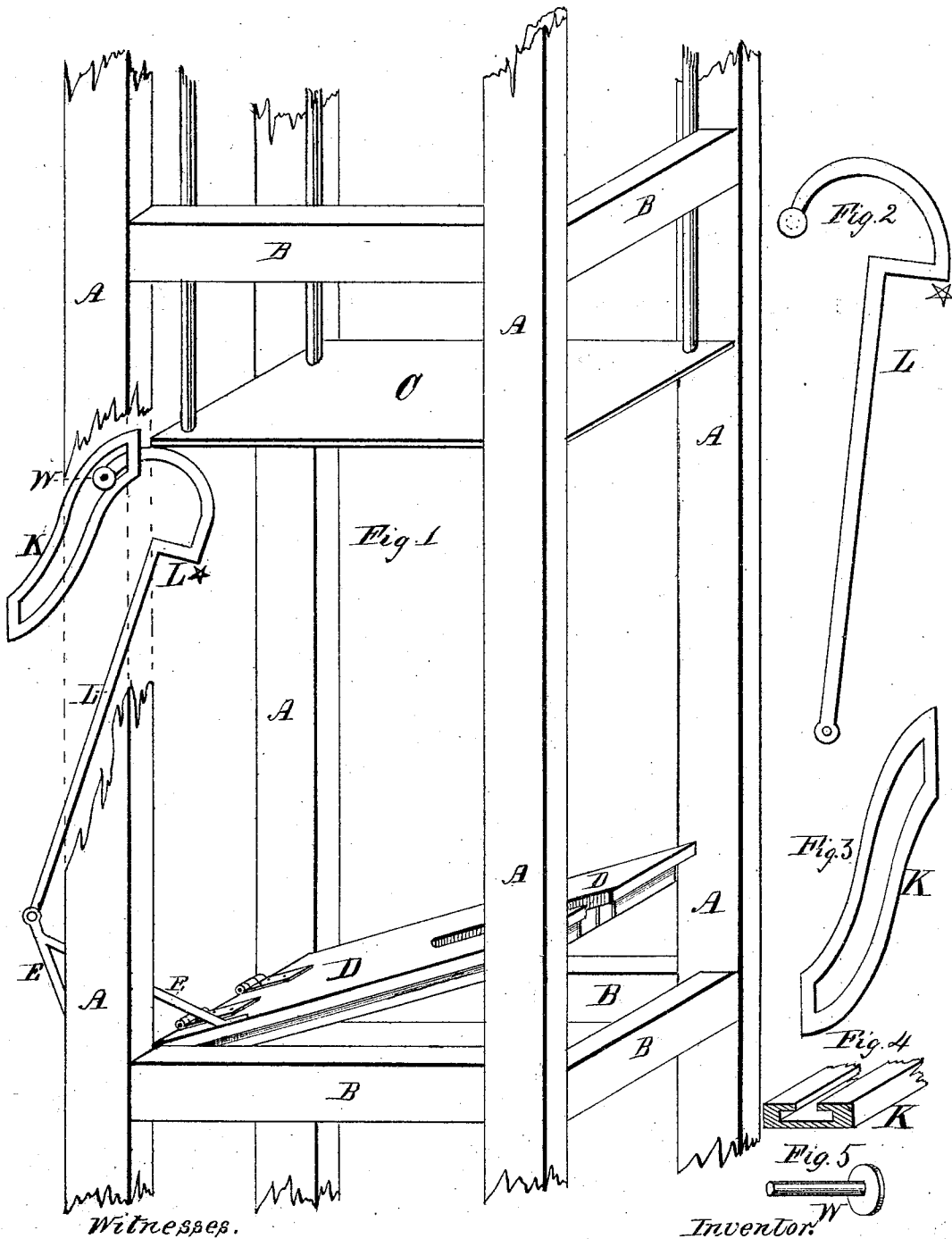


W. P. CHERRINGTON.
Self-Closing Hatchways.

No. 145,626.

Patented Dec. 16, 1873.



Witnesses.

William B. Foster
Benjamin Poff.

Inventor.

William P. Cherrington

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Fig. 1

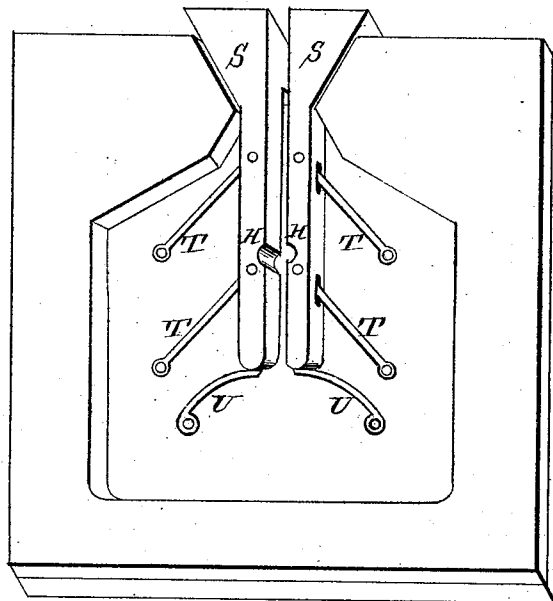


Fig. 2

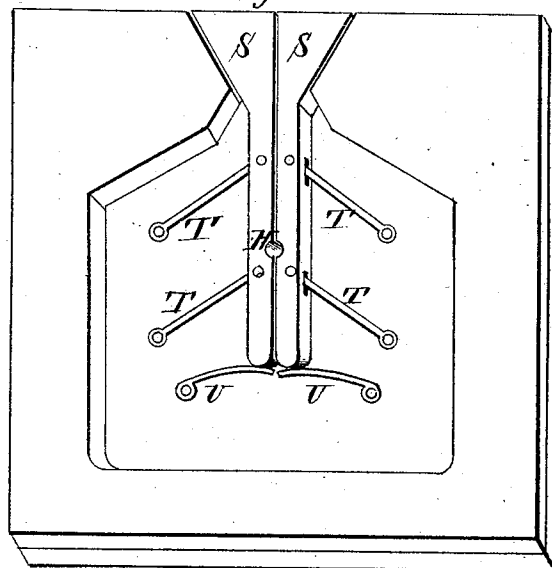
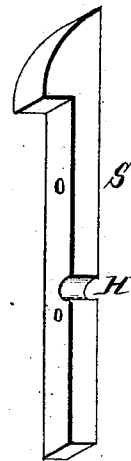


Fig. 3



Witnesses.
William R Foster
Benjamin Pope

Inventor.
William P. Cherrington

UNITED STATES PATENT OFFICE

WILLIAM P. CHERRINGTON, OF BOSTON, ASSIGNOR TO HIMSELF, WILLIAM B. FOSTER, OF MEDFORD, AND WILLIAM A. MORRISON, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN SELF-CLOSING HATCHWAYS.

Specification forming part of Letters Patent No. **145,626**, dated December 16, 1873; application filed March 27, 1873.

To all whom it may concern:

Be it known that I, WILLIAM P. CHERRINGTON, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a new Apparatus for Opening and Closing Trap-Doors or Hatch-Covers to close the openings in the floors of buildings through which elevators pass in ascending and descending, of which the following is a specification:

The first part of my invention relates to the method of opening and closing the trap-doors or hatches. The second part of my invention relates to the method of opening and closing any aperture that must be made in the trap-door or hatch-cover for the passage of the rope or wire cable through the same in opening the door or cover, or to close any other aperture that may necessarily exist by some such obstacle in the way of the door filling the full space of the opening in the floor when the door is closed.

The first part of my invention is illustrated by the figures on Plate 1.

Figure 1, Plate 1, is a view of an elevator with a portion of one corner post cut away to show the first part of my invention. Fig. 2 is a side view of the lever L, as shown in Fig. 1. Fig. 3 is a side view of the cam K. Fig. 4 is a sectional view of the cam K, showing the inside groove. Fig. 5 is a view of the wheel W made to fit the cam K, in which it revolves and passes up and down, this wheel being riveted to the upper end of the lever L.

The second part of my invention is illustrated by the figures on Plate 2.

Figure 1, Plate 2, is a view of the inside of the trap-door, showing only the middle and bottom thicknesses or sections, with the slides S S thrown open for the passage of the rope or cable. H is a hole half round in each slide for the rope. Fig. 2 is a view of the same with the slides S S closed, with the exception of a small round hole, through which the rope runs after the trap-door is closed down.

I will now proceed to describe the figures in detail. Fig. 1, Plate 1, A A A A are the upright posts of an elevator-frame. B B B B are the cross-beams of the same, representing the level of the floors of each story of the building. C C is the lower part of an elevator car

or carriage passing through the upper floor. DD is the door or hatch-cover partially opened. K is a cam, in which the wheel W moves. W is a wheel attached to the lever L by a rivet or pin, on which it may revolve. L is a lever attached to the elbow E with a loose joint by a rivet or pin on which it works, the upper end being attached to the wheel W, as before stated. E is an elbow or brace firmly fastened to the hinge side of the door or cover, being made in triangular or other shape to extend partly across the door, and at the back part projecting upward to the point where it joins the lever L. As the elevator-car ascends it opens the door, and as the door passes up the lever is drawn down by the elbow E, and the shape of the cam carries the top of the lever inside the line of the car's course, and as the car proceeds on its upward way the door is closed by the application of any common door-spring, the descent of the door being gradual by the action of the lever, which immediately passes under the elevator-car and checks the falling of the door, which can only close as fast as the car will allow it. In its descent the car strikes the top of the lever, pushing it down, which motion acting on the elbow or brace throws the brace back and raises the door. When the car has proceeded downward sufficient to open the door its full width, the door's outer edge closes under the projection in the lever at the point marked *, so that the top of the lever and the under side of the outside edge of the door are level or plumb with each other, and the car passes the door and continues on its downward passage, the door again closing, as before stated, gradual as the top of the car will allow it to follow. The projection * must be just as deep as the door is thick.

The other figures on Plate 1 are already sufficiently described.

As the object of this invention is to make a trap-door that will be a protection against fire, as well as against accidents, it is necessary to have an arrangement for closing the opening in the door, through which the rope or cable used in raising and lowering the car must pass; hence the necessity for the second part of my invention to complete the first part. Figs. 1 and 2, Plate 2, illustrate the method of closing

this opening in the door or any other aperture that must necessarily exist to make the door fill the full space of opening in the floor when the door is closed.

Fig. 1, Plate 2, is a view of the slides S S when open. T T T T are arms with movable joints at each end, one end connected with the slides and the other end to the door itself. These arms are placed in a diagonal position, so that any pressure on the end of the slides will move them one toward the other. When the door closes the outer ends of these slides are pressed in by the jamb, into which the door closes, and thus close the passage made for the rope or cable, as seen in Fig. 2 of this same plate. It is understood that the door is made of three or more thicknesses, this slide arrangement being in the center. To show the form of the slide S, which is shaped at the outer end like an ordinary lock-latch, I have made a drawing of it, as shown in Fig. 3, Plate 2. At the inside end of the slides are springs, U U, which force the slides open as soon as the door is free from its pressure against the jamb in which it closes. Be it understood that this slide may be made in any shape to close any opening in the door that may be of necessity made to admit of the passage of any obstruction to the rise and fall of the door, provided the same is made upon the plan or principle as laid down in the accompanying claims.

In the construction of my invention, the levers may be made of iron or other hard metal; the

cams of metal, (either brass or iron;) the wheels of brass or iron; the elbow or brace of iron. The slides in the door should be made of metal, or of wood with a metal face where it closes in the jamb. The arms that are attached to the slides may be made of metal or wood. The spring that pushes the slides outward may be made of any elastic metal (either spiral or flat form) of the proper elastic power to correspond with the size and weight of the slide. A guide-plate must be attached to the side of the car for the top of the lever to slide on.

I disclaim racks and cog-gearing for operating the door or hatch; but

What I claim is as follows:

1. The combination of the lever L and its wheel W, cam K, and the elbow or brace E upon the door or hatch, the combination being and operating substantially as and for the purpose set forth.

2. The combination, with the door, of the slides S S, arms T T, diagonally jointed to the slides and door, and the springs U U, substantially as and for the purpose set forth.

3. The door or hatch provided with the slides and diagonal arms T, for the purpose set forth, and also connected, by its brace E, to the lever L and cam K, substantially as and for the purposes set forth.

WILLIAM P. CHERRINGTON.

Witnesses:

BENJAMIN POPE,
RICHARD MONKS.