

(No Model.)

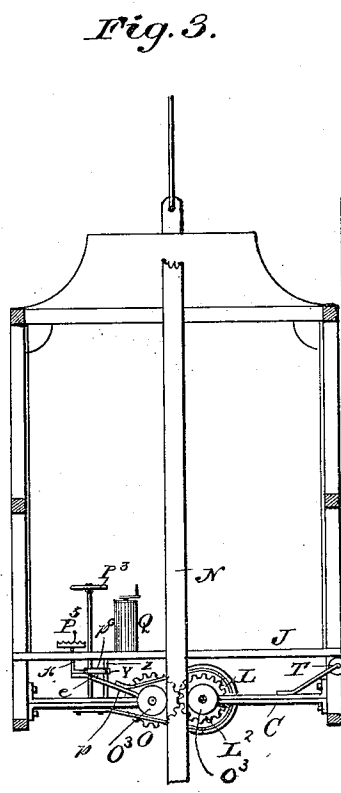
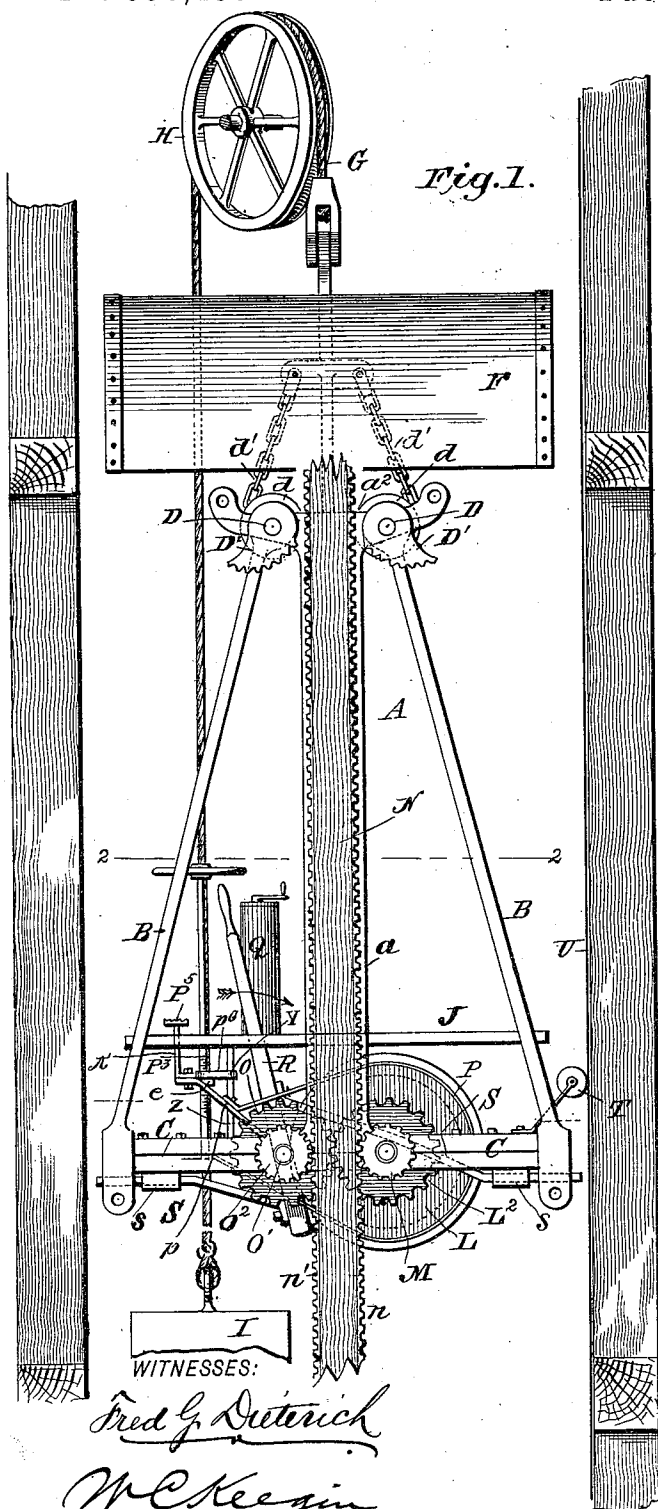
3 Sheets—Sheet 1.

C. J. CUTLER.

ELECTRIC MINE CAGE AND ELEVATOR.

No. 558,450.

Patented Apr. 14, 1896.



INVENTOR

Charles J. Cutler
BY Holcomb & Johnston

ATTORNEY *s*

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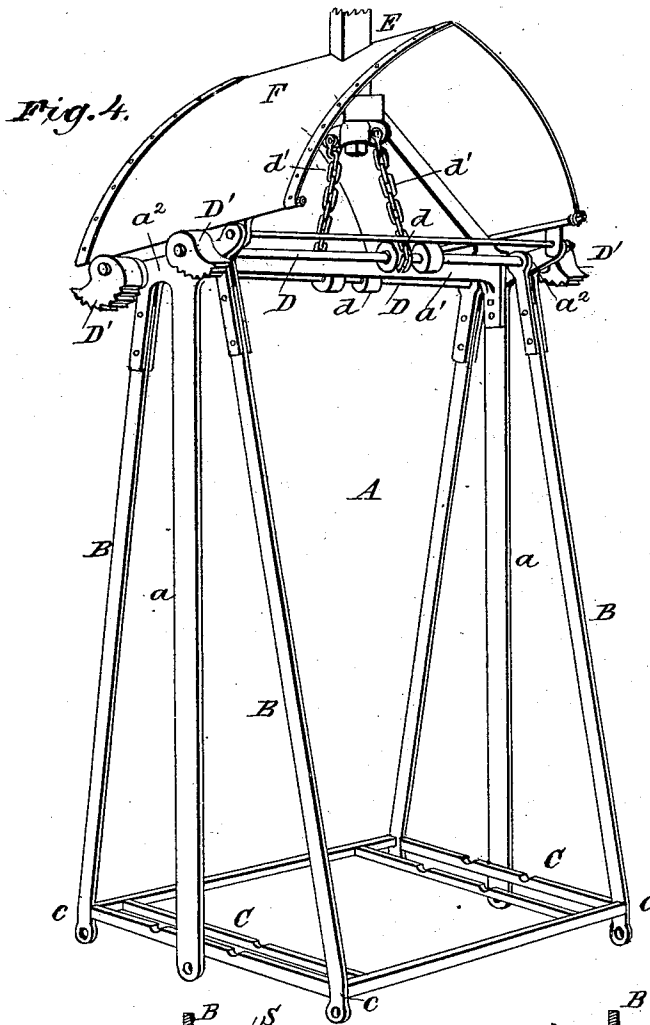
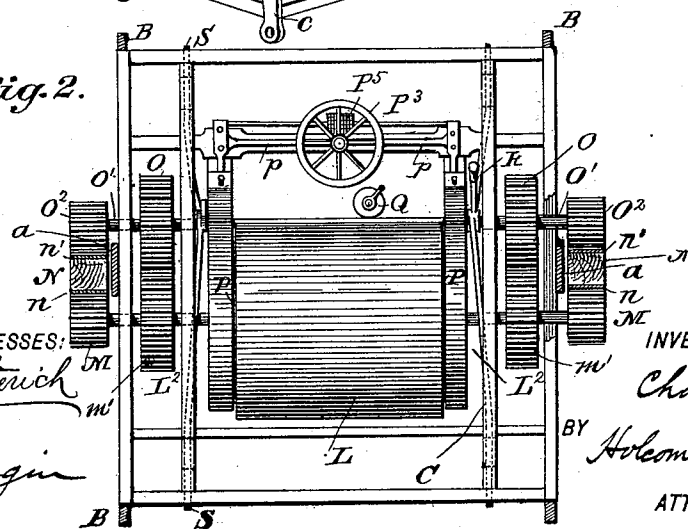


Fig. 2.



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(No Model.)

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Fig. 5.

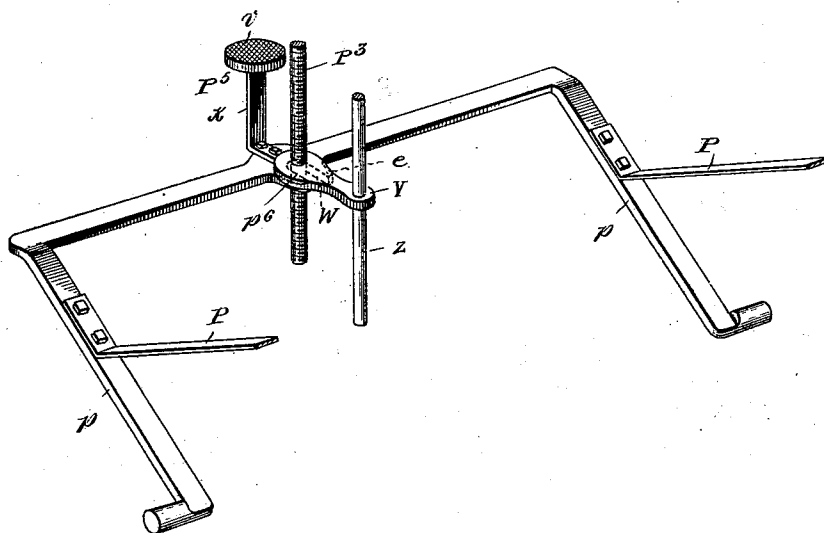
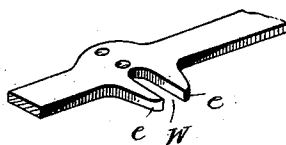


Fig. 5a.



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UNITED STATES PATENT OFFICE.

CHARLES J. CUTLER, OF BUTTE, MONTANA.

ELECTRIC MINE CAGE AND ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 558,450, dated April 14, 1896.

Application filed June 26, 1895. Serial No. 554,115. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. CUTLER, a citizen of the United States, residing at Butte, in the county of Silver Bow and State of Montana, have invented certain new and useful Improvements in Electric Mine Cages and Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates more particularly to an improved cage or elevator for mining-shafts and operative mechanism therefor, and primarily has for its object a simple and easily-manipulated electrically-controlled elevating mechanism and means for rendering it safe and positive in operation.

It also has for a further object providing a counterbalance for the cage, which latter carries an electric motor connected through a trolley or other suitable contact mechanism with a live wire or other electric source of supply secured to the side of the elevator-shaft.

A further object is to provide, in connection with the electrically-controlled elevating devices, a simple arrangement of brake mechanism, whereby its upward or downward movement may be easily controlled or arrested by hand or foot power, or automatically in case of breakage of the counterbalance-cable; also peculiarly constructed and operated chair-blocks adapted to be thrust out laterally from the cage-platform to engage the sides of the shaft at suitable points to arrest and support the cage at any desired stopping-point.

With other minor objects, which will be hereinafter referred to, it consists in certain details of construction and arrangement of parts, that will be set forth in the specification, illustrated in the drawings, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an end view of my elevator-cage, showing same in position in the shaft, parts being broken away to better illustrate the invention. Fig. 2 is a horizontal section taken practically on the line 2 2 of Fig. 1, looking in the direction of the arrow. Fig. 3 is a view, partly in vertical section and partly in

side elevation, of a modification of my invention. Fig. 4 is a perspective view of the cage shown in Fig. 1, with the controlling attachments and the floors or platforms omitted. Fig. 5 is a detail showing the movable or pivoted member by means of which the brake-bands surrounding the motor-pulleys are operated; and Fig. 5^a, a section of same, showing construction of its central portion.

In its practical application my invention embodies a main cage A, the preferable construction of which is shown in Fig. 4, and comprises pendent members *a a*, connected at the top by a cross-beam *a'* and at the sides attached by the cross-heads *a''* to divergent hanger-bars B, which connect at a point near their lower ends with the motor-carrying frame C.

D D are a pair of rock-shafts journaled in the cross-heads *a''*, carrying near their centers pulleys *d*, to which are connected chains *d'* depending from a swivel secured to the lower end of the lift-bar E, to the upper end of which lift-bar the counterbalance-cable G is attached. On the outer ends of these rock-shafts are toothed cams D', the purposes of which will be hereinafter explained.

F indicates a hood or cover portion through which passes the lift-bar E, connecting with the counterbalance-cable G, which latter passes over the large sheave H and supports at its lower end counterweight I, of suitable form and size.

J indicates a platform mounted on the cage-frame at a suitable point above the motor-frame C, which I term the "operator's platform," as upon it is mounted or disposed the controlling-lever, rheostat, and brake mechanism.

L is an electric motor of any preferred construction, having its shaft journaled in the frame C of the cage. Upon the outer ends of the motor-shaft are cog-pinions M, which are held to engage the racks *n* on one side of the guide-timbers N, which guide-timbers are suitably secured within the shaft at opposite sides of the cage. The motor-shaft is also provided at intermediate points near each end with cog-pinions *m'* of somewhat larger diameter than those on the ends. These pinions mesh with similar cog-pinions O on an aux-

iliary shaft O', journaled in frame C alongside of the motor. This auxiliary shaft is also provided on its ends with smaller pinions O², which engage the racks n' on the opposite sides of the guide-timbers N. The motor-shaft is further provided near the supported motor with enlargements or pulleys L² L², over which pass the steel brake-bands P, having wooden brake-blocks.

The lower end of each brake-band P is secured on the under side of a fixed portion of the cage-frame, as shown in Figs. 1 and 3, and its opposite or upper end is secured to the legs of the pivoted transverse member p, as shown in Fig. 5, whereby the bands may be clamped or tightened around the pulleys L² L² or loosened when it is desired to apply or release the brakes.

The member p, carrying the upper ends of the brake-bands, is depressed by either foot or hand power. To the center of its transverse portion is affixed a vertical standard k, projecting upward through the platform and terminating in a head or foot rest v, thus forming a foot-lever P⁵, by means of which the operator is enabled to readily depress said member and clamp the spring brake-bands with his foot. A transverse slot or opening W is also formed on the rear side of member p by means of projecting lugs e e, adjacent to each other, for the accommodation of the hand-brake P³. This hand-brake consists of a vertical screw-rod surmounted by a hand-wheel and extending down through the platform J, through the slot W, and having its lower end revolubly secured in the motor-frame C. This rod is screw-threaded where it passes through the slot W, and upon the screw-threaded portion above the member p is placed a nut p⁶, designed to be forced down the screw-threaded portion of the rod and carry with it the member p when the rod is revolved by hand. In order to prevent the nut from turning with the rod, it is provided with a perforated shank Y, intended to fit over and move upon a vertical guide-rod z.

It will be observed that by means of the hand-brake the bands P may be clamped in a locked position by screwing the nut down, while when only the foot-brake is used the brake is released when the pressure of the foot is removed. Either brake may be used separately or both in conjunction.

Q represents a rheostat mounted on the operator's platform for controlling the motor.

R is a hand-lever fulcrumed on the shaft O' to which are secured, one above and one below the fulcrum, chair blocks or plungers S S, secured in guides on the under side of frame C and projecting in opposite directions. These plungers are adapted to be projected outward through the medium of the lever R, so that their ends will engage a rack or openings in the sides of the shaft at any desired point for the purpose of arresting and sustaining the cage when ascending or descending.

T indicates a trolley or contact-maker flexibly secured to the frame C and which engages the wire or circuit-plate U, secured to the side wall of the shaft, as shown.

By referring again to Fig. 1 it will be seen that the rack-guides N occupy a position between the toothed-faced cams D' D' when the cage is in position, said cams being held out of contact with the racks n n' by the chains d', while the cage is suspended by the counterbalance-cable G. Should the latter break, the rock-shafts D would be caused to turn by the weight of the cams, throwing the toothed faces of the latter in contact with the racks n n' on the guides N, and they would operate as automatic safety-clutches, arresting the downward movement of the cage. At the same time the chair-blocks or plunger-rods S S might be forced outward by the lever and serve as an additional means of supporting the cage. The normal condition of the plunger-rods is as shown in Fig. 1, and when desired to operate them the lever is thrown forward in the direction indicated by the arrow.

The lower ends of the pendent members B of the cage are provided with eye-holes for conveniently attaching a lower cage or compartment, it being my purpose in mining-work to have a two-compartment cage, one above the other, the upper to be occupied by the operator.

While my improved cage or elevator is more especially designed for mining-shafts, it is obvious that it may be adapted to the purposes of an ordinary elevator, and the details of construction modified or varied without departing from the spirit of my invention.

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

1. In an electrically-operated elevator, the combination with fixed vertical guides provided with toothed racks on opposite sides, of a cage, an electric motor carried on the cage-platform having pinions on the ends of its shaft engaging the racks on one side of the vertical guides, an auxiliary shaft journaled in the cage-platform parallel with the motor-shaft, also provided with pinions on its ends engaging the toothed racks on the other or opposite side of the vertical guides, intermeshing gearing mounted on the respective shafts whereby both are made to operate in unison, and a trolley carried on the cage in contact with a conductor connected with an electrical source of supply, substantially as and for the purpose described.

2. The combination in an elevator, of the elevator frame or cage supported by a counterbalance-cable, fixed vertical guides provided with rack-bars on opposite sides of each guide, toothed cams mounted on the ends of rock-shafts journaled in the upper part of the frame or cage adapted to engage the rack-bars when the rock-shafts are turned by the weight of the cams, and chains connecting

the rock-shafts with the counterbalance-cable whereby the cams are held normally out of engagement with the rack-bars but permitted to come in contact with the latter should the counterbalance-cable break or give way, all arranged substantially as and for the purpose set forth.

3. The combination in an electrically-operated elevator, with the traveling cage thereof, the brake consisting of metallic straps, and brake-operating mechanism consisting of the transverse member *p* pivoted on the car, the foot-lever on said member *p*, and the hand-brake rod and its nut, of the motor carried by the cage and having pulleys on its shaft, and its gearing, said metallic straps inclosing said pulleys and being secured at their upper ends to said transverse member, whereby the metallic straps may be clamped on the pulleys by the foot or hand of the operator and

locked in the clamped position, substantially as described.

4. The combination with the elevator-cage, of the vertical lever *R* fulcrumed in the motor-supporting frame and extending up through the platform *J* within reach of the operator, and the plungers *S*, *S*, movably secured in guides on the under side of said motor-supporting frame, their inner ends connected with the lever *R*, on opposite sides of its fulcrum, whereby they are adapted to be thrust outwardly and engage recesses or stops in the sides of the elevator-shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES J. CUTLER.

Witnesses:

ALEXANDER LAIST,
GEORGE F. DOUGHERTY.