

W. H. COOKE.
Hatchway-Doors.

No. 216,154.

Patented June 3, 1879.

Fig: 1.

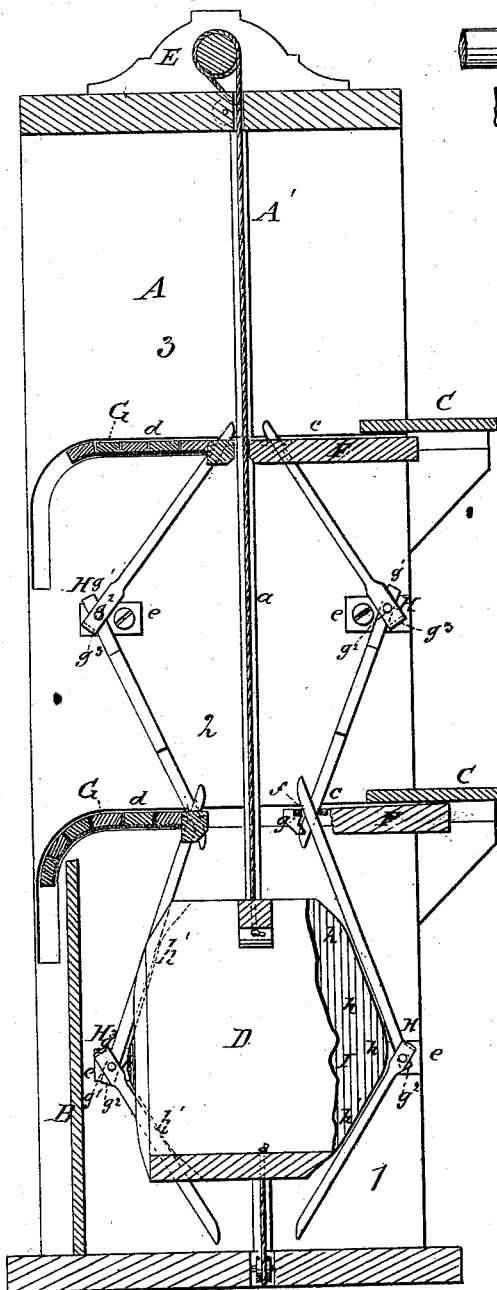


Fig: 2.

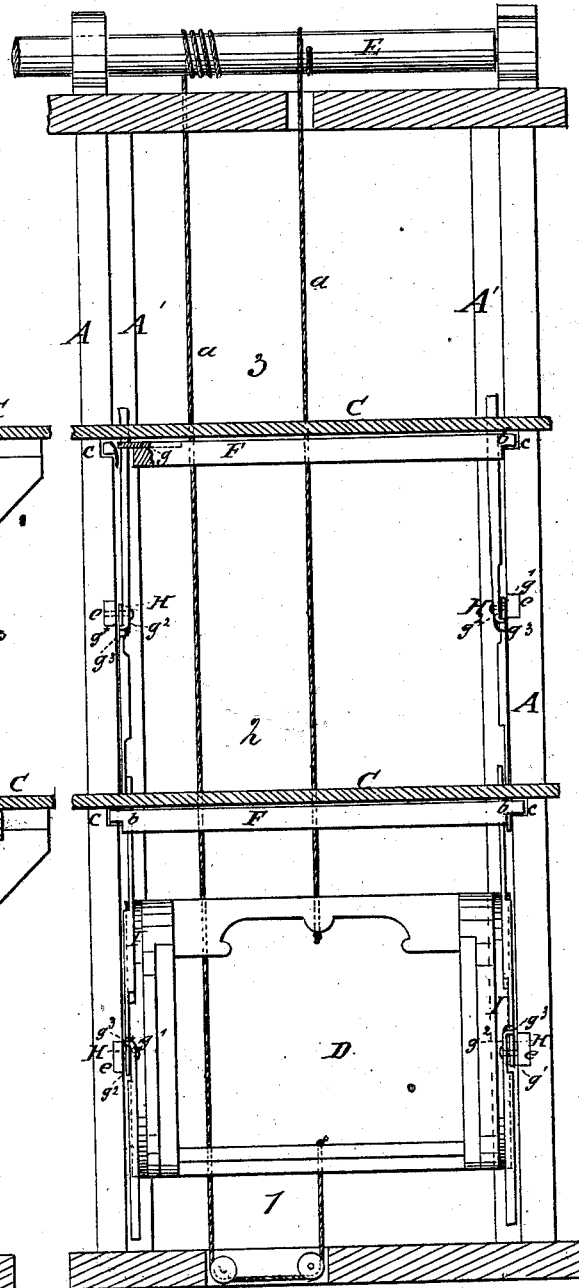
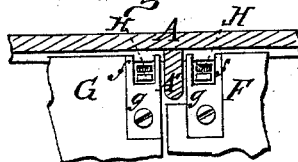


Fig: 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. COOKE, OF WILTON, CONNECTICUT.

IMPROVEMENT IN HATCHWAY-DOORS.

Specification forming part of Letters Patent No. **216,154**, dated June 3, 1879; application filed March 24, 1879.

To all whom it may concern:

Be it known that I, WILLIAM H. COOKE, of Wilton, in the county of Fairfield and State of Connecticut, have invented new and Improved Doors for Elevator-Hatchways, of which the following is a specification.

This invention relates to improvements in the construction, arrangement, and mode of operating doors for elevator-hatchways; and it has for its object to provide doors adapted to slide out of the way when open, and to operate the said doors automatically.

It consists in providing the hatchways with double doors, arranged to slide to and from each other, and to be operated by the elevator, which, in ascending and descending, comes in contact with levers fulcrumed in the cleading and connected with the said doors, so that the door ahead of the elevator is opened and the one behind closed simultaneously by the movement of the elevator.

In the accompanying drawings, Figure 1 is a vertical cross-section of an elevator-way with the elevator and other parts in position. Fig. 2 is a vertical and longitudinal section of the same, and Fig. 3 is a detail of the connection of the levers with the doors.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent the cleading of the elevator-way. B is a section of the wall forming the back of the way; and C represents the floors from which entrance is had into the elevator D, which is connected with the ropes *a a*, running over the windlass E at the top, by which it is raised and lowered in the usual well-known manner.

At each of the floors above the first a hatchway is provided for the passage of the elevator, thus making an open way from the lower floor as high as the elevator runs; and as this way, when a fire occurs in a building, acts as a flue for the draft and as a passage-way for the flame, thus materially aiding in spreading the fire, it is desirable that the hatchways should be closed when the elevator is not passing through them.

To accomplish this desirable object automatically is the purpose of my invention, and I will now proceed to describe the several devices and arrangements by which this is brought about.

At each hatchway, on the entrance or floor side, is placed a flat door, F, extending from side to side of the way, and sufficiently wide to extend from the floor C half-way across the hatchway to the guides A' A'. This door has on its sides flanges *b b*, which rest in horizontal rabbets *c c* in the cleading just below the floor C, so as to permit the said doors to slide back and forth to cover and uncover the half of the hatchway next to the floor.

In line with rabbets *c c* are rabbets *d* in the cleading, which are curved downward, as clearly shown in Fig. 1, and in these rabbets are entered the ends of the flexible sliding doors G, made of narrow strips of wood, fastened together edge to edge by ribbons of metal or other suitable material, which connect them securely, but at the same time permit the door to move readily and easily in the curved groove or rabbets *d* without binding. This curved rabbet and flexible door is necessary on account of the proximity of the wall of the building affording no space for the movement of the door straight out, as in the case of the door F; but if there should be space, two doors like F may be employed, and straight horizontal rabbets like *c*, instead of the two arrangements shown. The doors thus formed slide freely to and from each other, closing and unclosing the hatchway.

H H are rock-levers, crossed at their outer end, and fulcrumed at the point of crossing, midway between the floors, in the plates *e*, let into the cleading, one rock-lever being under each of the sliding doors. The long arms of these levers reach toward the guides A', and their ends are passed through slots *f*, cut into the doors near their inner edges, said slots being guarded by metal plates *g*. In this way the upper arms of the levers connect with the upper hatchways, while the lower arms connect with the doors below on every floor, the two crossing each other, as clearly shown in Fig. 1. The short arms *g' g''* of the levers are arranged to interlock, and thus enable both to be operated together, by bending the end of one over the edge of the other to form a lug, *g'''*.

On the first floor the short arms of the lower levers are bent over into lugs, to engage the upper levers, while on the next floor the lugs are formed on the upper levers, and so on al-

ternately. The object of this arrangement is to prevent the elevator from opening the doors of a hatchway after it has passed through and closed them when going in the same direction. Thus, when the elevator is ascending from floor 1 it strikes the upper arms of the first rock-levers, and throwing them back they open the doors in the first hatchway, and carry back at the same time the lower arms of the second rock-levers on floor 2, which turn on their fulcrums without affecting the upper arms, and when these are reached they are thrown back, opening the next doors, and their lugs g''' , engaging the lower arms, throw them toward each other and close the doors below. The elevator passes through the open doors to floor 3, and, reaching the upper arms of the next lever, (not shown,) it throws them back, and the lower arms are by the lugs on the upper thrown forward to close the doors below; but as the upper arms of the levers on the second floor turn independently of the lower in this movement, the latter are not affected, as they would be were the levers rigidly connected together at the fulcrums. Thus the doors when once closed by the elevator remain closed until the movement is reversed.

On the sides of the elevator adjacent to the ceiling A are fixed plates I I, the edges whereof rest between the rock-levers, and at the middle are formed into the rounded projections h , which join other projections, h' , above and below, thus forming two contact-surfaces for the edges of the levers, to avoid a too abrupt stroke on the levers. By making it gradual the upper projections, h' , start the levers back. Then, as the elevator ascends or descends, the rounded projections h come in contact with them, and press them back sufficiently far to enable the elevator to pass between the ends above. Thus they push the doors back far enough to enable the elevator to clear them in passing up and down.

The operation of the device is as follows: As the elevator ascends the upper projections, h' , of plates I strike the upper arms of the levers on either side, forcing them back, and when the projections h reach them they are thrown back as far as they will go, opening the doors F G, and the elevator passes through, and, ascending, the upper projections, h' , come in contact with the upper arms of the next le-

ver for the floor above, and the operation of opening the doors above for the passage of the elevator is repeated; but at the same time the lower arms of the lever are thrown in toward each other, and this closes the doors below through which the elevator has just passed, and when it reaches the next floor the same operation of closing the door below and opening the one above is repeated simultaneously.

The arrangement is such that when the elevator is in position for entrance to it or exit therefrom the doors on the floor above are closed, and they do not start open until it gets above the level of the floor at which it stands.

In descending, the operation of the levers is reversed; but otherwise it is the same—that is, the upper doors through which the elevator has passed closes as those below open for the passage of the elevator.

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

1. As an improvement in doors for elevator-hatchways, the rock-levers H, in combination with double sliding doors to close the hatchways, and the elevator D, provided with the plates, having projections h h' , for operating the levers, whereby as the elevator ascends or descends the doors through which it has just passed are closed and those it approaches are opened simultaneously for its passage through, substantially as described.

2. The straight door F, supported in rabbets e , and flexible door G in curved rabbet d , provided with slots f , to receive the ends of the rock-levers H, and adapted to slide back and forth to open and close the hatchway, in combination with rock-levers H and elevator D, with plates I, having projections h h' on the edges, whereby as the elevator ascends and descends the projections h h' come in contact with the arms of the rock-levers ahead and force them back, at the same time throwing the other arms forward, whereby the doors ahead of the elevator are opened for its passage, while those behind are closed simultaneously, substantially as described.

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Witnesses:

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