

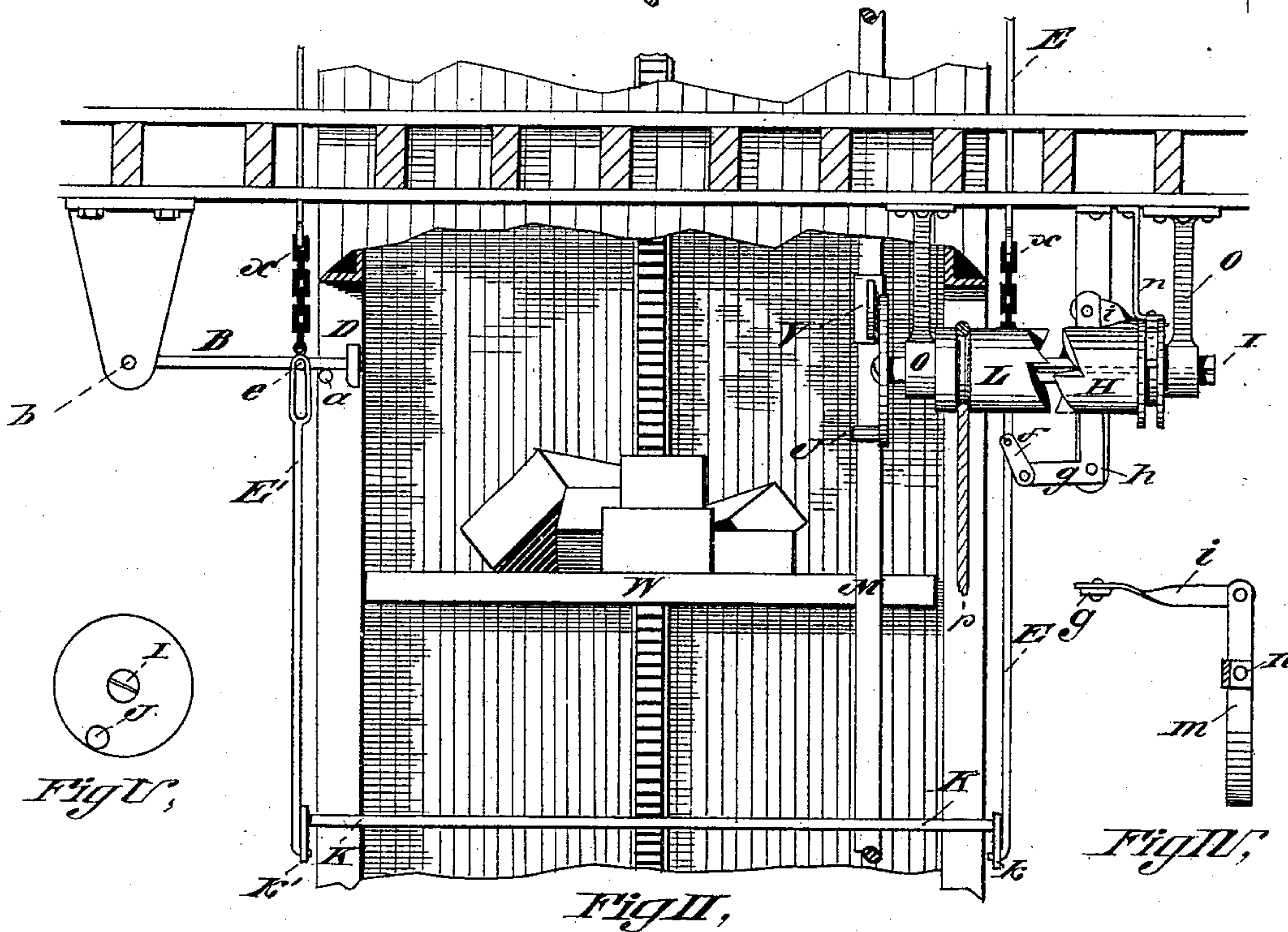
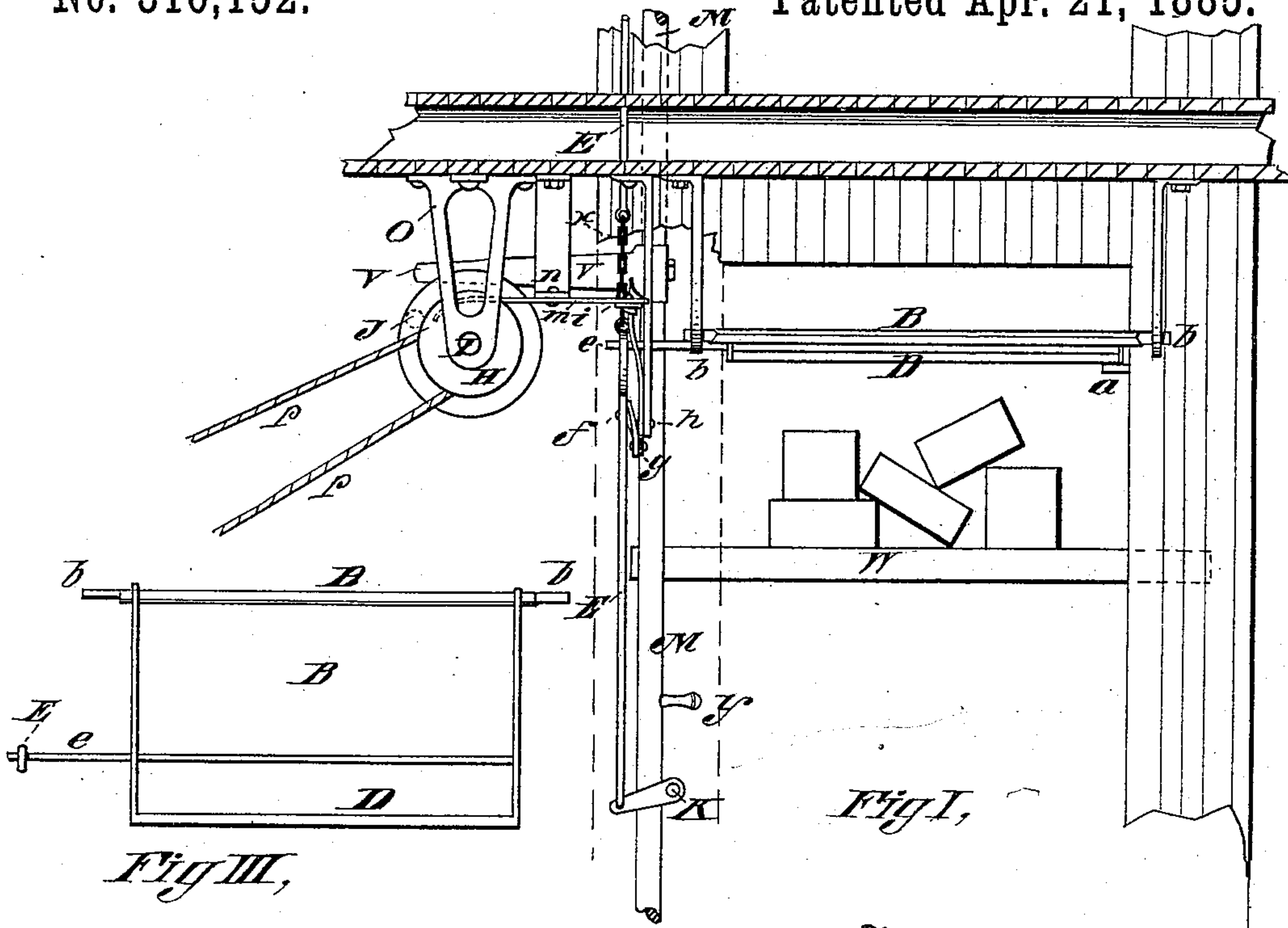
(No Model.)

F. S. KING.

ELEVATOR.

No. 316,152.

Patented Apr. 21, 1885.



Witnessed,
Per my
Timothy A. Brown

Inventor,
Frank S. King,
By R. F. Hyde
Att'y.

UNITED STATES PATENT OFFICE.

FRANK S. KING, OF WEST BRIMFIELD, MASSACHUSETTS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 316,152, dated April 21, 1885.

Application filed January 6, 1885. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. KING, a citizen of the United States, residing at West Brimfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Elevators, of which the following is a specification.

This invention, which may be termed a "safety stop-motion for elevators," having for its object the arrest of the carriage or "lift" before a portion of the person projecting therefrom can be caught between the carriage and the top of the doorway, consists, in brief, of a light movable frame, with an edge arranged to extend from side to side of the doorway, and in such proximity to its inner top edge as to intercept and be moved by anything projecting from the edge of the lift which would otherwise come against the top of the doorway, intermediate mechanism converting the motion of this frame to the movement of a clutch-section splined upon a spindle having a crank-arm upon one end, a corresponding clutch-section revolving loosely and constantly driven by power upon the same spindle, and an arm arranged upon the starting and stopping rod of the elevator to adapt it to be lifted with the rod by the crank-arm of the clutch-bearing spindle upon its first rotation.

My invention also consists in mechanism for conveying the motion given to a movable "contact-bar" upon either side of a double-door elevator to a common clutch for operating the stopping-rod, and in devices for operating one clutch from any doorway of any floor of a building without requiring any contact-bar to lift the weight of any connection to the clutch but of that or those immediately below it.

The construction of my invention is fully illustrated in the accompanying drawings, in which—

Figure I is a side view of a portion of an elevator with a part of one side broken away. Fig. II is a view of the same as seen from another face; and Figs. III, IV, and V are details.

B is a light frame, hung in bearings *b b* from the ceiling outside of the elevator.

D is the contact-bar, forming one side of frame B, extending from side to side of the

doorway, as seen in Fig. I, and coming close to the path of the edge of the lift W and nearly below the top of the doorway, as shown in Fig. II.

a is a stop to retain the frame B in a horizontal position.

e is an arm from the side of frame B. The arm *e* is received in a loop of rod E.

The rod E is connected by a link, *f*, to the end of a bell-crank lever, *g*, hinged and hung at *h* from the floor above. The other end of lever *g* is hinged to the toggle *i*, which is in turn hinged at its other end to the shipper *m*, hung in bearings from the floor at *n*. A plan view of toggle *i* and shipper *m* is shown in Fig. IV. The shipper *m* engages with the clutch-section H, splined upon the spindle I in bearings O O from the floor above.

The spindle I has upon one end the crank-arm J, as shown in Figs. II and V, and has also upon it, between one hanger O and the clutch-section H, the corresponding section, L. The section L is also a loose pulley driven constantly by the belt P.

M is the rod common to elevators, and within the well, by which the operator, by pushing down on a handle, as Y, Fig. I, starts the elevator, or by pulling it up stops the same. This rod has arranged upon it, so as to project through a slot in the wall of the elevator, (not shown,) an arm, V, to come within the circle described by the crank-arm J in a rotation, and the arm V is so relatively placed to the crank-pin J as to cause it to be lifted by the latter the distance required to stop the upward movement of lift W as the same movement of rod M would through its handle Y.

In operation a slight contact of anything upon the ascending lift W with the bar D raises it upon its hinges *b b*, to carry with it the rod E. The rod E, through link *f*, bell-crank *g*, and toggle *i* and shipper *m*, throws the clutch into operation to, through crank J and arm V, lift rod M to stop the ascent of the lift W. Any movement of frame B is instantly conveyed to the clutch-section H, which has only a short distance to move before engaging with the rapidly-revolving pulley, and the rod M is lifted to stop the elevator much quicker than it could be manually.

The weight of the frame B and its connections, while enough to unship the section H

when released by an obstacle raising it, is insufficient to hurt any one dragged against it, and can be made sensitive enough to be operated by the projecting toe of a shoe.

5 The operating-rod M of an elevator is made to remain in one position until deliberately moved, so that when once lifted the elevator is stopped, the clutch is released, and the crank-pin J returned to its position by its weight,
10 all as seen in Fig. II.

In an elevator having opposite doors the rod E is hinged at its lower end to the crank-arm *k* of a rock-shaft, K, carried without the casing or wall of the elevator, or through it at
15 a point which will not be in the track of the lift W.

The rock-shaft K is hung in bearings, and from a corresponding crank-arm, *k'*, on its other end a rod, E', is connected by being
20 looped over an arm, *e*, of a duplicate frame, B, so that any movement of the frame B upon this side is conveyed to the clutch, while any movement of rod E leaves the frame looped to rod E' uninfluenced.

25 Upon every doorway of every floor I arrange frames B, hung as shown in Fig. II, and connect the frames flexibly, as shown, by the chains *x x*, with those immediately below, by means of which arrangement, while any frame
30 will be operative to lift rod E or E' to throw in the clutch, no weight will have to be lifted above any frame B.

Without a departure from the spirit of my invention the crank J may be made to depress arm V to stop the motion of the lift W,
35 should the rod M operate in the reverse manner from that common.

Now, having described my invention, what I claim is—

1. The within-described improvement in 40 elevators, consisting of a movable bar, D, arranged in the doorway in close proximity to its top and the track of a lift, W, a clutch consisting of a splined section, H, a spindle, I, hung in bearings O O, and a constantly-re- 45 volving loose section, L, a crank-arm, J, upon spindle I, an operating-rod, M, having an arm, V, adapted to be moved by crank-arm J, and mechanism, substantially as shown and described, for connecting bar D and clutch-section H, and for converting a movement of the 50 former to a motion of the latter, for the purpose set forth.

2. In an elevator, the combination, with two 55 movable frames, B, having bars D, supported in position to intercept a projection from lift W before striking the top of the doorway, and arranged upon opposite doorways, of rods E E', framed to crank-arms *k k'* from shaft K, and adapted to convey a movement of the 60 frame B upon either side to the mechanism operating the stopping-rod M, substantially as shown and described.

3. In an elevator, the combination, with 65 rods E E' upon opposite doorways, and adapted upon an upward movement to operate mechanism for moving rod M, and so stopping the elevator, of superimposed frames B, arranged to operate as shown, and flexible connections from said frames to rods E E', adapted 70 to be operative upon a movement of frames B, to lift only the connections interposed between said frames and the rods below the same, for the purpose as set forth.

FRANK S. KING.

Witnesses:

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