(No Model.)

3 Sheets—Sheet 1.

T. WAKEFIELD.

ELEVATOR FOR MINING CARS.

No. 473,275. Patented Apr. 19, 1892.

Fig. 1.

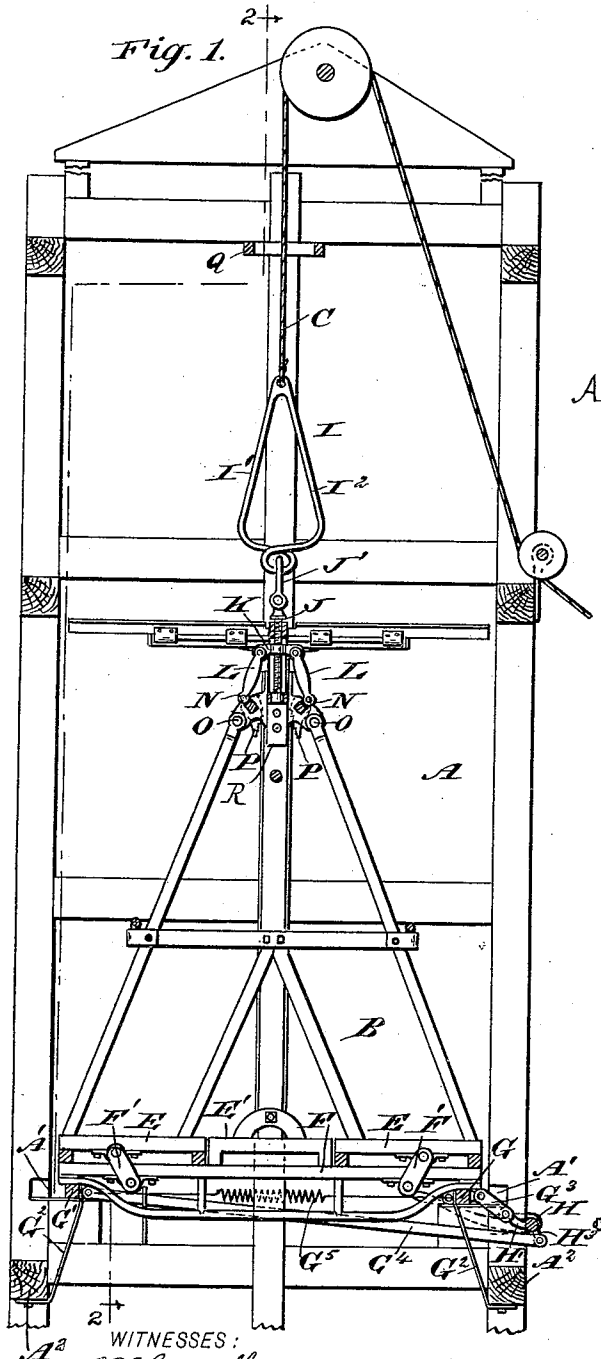
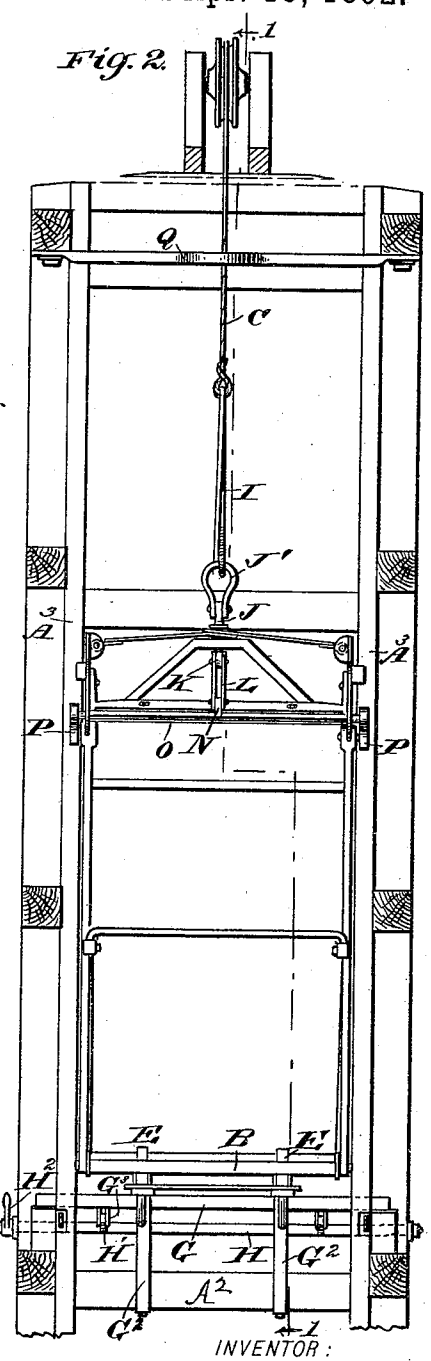


Fig. 2.



WITNESSES:

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(No Model.)

3 Sheets—Sheet 2.

T. WAKEFIELD.

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Fig. 3.

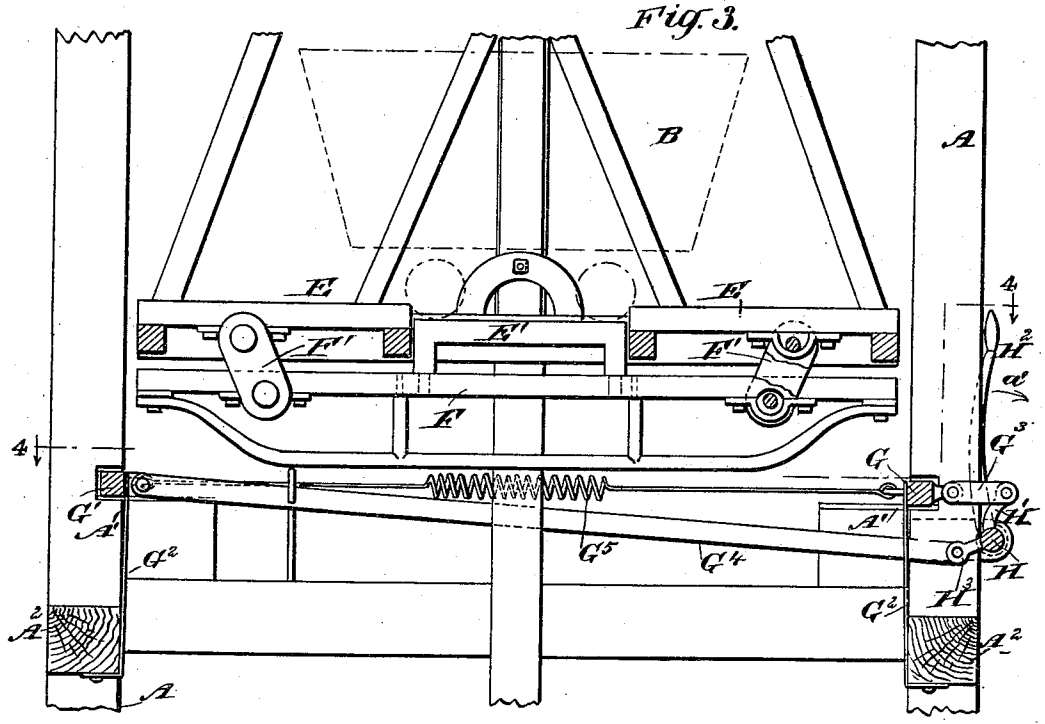


Fig. 6.

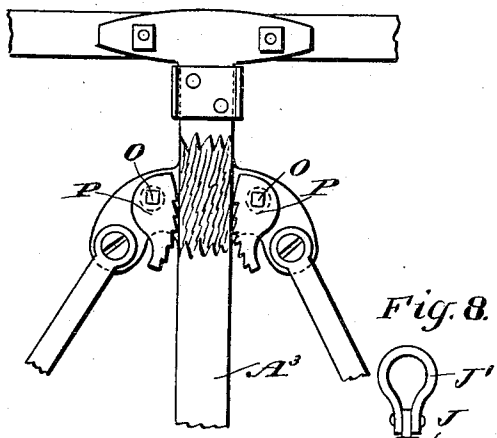


Fig. 7.

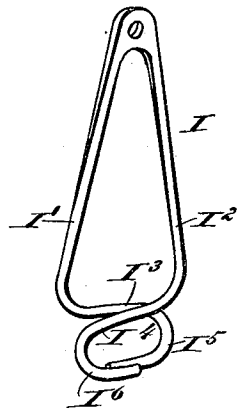
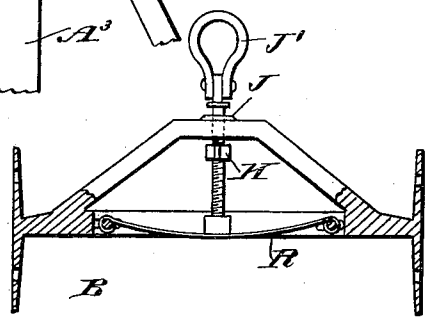


Fig. 8.



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(No Model.) 3 Sheets—Sheet 3.

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ELEVATOR FOR MINING CARS.

No. 473,275. Patented Apr. 19, 1892.

Fig. 4.

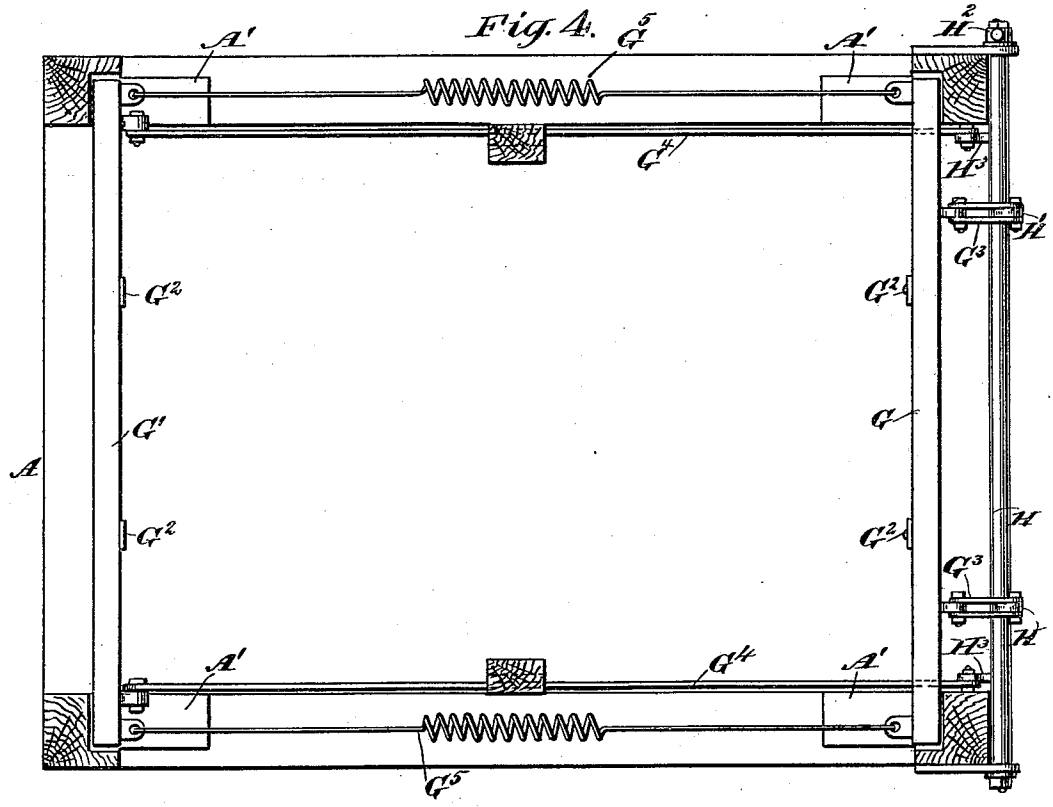
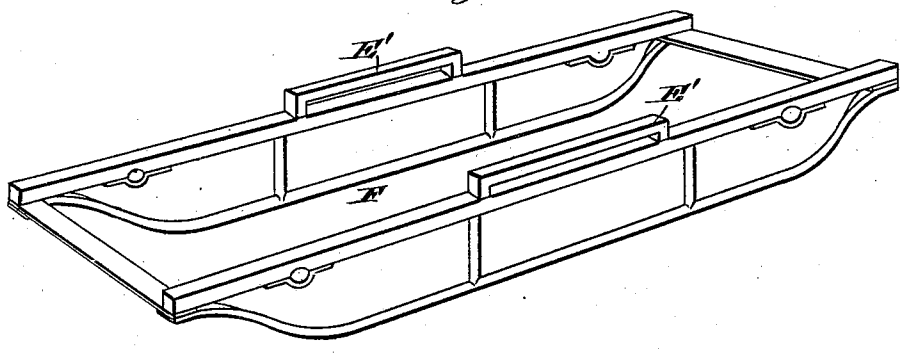


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS WAKEFIELD, OF ELY, MINNESOTA.

ELEVATOR FOR MINING-CARS.

SPECIFICATION forming part of Letters Patent No. 473,275, dated April 19, 1892.

Application filed January 11, 1892. Serial No. 417,709. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WAKEFIELD, of Ely, in the county of St. Louis and State of Minnesota, have invented a new and Improved Elevator, of which the following is a full, clear, and exact description.

The invention relates to elevators for use in mines and other places.

The object of the invention is to provide a new and improved elevator which is simple and durable in construction, very effective in operation, arranged to securely hold the car or other vehicle in place while the cage is in transit in the shaft, and securely lock the cage in an uppermost position to prevent accident when loading or unloading the cage.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is an enlarged sectional side elevation of the cage and support in the shaft. Fig. 4 is a sectional plan view of the support of the cage on the line 4 4 of Fig 3. Fig. 5 is a perspective view of the frame carrying the rail-sections. Fig. 6 is an enlarged sectional side elevation of the safety-dogs for the cage. Fig. 7 is a perspective view of the cage-hook, and Fig. 8 is a transverse section of the cage-top.

The improved elevator is provided with the usual shaft A, in which is mounted to travel up and down the cage B of any approved construction, according to the intended use.

The cage B is connected with the hoisting-rope C, connected with suitable machinery for raising and lowering the cage in the shaft A. On the platform of the cage B are arranged track-rails E, upon which the cars are moved, resting thereon while the cage B travels up or down the shaft. The ends of the track-rails connect with the track in the bottom of the mine and with the track on the ground to conveniently move the cars to and from the cage in the usual manner. The track-rails on the cage are made in sections. The center sections E′ are held vertically in a corresponding slot formed in the platform of the cage. The movable rail-sections E′ are secured on a frame F, of any approved construction, located on the under side of the cage and pivotally connected with the same by links F′, as is plainly illustrated in Figs. 1 and 3.

The links F′ at the end of the frame F permit the latter to swing upward and downward so as to hold the rail-sections E′ either in alignment with the fixed rails E on the platform of the cage, or the rail-sections E′ are held in a lowermost position, as illustrated in Fig. 3, the top of the said rail-sections E′ being but slightly above the top surface of the platform of the cage B. The car to be carried by the cage is moved so that its wheels are on the movable rail-sections E′, and when the cage is in transit in the shaft A the rail-sections E′ are in a lowermost position, and consequently the ends of the wheels of the car abut against the fixed track-rails on the platform of the cage, thus locking the car in place on the cage. In order to hold the frame F in an uppermost position to bring the rail-sections E′ in alignment with the rest of the track-rails, a support is provided, held in the shaft A and arranged to extend into the path of the frame F, so that the latter is supported by the same, and the links F′ swing upward to move the rail-sections E′ in an uppermost position by the weight of the cage B pressing downward. This support is preferably constructed as illustrated in the drawings, comprising two transversely-extending bars G and G′, mounted to slide horizontally in suitable bearings A′, arranged in the shaft A. The bars G and G′ are connected with downwardly-extending spring-bands G^2, secured to transverse beams A^2, arranged in the sides of the shaft A. The nature of the bands G^2 permits inward and outward sliding of the bars G and G′ in the manner presently to be described. The bar G is pivotally connected by links G^3 with arms H′, extending upward from a shaft H, journaled on one side of the shaft

A and provided at one end with a handle H^2 under the control of the engineer to impart a turning motion to the shaft H. From the latter extend downward the arms H^3, pivotally connected by links G^4 with the other bar G', so that when the shaft H is turned the two bars G and G' will move toward each other, according to the direction in which the handle H^2 is moved.

The two bars G and G' are connected with each other by the spring G^5, which serves to hold the bars G and G' in an innermost position in the path of the frame F. When the frame F, containing the cage B, passes up the shaft, it presses against the bands G^2, causing the bars G and G' to slide horizontally into the bearings A'. The frame F having passed in its upward movement in the shaft, the spring G^5 causes the bars G and G' to assume their innermost position in the path of the frame F, in which position they always remain, except when the operator moves the handle H^2 in the direction of the arrow a' to allow the frame F, containing the cage B, to descend in the shaft. This support for the frame F is located at the exit of the shaft or at any intermediate point to move cars to and from the cage B into side shafts in the mine. As shown in the drawings, the support is arranged near the upper end of the shaft, and when the cage B has moved past the support in its ascent, then the operator moves the bars G and G' inward, then lowers the cage, so that the frame F rests on the bars, and the lowering of the cage causes the links F' to swing until the cage has been lowered sufficiently to bring the sections E' in alignment with the track-rails E, so that the car can be conveniently run off the rail-sections E' upon the track-rails E, and from the latter to the track on the ground.

When the cage is to descend, it is first raised to disengage the frame F from the supporting-bars G and G', after which the operator moves the handle H^2 outward to cause the bars G and G' to slide into their outermost positions out of the path of the frame F and cage B. The latter can then be lowered in the shaft in the usual manner.

The hoisting-rope C is provided with a hook I, made of spring-steel and comprising two members I' and I^2 diverging from the top downward, as is plainly shown in Figs. 1 and 7. The two members I' and I^2 are formed with arms I^3 and I^4, respectively, extending in opposite directions crossing each other, and on the members I^3 and I^4 are formed the hooks I^5 and I^6, extending in opposite directions to form an eye or loop adapted to engage a link J', pivoted on the upper end of a screw-rod J, screwing in a nut-link K, pivotally connected by links L with arms N, projecting from shafts O, extending transversely and mounted to turn in suitable bearings in the frame of the cage B. On the outer ends of the shafts O are secured toothed dogs P, adapted to engage posts A^3, arranged in the shaft A, and usually forming guide-posts for the cage B. The two members I' and I^2 of the hook I are adapted to engage a ring Q, supported in the upper end of the shaft A, so that when the hook I passes into the said ring Q the members I' and I^2 are pressed toward each other, so that the hooks I^5 and I^6 open to disengage the links J'.

A spring R, secured by its ends in the frame of the cage B, is connected at its middle with the lower end of the screw-rod J, so that as soon as the hook I is disengaged from the link J' the said spring R causes a downward movement of the screw-rod J, whereby the nut-link K, the links L, and arms N turn the shafts O to move the dogs P into contact with the posts A^3, thus locking the cage in position. When the hook I engages the link J' and a pull is exerted by the hoisting-rope C, then the shafts O are turned in an opposite direction to move the dogs P out of engagement with the posts A^3, thus permitting the cage B to ascend and descend in the shaft A in the usual manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an elevator, the combination, with a cage provided with permanent track-rails, of vertically-movable track-rails between the permanent rails and means for raising and lowering said rails, substantially as set forth.

2. In an elevator, the combination, with a cage provided with permanent track-rails and vertically-movable track-rails between the permanent rails, of a support for the cage in the elevator-shaft and adapted to project thereunder and raise the movable rails into position between the permanent rails, substantially as set forth.

3. In an elevator, the combination, with a cage provided with permanent track-rails, of a vertically-movable frame hung on the under side of the cage and carrying movable track-rails, and means to raise said movable frame to extend the rails thereon between the permanent rails, substantially as set forth.

4. In an elevator, the combination, with a cage provided with permanent track-rails and vertically-movable frame hung on the under side of the cage and carrying movable track-rails, of a support in the shaft for said cage and adapted to project beneath the said frame and raise the movable rails thereon between the permanent rails, substantially as set forth.

5. In an elevator, the combination, with the parallel bars G G', supports for said bars, and springs pressing them inward into the path of the cage, of a rock-shaft H, parallel with the said bars and having arms H' H^3, short links G^3, connecting arms H' with bar G, long links G^4, connecting the arms H^3 with the bar G', and a handle H on the rock-shaft for rocking it, substantially as set forth.

6. In an elevator, the combination, with the cage-ring, of a hoisting-hook I, having integral arms I' I^2, having inwardly-projecting arms

I^3 I^4 at their lower ends and overlapping inwardly-projecting hooks I^5 I^6 at the ends of said arms, substantially as set forth.

7. In an elevator, the combination, with the cage, of a vertical suspension screw-rod J, a spring R, pressing the rod downwardly, a nut on the rod, two parallel rock-shafts O O, provided at their ends with toothed dogs P P and between their ends with arms N, and links L, pivoted at their upper ends to the nut and at their lower ends to the arms N, substantially as set forth.

THOMAS WAKEFIELD.

Witnesses:
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E. A. LOWE.