

(No Model.)

W. H. WHEELER.

DEVICE FOR OPERATING GATES TO ELEVATOR WELLS.

No. 460,788.

Patented Oct. 6, 1891.

FIG. 1

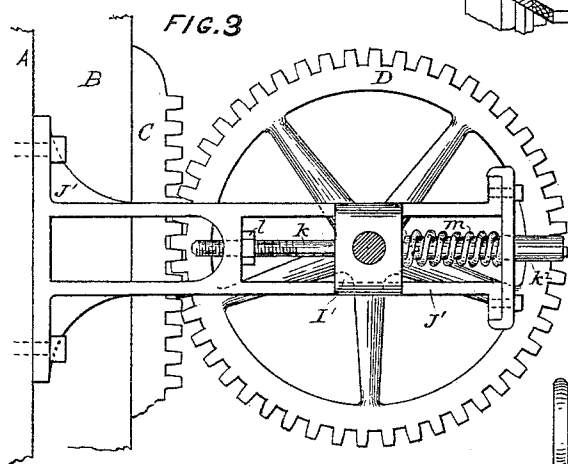
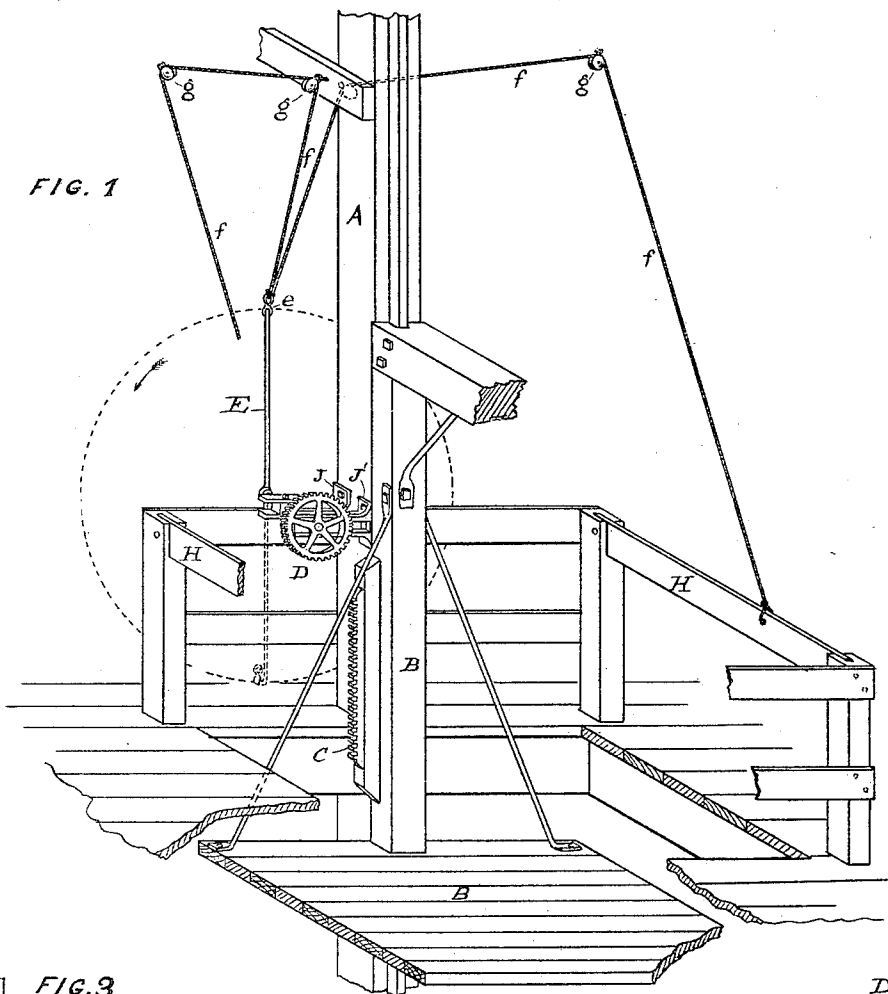
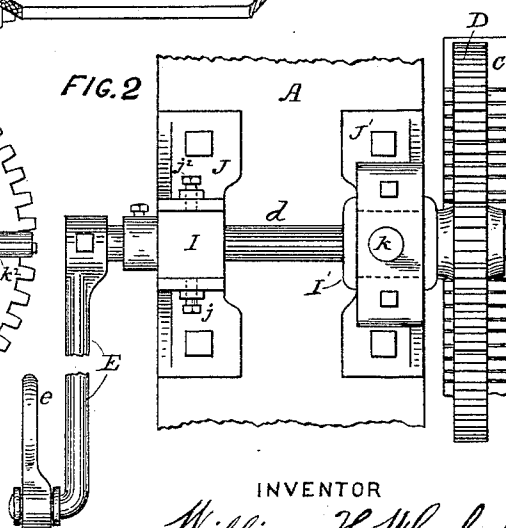


FIG. 2



WITNESSES:

E. C. Vorce
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INVENTOR

William H. Wheeler
by E. C. Vorce Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. WHEELER, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-THIRD TO
WILLIAM WIGHT, OF SAME PLACE.

DEVICE FOR OPERATING GATES TO ELEVATOR-WELLS.

SPECIFICATION forming part of Letters Patent No. 460,788, dated October 6, 1891.

Application filed December 27, 1890. Serial No. 375,954. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WHEELER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Devices for Operating Elevator-Gates; 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 to mechanism for automatically opening and closing the gates or doors of elevator-hatchways; and it consists in the combination and arrangement of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of an elevator-car with mechanism embodying my invention combined therewith. Fig. 2 is an elevation of the mechanism in side view; and Fig. 3 is an elevation of the gear and sliding bearing, viewed from the rear, the rear bearing being removed to give a clearer view.

A represents one of the guide-posts extending from top to bottom of the elevator-well, between two of which posts, one at each side of the well, the elevator-car B works in the usual manner.

C is a rack attached to the elevator-car and projecting into the space between the car and the side of the well. D is a gear-wheel projecting into the same space and so located as to mesh with the rack when the latter passes it going either up or down.

d is the shaft of the gear D, to the rear end of which shaft is rigidly affixed an arm E, provided at its extremity with a swiveling eye e, to which cords or chains f are secured and lead through suitable pulleys g g to the gates or doors guarding the elevator well or hatchway. The shaft d is supported in suitable boxes or bearings I I', carried by frames or hangers J J', secured in any convenient manner. In the drawings these hangers are shown bolted to the side of the guide-post A; but they may be otherwise secured or may be all in one piece, if preferred. The box I' nearest the gear D is arranged to slide in its hanger J', and a stop-rod k is threaded in

the hanger and provided with a jam-nut l to set it at any point to limit the motion of the box I'. A spring m on the other side of the box presses it toward the stop. The other bearing I, carrying the rear end of the shaft d, is pivotally secured in the hanger J, for which purpose I have found the set-screws j j', threaded through the hanger and having their points engaging the bearing I, to be efficient; but other means of pivoting the bearing may be employed, as I do not limit myself to the specific mechanical construction shown, but use any mechanical equivalent thereof. A similar gear-wheel with like connections to the gates is, of course, located on each floor, through which the elevator-car passes. The rack C is made of a length equal to the circumference of the gear, and thus the passage of the car in either direction will cause the gear, and consequently the arm E, to make one complete revolution, as indicated by the dotted circle in Fig. 1, and the lift of the gate at the point where the cord f is attached to it will be just twice the length of the arm E, as is seen by reference to Fig. 1.

In the drawings, H represents the gate, and, as there shown, is simply a pivoted bar; such as is in use in warehouses and similar places. Where the gate used is a vertically-sliding gate—such as is employed in many factories and stores—it is only necessary to locate one of the pulleys g directly over the center of the gate and lead the cord f through the same to the center of the gate at its upper edge, when the gate will be lifted vertically by the pull of the arm E on the cord. In a similar manner, by properly locating the pulleys g a door or a sliding gate normally kept shut by a spring or weight may be opened by the motion of the arm E.

The operation of the device is as follows: Supposing the elevator-car shown in Fig. 1 to be moving upward, the rack, when it engages the gear D, will revolve the same, and consequently the arm E, in the direction of the arrow, and this, by drawing down the cords f, will lift the gates. The rack C being so located on the car that its center is on a line with the axle of the gear-wheel when the car-floor is on a level with the floor of the building, the arm E will then extend directly

downward, and the gate will be lifted to its highest elevation. If the arm E be three feet in length, the gate will then be raised to a height of six feet, which is ample for most purposes, but can be increased by making the arm E longer. The gate does not begin to lift until the car-floor is within a few inches of the floor of the building, so that no opportunity is afforded for anything to fall down the well while the gate is rising, as it would be stopped by the car-floor. In case the elevator-car from the position shown ascends through the floor without stopping, the gates close as the arm E continues its circular path and have fully closed before the car-floor and its framework have risen far enough above the floor of the building for anything to fall through between them. If the car descends from above, the gates remain closed until the car-floor has almost reached the floor-level, when they open, as before, the arm E in that case moving in a direction the reverse of that indicated by the arrow.

By means of the spring-actuated sliding bearing of the shaft *d* the gear D is kept in engagement with the rack, but yields to any lateral play of the car on its guides, the pivoting of the rear bearing I permitting such motion, and thus not only is greater certainty of action insured, but less power is required to operate the mechanism than if the gear-wheel were supported in rigid bearings.

A friction-wheel and friction-plate might be substituted for the gear and rack in cases where only a light bar is to be lifted, and I have found such a device efficient in use; but I prefer the gear and rack, on account of the impossibility of any slipping such as might occur with friction-gear.

What I claim as my invention is—

1. In elevator-gate-operating mechanism, the combination, with the elevator-car having a rack thereon, of a shaft at the landing, a movable bearing thereof, a gear-wheel on said shaft projecting into the elevator-well and adapted to engage said rack during its passage, a spring acting on said movable bearing, an arm on said shaft, and cords passing over pulleys and connecting said arm with the elevator-gates, substantially as described.

2. The combination, with an elevator-car having a rack thereon, of a shaft at the landing having a sliding bearing and carrying a

gear-wheel adapted to mesh with said rack, an arm on said shaft, and cords connecting said arm with the elevator-gates, substantially as described.

3. The combination, with an elevator-car having a rack thereon, of a shaft at the landing having a sliding bearing, a gear-wheel on said shaft adapted to mesh with said rack, a spring acting on said bearing to maintain said gear in mesh with said rack when engaged, an arm on said shaft, and cords connecting said arm with the elevator-gates, substantially as described.

4. The combination, with an elevator-car having a rack thereon, of a gear-wheel adapted to mesh therewith and carried by a shaft at the landing supported in bearings, one of which is adapted to slide and the other of which is pivoted to permit such movement, a spring to maintain said gear in mesh with said rack when engaged, and an arm on the shaft of said gear-wheel connected by cords with the elevator-gates, substantially as described.

5. The combination, with an elevator-car having a rack thereon, of a shaft at the landing supported in bearings, one of which is adapted to slide and the other of which is pivoted to permit of such movement, a gear-wheel on said shaft adapted to mesh with said rack, a spring to maintain said gear in mesh with said rack when engaged, an arm with swiveling-eye on said shaft, and cords connecting said eye with the elevator-gates, substantially as described.

6. The combination, in elevator-gate-operating mechanism, with the elevator-car having a rack thereon and the gear-wheel at the landing adapted to mesh with said rack and having on its shaft an arm connected by cords with the elevator-gates, of the sliding bearing for the gear-wheel shaft, consisting of the bearing adapted to slide in its hanger, the spring acting on the bearing to maintain the gear in mesh with the rack, and the stop-rod to limit the motion of the bearing, substantially as described.

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

WILLIAM H. WHEELER.

Witnesses:

LOREN PRENTISS,
WM. G. TAYLOR.