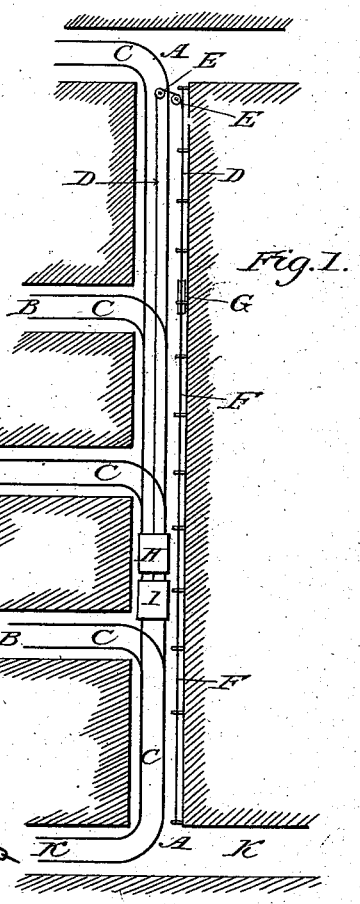
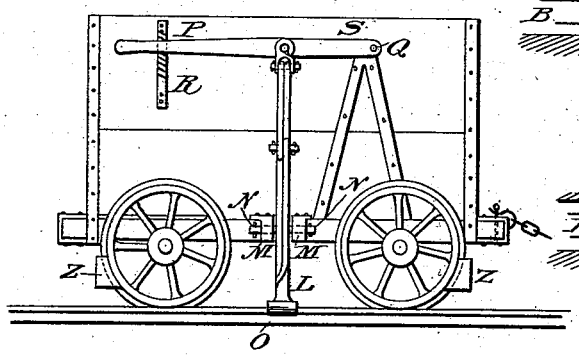


Fig. 1.

Fig. 2.



Witnesses.
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(No Model.) 3 Sheets—Sheet 2.

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APPLIANCE FOR OPERATING INCLINED PLANES.

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Fig. 4.

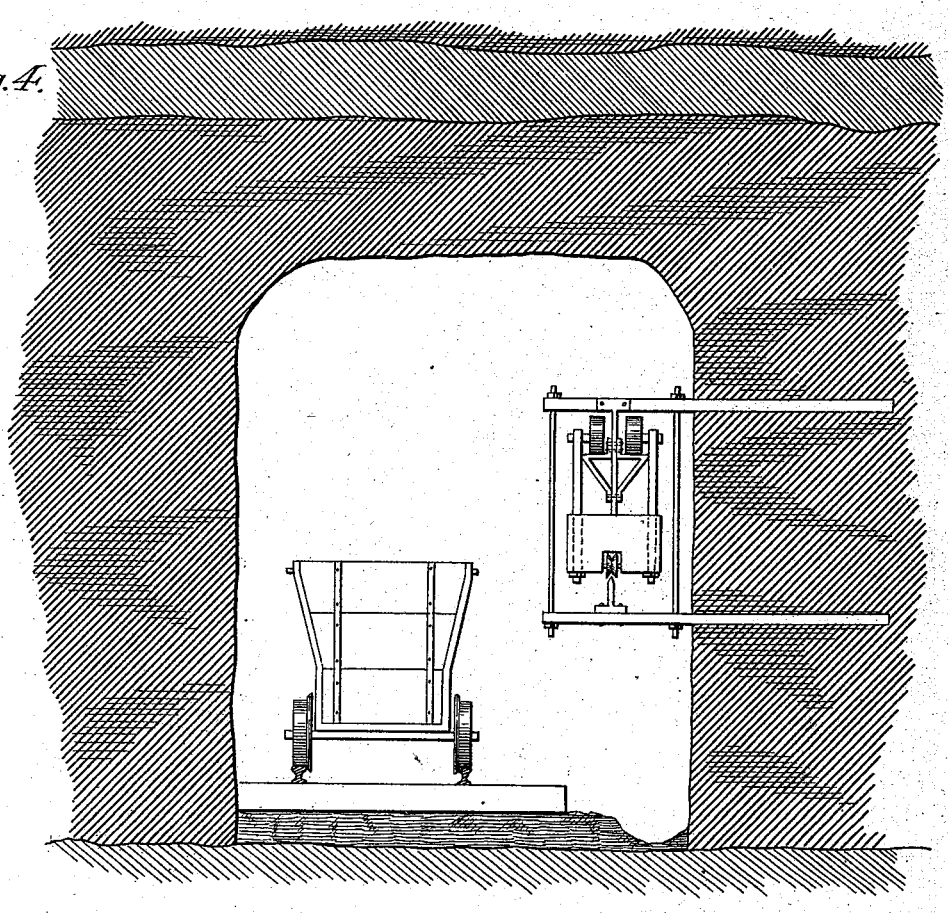


Fig. 7.

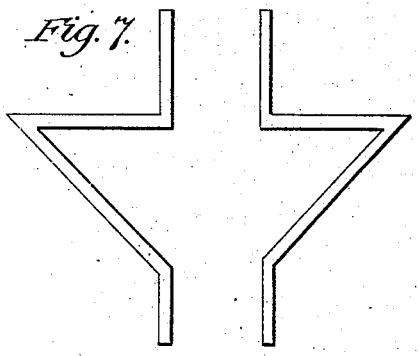


Fig. 8.

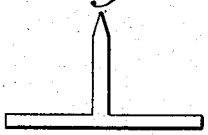
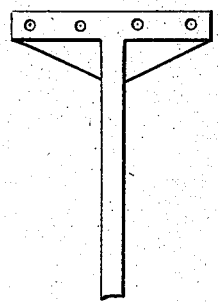


Fig. 9.



Witnesses.
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(No Model.) 3 Sheets—Sheet 3.

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APPLIANCE FOR OPERATING INCLINED PLANES.

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Fig. 6.

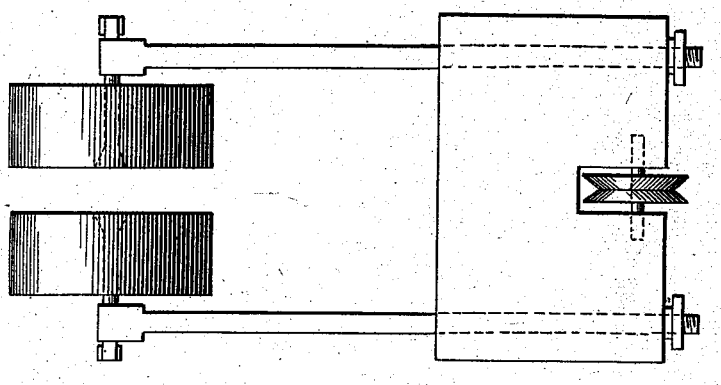
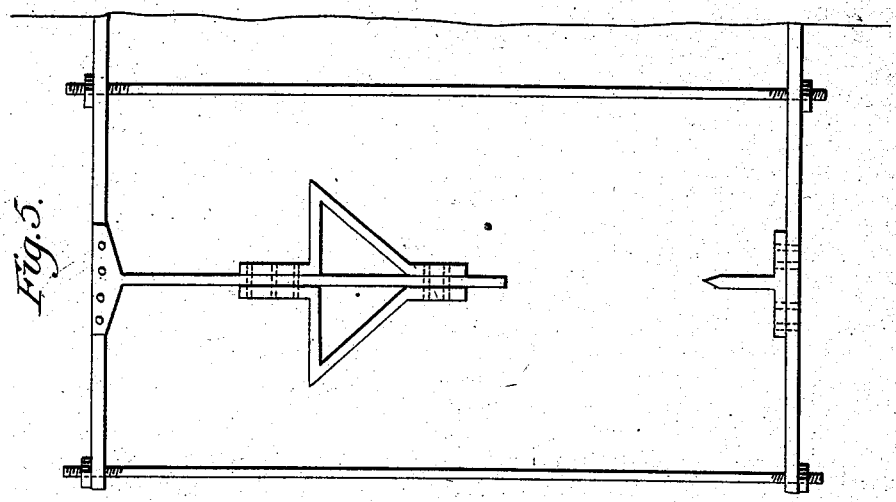


Fig. 5.



Witnesses.
H. F. Dethiler.
S. S. Babbitt.

Inventor:
Frederick Charles Keighley.

UNITED STATES PATENT OFFICE.

FREDERICK CHARLES KEIGHLEY, OF UNIONTOWN, PENNSYLVANIA.

APPLIANCE FOR OPERATING INCLINED PLANES.

SPECIFICATION forming part of Letters Patent No. 382,613, dated May 8, 1888.

Application filed December 12, 1887. Serial No. 257,685. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK CHARLES KEIGHLEY, a citizen of the United States, residing at Uniontown, in the county of Fayette and State of Pennsylvania, have invented a new and useful Appliance for Operating Inclined Planes, of which the following is a specification.

My invention relates to improvements in the lowering and raising machinery used on inclined planes in which the rope is attached to a grip car in connection with a back-balance at the other end of the rope; and the objects of my improvement are, first, to enable the person operating said machinery to stop and hold the rope at any desired point on the plane; second, to provide a means by which the operator can accompany the load or car either up or down and regulate the speed thereof; and third, to reduce the labor and expense required in the use of inclined planes as at present operated. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a ground plan of an inclined plane operated under my system and by means of my improved appliance, as designed for use in coal-mines in which the coal dips or lies at such an angle as to admit of the lowering of coal by gravity. Fig. 2 is a vertical side view of the grip-car to be used in this system. Fig. 3 is a cross-section of the grip-car, showing the working of the "grip" and its position on the car. Fig. 4 is an end view of my invention as in use, and Figs. 5, 6, 7, 8, and 9 are detail views of my overhead way and back-balance.

Similar letters refer to similar parts of the several views.

A A in Fig. 1 show the position of the inclined plane.

B B are the rooms or working places from which cars are to be raised or lowered.

C C show the several lines of track.

D D indicate the rope by which the car is raised or lowered.

E E are the pulleys or sheaves by which the rope is directed in its proper course.

F F show the suspended track upon which the back-balance G passes up and down.

H represents the grip-car coupled to the pit car or wagon I by means of a knock-off link-coupling.

J represents an extra set of wooden rails in each room upon which the empty car is placed until the loaded car is run out to the grip-car.

The plan of operation is as follows: In order to get the empty wagons or cars placed in the several rooms or working places, a mule is hitched to the grip car, which, together with its rope and back-balance, is drawn to the point K and there attached to an empty car, while the grip L, Fig. 3, holds the grip-car at the desired point. Then after the empty car is attached the grip L is released and the back-balance G, Fig. 1, pulls the empty car to the desired position—say any room C C C, Fig. 1—when the grip is again set and the empty car detached and placed in the room. This operation is repeated until one car has been placed in each room, after which the operation is as follows: An empty car being attached to the grip-car H, Fig. 1, and the grip L, Fig. 3, being released, the car is drawn up to any point, as C C C, Fig. 1, where grip L is again set and the empty car detached and run into room on siding J, Fig. 1. When the loaded car is run out over any track C C C and attached to grip-car, the grip is again released and the loaded car dropped down to point K, Fig. 1, and so on successively at will.

In all the above-described operations the operator is supposed to ride upon the grip-car and regulate its speed by means of an ordinary brake, as shown by Z Z, Fig. 2, in connection with the grip, if desired.

Fig. 2 is a side view of the grip-car, showing the grip L and the mode of its attachment to the car. M M show a plate with a recess for the reception of the grip in its center, which is so attached to the bottom of the grip-car by means of bolts as to enable the placing of the round pin N N (which passes through the lower part of the grip-levers L) over the center of the rail O and exactly perpendicular thereto. P, Fig. 2, is the lever by which the grip is operated. Q is the fulcrum, and R is a ratchet to hold the lever in position.

Fig. 3 is a side view of grip, showing its construction and mode of its attachment to the

car by means of a pin and washers, S S, at fulcrum Q. In this view the grip is released from the rail O.

The grip itself is an adaptation of the movement known as or sometimes called "lazy-tongs," and in this case the grip is set to the rail or released therefrom by the elevation or depression of the lever P, Fig. 2, which opens and closes the so-called "lazy-tongs" or "grip."

I am aware that prior to my invention loaded cars have been lowered and empty cars raised on inclined planes by means of various kinds of back-balances. Such plans of operation, however, require two lines of track, and consequently a large amount of space, whereas by my system but one line of rails is used in connection with a suspended rail for back-balance to run upon, (placed at one side of the entry,) thus admitting the operation of a plane within the width usually allowed for single entries—say eight feet.

By the means heretofore used it was possible to move the cars from the top to the bottom of the plane only, or vice versa, whereas by my invention a car may be stopped and detached and a loaded car attached at any intermediate point.

I also claim that my invention dispenses with the old-style brake-and-drum attachments as used on inclined planes, and consequently lessens friction, &c. I do not, however, claim such a combination, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The combination, in the operating of an inclined plane, of the suspended track F, the back-balance G, and the grip-car H, as shown by Fig. 1.

FREDERICK CHARLES KEIGHLEY.

Witnesses:
H. F. DETWILER,
CHARLES S. GAUSE.