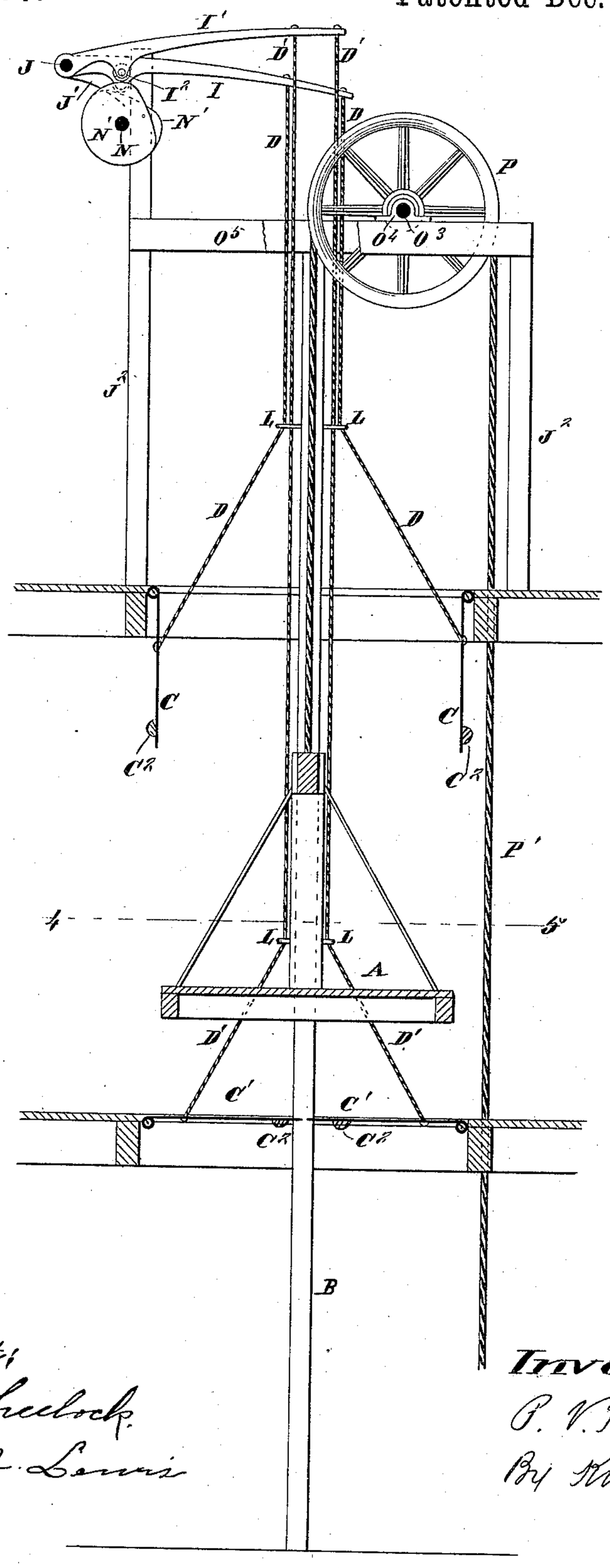
(No Model.) 2 Sheets—Sheet 1.

P. V. BAIL.

SELF CLOSING HATCHWAY.

No. 309,330. Patented Dec. 16, 1884.

Fig. 1.



Attest;
Geo. L. Wheelock.
Victor A. Lewis

Inventor;
P. V. Bail
By Knight Bros
Attys

(No Model.) 2 Sheets—Sheet 2.

P. V. BAIL.

SELF CLOSING HATCHWAY.

No. 309,330. Patented Dec. 16, 1884.

Fig. 2.

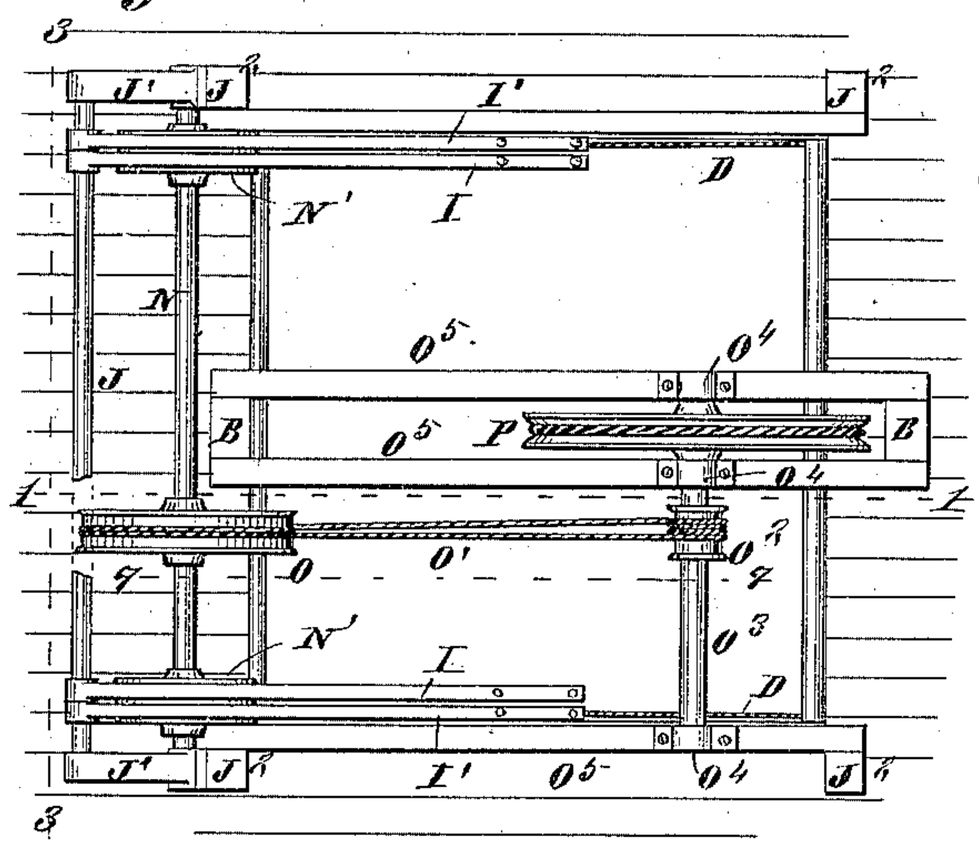


Fig. 3.

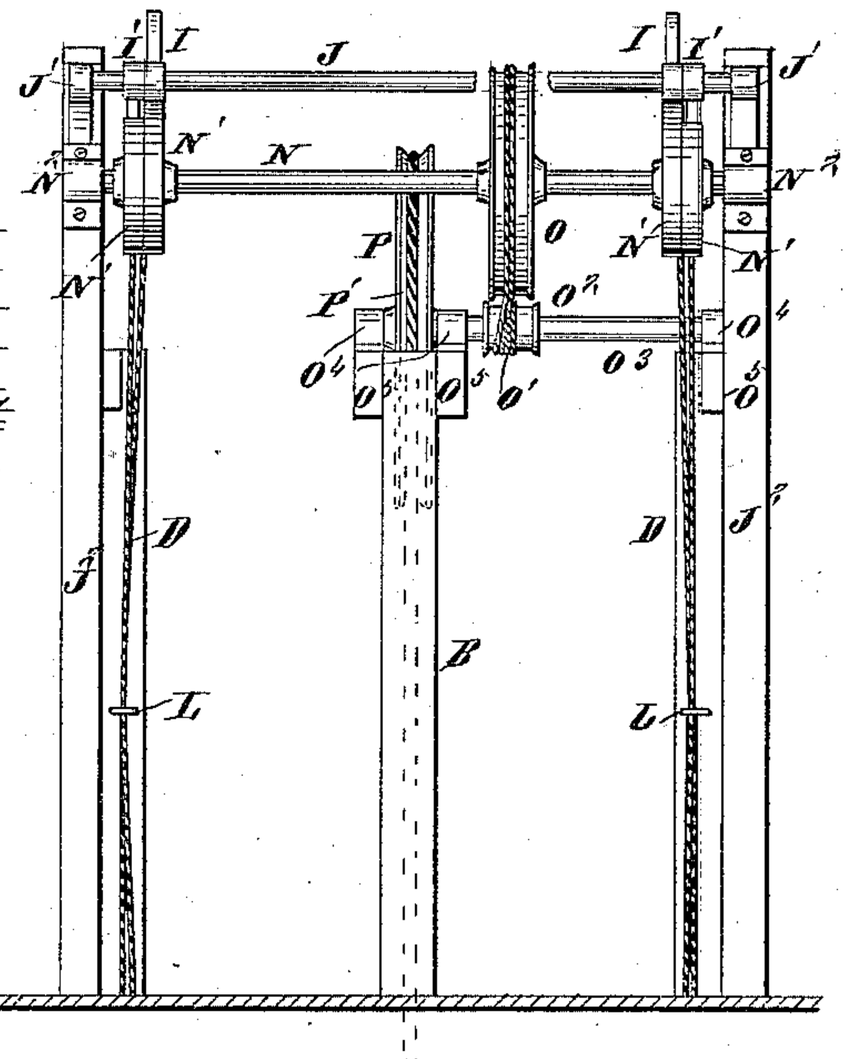


Fig. 4.

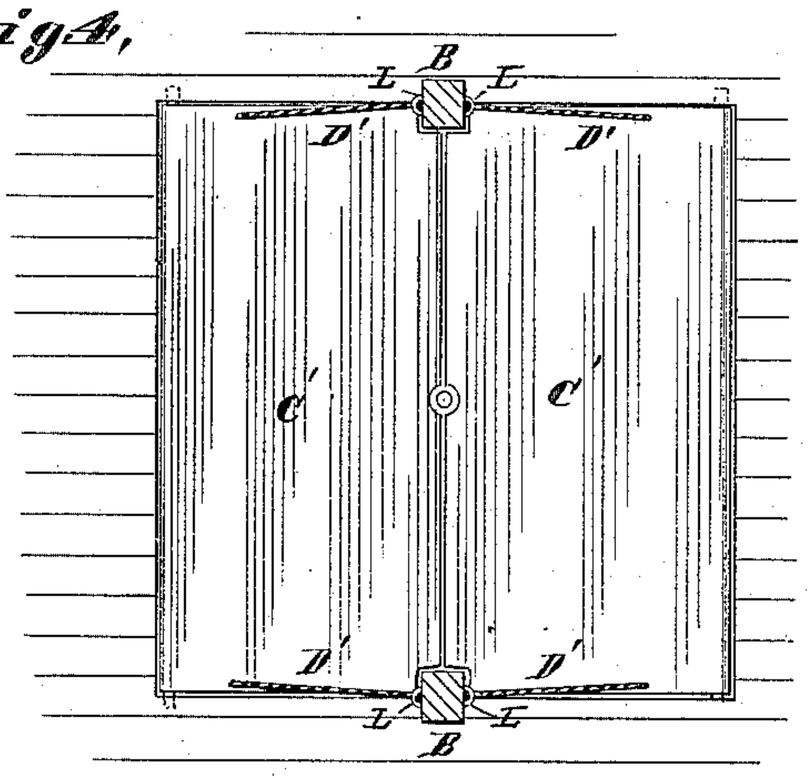


Fig. 6.

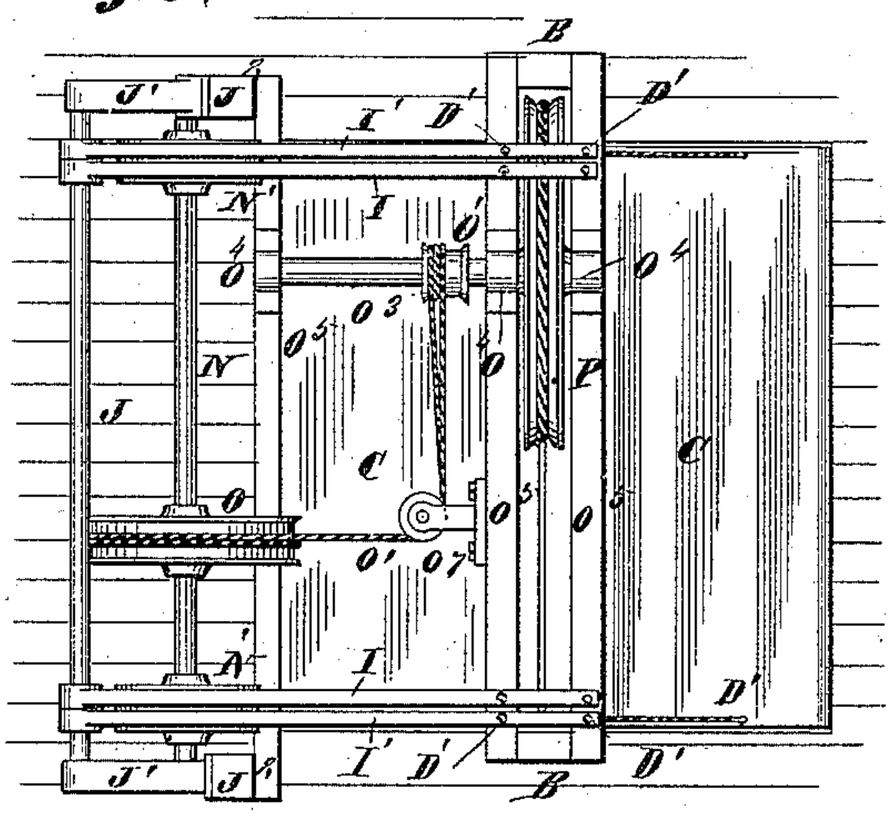


Fig. 5.

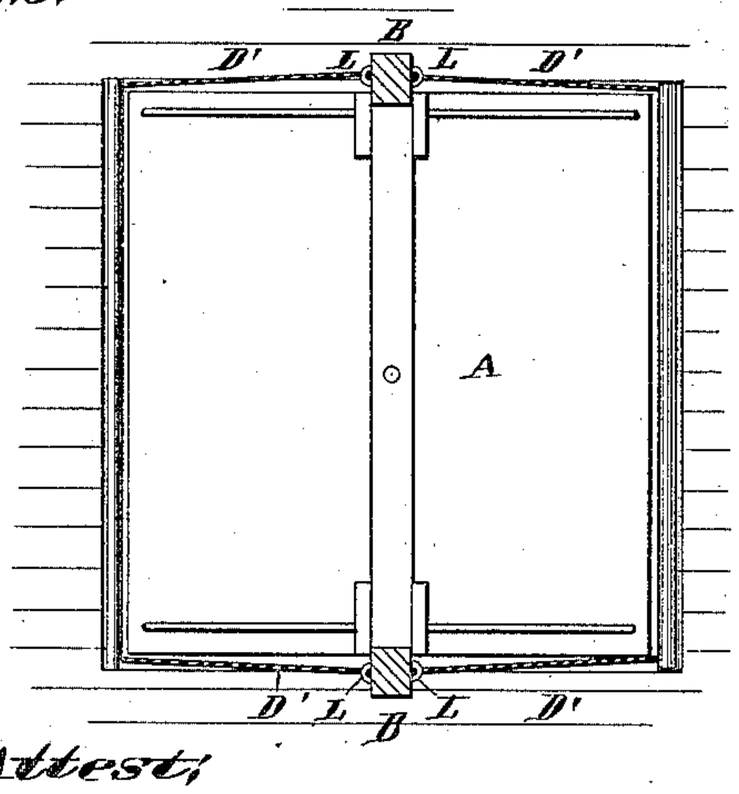
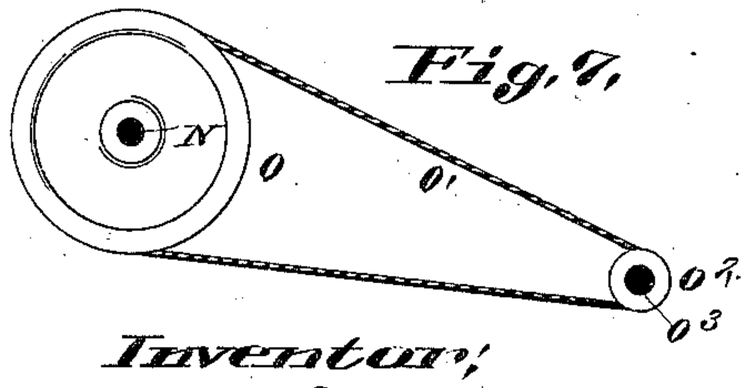


Fig. 7.



Attest;
Geo. W. Heelock
Victor A. Lewis

Inventor;
P. V. Bail
By Wright Bros
Attys

UNITED STATES PATENT OFFICE.

PHILIP V. BAIL, OF COWDEN, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO WILLIAM H. BAIL AND ANDREW S. BAIL, OF SAME PLACE.

SELF-CLOSING HATCHWAY.

SPECIFICATION forming part of Letters Patent No. 309,330, dated December 16, 1884.

Application filed September 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, PHILIP V. BAIL, of Cowden, in the county of Shelby and State of Illinois, have invented a certain new and useful Improvement in Self-Closing Hatchways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a vertical section taken on line 1 1, Fig. 2. Fig. 2 is a top view. Fig. 3 is a side elevation of the operating mechanism, being a section of the floor, taken on line 3 3, Fig. 2. Figs. 4 and 5 are transverse sections taken on line 4 5, Fig. 1, the doors being closed in Fig. 4 and the cage not shown, and in Fig. 5 the doors being open and the cage between them. Fig. 6 is a top view showing a modified form of the arrangement of the rope or cable for operating the cams. Fig. 7 is a section taken on line 7 7, Fig. 2.

My invention relates to those automatic self-closing hatchways whose doors are connected to levers which are elevated by means of cams mounted on shafts connected with the hoisting apparatus; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, A represents the cage, B the uprights, and C C′ the doors, of an elevator.

D D′ represent ropes or cables connecting the doors C C′ with the free ends of levers I I′, hinged on a rod or shaft, J, supported by brackets J′, secured to posts J^2 or to other suitable objects. I have shown two cables and two levers for each door; but a single cable and lever could do the work. The cables may pass through staples L, secured to the uprights. Beneath each lever, on a shaft, N, is an eccentric cam, N′. The shaft is journaled in boxes N^2, secured to the posts J^2. The levers bear against the cams and are preferably provided with friction-rollers I^2. (See Fig. 1.) On the shaft N is a large pulley, O, which is connected by means of a rope or belt, O′, to a small pulley, O^2, on a shaft, O^3, to which the main cable-pulley P is secured; or the rope or belt may pass around and be secured to the shaft itself, and the pulley O^2 be dispensed with. The shaft is journaled in boxes O^4, secured to cross-pieces O^5, made fast to the uprights B and two of the posts J^2. (See Fig. 2.)

P′ represents the main hoisting-cable, passing over the pulley P. It will thus be seen that as the cage ascends and descends the shaft N and cams thereon will be turned through means of its connection with the shaft O^3, which is turned by the hoisting-cable. The levers hold the doors in their closed position until the narrow parts of the cams come opposite the levers, when they drop, allowing the doors connected to that set of levers to fall open, as shown in the upper part of Fig. 1. The parts are so adjusted that the doors of each floor will be opened just before the cage reaches them, and will be closed as soon as the cage passes. The pulley O should be enough larger than that O^2 so that the cams would have but one revolution during the entire travel of the cage in either direction; otherwise the doors would be opened more than once, which would be objectionable. The cams and levers are located at the top of the building, and there would be as many pairs of them as there are doors, of which there is a pair for each floor. The doors may have weights C^2, to open them quickly when the depressed parts of the cams come opposite the levers, as stated. When the hoisting-cable pulley P is at the side of the elevator-shaft at right angles to the levers, the belt O′ would pass over or through an idler-pulley, O^7. (See Fig. 6.) The mechanism for opening the doors and closing them thus being entirely at the top of the building, the noise through the building so common to these hatch-closers is avoided.

I claim as my invention—

1. The combination of brackets J′, secured to suitable supports, rod J, supported in the brackets, eccentric cam N′, cam-shaft N beneath the brackets, lever I, hinged to the rod and supported on the cam, drop-doors C, cables D D′, connecting drop-doors to outer end of lever, large pulley O on the shaft, hoisting-cable shaft O^3, rope O′, connecting large pulley to hoisting-cable shaft, main pulley P, and hoisting-cable P′, as set forth.

2. In a self-closing hatchway, the combination of the platform or cage A, doors C C′, hinged levers I I′, cables or ropes D D′, connecting the levers to the doors to close or drop the latter, guide-staples L, through which the cables pass, cams N′, cam-shaft N, friction-rollers I² on the levers bearing against the cams, large pulley O on the cam-shaft, belt O′, connecting the pulley to a pulley on the hoisting-cable shaft, and weight C², secured to the doors, all substantially as set forth.

PHILIP V. BAIL.

In presence of—
WM. H. BAIL,
CHARLES B. EVANS.