

(No Model.)

E. F. SHAW & J. N. LORIO.
ELEVATOR GATE OPERATING DEVICE.

No. 502,936.

Patented Aug. 8, 1893.

Fig. 1

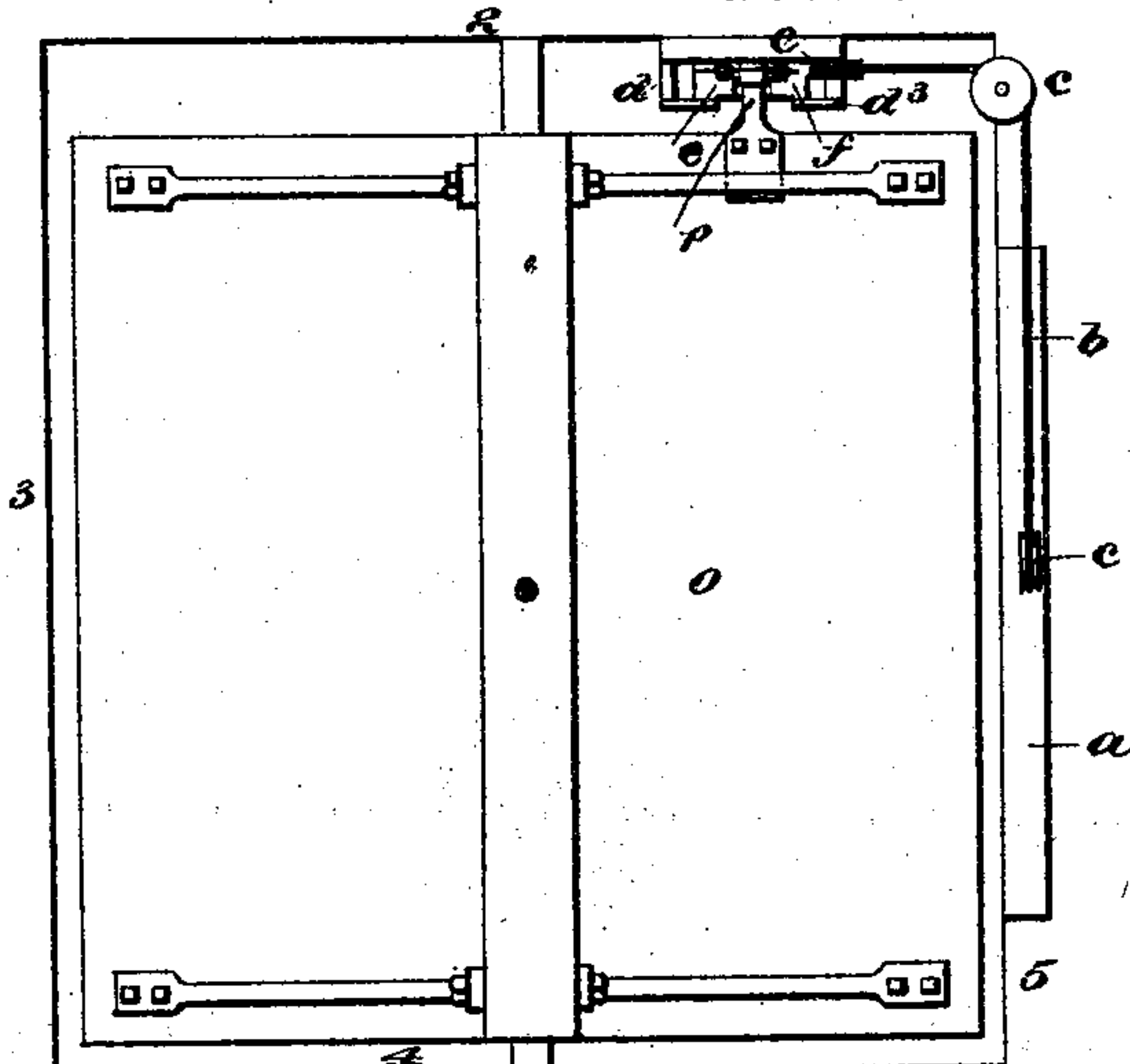


Fig. 5

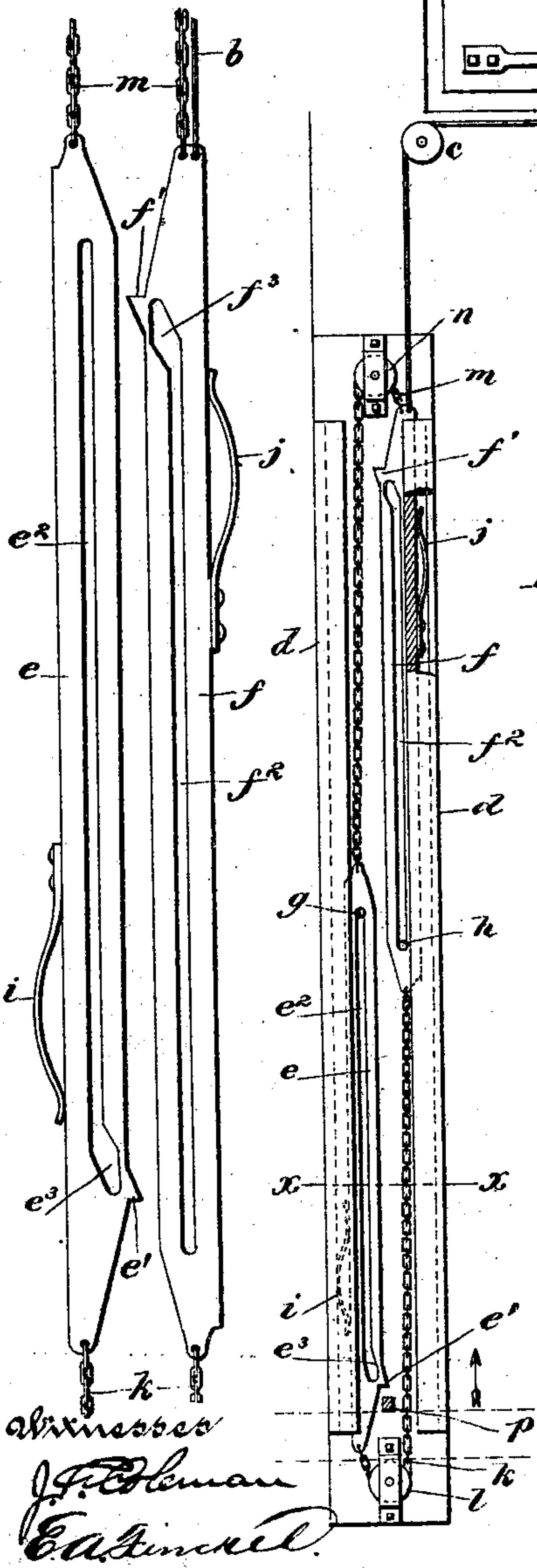


Fig. 2

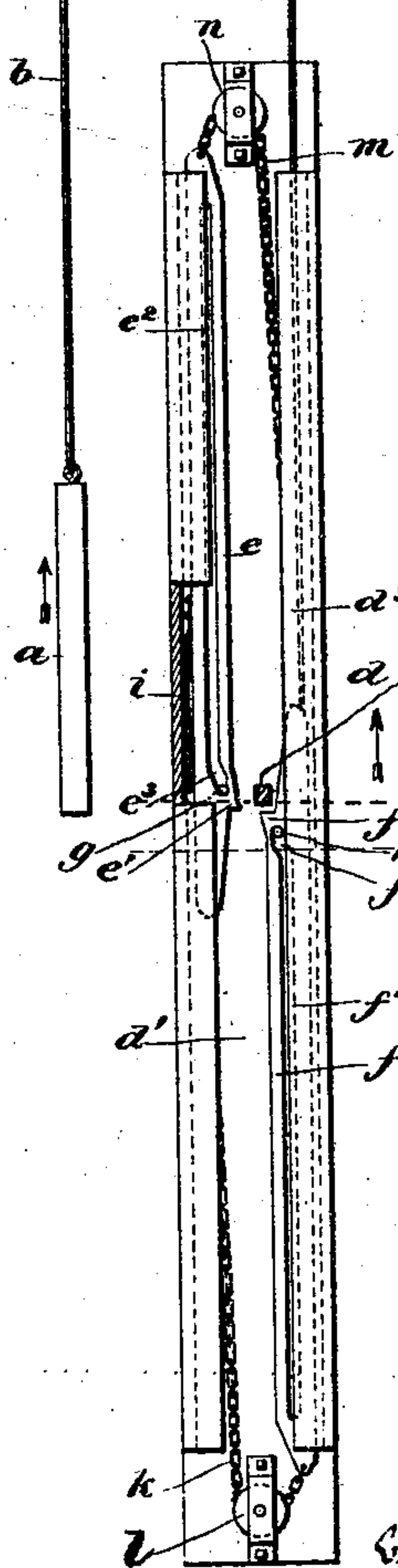
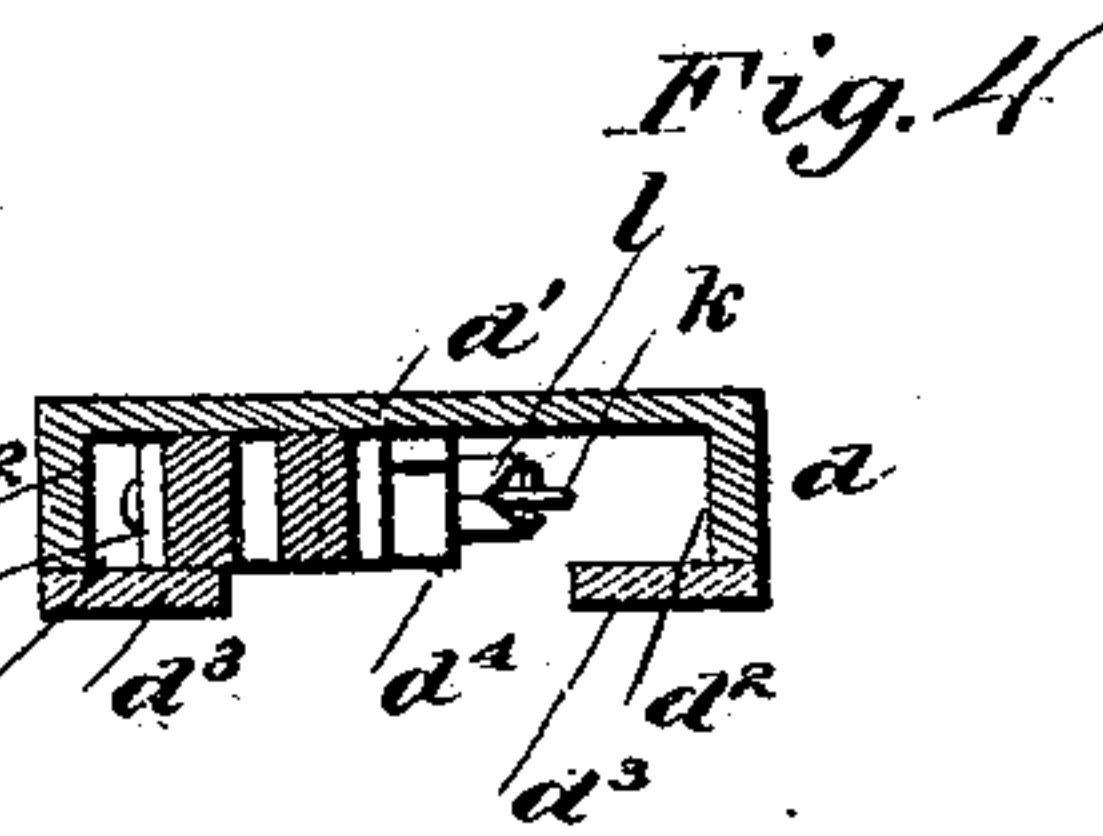


Fig. 3



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UNITED STATES PATENT OFFICE.

EDWIN F. SHAW AND JOSEPH N. LORIO, OF PHILADELPHIA, PENNSYLVANIA.

ELEVATOR-GATE-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 502,936, dated August 8, 1893.

Application filed May 10, 1893. Serial No. 473,678. (No model.)

To all whom it may concern:

Be it known that we, EDWIN F. SHAW and JOSEPH N. LORIO, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Devices for Operating Elevator Safety-Gates, of which the following is a full, clear, and exact description.

10 The object of this invention is to provide for the automatic opening and closing by the elevator car itself of the safety gates commonly used at the landings of elevator shafts or wells in buildings and other structures.

15 In practicing our invention we make use of pairs of oppositely moving trip-slides, as we shall name them for lack of a better term, which are arranged in the well or shaft near each landing, each pair of trip-slides being 20 connected, independently of the others, with the gate at the landing near which the trip-slides are located, to raise and lower the gates as the elevator car approaches the respective landings in its ascent and also in its descent; 25 and for this purpose the elevator car is provided with means for actuating the trip-slides, all as will appear hereinafter more fully, and as particularly pointed out and claimed.

30 In the accompanying drawings illustrating our invention, in the several figures of which like parts are similarly designated, Figure 1 is a plan view of a freight elevator equipped with our invention. Fig. 2 is a side elevation, 35 with part of the guides broken out to show the springs of the trip-slides, and showing the parts in position to be engaged to open or raise the gate. Fig. 3 is a side view showing the parts in position after the gate has been 40 raised and is ready to close, the finger *p* being shown in a false position to illustrate the relation of said finger and the offset *f'* when the gate begins to descend. Fig. 4 is a cross-section on a larger scale of the trip-slides and 45 their guides, taken in the plane of line *x-x* of Fig. 2 and looking downward, and Fig. 5 is an elevation on a larger scale of the two trip-slides detached.

50 The figures 2, 3 and 4 designate the walls of the elevator well or shaft, and 5 designates the landing side. On either of these walls or at the landing side, we arrange our trip-

slides, one pair of the trip-slides for each landing, and we connect the respective gates of the several landings with the pair of trip-slides located at such landings. We have 55 shown, for illustration, the trip-slides located upon the wall 2. *a*, is the gate, *b* its operating cord, chain or other flexible medium, and *c* properly disposed pulleys over which the 60 operating medium is conducted from the gate to the pair of trip-slides to be moved thereby. The guides *d* for the trip-slides are fixed to the wall and are of the cross-section shown in detail in Fig. 4—that is to say, they have a 65 solid back *d'*, the parallel grooves *d²*, and the face-plates *d³* between which is the slot *d⁴*. The trip-slides *e* and *f* are substantially counterparts of one another, or rights and lefts, and are arranged in the guide grooves. The de- 70 scription of one of these trip-slides will answer for both, and hence we will describe them together and designate their corresponding parts by similar distinguishing marks applied to their respective reference letters. 75 These trip-slides have parallel sides, excepting that the lower end of slide *e* has a flat-faced offset *e'*, while the slide *f* has a reversed flat-faced offset *f'* at its upper end. The slides are provided with longitudinal slots *e²*, 80 *f²*, the slot *e²* terminating in a cam-slot *e³* at its lower end, and the slot *f²* terminating in a similar cam-slot *f³* at its upper end. Pins *g* and *h* made fast in the back *d'*, enter the slots *e²* and *f²* respectively, and springs *i* and 85 *j* are interposed between the slides and their guides in order normally to throw the slides against their pins. These springs may be fixed to the slides and they are shown here so applied, but, obviously, they may be other- 90 wise arranged. The lower ends of the slides are connected by a flexible medium *k*, such as a chain, and this chain passes around a pulley *l* below the slides. The upper ends of these slides are also connected by a flexible 95 medium, such as a chain *m* which passes around a pulley *n* above the slides; and the chain *b* of the gate is connected with the upper end of the slide *f*. It will be observed, therefore, that the motion of one slide will be 100 imparted to the other slide to cause it to travel in the opposite direction, and hence that the movement of either slide will cause the gate to be moved.

We have shown the elevator car *o* as having a finger *p* rigidly affixed thereto and projecting beyond its edge into the slot *d*¹ and between the slides. This finger travels in the line of the offsets *e'* and *f'*, and hence, assuming the parts to be as in Fig. 2, the finger *p* of the ascending elevator car will engage the offset *e'* and will carry up the slide *e* with it until the cam-slot *e*³ reaches the pin *g*, when the pin acting against the cam-slot's edge will cause the slide to recede into its guide groove and thereby draw off the offset *e'* from the finger. During the ascent of the slide *e*, the slide *f* will have been carried down by virtue of the connectors *k* and *m*, and the gate *a* will have been raised, but as soon as the pin *g* acts upon the cam-slot *e*³, and thus frees the slide *e* from the finger *p*, the superior weight of the gate tends to cause the gate to descend, and this movement of the gate will bring the offset *f'* into engagement with the under side of the finger *p*, and hence arrest the further movement of the gate and permit it to close only as the elevator car rises. The trip-slides, moved by the descending gate, are restored to normal position in readiness for operation when the elevator car descends on the return trip. Upon such return trip, the finger *p* engages the offset *f'* of the trip-slide *f*, causes such slide to descend, and the slide *e* to ascend, and the gate to open, and then when its cam-slot *f*³ engages the pin *h*, the offset *f'* is freed from the finger and the falling gate arrested by the offset *e'* engaging the finger *p* and following the descending elevator car. Obviously, by stopping the elevator car short of the pins *g* and *h*, the gate may be held open for any length of time.

We have described the finger *p* as fixed to the elevator car and thus the gate of each landing will be opened whether a stop is to be made or not, but we do not limit our invention to a fixed finger. Of course, for mere purposes of insuring the closing of the gates as the elevator car leaves the landing, the fixed finger is most efficient.

It will be seen that the trip-slides are always automatically "set" or ready for operation, and are wholly independent of the action or inaction of the elevator operator in this regard, and so the main purpose of providing safety gates, namely, to insure the closing of the gates when the elevator car is not at the landing is fulfilled.

What we claim is—

1. A device for operating an elevator safety gate, comprising a pair of trip-slides connected to move together in opposite directions

and also connected with the gate, and provided with cam-slots and adjacent offsets, a finger on the elevator car adapted to engage the offset of one or the other of the pair of trip-slides, and fixed pins which periodically engage the cam-slots to disengage the finger and trip-slides, substantially as described.

2. A device for operating an elevator safety gate, comprising a pair of trip-slides connected to move together in opposite directions and also connected with the gate, and provided with longitudinal slots which terminate in cam-slots at opposite ends of the respective slides, guides in which said slides are movable lengthwise, pins on said guides engaging the slots and which pins cause the said slides to move laterally when entering their cam-slots, offsets on the said slides opposite their cam slots, and a finger on the elevator car traveling in a right line between the slides and in the line of their offsets, substantially as described.

3. A device for operating an elevator safety gate, comprising a pair of trip-slides connected to move together in opposite directions and also connected with the gate, and provided with longitudinal slots which terminate in cam-slots, the cam-slot of one slide being at the end opposite that in the other slide, offsets on adjacent sides and at opposite ends of the respective slides, guides in which the slides are capable of longitudinal and also of lateral movement, springs interposed between the slides and their guides which normally press the slides toward one another, pins on the guides entering the slots in the slides, and a finger on the elevator car adapted to engage the offsets, substantially as described.

4. A device for operating an elevator safety gate, comprising a pair of trip-slides connected to move together in opposite directions and also connected with the gate, means on the elevator car to engage one or the other of such slides and move it in the direction in which the elevator car is traveling and thereby open the gate, and means to move the said slide so engaged laterally away from and out of engagement with its elevator car connection and to move the other slide into engagement with the car connection to effect the closing of the gate, substantially as described.

In testimony whereof we have hereunto set our hands this 8th day of May, A. D. 1893.

EDWIN F. SHAW.
JOSEPH N. LORIO.

Witnesses:

HENRY W. SCATTERGOOD,
SAMUEL E. CARVER.