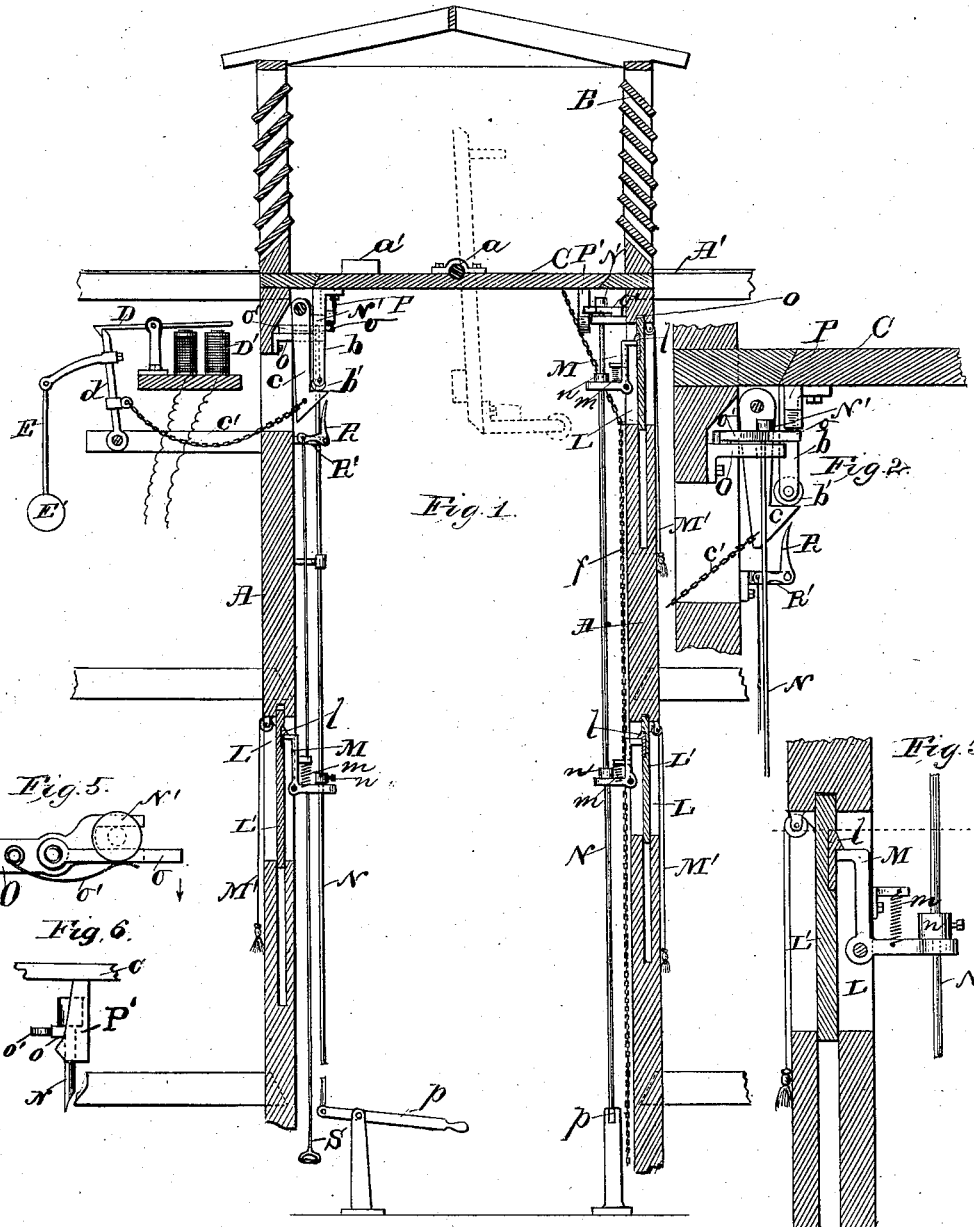
(No Model.)

S. W. WILLARD.

ELEVATOR SHAFT.

No. 261,286. Patented July 18, 1882.



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UNITED STATES PATENT OFFICE.

SAMUEL W. WILLARD, OF WEST DE PERE, WISCONSIN, ASSIGNOR OF ONE-HALF TO CHARLES A. WILLARD, OF SAME PLACE.

ELEVATOR-SHAFT.

SPECIFICATION forming part of Letters Patent No. 261,286, dated July 18, 1882.

Application filed May 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. WILLARD, of West De Pere, in the county of Brown, and in the State of Wisconsin, have invented certain new and useful Improvements in Elevator-Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to the construction of elevator-shafts in large buildings, and its nature will be fully set forth hereinafter.

In the drawings, Figure 1 is a vertical section through an elevator-shaft embodying my invention, and Figs. 2, 3, 4, and 5 are details. Fig. 6 is also a detail.

A A are the walls of the shaft, and A′ is the roof of the building in which the shaft is located. This shaft is surmounted by a cupola, B, having openings into the outer air, or by a chimney.

C is a trap-door hinged in the bottom of the cupola or chimney on a rod, *a*.

a′ is an overbalancing-weight placed on one side of the trap-door, and *b* is an arm projecting down from that side of the trap-door that carries the weight. This arm *b* carries preferably a roller, *b′*, on its lower end.

c is a latch that is hung from the top of one of the walls A A and depends down in position to fall under the lower end of arm *b* when the trap is closed, as shown in Fig. 1. The latch *c* is connected by a chain or cord, *c′*, with a trigger, *d*, that is pivoted to a support under the roof of the building near the top of the elevator-shaft. This trigger projects up to engage with a catch on one end of the pivoted armature D of an electro-magnet, D′, and carries an arm, E, from which a weight, E′, is swung, so that when the armature releases the trigger it will fall from an almost vertical toward a horizontal position, and drawing upon the chain or cord *c′* pull the latch *c* from under the arm *b*, and when this occurs the trap-door will fall into the position shown in dotted lines, Fig. 1, thus opening the trap-door to permit a free draft of air through the shaft from below. The magnet is connected by wires with a battery located at any convenient point, and the wires run to keys properly located, so that at any time a current may be established by manipulating one of the keys, or by a mercurial bulb, and this current will cause the coils to draw the long arm of the armature down to raise its short arm out of engagement with the trigger, and thus the trap-door is opened.

Now, as the object of my invention is to provide a draft that will carry the smoke out of the rooms and building when a fire occurs, so as to enable the firemen to work, and to prevent suffocation of the inmates, I provide openings L from the rooms that adjoin the shaft and close them by vertically-sliding doors L′, and I provide each door with a beveled rib, *l*, to engage with a catch, M, pivoted to a bracket on the wall of the shaft, and these catches are held in position to engage with the ribs *l* by a spring, *m*. (Shown more plainly in Fig. 3.) The catches M are in the shape of a "bell-crank," having each a vertical arm that supports the door, and a horizontal arm through the free end of which I pass a rod, N. The catches on all the doors of a wall are connected by one of these rods N, and just above the arm of each catch I provide the rod N with a ring or enlargement, *n*, that rests lightly upon it. At its extreme upper end I provide each of the rods N with a cap, N′, having about three times the diameter of the rod, and each of these caps rests upon a latch, *o*, pivoted to a bracket, O, in the upper portion of the wall. Each of the latches *o* is actuated by a spring, *o′*, that when the rod is in the position shown in Figs. 1 and 5 throws it under the cap N′, so that it supports the main weight of the rod N when the trap-door C is closed; but as I desire that the opening of the trap-door shall cause the doors L to open at the same time I provide the trap-door C on its weighted edge with a short tripper, P, wedge-shaped or inclined from its bottom or lower end upward, and I provide the light edge of the trap-door with another tripper, P′, which is bellied, as shown in Fig. 6. These trippers are designed to rest each against one of the latches *o*, and in position to crowd the latches from under the caps when the trap is tilted and let the entire weight of the rods N fall upon the horizontal arms of the catches M. This weight will trip the catches from beneath the ribs on the doors L and let them fall and permit the air from the rooms that adjoin the elevator to be drawn into the elevator-shaft.

It will be perceived that as the latches *o* are

pivoted to the brackets O on their upper side, and as the edges of each of the caps N′ project out over its bracket, the face of the rods will be limited by the brackets when the latches *o* are tripped from beneath them to a distance only equal to the thickness of the latches.

The trap-door C may be closed by drawing on a chain, *f*, and each of the shafts N may be set so as to throw its cap above the latch *o* by a lever, *p*, secured to its lower end and fulcrumed to the floor of the shaft, and the doors L may be raised from the inside of the room by cords M′, while I generally propose to open the trap and side doors by battery-power. I propose to provide each shaft with apparatus for opening them by hand. This consists of a bell-crank tripper, R, pivoted to a bracket, R′, and having a rod or chain, S, depending from its horizontal arm, by the pulling of which the vertical arm may be thrown against the face of catch to force it from beneath the arm *b*.

It is obvious that instead of the sliding doors L′, I may use swinging spring-doors.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an elevator-shaft, a trap-door for closing its upper end, weighted as described, in combination with a catch adapted to secure it when closed, and means for tripping said catch from any convenient point in the building, as set forth.

2. The combination of the trap-door and connections with doors L′ and catches M, whereby as the trap-door opens it releases the doors L′ and permits them to open also, as set forth.

3. The combination of trap-door C, having arm *b*, with the catch and device for tripping it, as set forth.

4. The trippers P P′, depending from the trap-door C, in combination with the capped rods N, latches *o*, bracket O, and catches M, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, on this 7th day of April, 1882, in the presence of two witnesses.

SAMUEL W. WILLARD.

Witnesses:
W. H. CHAPMAN,
JOHN BRYANT.