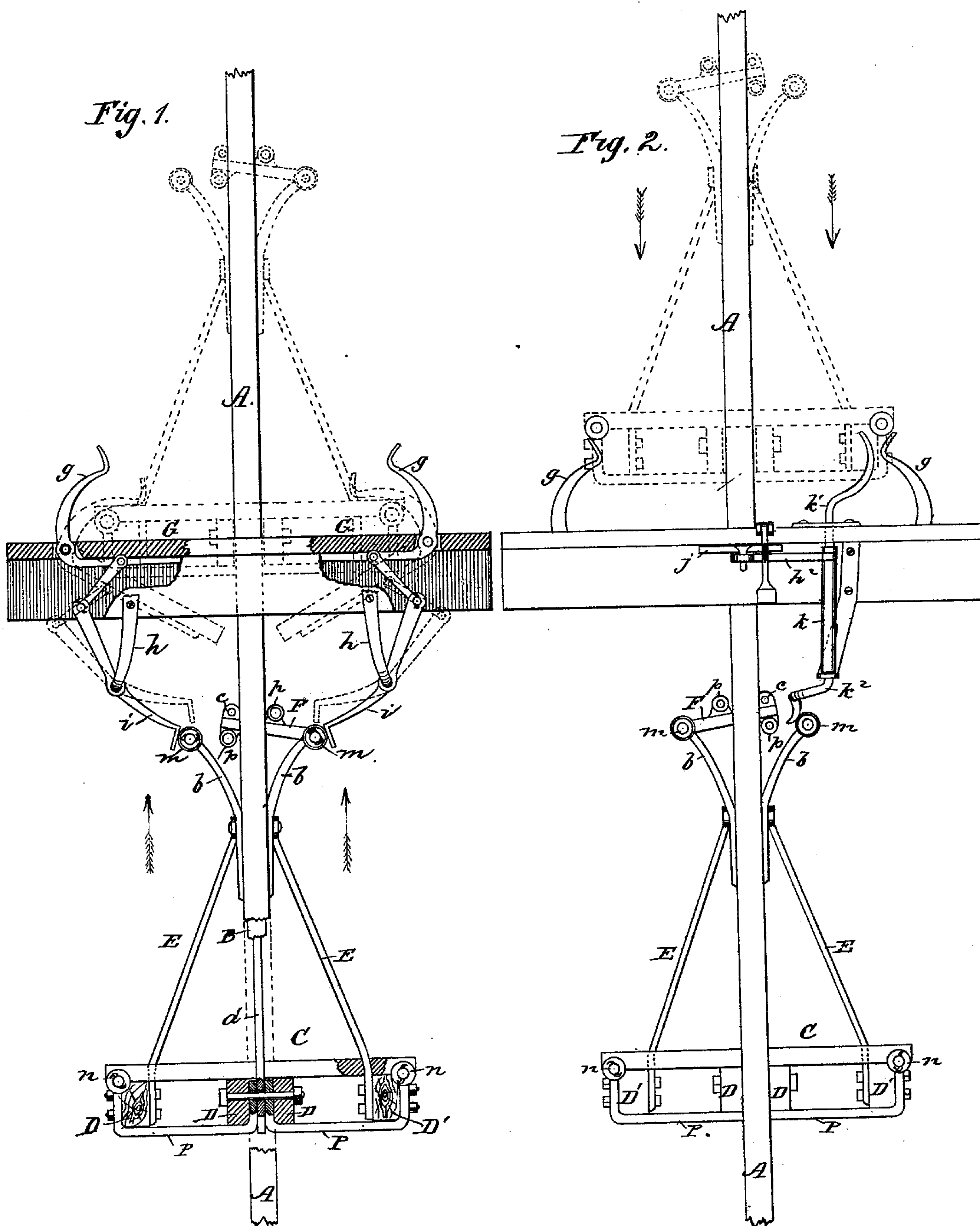


B. SLUSSER.
Elevator.

No. 222,318.

Patented Dec. 2, 1879.



WITNESSES:

W. W. Hollingsworth
Edw. W. Dyer

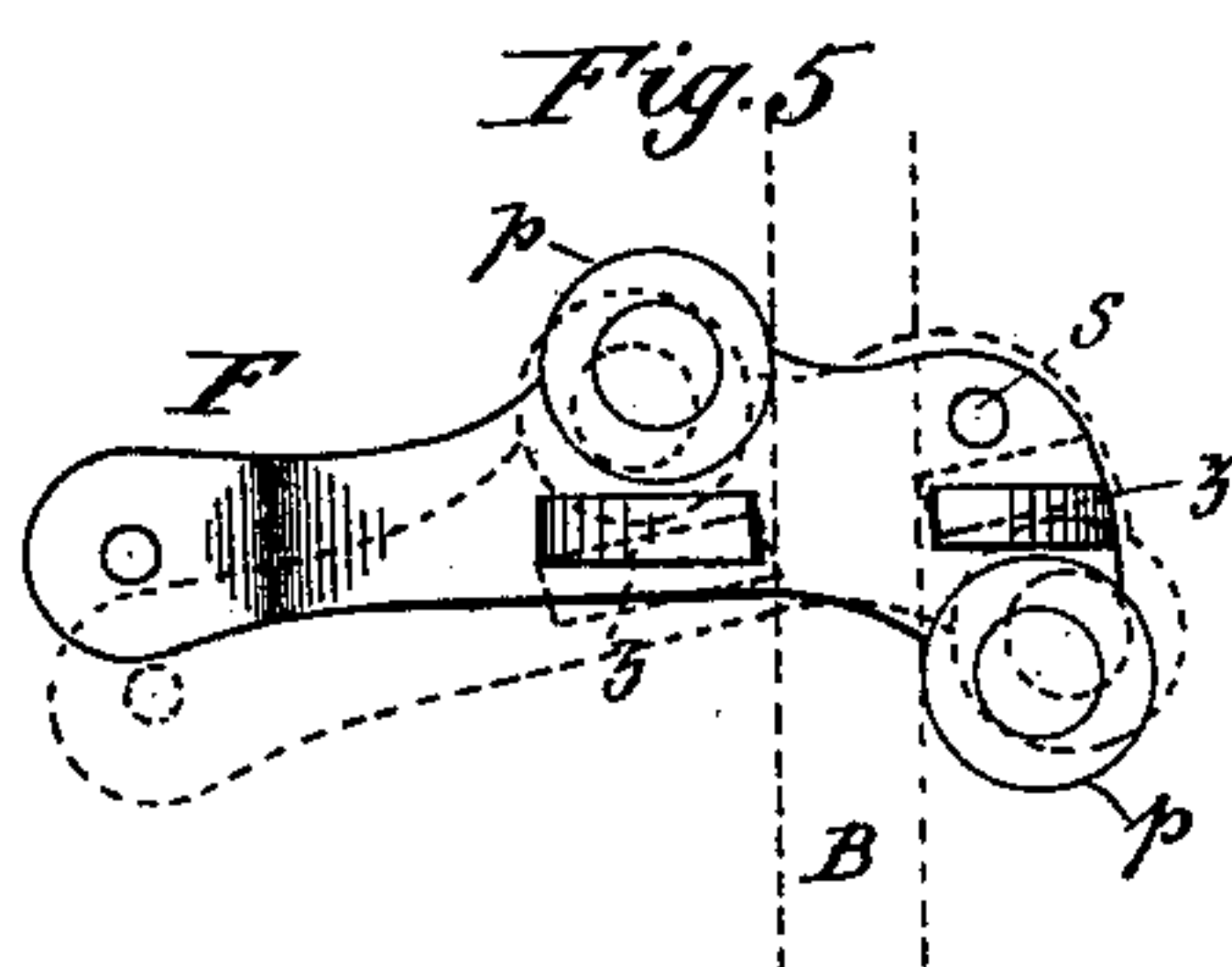
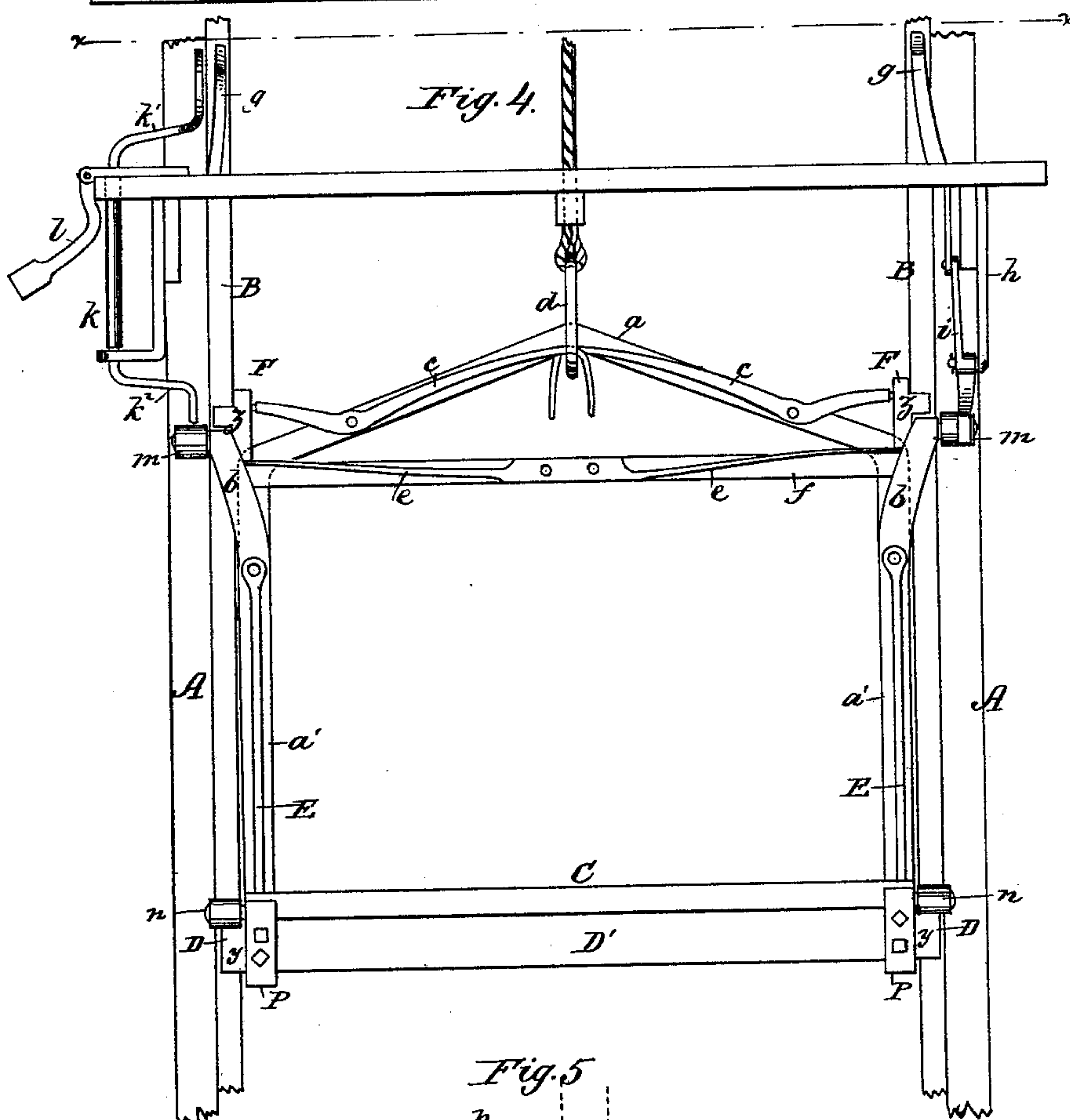
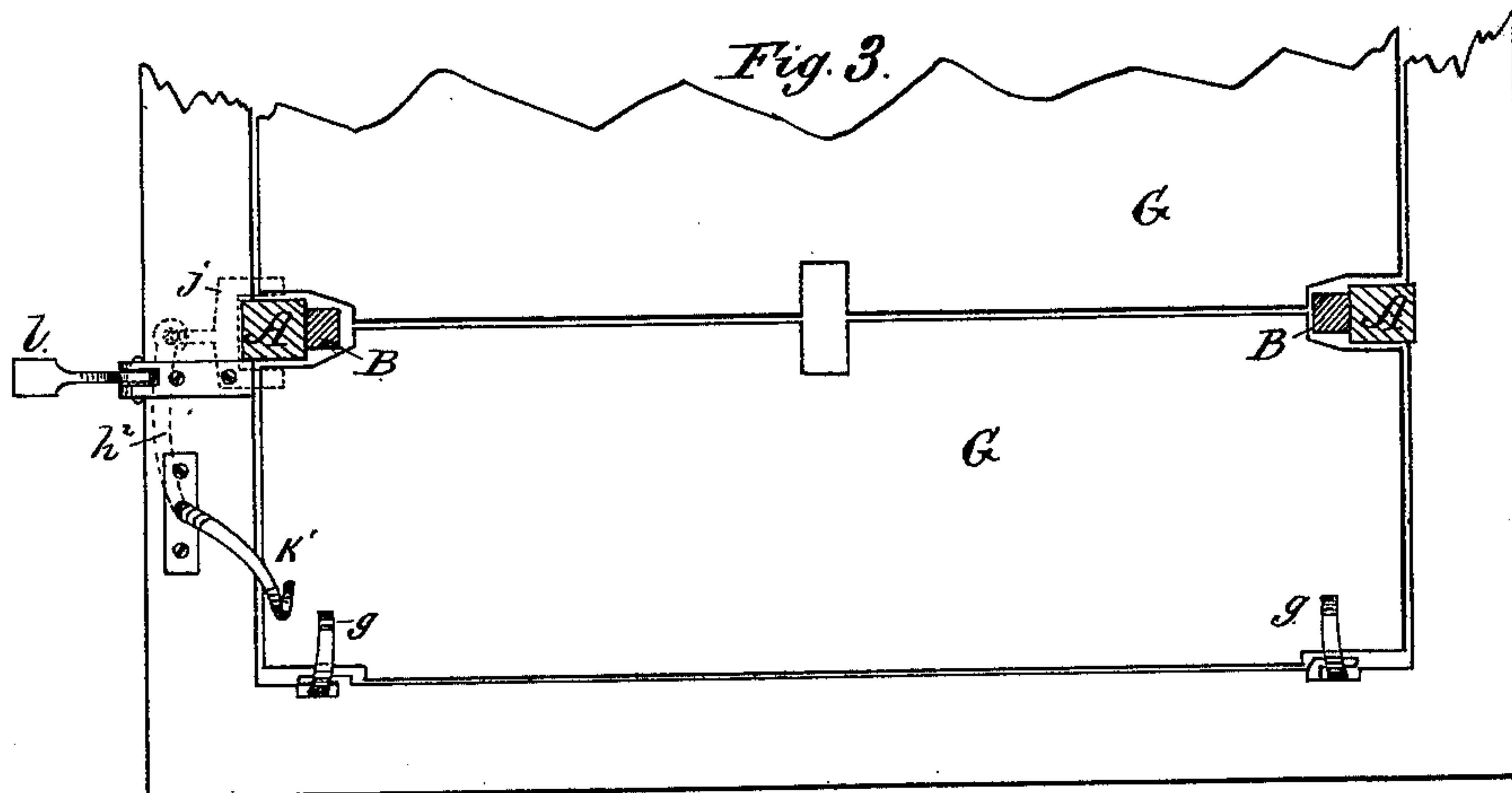
INVENTOR:

Benj. Slusser
BY *Wm. L. ...*
ATTORNEYS.

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WITNESSES:

W. W. Hollingsworth
Edw. W. Byrnes

INVENTOR:

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UNITED STATES PATENT OFFICE.

BENJAMIN SLUSSER, OF SIDNEY, OHIO.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. **222,318**, dated December 2, 1879; application filed September 24, 1879.

To all whom it may concern:

Be it known that I, BENJAMIN SLUSSER, of Sidney, in the county of Shelby and State of Ohio, have invented a new and Improved Elevator for Buildings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an edge view of the elevator, partly in section. Fig. 2 is an edge view of the elevator from the opposite side. Fig. 3 is a plan view of a part of the trap-door of the hatchway with the guide in section through line *x x*, Fig. 4. Fig. 4 is a side view; Fig. 5, a detail of the clutch-frame.

My invention relates to an improved construction of elevator for warehouses and other buildings, constructed with a view to securing greater safety against the sudden fall of the elevator-platform from the breakage of the rope, and to provide against persons falling through the hatchways in the several floors.

The invention consists, first, in a novel automatic clutch for arresting the descent of the platform in the event of the sudden breakage of the rope; secondly, in the peculiar means for opening and closing a set of automatically-operated trap-doors for the hatchways, which are opened above and closed after the platform in rising, and also opened below and closed above the platform in descending, so that at no time is the hatchway left open; thirdly, in the peculiar construction of the platform, which is built with a view to securing strength without great weight, as hereinafter more fully described.

In the drawings, A A represent the two vertical side posts or beams, to which are attached the guide-bars B B, which are made of iron and extend the whole distance the elevator is designed to travel. C is the elevator proper, which is constructed as follows: A bar of iron, *a a' a'*, Figs. 1 and 4, constitutes the main frame, and is bent three times at the top to form a bail, and then extends down each side parallel with and inside of the guide-bars. At the lower ends of each side of bar *a'* is arranged a horizontally-projecting U-shaped bracket, P, one on each side of the lower end

of bars *a'*. These iron brackets carry each two wooden beams, D D', of which the inner beams, D D, and inner bend of each bracket, are bolted through the lower end of bars *a'*, while the outer beams, D' D', and the outer bend of the brackets, are bolted to the inclined hangers or suspending-rods E E. These hangers are bolted at the top to the main frame, and across the beams D D' is laid the flooring of the platform. In bolting the inner beams, D D, together they are extended out past the floor of the platform, as at *y*, Fig. 4, so as to embrace the guide-bars B B and form guides to steady the platform in its vertical movement.

For holding the platform when the rope breaks, a peculiar form of safety-clutch is provided. To the upper end of the frame-work carrying the platform are attached upwardly-projecting and offsetting arms *b*, to one of which, on each side, is pivoted the clutch-frame F. This frame consists of a short horizontal bar having two lugs, *z z*, forming a notch between the same, that receives the guide-bar B (see Fig. 5) and two rollers, *p p*, placed upon opposite sides of the notch, and one above and the other below the frame. Now, whenever the frame F is horizontal the rollers *p p* rest against the guide-bars B, and the frame and platform move freely up and down. When, however, a strain is brought upon the outer end of the frame to depress it, the edges of the lugs in the clutch-frame bind against the bar B and cramp against the same with sufficient friction to sustain the platform and its weight. To hold the clutch-frame horizontal for normal action, levers *c c* are fulcrumed to the bent bar *a*, and their shorter and outer ends are coupled, at *s*, Fig. 5, to the side of the clutch-frame opposite its attachment to the platform. The inner ends of these levers extend to the center of bar *a*, and are bent and loosely contained in a link, *d*, which encircles bar *a* and forms an attachment for the rope whereby the platform is lifted.

Now, it will be seen whenever there is a tension on the rope the link *d* lifts the inner ends of the levers *c c*, which movement depresses their outer ends and holds the clutch-frame horizontal with its rollers against bar A for free movement. When, however, this

tension on the rope ceases by breakage or other cause, the inner and heavier ends of the levers descend, while their outer ends rise and throw the edges of the notches of the frame against the bar A to cramp it, while the weight of the platform as suspended from the offsetting arm at the long end of the clutch-frame serves to increase the binding and arrest by friction any downward movement of said platform. To render the action of the clutch-frame more sensitive, a spring, *e*, is arranged on each side of a brace, *f*, to press the clutch-frame into its engaging position whenever the breakage occurs in the rope. The inner ends of the levers *c c* may, however, be weighted sufficiently to dispense with this feature.

To avoid the danger of falling through the open hatchways of the several floors, I hinge to each side of each hatchway a door, G, Fig. 3, which two doors of each hatchway close in the center and drop down when they are to be opened.

To automatically operate these doors, as described, I attach to them, at their hinges at each end and on each side, upwardly-projecting arms *g*, whose function is to close the doors on the upward movement, while below the hatchway I pivot in lingers *h*, Fig. 1, the levers *i*, jointed to rigid arms depending from the doors, which close said doors on the downward movement.

To lock the doors when closed a double sliding locking-bolt, *j*, Figs. 2 and 3, is arranged to embrace the vertical bars A and slide under the doors—one branch under one door and the other branch under the other door. This bolt is withdrawn by the attached arm *k*² of a vertical rock-shaft, *k*, and shot again to its place by a pendent weighted arm, *l*.

The rock-shaft *k* terminates above the floor in a bent arm, *k'*, near one of the arms *g*, and terminates below in a second bent arm, *k*². Both of these bent arms *k'* *k*², as also the arm *g* and levers *i*, are in range of contact with rollers *m*, located on the extremities of the offsetting arms *b* of the platform-frame.

The operation of the parts is as follows: Supposing the platform and frame to be below the floor, and the trap-doors above being closed, as shown in Figs. 1 and 2. Then when the platform and frame rises the rollers *m* strike first the lower ends of levers *i*, Fig. 1, slightly raising the doors, so as to relieve the bolts of their weight. Quickly following this the rollers strike the lower arm, *k*², Fig. 2, of the rock-shaft *k*, and, rocking it vertically, its arm *k*² withdraws the double bolt *j* from beneath the doors, allowing them to fall open of their own gravity, and the upper part of the platform-frame passes through. As the platform itself is about to pass through, a set of rollers, *n*, on each corner of the platform strike the now horizontal arms *g*, and by lifting them, as shown in dotted lines in Fig. 1, bring back the doors to a horizontal position, said rollers at the same time striking the upper arm, *k'*,

of the rock-shaft and withdrawing the bolt *j*, which, as soon as the rollers leave the arm, is shot under the door by the pendent weighted bar.

In descending the rollers *n* (see dotted lines of Fig. 2) strike first the arm *g* and slightly raise the doors to allow the bolts to be withdrawn, when, quickly following this action, the same rollers strike arms *k'* of the rock-shaft to withdraw the bolts. The doors then drop down, and as the top of the platform-frame passes through the floor the rollers *m* strike the ends of levers *i*, as shown in full lines in Fig. 1, to restore the doors to the closed position, while the same rollers *m* acting on lower arm, *k*², Fig. 2, of the rock-shaft withdraws the bolt, and the weighted arm again shoots it beneath the doors to lock them closed.

As shown, I have arranged the lock device at one end only of the door; but in practice I propose to lock the doors upon both sides, to enable them to stand considerable weight.

Having thus described my invention, what I claim as new is—

1. The safety-clutch for an elevator, consisting of the clutch-frame F, notched to receive the guide-bar, and provided with rollers *p p*, combined with and pivoted to the platform-frame on one side, and connected by levers *c c* with the draft-rope for holding the clutch-frame in its normal position, substantially as described.

2. The combination, with the vertical guide-bars and the movable platform-frame, of a right-angular bar or clutch-frame, notched to receive the guide-bars, and pivoted at one side of the guide-bars to the said platform-frame, so as to cause the weight of the platform to cramp the guide-bars and arrest the downward movement of the same, as described.

3. The combination of the trap-doors having arms *g* and levers *i*, the rock-shaft *k*, connected with bolt *j*, and having arms *k'* *k*², together with the movable platform having offsetting projections for striking and operating said arms, substantially as described.

4. The combination, with the guide-bar B and the double trap-doors, of the bifurcated bolt *j*, arranged to embrace the guide-bar and hold up both doors, together with suitable mechanism for operating said bolts.

5. The platform-frame consisting of the single bent bar *a a'*, the U-shaped brackets P P, carrying beams D D', and the suspending-rods E E, the inner beams, D, and arms of the bracket being bolted through the lower ends of bars *a'*, and the outer beams and arm of the brackets being bolted to the suspending-rods E, substantially as described.

The above specification of my invention signed by me this 12th day of September, 1879.

Witnesses:

B. SLUSSER.

SOLON C. KEMON,

EDWD. W. BYRN.