2 Sheets—Sheet 1.

A. G. STEVENS.

SELF-CLOSING HATCHWAYS.

No. 184,671. Patented Nov. 21, 1876.

Fig 1.

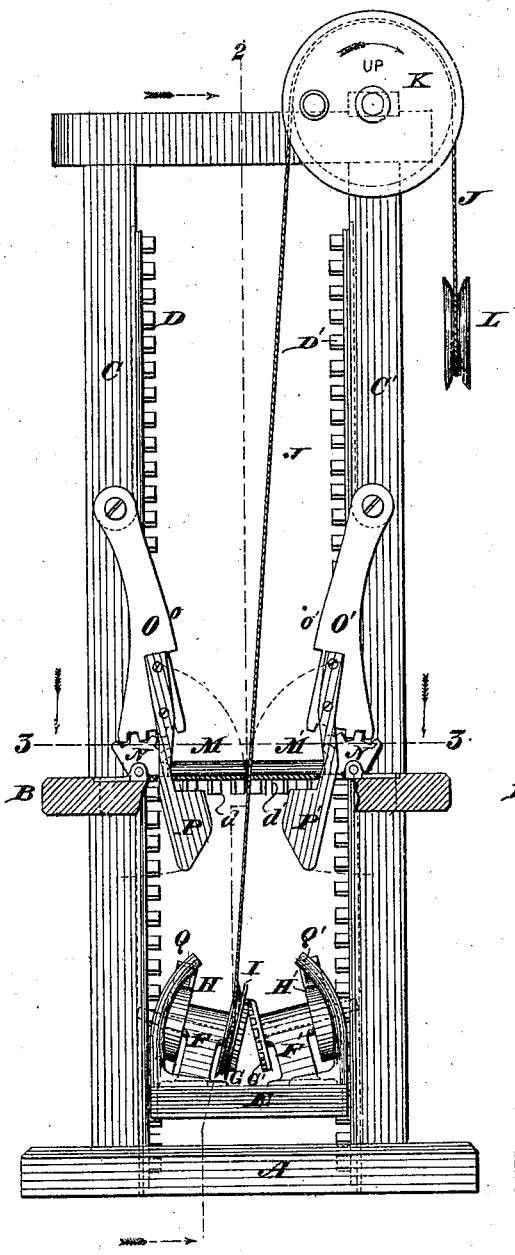
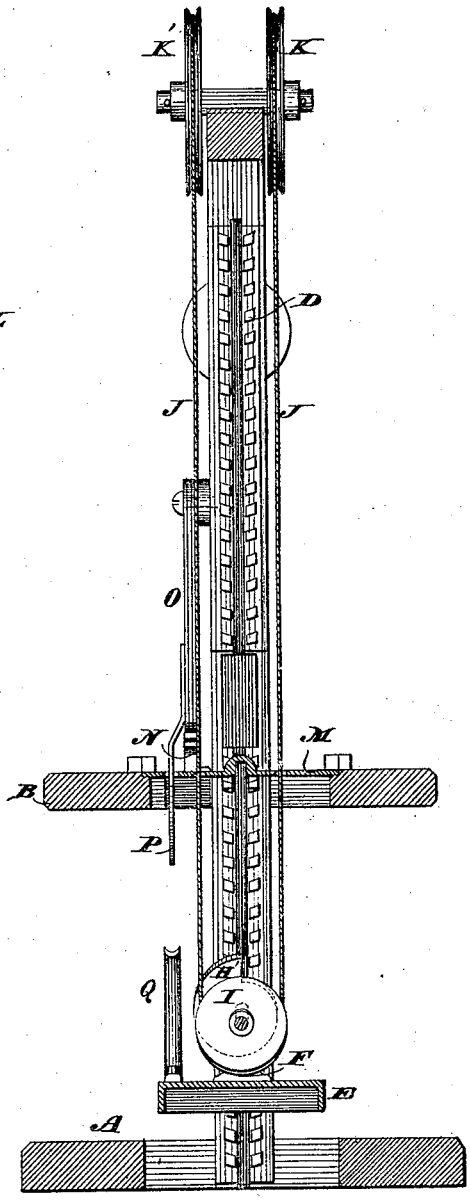


Fig 2.



WITNESSES

Wm. A. Stinkle.
F. Stahl

INVENTOR

Augustus G. Stevens

By his Attorney Marcus S. Hopkins

2 Sheets—Sheet 2.

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Fig 3

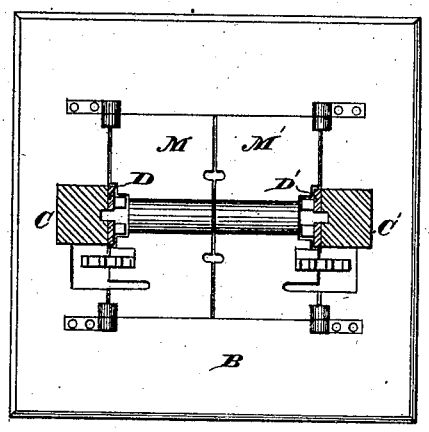


Fig 4.

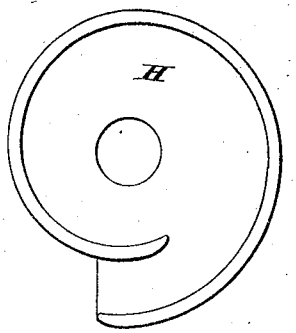
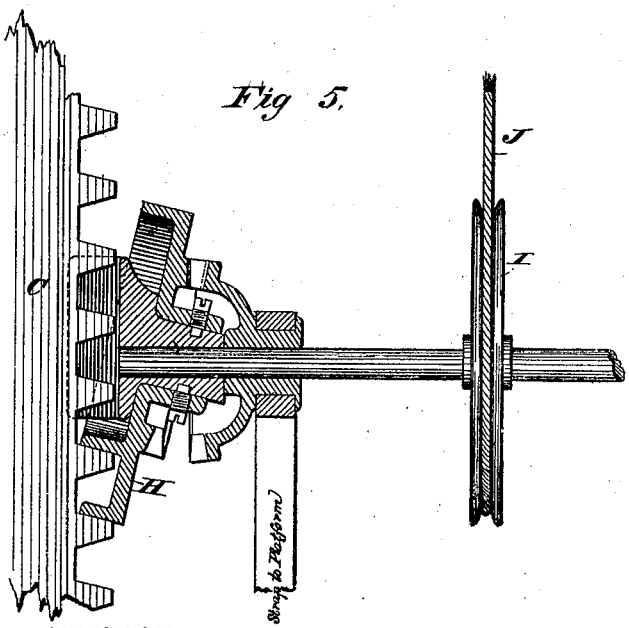


Fig 5.



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UNITED STATES PATENT OFFICE.

AUGUSTUS G. STEVENS, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN SELF-CLOSING HATCHWAYS.

Specification forming part of Letters Patent No. **184,671**, dated November 21, 1876; application filed May 15, 1876.

To all whom it may concern:

Be it known that I, AUGUSTUS G. STEVENS, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Elevators, of which the following is a specification that will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention consists in the features and combinations hereinafter described, and more particularly specified in my claims.

In the drawings I have represented the frame of an elevator in miniature, with my invention applied.

Figure 1 is an elevation, and Figs. 2, 3, and 4 are detail views.

The frame, for purposes of illustration, is represented as resting upon the base A, which corresponds to the lower floor of a building provided with my elevator. B represents the second floor, and C C′ the posts connected at their tops. Upon these posts are the double racks D D′, having their teeth or cogs inclined for engagement with the spiral or worm gears of the elevator. E represents the car or platform. On this platform rest the two inclined bearings F F′, carrying inclined shafts geared together at their inner ends by the two beveled gears G G′. Near the outer ends of these shafts, which project into the spaces between the racks, and keep the platform in place, are the scrolls or worm gears H H′, that engage with the double racks D D′ for raising and lowering the elevator. Motion is communicated to the inclined shafts and worm gears by means of the grooved pulley I, cord or cable J, grooved pulleys K K′, and grooved weight-sheave L, which last must be sufficiently heavy to give proper tension and friction to the cord or cable. The pulleys K K′ are loose on the same or different shafts, and always revolved in opposite directions. When the pulley K is turned in the direction of the arrow the elevator will be raised, and the weight-sheave will correspondingly descend. If turned in the opposite direction the elevator will descend and the weight-sheave will rise.

It is obvious that by a different arrangement of pulleys a flat band could be used instead of a cord. Should the cord break the elevator could not fall, because it would be held by the scrolls (the revolution of which would cease) engaging with the racks. Breaks could be applied to the pulleys as additional security, but in practice it will be found that they are not necessary, and that the scrolls will insure perfect safety.

To close the opening on each floor as soon as the elevator has passed above or below it, in order to prevent accidents from falling, and to prevent the spread of fire through the several stories of a building, I have provided automatic hatches or trap-doors M M′, hinged to the corners of the openings. To the outer sides of these doors, near the posts C C′, are attached the segmental gears N N′, which engage with the pivoted swinging rack-levers O O′. To the lower ends of these levers are attached the shoes or strikers P P′. As the elevator rises and approaches a floor above it the curved lifters or cams Q Q′ strike the shoes, swing the pivoted levers outward, and cause the trap-doors to swing upward on their hinges, and rest in perpendicular position against the posts C C′ in a space cut away for the purpose. On the under sides of the doors are sections of racks *d d′*, which, when the doors are opened and in perpendicular position against the posts, coincide with and form a continuation of the racks on the posts whereby the elevator ascends without interruption. When it has passed the sections of the rack supplied by the platform the trap-doors immediately fall by their own weight to close the aperture, being pivoted and geared to the swinging levers, so as to insure this action by the force of gravity; but to prevent them from closing too suddenly, and producing a shock, the rack-levers are provided with curved projections *o o′* on their inner faces, which press against the contiguous edges of the platform or elevator as it ascends, causing the doors to fall slowly and noiselessly. When in descending the elevator approaches a floor below it these curved projections are struck and pressed outward, which, as will be apparent from the drawings, will cause the trap-doors to be opened and set in perpen-

dicular position to form a continuation of the rack, and permit the uninterrupted passage of the elevator on its descent, as above set forth respecting its ascent. When it passes down below a given floor the trap-doors immediately tend to close above it by gravity, but are prevented from slamming by the engagement of the shoes P P′ with the lifters or cams Q Q′. The trap-doors or hatches are thus operated automatically, and their movements, both in opening and closing, are under positive control of the elevating mechanism.

When desirable, I propose to have a single transverse shaft for the worm-gears, as shown in Fig. 4.

My invention insures absolute safety from the accidents so commonly incident to elevators.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the inclined bearings F F′, the shafts projecting into the spaces between the racks, the scrolls or worm-gears H H′, and the double racks with inclined teeth, substantially as and for the purposes specified.

2. The combination of the pivoted rack-levers, the shoes or strikers P P′, and the lifters or cams Q Q′ for controlling the movements of the hatches when the elevator is below them, substantially as and for the purposes described.

3. In an elevating mechanism the combination of, first, the double inclined racks D D′, with a guide space or groove between them; second, the scroll or worm gears H H′ engaging therewith, and actuated simultaneously by suitable driving mechanism; and, third, the transverse shaft carrying the worm-gears and projecting at each end into the guide spaces of the racks, all constructed and operating substantially as and for the purposes set forth.

In testimony whereof I have hereunto subscribed my name.

AUGUSTUS G. STEVENS.

Witnesses:
RICHARD J. P. GOODWIN,
Mrs. BETSEY J. HOYT.