

No. 641,231.

Patented Jan. 9, 1900.

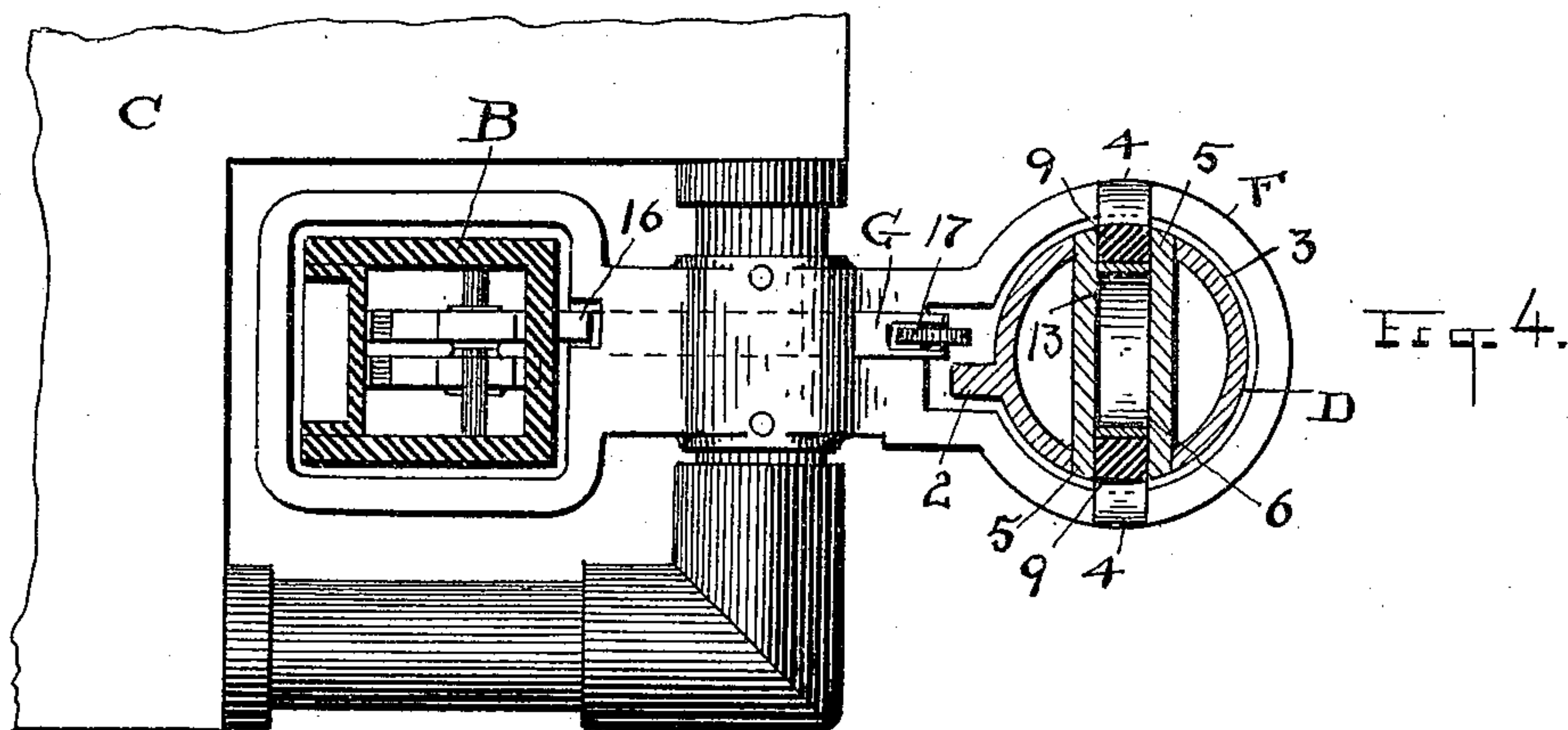
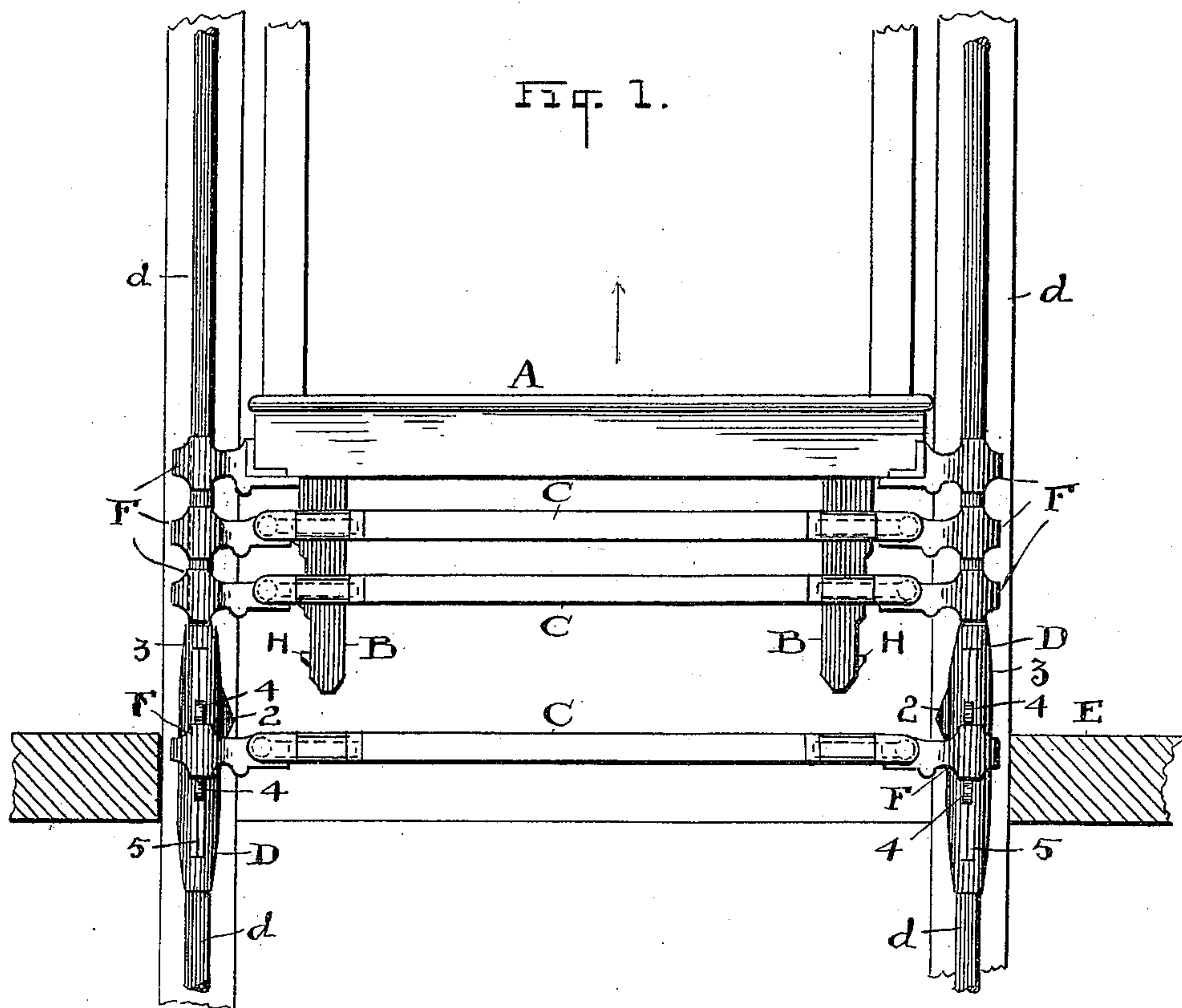
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HATCH DOOR MECHANISM FOR ELEVATORS.

(Application filed May 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.



ATTEST

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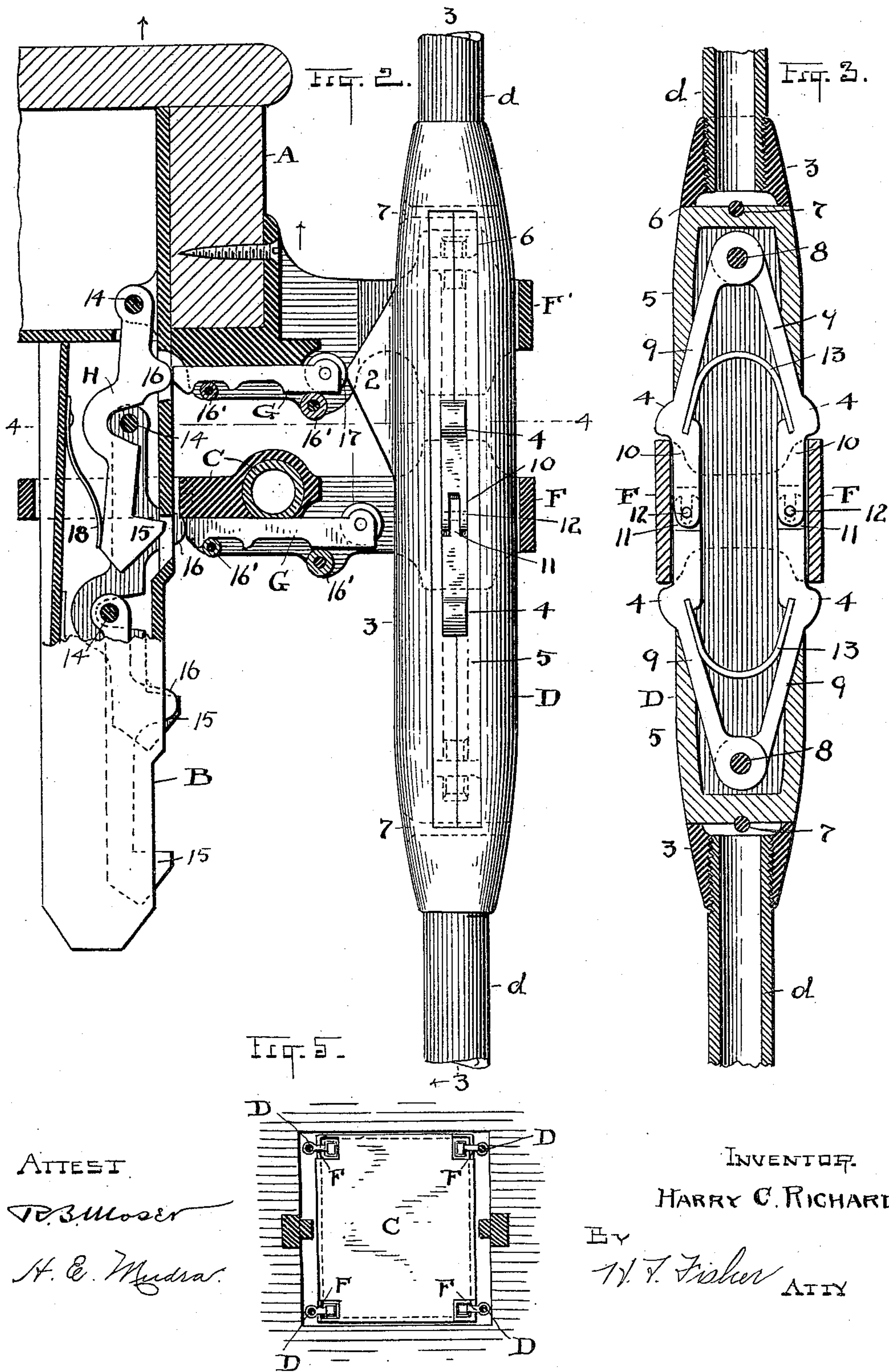
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

HARRY C. RICHARDS, OF CLEVELAND, OHIO.

HATCH-DOOR MECHANISM FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 641,231, dated January 9, 1900.

Application filed May 3, 1899. Serial No. 715,396. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. RICHARDS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Hatch-Door Mechanism for Elevators; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to hatch-door mechanism for elevators; and the invention is an improvement on the construction embodied in my application filed on the 19th day of September, 1898, Serial No. 689,087.

In the accompanying drawings, Figure 1 is an elevation of the lower portion of an elevator or elevator-platform with two hatch-doors in position to be carried up and a third, below, released from the elevator, but in position in the hatch of the landing, where it is held by its supports at each corner of the crib. Fig. 2 is a side elevation of one of the door-engaging devices and showing a door-carrying ring in section thereon and engaged thereby and also showing in section the engaging and releasing mechanism on the elevator and door, all as hereinafter fully described. Fig. 3 is a central vertical section of the door-supporting mechanism in the corners of the shaft, Fig. 3, and showing a vertical section of the ring F engaged therein on line 3 3, Fig. 2. Fig. 4 is a plan and sectional view of a hatch-door and its ring and carrier, taken on line 4 4, Fig. 2. Fig. 5 is a cross-section of the shaft reduced in scale.

A represents an elevator-platform, to the bottom of which are attached carriers B, one at each corner of the platform or car, but only two are shown. These carriers B support the hatch-doors C when the elevator is in motion and until such time as each door reaches the landing at which it belongs. At each landing E and at the four corners thereof in the shaft are door-supporting devices or mechanism D, built into a vertical line of pipe or rod d and which are fastened in any suitable way to or in the top and bottom of the elevator-shaft. These devices D engage and support their respective doors C through rings F on said doors, and each door is provided with

bolts G, which are each engaged by an inclined projection or lug 2 on the long body 3 of each door-support when the door below the one on which the said bolt is mounted reaches its own supports and landing.

A pivoted catch or dog H, one for each corner, which engages and carries each door C with the elevator, operates in conjunction with bolt G and has its own hold released through the bolt G and lug 2, and the distribution of the several doors to their hatches is effected by a graduation in the depth of lugs 2 on the bodies 3 of the door-supports, so that only certain lugs will actuate certain bolts. When the bolts G are engaged by the lugs 2, as described, the rings F have reached the engaging portions 4 of the supporting mechanism, and the hatch-door is then firmly held suspended at its landing while the elevator ascends.

The weight of the hatch-door and the desired smoothness and certainty of operation demand a very complete construction of its supporting mechanism, and to this end I have made a substantially cylindrical body 2, which serves as a casing for the entire device, (marked D,) provided with a two-piece arm-supporting frame 5, which fits snugly in a slot 6 in the body 3 and which is flush with the outer contour of the body. This frame is removably held in place by cross rods or screws 7 at its ends, fastened through the body 3 at the top and bottom of the parts 5. Within the said frame and pivoted on cross-pins 8 are the door-engaging arms 9. These arms are arranged in pairs opening laterally on opposite sides and provided each with rounded projections 4, which protrude through openings at each side of the frame 3. The lower ends 10 of the upper arms are slotted to receive the bifurcated tongue 11 on the lower arms, and a pin 12 connects the said ends and causes both sets of arms to move in unison or together when either one is actuated. Bow-springs 13 are interposed between the two upper arms as well as between the two lower arms and serve to keep each set of arms spread laterally to keep the projections 4 always out in position to be engaged by the ring F.

When the ring F, which is rigid with the door C, strikes the arm projections 4 from

either direction, down or up, the said arms are forced inward until the ring has passed beyond the engaged projections, after which said arms again instantly assume their normal or spread position. Now when the said ring is between the upper and lower projections 4 and opposite the extensions 10 11 and the door C of that ring is at its own landing a release of the said door C from the carrier B is effected by the bolt G engaging lug 2, and the said door is then rested by or upon its rings F on the projections 4 of the lower arms 9, which now carry the door C. It will be seen that these door-engaging arms 9 require not only a free jointed action, but also need to be strong enough to carry not only the doors, but such weight as may come onto the doors.

Another feature of the invention which requires an easy and certain action without any undue loose play is the latch mechanism which releases the said doors from the carrier B of the car. This mechanism comprises the catch H, which is pivoted at its upper end at 14 on the elevator-platform, and the bolt G, located transversely to the catch H near its upper or pivot end and engaging a rounded projection 16 on the catch when the said bolt is actuated by striking the lug 2 at its other end. The bearing of bolt G against said projection 16 is such as to require a comparatively slight lateral motion to obtain a greater arc of movement at the hook 15 on the catch, and as the bolt G is not mounted on the hatch-door which is to be released, but always on the one above it, an easy disengagement of the hook 15 is effected.

Each hatch-door is provided with one of the bolts G, which actuates the catch H for the door beneath, and none other, except the bolt G on the car-frame at the top in Fig. 2, which releases the top door-catch H. To secure a free and easy movement of the bolt G, rollers 16' are provided, on which it rides, and a roller 17, set in the end of the bolt, makes an easy and frictionless engagement with the lug 2.

Springs 18 in the carrier B normally keep each catch H pressed outward to engaging position.

What I claim is—

1. A holding and releasing device for elevator hatch-doors comprising a body and a frame in a separate piece therein, arms pivotally supported in said frame and projections on said arms normally extending beyond the surface of said body, and springs to spread the said arms, substantially as described.

2. A device for elevator hatch-doors consisting of a substantially cylindrical body, two sets of oppositely-disposed arms pivotally supported in said body and having projections near their ends extending outward beyond the said body, and a spring to spread each

set of arms and hold them normally apart, substantially as described.

3. A device for elevator hatch-doors comprising a body and a two-part frame within the body, arms pivoted in said frame and having projections extending outward beyond the frame, and means to keep said arms normally extended, substantially as described.

4. A device for elevator hatch-doors comprising a substantially cylindrical body, a separable frame removably fixed within said body, two sets of arms pivoted in said frame, and means to keep said arms in each set normally spread, substantially as described.

5. A device for elevator hatch-doors having a body part, a separable frame removably fastened therein, and arms pivoted in pairs in the ends of said frame and having their proximate extremities connected, substantially as described.

6. A device for elevator-hatches comprising a body part, a removable frame within said body, arms pivoted in pairs in said frame, and means to spread said arms, in combination with an elevator hatch-door having means to engage said arms, substantially as described.

7. An elevator hatch-door having an engaging ring, in combination with fixed supporting-bodies in the corners of the shaft, a removable frame in each body, and arms pivoted within said frame constructed to engage the corresponding ring on the hatch-door, substantially as described.

8. In elevator hatch-door mechanism, the combination of a hatch and a bolt thereon, a carrier on the car having a pivoted catch constructed to be engaged by said bolt between the pivot-point and hook of said catch, and fixed means to be engaged by said bolt as the bolt travels up and down, substantially as described.

9. In hatch-door mechanism the combination of a carrier having a pivoted catch pivoted at one end and a hook on the other, and a hatch-door having a sliding bolt engaging said catch between its hook and pivot, and a stationary projection to engage and operate said bolt, substantially as described.

10. In hatch mechanism for elevators, a hatch having in each corner a fixed body and two pairs of arms pivoted at one end in said body and at their opposite ends operatively connected with each other, and said arms having laterally-projecting lugs exposed without said body and spaced apart to enable a platform to be engaged between them, substantially as described.

Witness my hand to the foregoing specification this 11th day of March, 1898.

HARRY C. RICHARDS.

Witnesses:

H. T. FISHER,
R. B. MOSER.