(No Model.) 2 Sheets—Sheet 1.

A. ELLIOTT.

ELEVATOR GUARD.

No. 492,350. Patented Feb. 21, 1893.

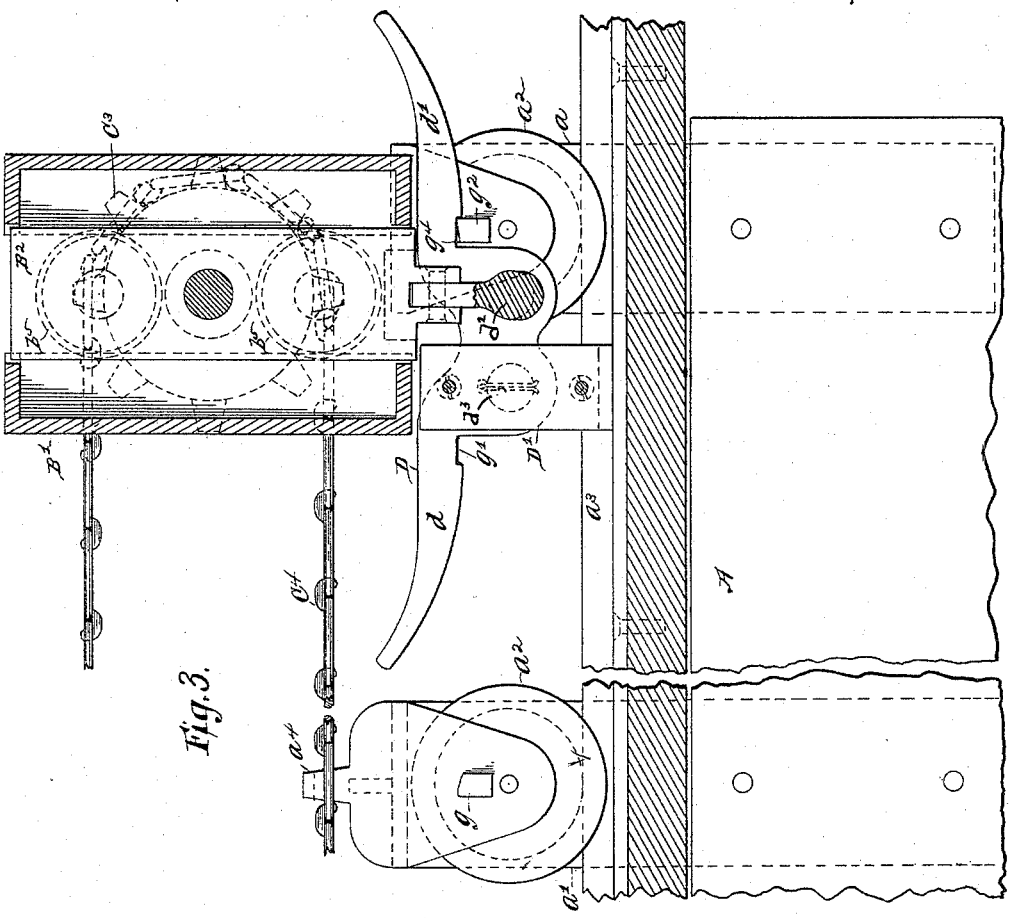

Fig. 3.

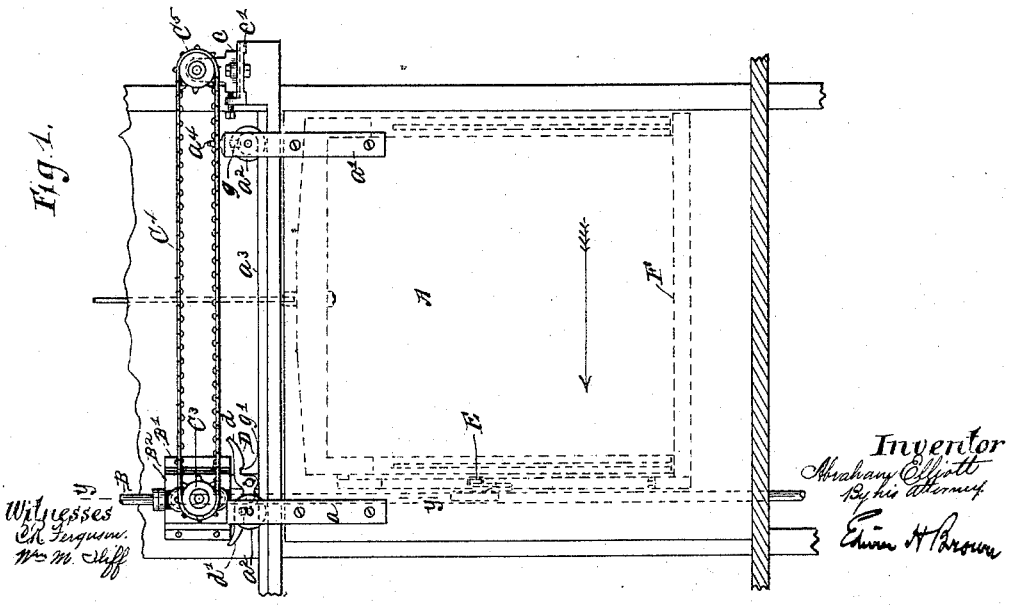

Fig. 1.

Witnesses
C. K. Ferguson.
Wm. M. Hoff

Inventor
Abraham Elliott
By his Attorney
Edwin A. Brown

(No Model.) 2 Sheets—Sheet 2.

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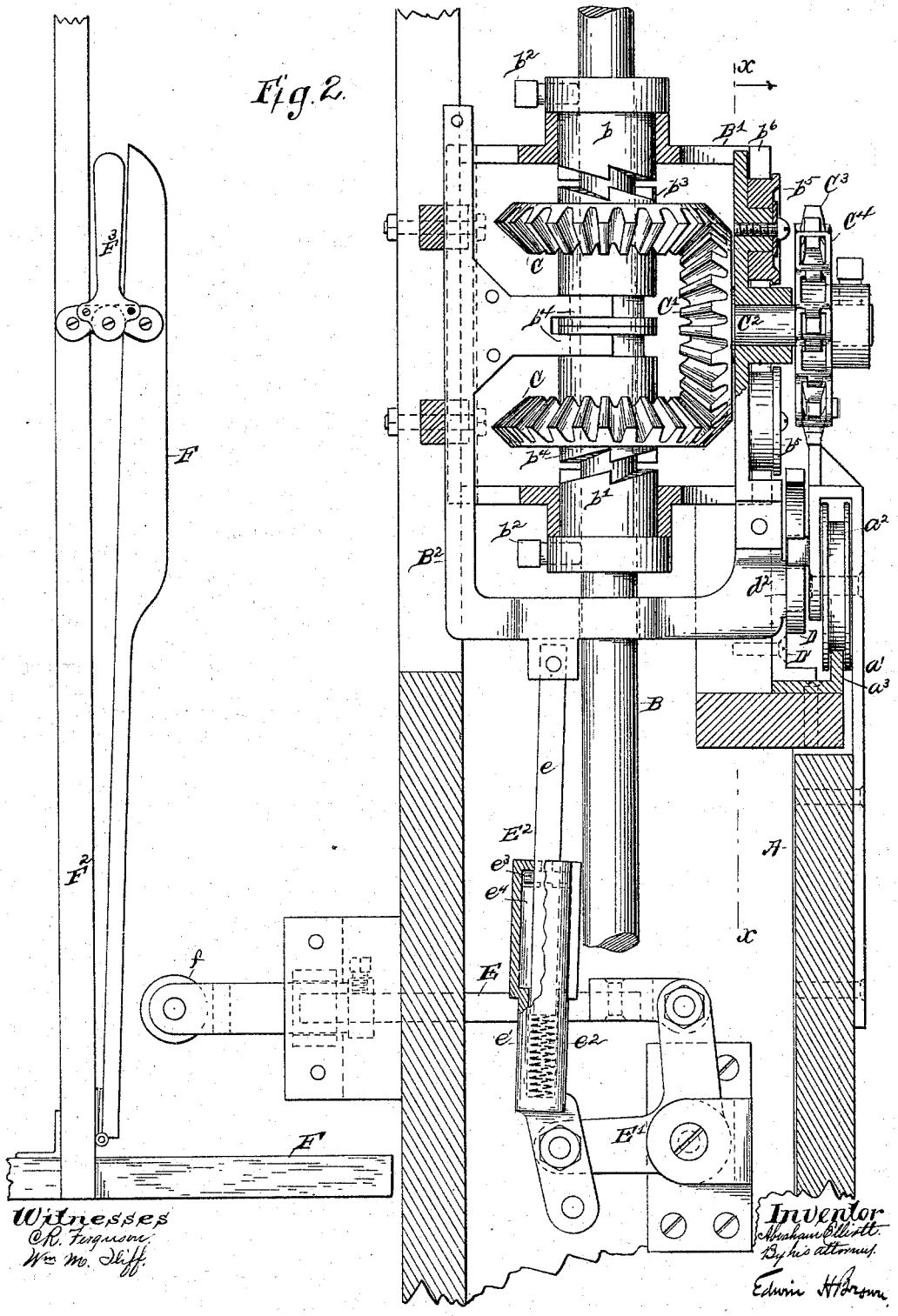
Fig. 2.



UNITED STATES PATENT OFFICE.

ABRAHAM ELLIOTT, OF ROCHESTER, ASSIGNOR TO THE EXCELSIOR ELEVATOR GUARD AND HATCH COVER COMPANY, OF NEW YORK, N. Y.

ELEVATOR-GUARD.

SPECIFICATION forming part of Letters Patent No. 492,350, dated February 21, 1893.

Application filed April 11, 1892. Serial No. 428,606. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM ELLIOTT, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Elevator-Guards, of which the following is a specification.

This invention relates to that class of elevator guards or doors which is opened by the movements of the elevator or car, and it consists in the construction and novel arrangement of parts as hereinafter set forth.

In the accompanying drawings, Figure 1 is a front elevation of a mechanism embodying my improvement. Fig. 2 is an enlarged vertical section on the line *y y* of Fig. 1. Fig. 3 is a rear sectional elevation on the line *x x* of Fig. 2.

Similar letters of reference designate corresponding parts in all the figures.

Referring by letter to the drawings, A designates a guard or door for an elevator shaft supported by hangers *a a'*, each provided with a roller a^2 running upon a fixed track a^3. The door, in Fig. 1, is shown as closed and the arrow indicates the direction of movement to open it. This door or guard A may be opened and closed automatically and I will now describe the mechanism employed therefor.

B designates a vertical shaft extending adjacent the elevator shaft and the full length thereof, or from the lower floor to the top of the last upper door or guard. This shaft is rotated, while the elevator is in use, by any suitable means such as an engine, and at each floor a clutch mechanism is provided between this shaft and a door or guard, but, as these several mechanisms are of similar construction, I have shown but one of them.

The clutch mechanism consists of clutch sections *b b'* rigidly mounted on the shaft and held in position by means of set screws b^2. These clutch sections *b b'* are here shown as having bearings in a boxing or casing B' secured by screws or otherwise to a wall of the elevator shaft above the door or guard. Clutch sections b^3 b^4 are loosely mounted on the shaft B and are movable lengthwise thereof to coact with the clutch sections *b b'*. At their adjacent ends the clutch sections b^3 b^4 are provided with annular grooves into which arms b^4 engage. The arms b^4 are integral with or are secured to a frame B^2 movable vertically in the casing B'. The front portion of the frame B^2 may have anti-friction rollers b^5 journaled to it to engage with the side walls of a vertical slot b^6 in the front of the casing B'.

Each clutch section b^3 b^4 has attached to it a bevel gear C which engages at opposite sides with a bevel gear C' having its shaft C^2 extending outward through a bearing in the front of the frame B^2. A sprocket wheel C^3 is attached to the projected end of the shaft C^2 and a sprocket chain C^4 extends from the wheel C^3 over the top of the door or guard to a sprocket wheel C^5. This sprocket wheel C^5 may be rendered adjustable to take up any slack in the chain C^4 by mounting it on a block *c* movable on a base *c'* and held in position by means of a set screw c^2.

One of the door hangers, here shown as the door hanger *a'*, is provided with an upward extension a^4 which engages with the sprocket chain c^4 so that when said chain is moved the door or guard will also be moved.

D is a lever having oppositely extending arms *d d'* provided with cam or curved surfaces. This lever D is pivoted at a point at one side of its vertical center to a lug d^3 extending from a plate D' attached to a fixed wall and at the opposite side of its vertical center the lever has a pivotal engagement with a lug d^2 extending from the frame B^2.

E is a push bar extending through an opening in the side wall of the elevator shaft and having a pivotal engagement with one arm of a bell crank lever E' pivoted to a fixed bracket. A link E^2 extends from the other arm of the bell crank lever E' to a pivotal connection with the frame B^2. I prefer this link E^2 to have a slight longitudinal yield and I therefore construct it of two sections *e e'*. The upper section is in the form of a bar or rod and the lower section is in the form of a cylinder into which the lower end of the section *e* extends and is movable. A cushion in the form of a spiral spring e^2 is interposed between the lower end of the section *e* and the bottom or the section *e'*.

To prevent the section *e* from turning relatively to the section *e'*, I may provide the section *e* with pins e^3, which extend into vertical

ways or grooves e^4 formed in lateral projections of the section e', as shown in Fig. 2.

F designates the elevator or car carrying a cam bar F′ for operating against the push bar E during an upward or downward movement of the car. The cam bar F′ is shown as having a hinge connection at its lower end with an upright F^2 on the car F, and the upper portion of the bar F′ has a toggle link and lever connection F^3 with the upright F^2. By means of this toggle link and lever connection, the cam bar F′ may be moved by an operator into or out of the plane of the push bar E; so that it is optional whether or not a door or guard at a certain floor shall be opened by the movement of the car. The outer end of the push-bar E is preferably provided with an anti-friction roller *f*.

The operation is as follows. As the car ascends the upper end of the cam bar F′ engages the push bar E and forces it longitudinally inward, and this movement operating through the lever E′ and link E^2 elevates the frame B^2 so that the clutch sections b b^3 engage. The rotating shaft B thus operates the gears C C′ and the sprocket mechanism to open the door or guard. When the door is nearly closed a tapper g on the hanger a' engages the under side of the arm d of the lever D and forces said lever to a substantially level position to draw the clutch sections out of engagement and in the position shown in Fig. 2. When the door is completely opened the tappet g engages a notch g' in the lever. These two parts interlocking will prevent the rebounding of the door. The last movement described, that is, the disengaging of the clutch sections b b^3 compresses the spring e^2 but does not impart any movement to the bar E because said bar is still in engagement with the cam F′. Upon a further movement of the car to release the cam from the bar E, the bar E is forced outward by the spring e^2 and the clutch sections b' b^4 fall into engagement and operate to close the door. Of course when the door is closed the clutch sections are disengaged by a tappet g^2 on the hanger a operating the lever D in a manner as before described, and locking with a notch g^4 in the arm d' of the lever.

Having described my invention, what I claim is—

1. In combination with an elevator guard or door, a vertical rotary shaft, clutch sections rigidly mounted thereon, clutch sections movable longitudinally on the shaft and constructed to engage with the first named clutch sections, connections between said clutch sections and the guard or door, and a lever, having the oppositely extending arms alternately engaged by the guard or door to disengage clutch sections, substantially as specified.

2. In combination with an elevator guard or door and a car, a vertical rotary shaft, clutch sections rigidly mounted thereon, clutch sections movable longitudinally on the shaft, a frame carrying the movable clutch sections, connections between said frame and the car whereby clutch sections are moved into engagement, a sprocket mechanism between the guard or door and clutch mechanism whereby the guard or door is operated, and a lever, having oppositely extending arms alternately engaged by the guard or door to disengage clutch sections, substantially as specified.

3. In combination with an elevator car and elevator shaft and a guard or door therefor, the vertical rotary shaft, clutch sections rigidly mounted thereon, clutch sections movable longitudinally on the shaft, a gear wheel on each of the movable clutch sections, a gear wheel meshing with the first named gear wheels, a chain operated by the last named gear wheel and having a connection with the guard or door, a lever, having the oppositely extending arms alternately engaged by the guard or door to disengage clutch sections, and a cam on the elevator operating to move clutch sections into engagement, substantially as specified.

4. In an elevator shaft guard or door actuating mechanism, the combination with a vertical rotary shaft, of a sprocket mechanism engaging the guard or door, clutch mechanism on the shaft operating the sprocket mechanism, a vertically movable frame carrying portions of the clutch mechanism, a cam carried by an elevator car, a push bar operated by the cam, a bell crank lever, and a link connection between the bell crank lever and the frame carrying the clutch mechanism, the said link comprising two sections and a cushion providing a yielding connection between the two sections, substantially as specified.

5. The combination with the elevator shaft guard or door, of the vertical rotary shaft, clutch mechanism substantially such as described, a sprocket mechanism between the clutch mechanism and guard or door, the lever D having the oppositely extending arms, and tappets carried by the guard or door for operating the lever to disengage clutch sections, substantially as specified.

6. In combination with the guard or door, the vertical rotary shaft and clutch mechanism, substantially such as described, of the sprocket mechanism engaging with the guard or door, tappets carried by the guard or door and the lever having the oppositely extending arms provided with the cam surfaces and having the notches with which the tappets may interlock, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ABRAHAM ELLIOTT.

Witnesses:
S. O. EDMONDS,
WM. A. POLLOCK.