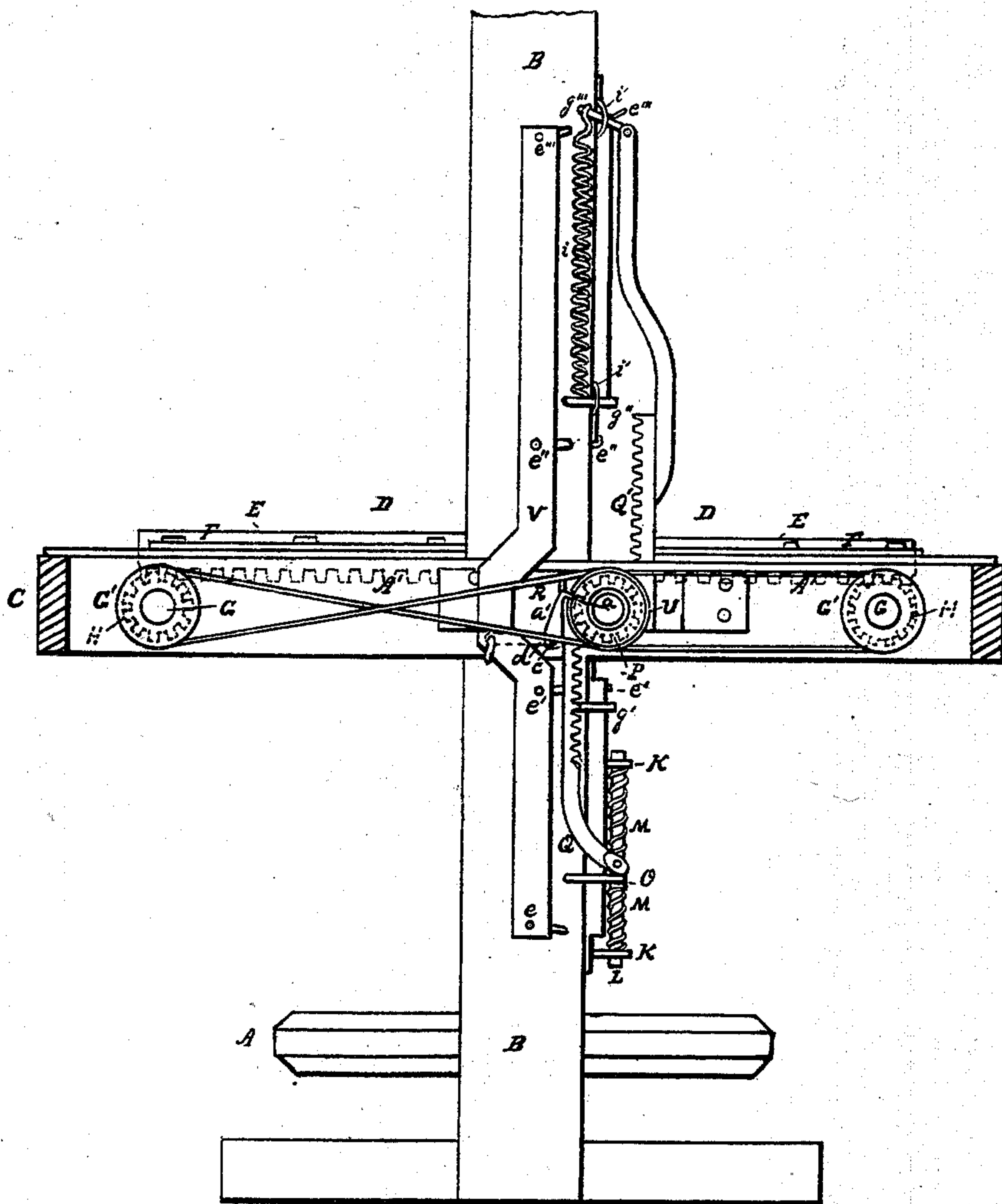


**J. W. TRIPP.**  
**Self-Closing Hatchways.**

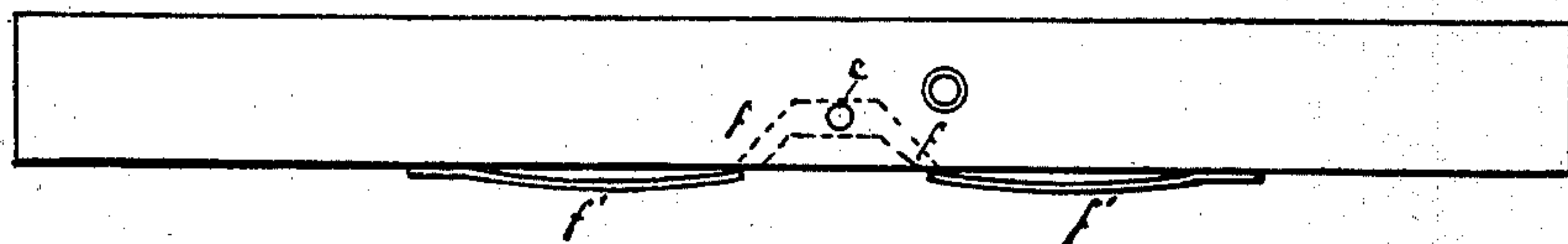
No. 146,788.

Patented Jan. 27, 1874.

*Fig. 1.*



*Fig. 3.*



WITNESSES.

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*his Atty*

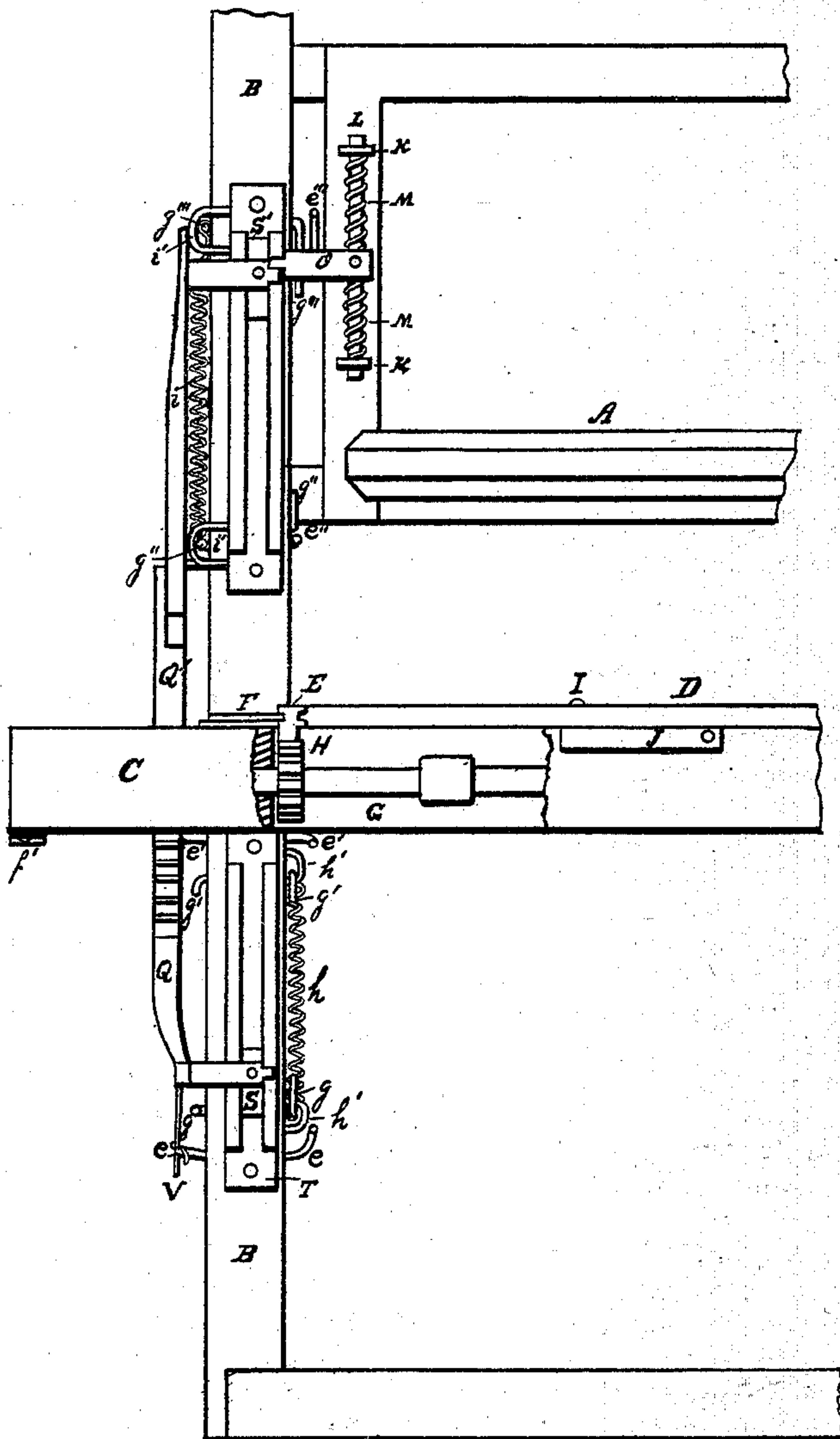


**J. W. TRIPP.**  
**Self-Closing Hatchways.**

No. 146,788.

Patented Jan. 27, 1874.

*Fig. 2.*



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JACOB W. TRIPP, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN SELF-CLOSING HATCHWAYS.

Specification forming part of Letters Patent No. **146,788**, dated January 27, 1874; application filed May 31, 1873.

*To all whom it may concern:*

Be it known that I, JACOB W. TRIPP, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevators for Builders, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a side elevation of an elevator provided with my improvements; and Fig. 2, a front elevation of the same, one of the side joists being removed; and Fig. 3, a side elevation of said joist and its attachments.

My invention relates to that class of elevators employed for the purpose of conveying persons and various things from one story of the building to another, and which automatically opens and closes the hatchway-doors during its progress in either direction. The object of my invention is to improve the means whereby the elevator is made to operate automatically, for the purpose above set forth; and to that end it consists in certain novel features, hereinafter fully described and set forth, relating to the means employed for the purpose stated.

In the drawing, A represents the elevator-carriage, and B B are the carriage-guideways. It will be observed that I employ guideways arranged centrally, one on each side of the carriage. C represents a floor, which is open to allow the carriage to pass from one story to another. D D are doors, arranged to slide to and from each other, so as to alternately close and open the hatchway. E E are grooved pieces, arranged on the lateral edges of the doors. F F are ways, arranged on joists, and extending into the grooves of the pieces E E. G G are shafts, arranged in the joists. These shafts are made in sections, rigidly united to each other by means of couplings, as indicated in Fig. 2, so that they may be arranged through holes in the joists. By this means the joists need not be weakened by being cut out or notched to receive the shafts. H H are pinions rigidly attached to the shafts G G. The lower face of the pieces E E is spurred, and engages the pinions H H, so that the said

pieces will operate as racks. I is a pin extending through the doors. J is a spring, arranged to exert an inward pressure against the pin I when the doors are open. A like spring is arranged to exert an outward pressure against the said pin when the doors are closed. K is a bracket attached to one of the vertical posts of the carriage. L is a pin arranged vertically in the bracket K. M M are spiral springs arranged on the pin L. O is a catch, set loosely on the pin L, and arranged between the springs M M. One end of each spring M is attached to the catch O, and the other end to the rod L, and the action of the springs is such as to press the free end of the catch toward the post of the carriage. P is a pinion rigidly attached to a shaft having suitable bearings in the joists. Q and Q' are racks engaging the pinion P. The upper end of the rack Q is held to its engagement with the pinion by means of a lug, R, attached to the joists, and the lower end of the rack Q' is held to its engagement with the pinion in like manner. The lower end of the rack Q is bent inward sufficiently to be engaged by the catch O. S is a sliding block, and T is a vertical way in which it slides. The way T laps the block S in such a manner that it cannot leave the way, except at the ends. The horizontal arm of the rack Q is attached to the block S. The upper end of the rack Q' is also bent inward, so as to be engaged by the catch O, and is also attached to a sliding block, S', operating in all respects like the block S. U is a belt-wheel rigidly attached to the shaft of the pinion P, and provided with a lateral annular flange having a notch, *a*, cut therein. V is a vertical piece pivoted to the bent levers *e*, *e'*, *e''*, and *e'''*, turning in bearings in the way B, and having their inner ends arranged to be engaged by the catch O. *a'* is a catch, constructed and arranged to engage the notch *a*. The catch *a'* is rigidly attached to the rod *c*, turning freely in bearings in the joists. *d* is an arm rigidly attached to the rod *c*, and pivoted to the piece V. *f f* are arms rigidly attached to the rod *c*, and resting on the free ends of the springs *f' f'*. G' G' are belt-wheels rigidly attached to the shafts G G. A' A' are belts arranged on the wheel U and on the wheels G' G', in such a manner that the latter will be rotated in opposite directions whenever



the wheel U is rotated.  $g, g', g'',$  and  $g'''$  are bent pieces turning freely in the way B, and having their inner ends arranged for contact with the catch O, and their outer ends arranged for contact with the horizontal arms of the racks Q and Q'.  $h$  is a spring tending to draw the free ends of the arms  $g$  and  $g'$  together, and  $h' h'$  are staples to limit the movement of these arms.  $i$  is a spring, operating in connection with the arms  $g''$  and  $g'''$  in the same manner that the spring  $h$  operates in connection with the arms  $g$  and  $g'$ ; and  $i' i'$  are staples to limit the movement of the arms  $g''$  and  $g'''$ .

As the carriage A moves upward, the catch O strikes the inner end of the arm  $e$ , and thus throws the catch  $a'$  from the notch  $a$ . The arm or lever  $e$  then slips from the catch O, and the latter then engages the under face of the horizontal arm of the rack Q, thus setting in action the mechanism which slides the doors D D apart. During this operation the rack Q' moves downward by reason of its contact with the pinion P. By the time the doors have opened sufficiently to allow the elevator-carriage to pass between them, the horizontal arm of the cam Q has reached the arm or lever  $g'$ , and carries the inner end of the latter upward, and the catch O is thus pushed from its engagement with the arm of the cam Q, and moves above it, and above the inner end of the lever or arm  $e'$ . The catch O was not pushed from its engagement with the rack Q by the arm  $g$  when the carriage began to move upward, for the reason that the spring  $h$  then draws up the inner end of the said arm, so that it would not then engage the catch. By the time the catch O has left the rack Q the catch  $a'$  has entered the notch  $a$ . The doors, therefore, remain open, and the moving mechanism is locked. By the time the elevator-carriage has passed the doors in moving upward, the catch O strikes the lower face of the horizontal arm of the rack Q', and the movement of the mechanism is reversed, and the doors closed, it being understood that the catch O, while moving upward, operates in connection with the levers or arms  $e''$  and  $e'''$ , and  $g''$  and  $g'''$ , in like manner as it operated in connection with the arms or levers  $e$  and  $e'$ , and  $g$  and  $g'$ . When the carriage A moves downward, the catch O engages the upper face of the racks Q and Q', respectively, and is pushed therefrom at the proper time by means of the levers or arms  $g''$ ,  $g'$ , and  $g$ , and the doors are thus again opened and closed. The springs J give the doors a starting push

when they begin to open and close. The springs M M, besides operating on the catch O in the manner described, also tend to prevent a jar when the said catch comes in contact with the horizontal arms of the racks Q and Q'.

Rag-wheels and endless chains may be substituted as equivalents for the wheels G' G' and belts A' A', and for the racks and pinion Q Q' and P. A belt and pulleys may also be substituted for the racks Q and Q' and pinion P. Either rag-wheels and endless chains or wire ropes and pulleys may be substituted for the racks E E and pinions H H. The doors, instead of moving in a horizontal plane, may swing on hinges, or fold either up or down, and a single door may be employed at each floor instead of double doors, the single door moving over the whole opening.

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

1. The combination and arrangement, in connection with an elevator for buildings and with sliding doors arranged in the hatchway, of the catch O, racks Q and Q', pinion P, wheels U and G' G', belts A' A', pinions H H, racks E E, and one or more yielding arms or levers,  $g$ , all operating together substantially as and for the purposes specified.

2. One or more shafts, G G, provided with the wheels H H and G', and made in sections, arranged through holes in the joist, in combination with mechanism for driving the same through the medium of the elevator-carriage, and with one or more doors, D D, arranged to ride over the elevator-hatchway, and provided with the racks E E, engaging the wheels H H, substantially as and for the purposes specified.

3. In an elevator-hatchway, wherein the doors or guards are automatically opened and closed during the operation of the elevator, the combination of the crank-arms  $e, e', e'',$  and  $e'''$ , one or more, having bearings in the guideway B, and extending freely into the piece V, the yielding catch O, arranged on the elevator-carriage, the crank or catch  $a' c d$ , also having bearings in the way B, and engaging the notched wheel U, and extending freely into the piece V, and provided with the arms  $f f$ , resting on the springs  $f' f'$ , substantially as described, and for the purposes set forth.

Witnesses: JACOB W. TRIPP.

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