2 Sheets—Sheet 1.

D. P. VAN COTT.

Door for Elevator Hatchways.

No. 196,317. Patented Oct. 23, 1877.

Fig. 1.

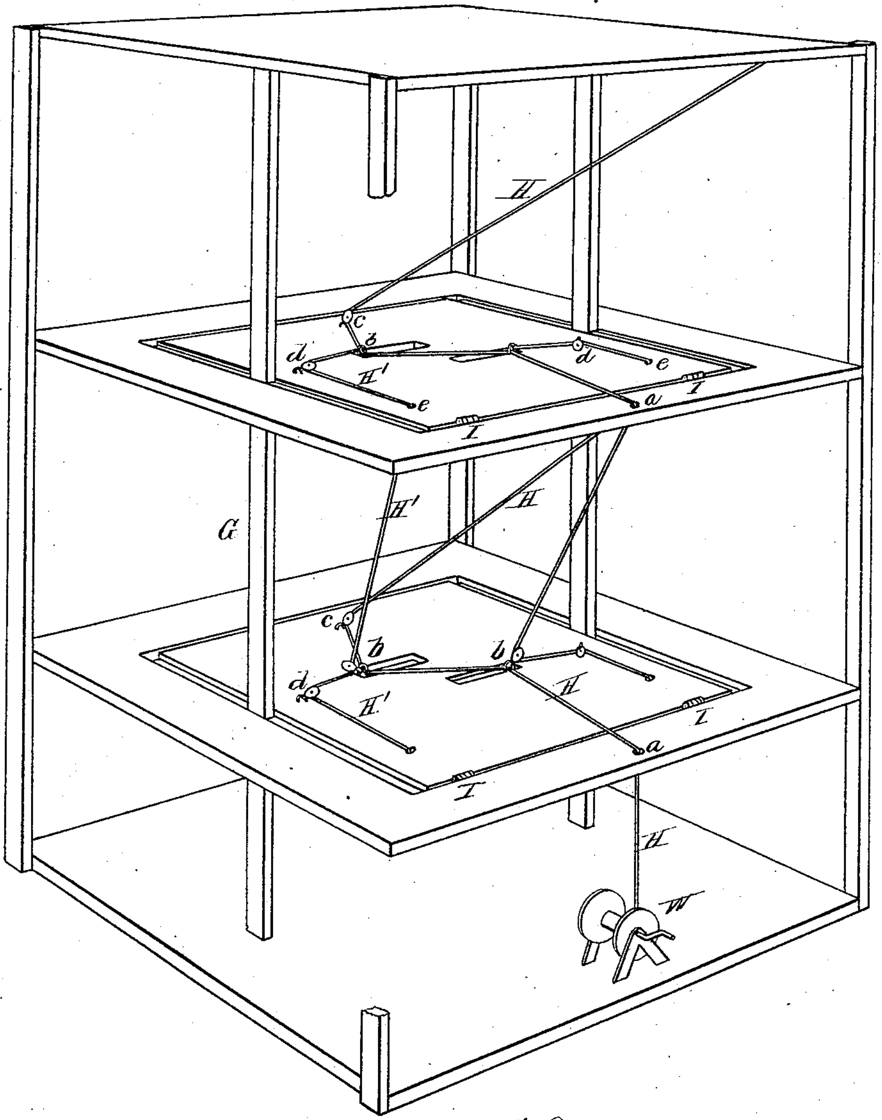
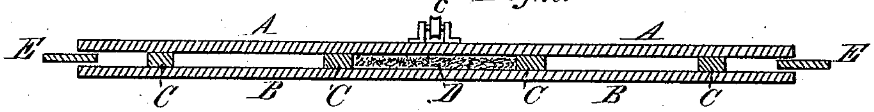


Fig. 2.



Attest:
Chas. H. Searle,
T. B. Groff.

Danl. P. Van Cott,
Inventor:
By Worth Osgood,
Attorney.

2 Sheets—Sheet 2.

D. P. VAN COTT.

Door for Elevator Hatchways.

No. 196,317. Patented Oct. 23, 1877.

Fig. 3.

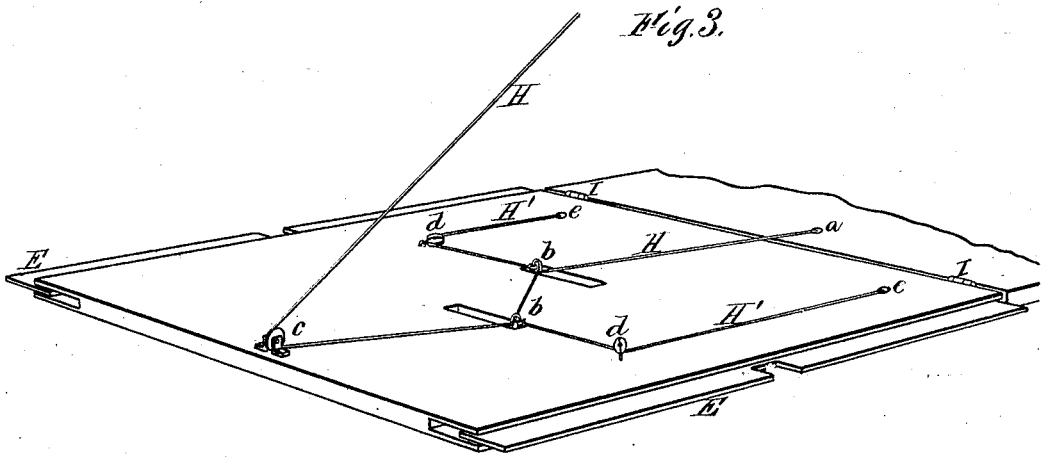
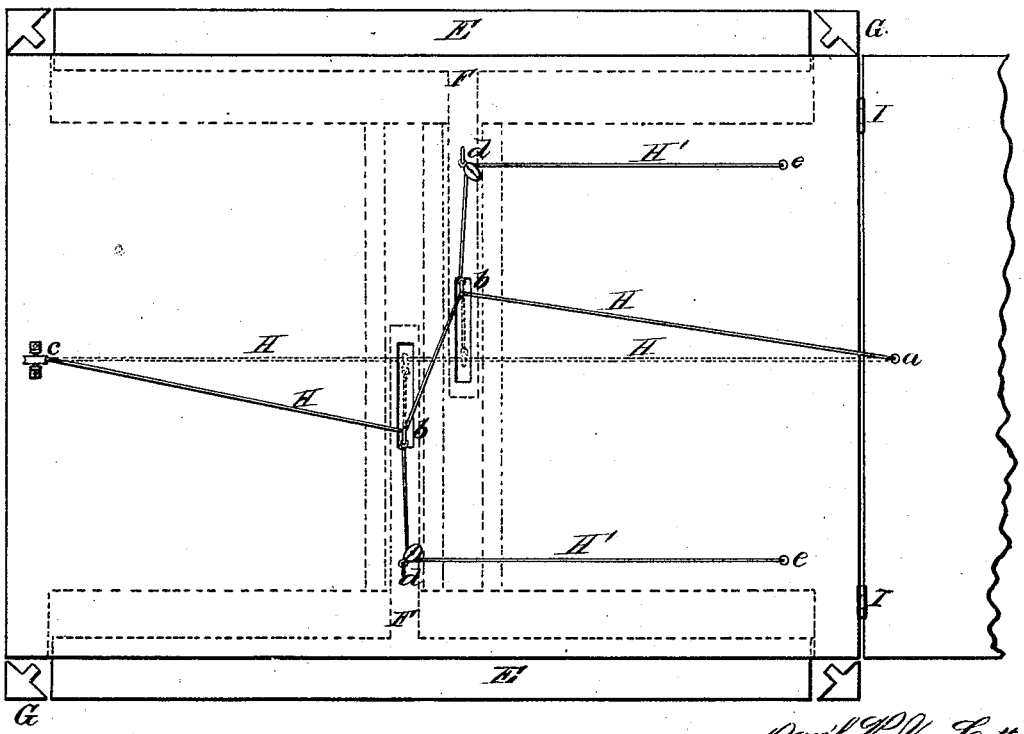


Fig. 4.



Witnesses:
Chas. H. Searle.
A. Scott

Daniel P. Van Cott,
Inventor:
By Munn & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

DANIEL P. VAN COTT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN DOORS FOR ELEVATOR-HATCHWAYS.

Specification forming part of Letters Patent No. **196,317**, dated October 23, 1877; application filed July 27, 1877.

To all whom it may concern:

Be it known that I, DANIEL P. VAN COTT, of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Doors for Elevator-Hatchways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is a perspective view, showing the location and arrangement of the doors in an elevator-hatchway, together with the position which the operating ropes or cables assumes when the doors are down. Fig. 2 is a sectional view, showing the door as made of two plates, separated by division-strips, to form air-tight or fire-proof compartments. Fig. 3 is a perspective view of the upper door detached from the hatchway, illustrating the location of the operating-ropes and the slides when the door is down or closed. Fig. 4 is a plan view of an upper door, designed for a hatchway, in which the ratchet or guide-posts are placed in the corners, the dotted lines indicating the position which the ropes and slides assume when the door is being elevated.

Like letters in all the figures refer to corresponding parts.

The object of my invention is to produce a simple and effective door for closing the hatchways of elevators, such as are commonly used in hotels, warehouses, &c., and to provide a simple method of opening and closing the same.

To accomplish this the invention consists in a peculiar manner of operating the slides which close the spaces between said door and the hatchway; and in certain details of construction and arrangements of parts, all of which will be first fully described, and then pointed out in the claims.

The desirability of a door of some kind in this particular location has been sufficiently established by the well-known fact that the hatchway forms a flue or draft-chamber, and in the event of a fire in the vicinity of the lower portions of said hatchway induces the flames to ascend very rapidly.

I propose to place a door at each landing, or at such other convenient points as may be preferred. If at each landing, they may be made to serve as platforms, upon which firemen and others may stand; and for this reason they are made to open upwardly, so that there will be no danger of their being opened by the weight of any one standing thereon. They (the doors) are made of wood, principally because it is contemplated using a series of them, and it is desirable that they be made as light as is consistent with their necessary strength. If of iron they would be too heavy. To make them fire-proof they may be tinned over, and air-chambers left between the upper and lower plates.

In Fig. 2, A is the upper and B the lower plate of the door, separated by the division-strips C C, &c., into as many compartments or chambers as may be convenient, care being taken to leave room for the slides and connected mechanism to be operated without interference. These chambers should be made air-tight, and may be filled with plaster-of-paris, asbestus, cement, or any other non-conducting medium, as indicated at D.

A hatchway having only two of my improved doors applied is chosen as sufficient to illustrate the principles governing the operation of said doors. If a greater number be employed, corresponding arrangements for each door are, of course, made.

The ratchet or guide posts for the elevator are variously placed in the hatchways, and prevent making the door of equal area with such hatchway. It is, therefore, necessary to provide a suitable means for closing the space necessarily left at the sides of the doors, in order that the flue may be effectually closed.

I employ two slides, E E, which fit into recesses in the edges of the doors, and are capable of being thrust outwardly or drawn inwardly by means of the attached arms F running toward the centers of the doors.

If the ratchet-posts G be placed as in Fig. 1, then the slides are suitably cut away, so that they will fit about said posts when thrust outwardly; and if corner-posts be employed, as in Fig. 4, then correspondingly suitable fittings are made.

From the arms F eyes or staples project up through the upper plate, and move backward and forward in slots cut to receive them. These eyes serve to connect the operating cables or ropes with the arms, through the medium of appropriate sheaves.

The rope or cable H, which serves to elevate the doors, passes from a windlass, W, located below the lower door, up through the flooring at *a*, in rear of the hinges I, thence forward through the sheaves *b b*, attached to arms F F and to a suitable sheave, *c*, centrally disposed upon the lower door. From this point the cable H passes backward to the rear of the hinges upon the upper door, through the flooring at that point, and through sheaves corresponding to those upon the door below. From the last door of the series the cable is carried and attached to a point over the hinges of said door. The arms F F are of such length that when the slides are thrust outwardly the sheaves are separated, as indicated in Fig. 1. The several doors of the system being closed, to open them for the passage of the elevator the windlass W is turned so as to wind up the rope H. This operation will first bring a strain upon said rope from the point *a* to the central sheave *c* on the lower door, causing the rope to straighten out between these two points, as indicated by the dotted line H, Fig. 4, and thereby draw the slides E E on said door within the space provided for them, and out of the way of the ratchet or guide posts. This door is then gradually brought to an elevated position by the continuous turning of the windlass; and, when elevated, the rope upon the top of the second door is straightened out, its slides drawn inwardly, and it commences to rise. All the doors of the system will be operated in a similar manner, their movements being successive, one at a time, from the lower to the upper one.

To lower or close the doors the windlass is released, and they (the doors) commence to drop down, the top one being closed first, the next one below it next, and so on until they are all closed.

From this arrangement and operation it will be apparent that the slides are drawn inwardly by a positive motion communicated through the operating-cable.

To thrust these slides outwardly by a similar positive and effective means whenever the doors are closed is the object of the next feature of the invention, and this is accomplished by the following simple means: Two sheaves, *d d*, are secured to each door, at a little distance beyond the staple-slots. A second cable, H^1, is attached to the arms or staples upon the arms F F of the upper door, and is then carried through the sheave *d* backward to a point, *e*, where it passes through the door, and thence similarly through the staple, or sheave upon the staple, in the next door below. After passing through the sheave *d* upon the lower door it is made fast to said door at a point and in such a manner as that it shall be drawn taut when the doors are closed and the slides thrust outwardly. Now, when the doors are elevated, this rope H′ is, of course, slackened and the slides permitted to be drawn in, as previously explained. When they (the doors) commence to descend, the upper one being closed first, the strain upon H′ is sufficient to draw the slides outwardly to their proper position; and the rope being attached to some point of the lowermost door, the slides thereon are similarly pushed or rather pulled outward at the time when the door is finally located. From this arrangement I am enabled to produce the desired positive and automatic motion in the slides.

The sheaves employed may be of any suitable pattern, and the cable may be made of wire or chain, or it may be of rope saturated with some chemical which will render it fireproof. In the event of a fire it will not ordinarily be desired to open the doors after they have been closed, so that any damage to the ropes under the above arrangement will not have any tendency to disarrange either the doors or the closing slides.

The slides may be variously arranged to correspond with the character of the hatchway; and the doors may be made double, if desired, instead of single, as in the several figures.

The simplicity and durable character of the contrivance as above described, as well as its non-liability to get out of order, are features which it is believed will recommend the system for use above any other now known to me.

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

1. In combination with the closing-slides attached to a door for an elevator-hatchway, the operating-rope passing from the rear of said door toward its front, and through suitable sheaves connected with said slides, the arrangement being such as to draw in said slides when the rope is straightened, as and for the purposes set forth.

2. In combination with the slides adapted to close the space between an elevator-door and its hatchway, a rope or cable attached thereto, and adapted to thrust said slides outwardly when the door is closed, substantially as explained.

3. In combination with slides E E, a rope, H, connected therewith and with the doors, substantially as set forth.

4. In combination with slides E E, adapted to be drawn inwardly by a rope or cable, H, a second rope or cable connected with said slides and adapted to force them outwardly, in the manner shown and described.

5. The slides E E, having arms and sheaves applied thereto, the ropes H H′, and windlass W, the whole being combined to operate in the manner and for the purposes explained.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

DANIEL P. VAN COTT.

Witnesses:
JAMES D. SINCLAIR,
JOSEPH MCCANN.