

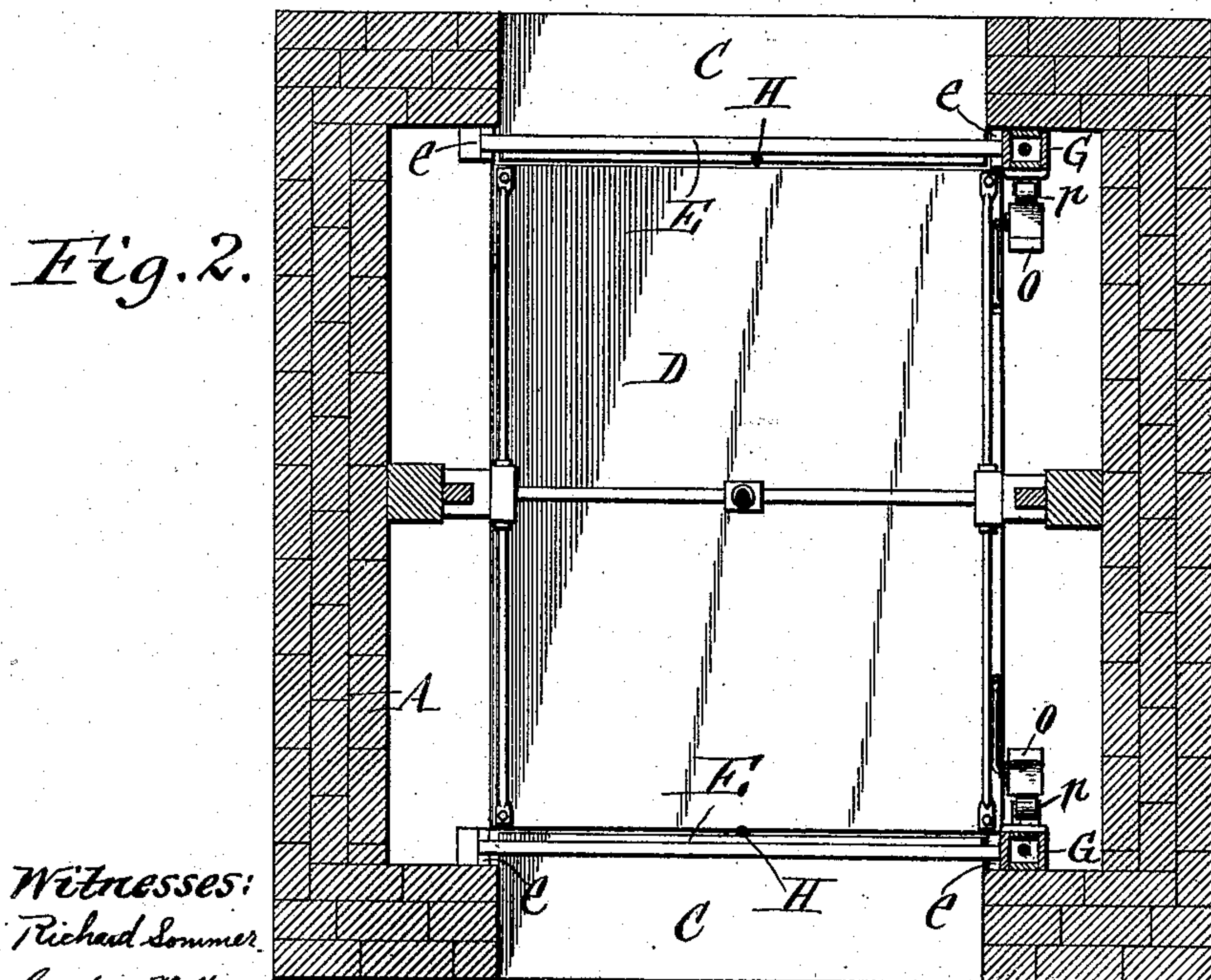
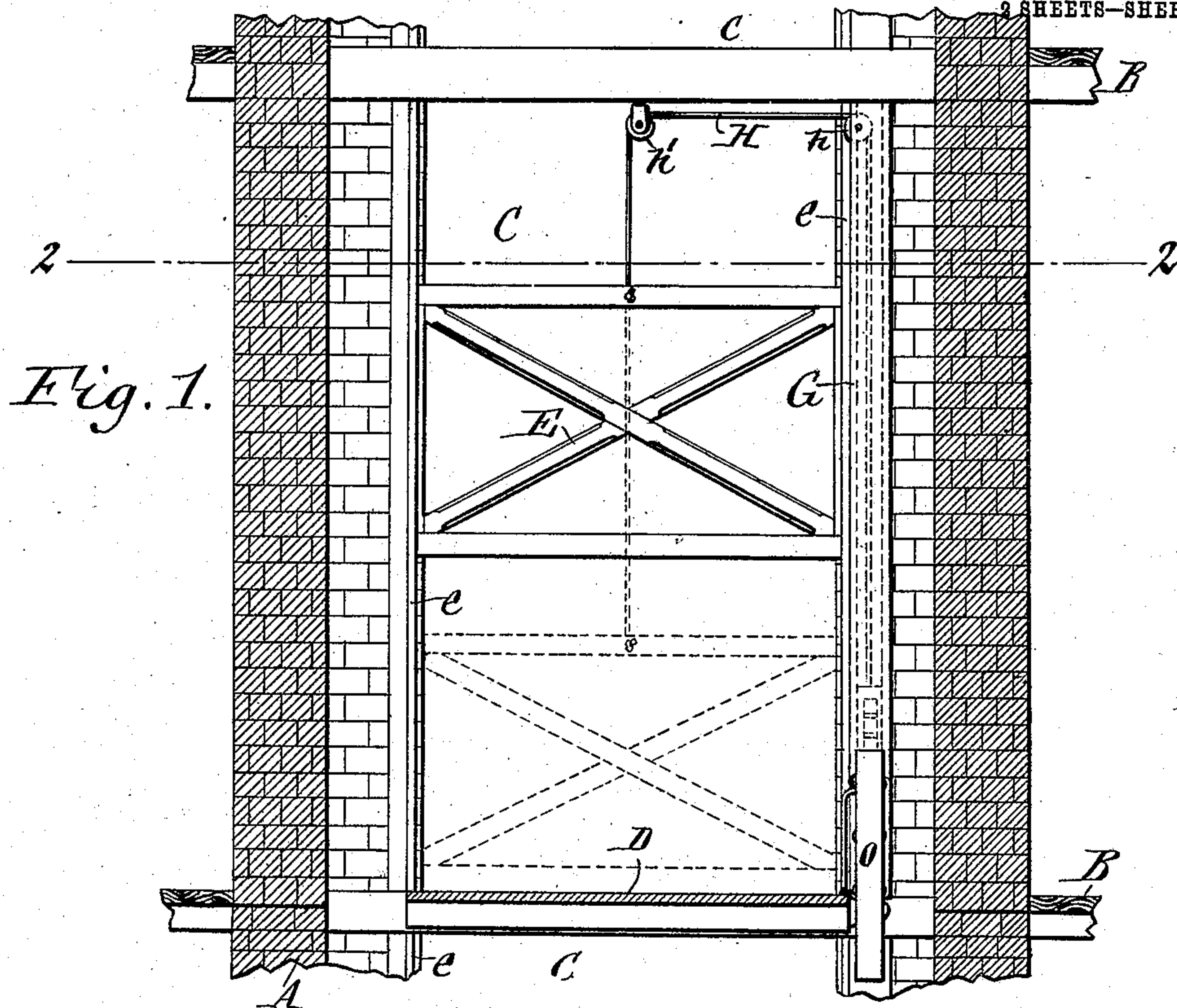
M. D. VANDERHEYDEN.
SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED JAN. 27, 1908.

911,631.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 1



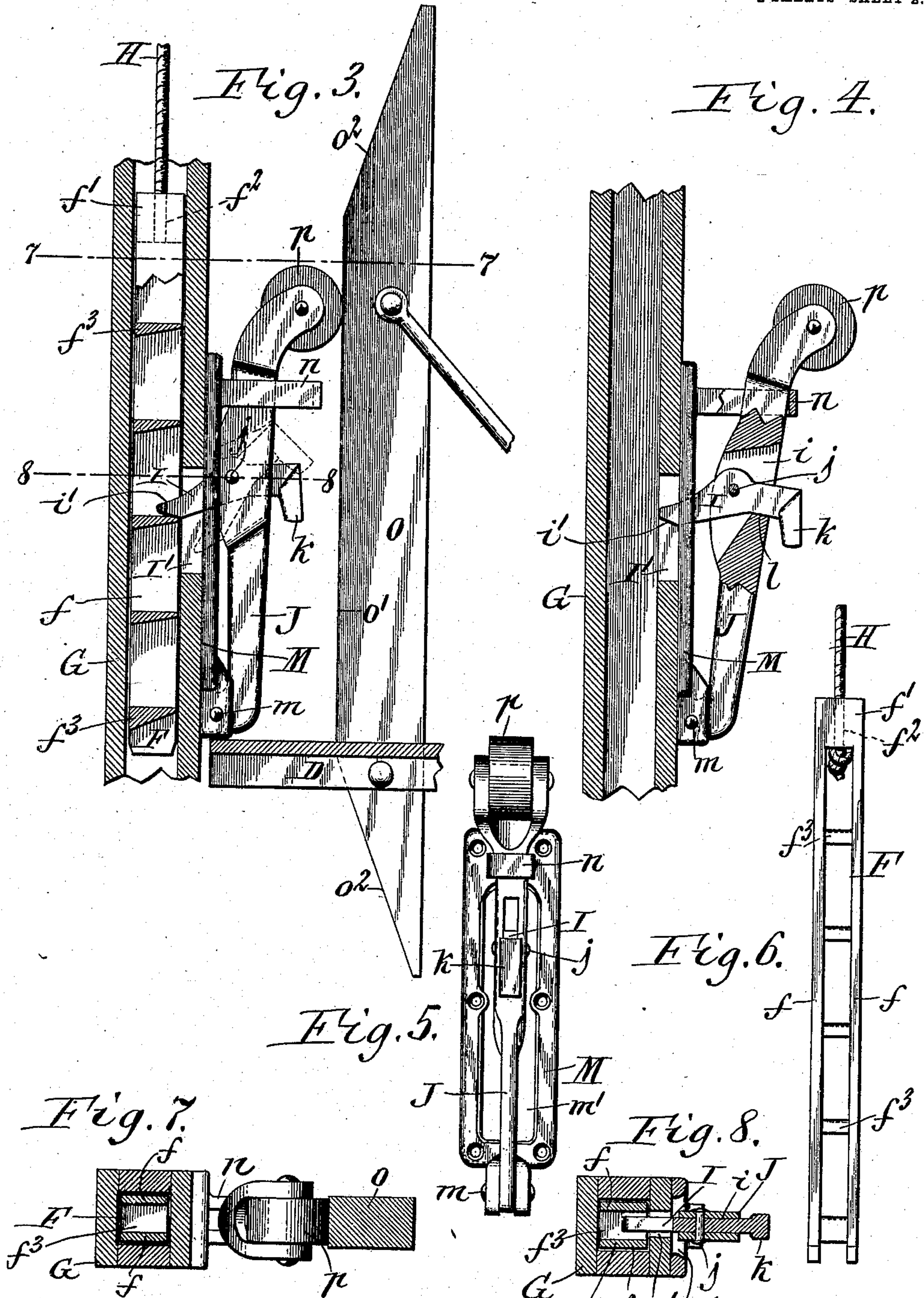
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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

No. 911,631.

Specification of Letters Patent.

Patented Feb. 9, 1909.

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To all whom it may concern:

Be it known that I, MERTON D. VANDERHEYDEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Safety Devices for Elevators, of which the following is a specification.

This invention relates to a safety device for controlling the operation of the gates or doors which close the doorways or openings leading to elevator shafts or hatchways and more particularly to that class of devices or controllers which are known as semi-automatic in which the door or gate is raised or opened manually and held in this position if the elevator car is located at that particular floor but releases the door or gate and permits the same to close automatically when the car leaves that particular floor.

The object of this invention is to provide an improved safety device of this character which is simpler in construction and more reliable in operation and which is very compact in construction, thereby rendering the same especially suited for elevators having a brick hatchway in which the available space for installing a safety device is very limited.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a fragmentary vertical section of an elevator provided with my improved safety device. Fig. 2 is a horizontal section thereof on line 2—2, Fig. 1. Fig. 3 is a fragmentary vertical section, on an enlarged scale, and showing the parts of the safety device in position for holding the gate or door in its elevated position. Fig. 4 is a similar view showing the position of the detent pawl or dog in its retracted or inoperative position in which the gate is released and permitted to descend into its closed position. Fig. 5 is a face view of the detent pawl, its shifting lever and associated parts. Fig. 6 is a similar view of the gate weight. Figs. 7 and 8 are horizontal sections on the correspondingly numbered lines in Fig. 3, respectively.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the elevator shaft or hatchway extending vertically through the several floors B of the building and provided on each floor with one or more gate ways or door openings C. As shown in the drawings, this

hatchway is constructed of brick for better protection against fire and provided on its opposite sides at each floor with gateways or door openings. Moving vertically in this shaft or hatchway is the car D which together with its raising and lowering mechanism may be of any suitable and approved construction.

Each of the gateways or door openings of the elevator shaft is provided with a gate or door E which is guided on its opposite vertical edges in vertical guideways *e* arranged on the respective sides of the gateway. This gate normally remains by its weight in its lowered position in which it practically closes the opening leading from the floor to the hatchway.

F represents a gate-weight which moves vertically in an upright guideway or weight box G arranged on the inner side of the hatchway adjacent to one side of the gateway and which is operatively connected at its upper end with the top of the gate by means of a rope or similar flexible member H passing over wheels or pulleys *h*, *h*¹ at the top of the weight box and the gateway so that upon lowering the gate the weight will be raised while upon raising the gate the weight will be lowered in the box G. This gate-weight preferably consists of two upright parallel bars *f*, *f*, a head *f*¹ connecting the upper ends of these bars and provided with a vertical opening *f*² and a plurality of cross pieces or teeth *f*³ connecting said side bars at different points in its height below the head thereof. The gate rope H is secured to this gate-weight by passing it through the opening of the head and tying a knot in the rope for engagement with the underside of said head, as shown in Fig. 6. Each of the teeth *f*³ is preferably made V-shaped or tapering in cross section with its pointed or narrow end facing forwardly and its upper side arranged horizontally while its lower side inclines downwardly from its front to its rear end.

I indicates a detent pawl or dog which is arranged with its operative or front arm in an opening I¹ in the outer side of the weight box adjacent to the place where the gate-weight is located when the gate is raised and which is adapted to be moved transversely forward into the path of the gate weight for engaging one of the teeth thereof and holding the gate in its raised position or to be

retracted from the path of the weight and the respective teeth thereof to permit the gate to descend into its lowered position. This pawl is arranged in an opening i formed in the central part of an upright shifting lever J to which it is pivoted by means of a transverse pin j so as to be capable of swinging in a vertical plane. The pawl is normally held in a nearly horizontal position by means of a weight k arranged on its outer or rear arm which tends constantly to lift its front or inner arm, the movement of the pawl in this direction being limited by means of a stop shoulder l which is formed on the bottom of the recess or opening i in the shifting lever in position to be engaged by the underside of the rear arm of the pawl, as shown in Fig. 4. The lower end of this shifting lever is pivoted by means of a transverse pin m to the lower end of a bracket M which is secured to the weight box and extends upwardly nearly the full height of the shifting lever.

The central part of the bracket is provided with an opening m^1 through which the front arm of the detent pawl projects. The pivot at the lower end of the shifting lever is located in front of the center of gravity of the shifting lever so that the weight of the latter constantly tends to swing the upper end of the same backwardly or away from the weight box. The movement of the shifting lever in this direction is limited and also guided by a stop and guide device which preferably consists of a loop n arranged on the upper part of the bracket and embracing the shifting lever near its upper end and above the pawl.

O represents a shifting cam or shoe which is mounted on the elevator car and adapted to shift the lever J when the car is opposite the gateway or opening at the respective floors and cause the detent pawl to be moved into the proper position for engaging the gate-weight and holding the gate open if the same should be raised by hand. This cam or shoe is provided with a central vertical face o^1 and inclined or receding faces o^2 at opposite ends of the vertical face which are adapted to engage with an anti-friction roller p pivoted on the upper bifurcated end of the shifting lever above the pawl and guide and stop n .

When the elevator car is not present at the particular floor of the building then the shifting lever is free to swing outwardly or rearwardly by gravity into the position shown in Fig. 4 in which it carries the detent pawl backwardly so that its front arm clears the path of the gate weight. If at this time the gate should be raised the same will not be caught and held but will immediately return by gravity when released to its closed position, thereby preventing leaving the gateway leading to the hatchway unob-

structed when the car is not at that particular floor. When the car arrives opposite a gateway, its cam or shoe by engaging with the roller of the shifting lever moves the latter forwardly together with the detent pawl so that the front arm of the same projects into the guideway within the guide box. If the gate is raised while the shifting lever, pawl and car are in this position the gate weight in its descent through the weight box will cause the front arm of the pawl to be deflected every time one of its teeth f^3 strikes the same. After a tooth of the gate weight clears the front arm of the detent pawl, the latter swings forwardly over the respective tooth in position to engage with the upper side of the same and prevent the weight from rising and the gate from descending when the latter is let go by the person who lifted it. As the elevator leaves the particular floor the cam or shoe is withdrawn from the roller p , whereby the shifting lever is permitted to swing backwardly by gravity and withdraw the operative or front arm of the detent pawl from the particular tooth or cross piece of the gate weight, whereby the latter is released and the gate is permitted to automatically descend into its closed position.

The end of the front arm of the detent pawl or dog is preferably made pointed and provided with an inclined lower face i^1 which extends backwardly and downwardly from its front end whereby the possibility of this pawl meeting end to end with one of the teeth of the gate weight and the liability of blocking the safety device or breaking the same is avoided.

By mounting the detent pawl on a single armed shifting lever which is pivoted at its lower end so that gravity will operate to retract it to its inoperative position, the use of springs for this purpose is avoided thus reducing the liability of this mechanism getting out of order. Furthermore, by operatively engaging the shoe or cam on the car with the shifting lever above the detent pawl it is possible to obtain a very compact construction and still give the parts sufficient freedom of movement to work reliably.

By constructing the weight in the manner shown and described comparatively long teeth are provided without unduly widening the weight for this purpose and as no bottom is present at the base of these teeth it is impossible for the front arm of the detent pawl to strike an obstruction as it is moved forwardly over a tooth, thereby avoiding the necessity of nicely adjusting these parts relatively to each other and preventing breakage of parts which would be liable to occur if the rear ends of the teeth on the weight bar were connected and formed a bottom with which the front end of the detent pawl would be liable to engage.

Although my improved safety device owing to its compact construction is particularly desirable for use in elevators having brick hatchways it is equally serviceable for
5 elevators in which the hatchways are open.

I claim as my invention:

1. A safety device for elevators comprising a weight adapted to be connected with the gate and having two upright side bars and a
10 plurality of teeth or cross pieces connecting said bars at different points in their height, a shifting lever, a detent pawl pivoted on the shifting lever and adapted to engage with said teeth, and a shoe or cam adapted to
15 operatively engage said shifting lever and to be connected with the car, substantially as set forth.

2. A safety device for elevators comprising a weight adapted to be connected with the

gate and having two upright side bars and a 20 plurality of teeth or cross pieces connecting said bars at different points in their height, a shifting lever, a detent pawl pivoted on the shifting lever and adapted to engage with said teeth, and a shoe or cam adapted to 25 operatively engage said shifting lever and to be connected with the car, the teeth of said weight tapering toward their front ends and said pawl having a pointed front end and an inclined face extending downwardly 30 and backwardly from the pointed end of the pawl, substantially as set forth.

Witness my hand this 18 day of December, 1907.

MERTON D. VANDERHEYDEN.

Witnesses:

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ANNA HEIGIS.