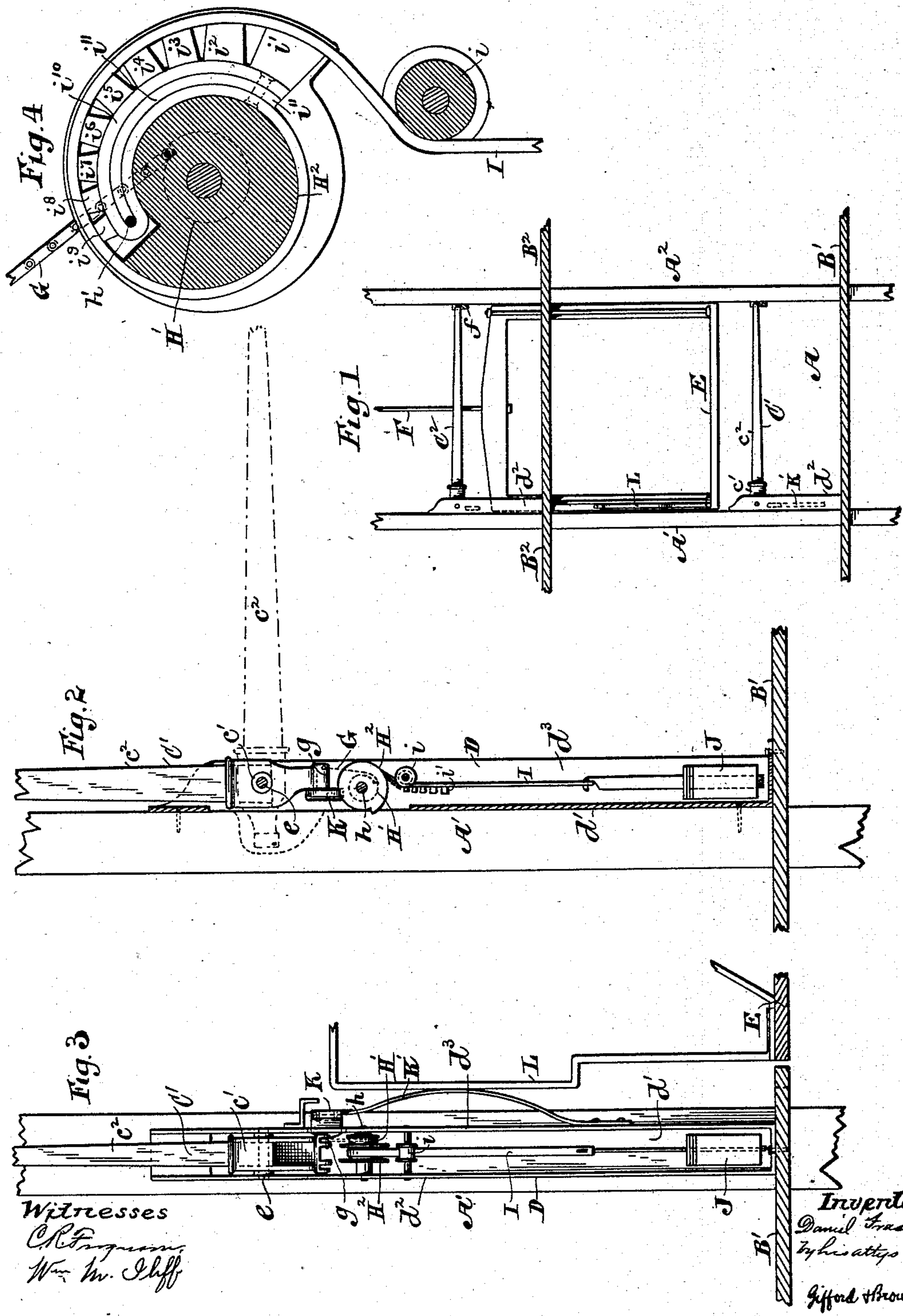


(No Model.)

D. FRASER.
ELEVATOR HATCHWAY GUARD.

No. 413,318.

Patented Oct. 22, 1889.



Witnesses
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DANIEL FRASER, OF NEW YORK, N. Y., ASSIGNOR TO THE EXCELSIOR ELEVATOR GUARD AND HATCH COVER COMPANY, OF SAME PLACE.

ELEVATOR-HATCHWAY GUARD.

SPECIFICATION forming part of Letters Patent No. 413,318, dated October 22, 1889.

Application filed June 26, 1889. Serial No. 315,682. (No model.)

To all whom it may concern:

Be it known that I, DANIEL FRASER, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Guards for Elevator-Hoistways, of which the following is a specification.

I will describe a guard for an elevator-hoistway embodying my improvement, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a vertical section through two floors of a building and a side view of the hoistway of an elevator and of an elevator-car and appurtenances. Fig. 2 is an enlarged vertical section taken in a plane parallel to the plane of Fig. 1, and showing parts of the hoistway and a guard applied thereto embodying my improvement. Fig. 3 is a vertical section through the hoistway in a plane at right angles to the planes of Figs. 1 and 2. Fig. 4 is a vertical section of certain appurtenances of the guard.

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

A designates the hoistway. It is intended to have four corner-posts, as usual.

A' A² are the front posts, or, in other words, the posts which are adjacent to the openings affording communication between the hoistway and the several floors of the building.

E designates the elevator-car. It may be of any suitable construction, and is raised and lowered by means of a cable F.

C' C² designate guards, which are intended to normally extend across openings affording communication between the hoistway and the different floors. Each of the guards consists of a lever fulcrumed near one end to one of the posts of the hoistway—in the present instance to the post A'. I have shown a casting D secured to one side of the post A', and having the lever forming the guard fulcrumed to it. This casting D is made in the form of a box having a back d' and two sides $d^2 d^3$. The back is cut away at one point to allow of the swinging of the short arm of the lever forming the guard, and opposite the cut-away portion a cavity is formed in the post A' to accommodate the lever.

The lever forming each guard is shown as made of two parts—a socket-piece c' and an

arm c^2 . The socket-piece may be made of cast-iron, and this is connected to the casting D by means of a pin e passing transversely through it and through the sides $d^2 d^3$ of the casting D. The arm c^2 is fitted in one extremity of the socket-piece, and fastened there in any suitable manner. For instance, it may be driven in friction-tight, and the pin e may pass through it as well as through the socket-piece c' . The lever normally occupies a horizontal position, and when it is in this position its free end descends into a rest f , consisting, in the present instance, of a notched plate fastened to the post A² of the hoistway. The short arm of the lever is connected to a chain G. This chain is wound around a volute drum H', which is of spiral form, and one end of the chain is attached to this drum. The end of the chain which is attached to the lever passes between two small jaws g , which are formed at the extremity of the lever, and is secured there by a cross-pin passing through the jaws and the chain. It will be seen by reference to Fig. 3 that there are two pairs of the jaws g . This is only because it is sometimes desirable to arrange a lever on one side and sometimes to arrange it on the other side of a hoistway, and by having two pairs of jaws this becomes possible.

The drum H' is formed integral with or connected to a volute drum H², so that when one drum rotates the other also rotates. A shaft or bar h , supported in the side pieces $d^2 d^3$ of the casting D, supports the drums.

The drum H² is of spiral form and has wound upon it a strap I. This strap passes around a guide-pulley i and has connected to the lower end a weight J.

It will be observed that the drums, the guide-pulley, the chain and strap, and the weight J are located within the casting D. It is obvious that there may be a front plate detachably secured to this casting to inclose these parts.

The weight J is not sufficient to overbalance the lever forming each guard; hence the lever will always descend into the horizontal position despite the fact that it is combined with the weight.

It will be seen that the chain G is connected

to the lever forming a guard at one side of the longitudinal center of the lever, and that the point of the connection is offset from the longitudinal center of the lever, so that when the lever is raised the point of connection will be farther from the post A' than the center of the lever will be.

The strap I is of peculiar construction and peculiarly combined with the windlass H². The strap may be of leather. The upper part has a number of blocks *i'* *i*² *i*³ *i*⁴ *i*⁵ *i*⁶ *i*⁷ *i*⁸ *i*⁹ secured to that side which is innermost when this portion of the strap is wound upon the drum. It will be seen that these blocks project different distances, the block *i'* projecting farther than the block *i*², and so on down to the end of the series until the block *i*⁹ has but a slight projection. The terminal portion of the strap I beyond that portion which has the said blocks fastened to it is a plain smooth strap and is wound upon the drum. The extremity is secured to the drum by being doubled around a pin *h'*, and the portion *i*¹⁰ of the strap which passes around the loop is doubled or turned back and has between it and the adjacent portion of the strap a piece of strap *i*¹¹. The doubled portion of the strap I and the interposed piece of strap *i*¹¹ are secured together by a rivet. These three thicknesses of strap are nevertheless flexible.

By the spiral shape of the drum H' the chain connected to the lever forming the guard will, as the lever descends toward a horizontal position, pass from a surface of smaller diameter continuously, and in this way the force which the lever exerts through this drum is continuously decreased as compared with what it would be if the chain were unwound from a cylindrical surface.

The spiral of the drum H² is the reverse of that of the spiral H'. As the lever forming a guard descends, the strap will be winding continuously upon a surface of increasing diameter, and hence the weight will become more powerful to resist the descent of the lever as the lever descends.

The action of the chain and the strap in connection with the spiral drums causes the lever to descend gently. I desire to call attention to the fact that as the point of the connection of the lever G to the lever forming the guard is offset from the longitudinal center of the lever the counterbalance-weight serves to pull the short arm of the lever backward or toward the post A' after the lever has been raised to its upright position and released, and that the counterbalance-weight is therefore enabled to start the lever in its descent.

The counterbalance-weight J may be composed of a main part and of several slotted leaves or plates superposed upon the main part and embracing a bar to which the main part is secured. These plates may be removed or added to establish a proper relation between the whole ponderosity of the weight J

and the weight of the lever forming the guard. The bar to which the various parts of the weight are fastened is shown as having a hooked upper end, which engages with a hole in the strap I.

The lever forming the guard is intended to be raised by hand. It will be locked in position when the elevator-car is opposite the corresponding floor in the building, so that the lever will not interfere with taking goods off or on the elevator-car. The locking device consists of a plate K, attached to the upper end of a spring K', which at the lower end is shown as fastened by rivets or similar means to the side *d*³ of the casting D. The elevator-car carries a bar L, which at the upper portion is bent toward the front of the hoistway and forms, in effect, a cam-surface. When the elevator-car is level with a floor of the building, it forces the free end of the spring forwardly, and if the lever forming the guard for that floor is at the time elevated the plate K will be forced behind the short arm of the lever, and will thereby hold the lever in an upright position. As soon as the car is moved sufficiently far in either direction to release the spring K', the plate K will be moved outwardly by the spring and will release the guard.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight for the lever, a drum having a spiral surface, a flexible connection between the drum and the lever, a second drum united with the first and having a spiral surface reverse to the first-named spiral, and a flexible connection between the second drum and the counterbalance-weight, substantially as specified.

2. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight for the lever, a drum, a flexible connection between the drum and the lever, a second drum united with the first and having a spiral surface, and a strap sustaining the counterbalance-weight and having a series of blocks of different projections attached to its inner side, substantially as specified.

3. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight for the lever, a drum, a flexible connection between the drum and the lever, a second drum united with the first and having a spiral surface, a strap sustaining the counterbalance-weight and having a series of blocks of different projections attached to its inner side and its extremity doubled back and united to the main portion, substantially as specified.

4. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight for the lever, a drum, a flexible connection between the drum and the lever, a second drum united with the first, and a flexible connection between the second drum and the counterbalance-weight, the said drums being

made in the form of reverse spirals, substantially as specified.

5 5. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight for the lever, a drum, a chain, cord, or strap connecting the drum with the lever, the chain, cord, or strap of the drum being connected to the lever at a point offset to one side of the longitudinal center of the lever, substantially
10 as set forth.

6. The combination, with a hoistway of an elevator, of a lever, a counterbalance-weight

having a flexible connection with the lever, a box-shaped casting containing the weight, a spring connected to the casting, a detent at 15 the end of said spring to engage with and lock the lever, and a cam carried by the elevator-car for operating the spring, substantially as specified.

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Witnesses:

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