

(No Model.)

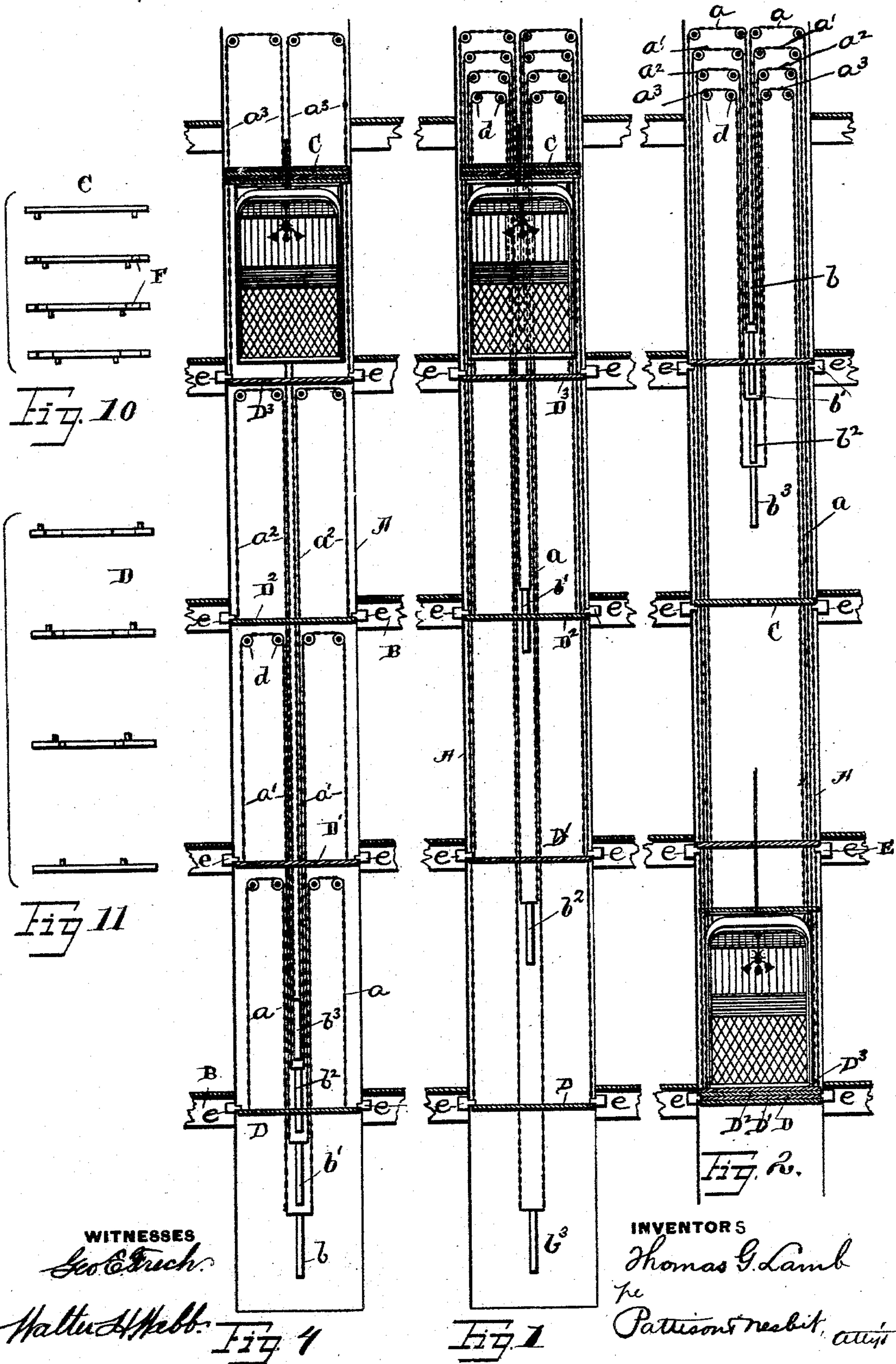
2 Sheets—Sheet 1.

T. G. LAMB.

AUTOMATIC FIRE TRAP FOR ELEVATOR SHAFTS.

No. 514,423.

Patented Feb. 6, 1894.



WITNESSES

Geo. C. Truch.

Hall & Webb.

Fig. 4

Fig. 1

INVENTORS

Thomas G. Lamb

per Patterson & Nesbit, attys

(No Model.)

2 Sheets—Sheet 2.

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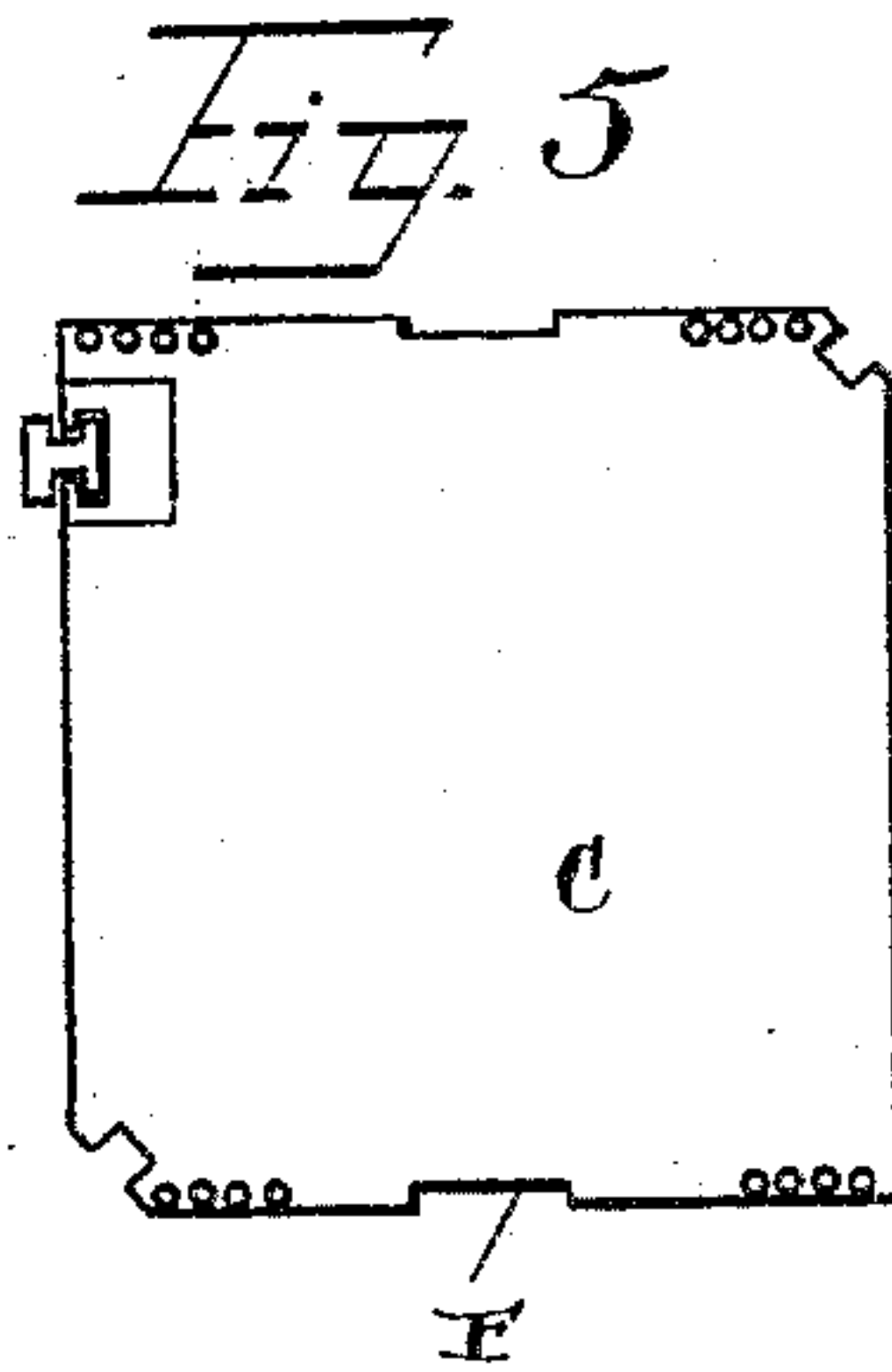
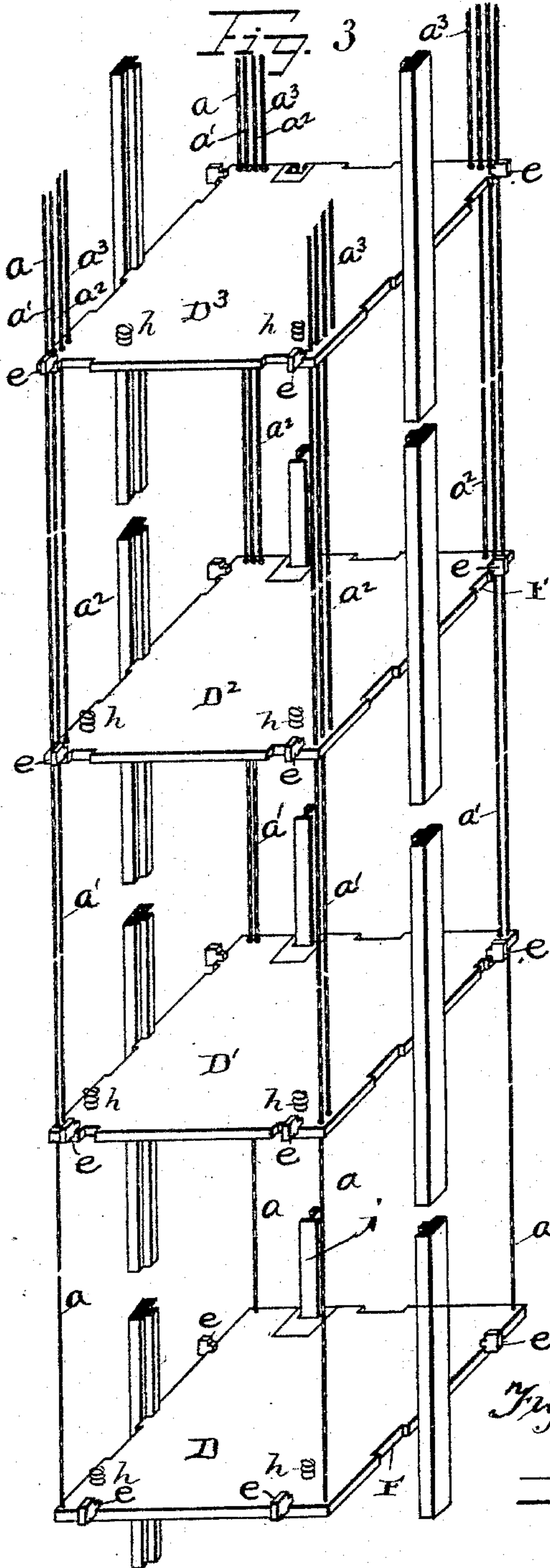


Fig. 6

Fig. 7R.

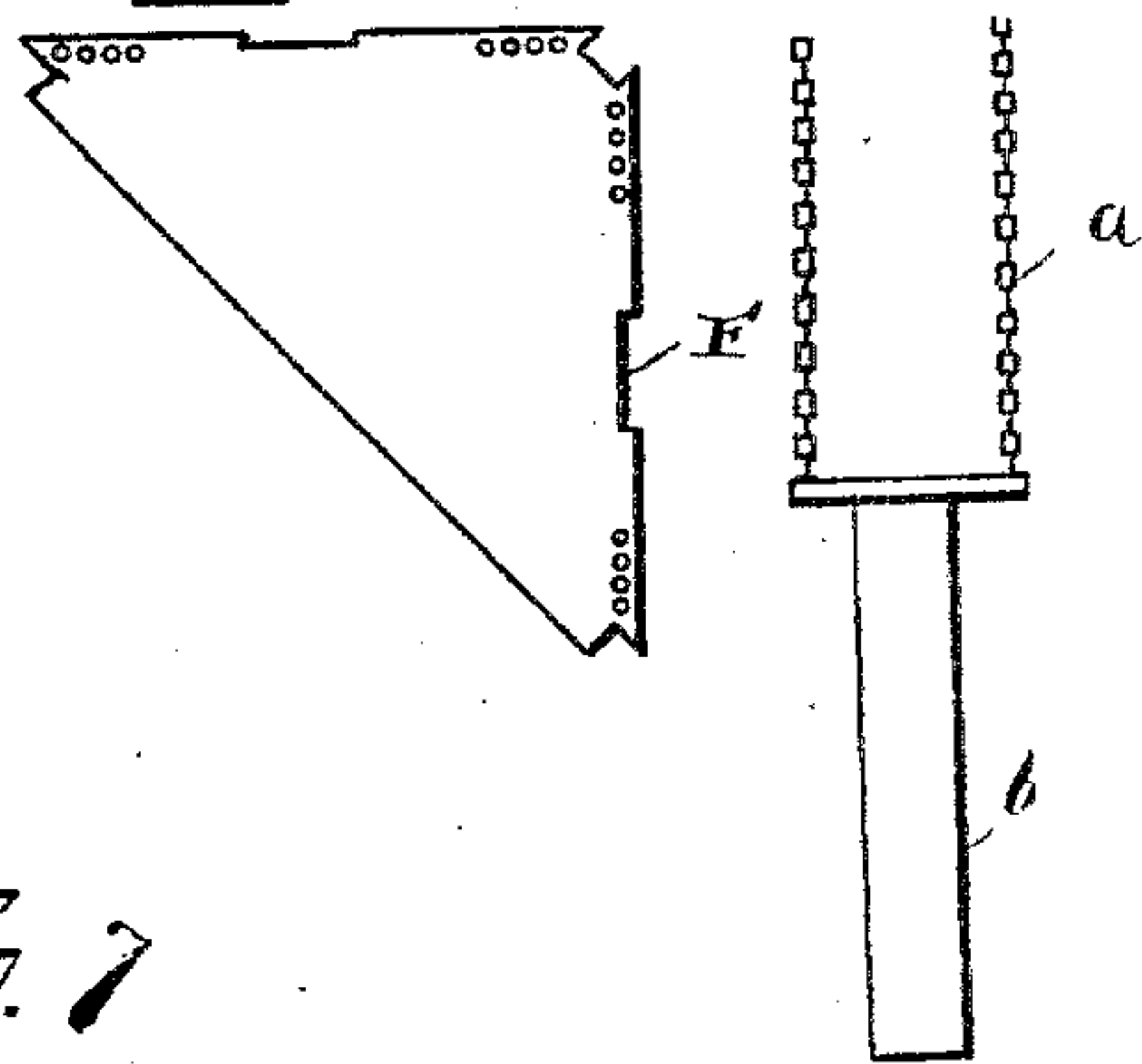


Fig. 7

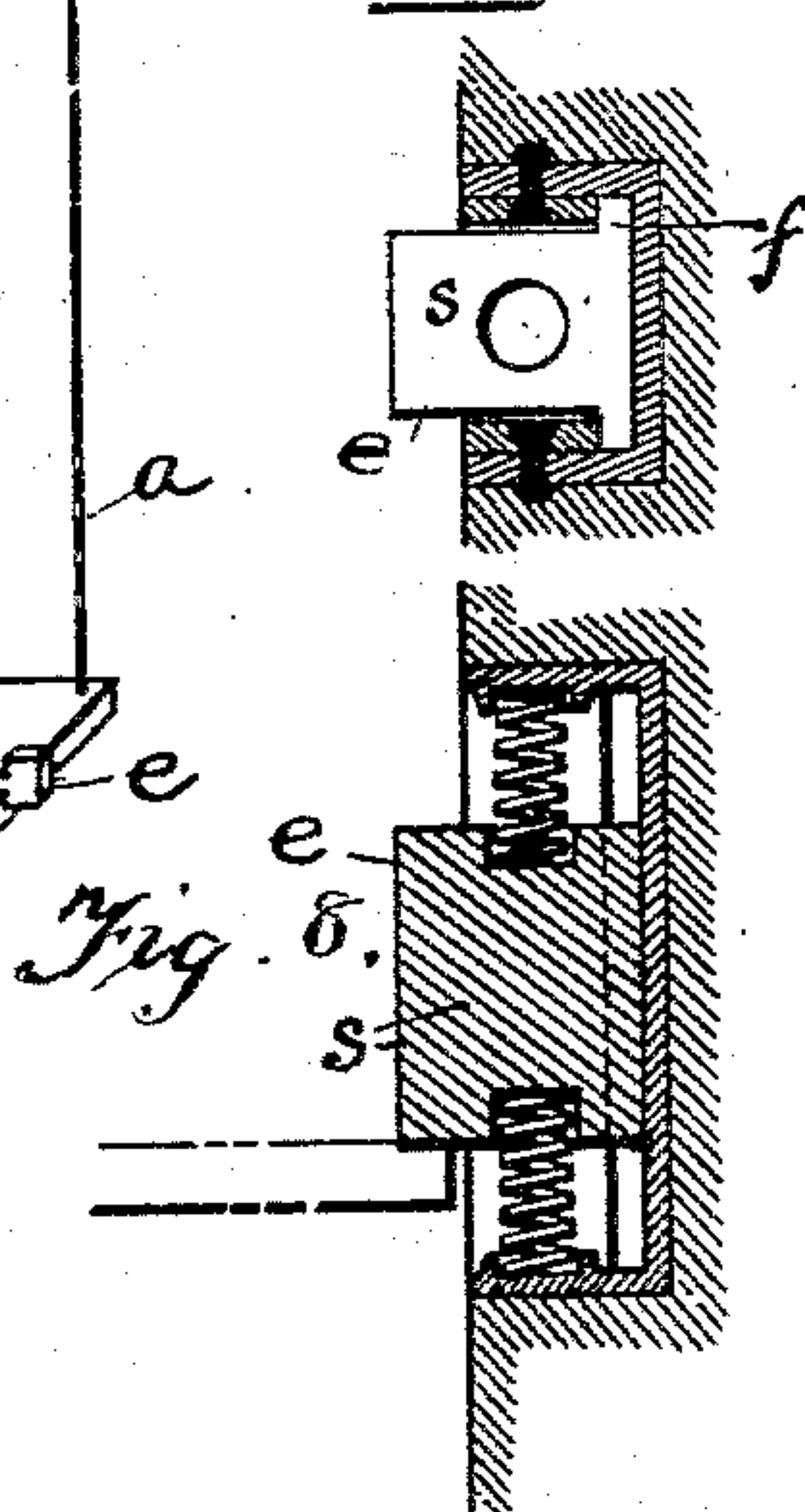
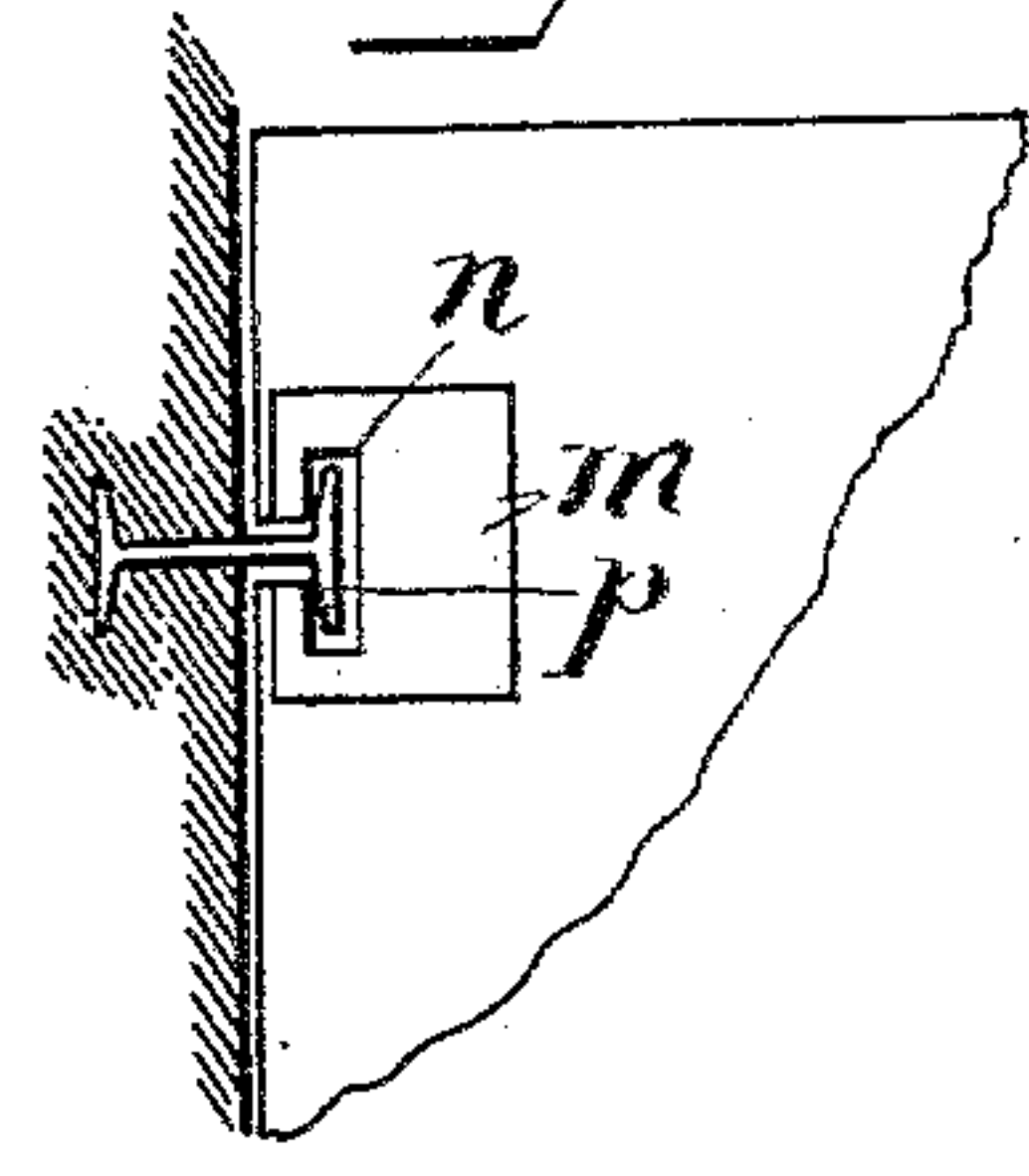


Fig. 9



WITNESSES

Geo. C. Frech.

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INVENTOR'S

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UNITED STATES PATENT OFFICE.

THOMAS G. LAMB, OF HOMESTEAD, ASSIGNOR OF ONE-HALF TO GEORGE F. PITTS, OF DUQUESNE, PENNSYLVANIA.

AUTOMATIC FIRE-TRAP FOR ELEVATOR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 514,423, dated February 6, 1894.

Application filed October 26, 1893. Serial No. 489,209. (No model.)

To all whom it may concern:

Be it known that I, THOMAS G. LAMB, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented certain
5 new and useful Improvements in Automatic Fire-Traps for Elevator-Shafts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as
10 it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in automatic fire traps for elevator shafts; and
15 it consists in the particular construction, arrangement and combination of parts which will be fully described hereinafter and particularly pointed out in the claims.

My invention has relation to that class of
20 elevator shafts which are provided with a series of doors or plates above and below the car which are automatically left at each landing or floor as the car ascends or descends, and one object of my invention is to so ar-
25 range, construct and combine the parts that it is not necessary to change or alter the interior wall of the shafts now in use, and which can be equally as well applied to one style or shape of elevator as another.

30 A further object of my invention is to support the lower doors or plates by weights in such a manner that the four supporting chains or ropes for each door are attached to two weights in contradistinction to using four
35 weights, which construction has two important advantages. First, when any part of one of the lower doors bind from any reason, the chain attached to the unbound portion is slackened which throws the whole heft of the
40 weight upon the binding portion, which will always be sufficient to carry it up, and cause the door to ascend evenly. Second, it enables me to dispense with one half the number of weights, thus reducing the cost of construc-
45 tion.

Another object of my invention is to have all the weights moving in a single guideway, one below the other, and the upper weights in a vertical line between the two cords which
50 are connected to the weight below it. This

construction enables me to apply my invention to buildings having any desired number of floors, say twenty, and requiring but little room for the weights to work in, while if the weights were one along side of the other
55 and a separate one for each corner of the door, it would require a shaft or a slideway for the weights forty times the width of a single weight, which would therefore make such a construction impractical if not impossible
60 of application.

Another object of my invention is to journal the pulleys over which the doors for the lower chains pass, so that they lie face against the wall of the shaft, which enables me to
65 place them in the space ordinarily left between the car and the shaft without disturbing or changing even in the slightest manner the walls of the shaft to accommodate the pulleys, which would not be the case if pul-
70 leys of proper size were placed edgewise to the wall; and to use two pulleys at the upper end of the shaft for each chain, so that it extends upward in a line from the point of at-
75 tachment to the door, and downward at a point about midway between the edge of the door to which it is attached and has its opposite end connected to one side of a weight.

A further object of my invention is to provide yielding stops for the lower doors, and
80 yielding supports for the upper doors, for the purpose of having them stop gradually and substantially noiselessly to prevent thumping, which would otherwise be the case, and which would be extremely objectionable.
85

In the accompanying drawings, Figure 1 is a sectional view of an elevator shaft and car, with my invention applied thereto, the car being shown at the top of the shaft. Fig. 2 is a similar view with the car at the bottom of the
90 shaft. Fig. 3 is a perspective of a series of lower floors showing the supporting chains attached thereto, the safety guide-rail, and the stops. Fig. 4 is a vertical section of an elevator shaft and car showing a modified
95 form of arranging the supporting chains for the lower doors. Fig. 5 is a detached plan view of one of the doors. Fig. 6 is a similar view of a door for a triangular elevator shaft. Fig. 7 is a sectional view looking down on one
100

of the yielding stops. Fig. 8 is a vertical sectional view showing one of the yielding stops. Fig. 9 is an enlarged view of a portion of one of the doors showing the safety guide rail. Fig. 10 are detached views of the upper doors. Fig. 11 is a similar view of the lower doors. Fig. 12 is a detached enlarged view of one of the weights.

A represents an elevator shaft of any desired construction, and B the several floors of the building in which it is placed.

C is a series of upper doors which are carried on top of the car as it ascends and which follow it as it descends, each succeeding door beginning with the upper one being stopped and supported at the floors as the car descends. The automatic stopping of these doors successively as the car descends is accomplished by providing a series of stops E projecting from opposite sides of the walls of the shaft, out of a vertical line one with the other and by providing each succeeding door after the top one with slots F in their edges which are made widest in the lower door to permit it to pass the upper stops and narrower in the door next above and so on, thus causing each succeeding door to engage the proper set of stops to support it at the proper floor as the car descends as will be clearly understood.

D D', D², D³ is a series of doors below the car, and to opposite sides or corners of these doors chains *a*, *a'*, *a*², *a*³ are attached, the opposite ends of these chains being attached to the weights *b*, *b'*, *b*², *b*³, at the center of the adjacent wall of the elevator shaft.

Attention is directed to the fact that the two chains at one end of the door pass up the shaft and over two pulleys *d*, and thence inward and downward to opposite sides of a single weight, the weights having projecting arms for that purpose. It will also be noticed that the projecting arms of each succeeding weight below the top one are made slightly longer than the arms of the weight above, so that the chains extending upward from the weight below are clear from the arms and chains of the weight above, and that the two pulleys at the top of the shaft over which the chains pass are placed one series above the other, and each succeeding series beginning with the lower are slightly farther apart so that the chains for the upper pulleys are outside of the chains of the lower series of pulleys.

As the car descends each door remains in its place closing the shaft at that point until the car reaches it and carries it down, thus entirely shutting all draft from one floor of the building to the one above or below no matter at what point of the building the car may be.

The pulleys *d*, are placed with their face or sides to wall of the shaft, for the purpose previously set forth.

Referring now to Figs. 7 and 8 it will be seen that the stops *e* upon and against which

the upper and lower doors abut, consist of the outwardly extending lugs *s*, which have at their inner ends projections *f*, both of which slide in suitable castings placed in an opening between the floor and ceiling of each story of the building, and that these stops are provided with springs above and below them, for the purpose specified.

If thought necessary springs *h*, of any desirable construction, or cushions, may be placed upon the corners of adjacent faces of the upper and lower doors, so that as they come together, the noise will also be prevented and lessened thereby.

Each door is provided with plates *m*, having recesses *n*, which receive the lateral flanges of the safety guide rails *p*. If these rails were not provided the upper doors would be liable to bind and turn edgewise and descend headlong upon and through the top of the car. By providing the guide-rails however, all possibility of such an occurrence is entirely avoided, and the doors compelled to descend evenly.

It will of course be understood that the weights for the lower doors are sufficient to overcome their weight so that they are automatically raised behind the car as it ascends. So also the lower doors are stopped in the same manner as the upper doors, by having the slots at their edges increase in width from the lower to the upper one as clearly shown in Fig. 11.

In Fig. 4 I show a modified form of arrangement of the pulleys for the chains, in which event I have the pulleys *d* arranged below each floor in succession, instead of arranging all of them at the top, whereby a great multiplication of the chains at the corners of the shaft throughout the entire length thereof is avoided as clearly illustrated.

From the above description it will be seen that I have produced a fire trap for elevator shafts which is thoroughly automatic in its operation, closing the opening at each floor as the car ascends or descends, and which is so constructed that it is capable of being placed within a very small space of the elevator shaft without changing the walls thereof, or making any alteration therein, the only cutting required being the small openings between the floor and ceiling of each story for the yielding stops; and which construction is cheap, simple, durable and reliable in its action.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with an elevator shaft and car, of a series of vertically moving horizontal doors, two supporting connections at each side or end of each door, and a single weight for each two connections.

2. The combination with an elevator shaft and car, of a series of vertically moving horizontal doors, a single weight for each end or side of each door, the weights at end or side

being in a vertical line one above the other, and connections between the ends or sides of the doors and the weights.

5 3. The combination with an elevator shaft and car, of a series of vertically moving horizontal doors, a chain for each corner of the doors, two pulleys at the upper end of the shaft for each chain, and weights which are connected to the ends of the chains.

10 4. The combination with an elevator shaft and car, of a series of vertically moving horizontal doors, a chain for each corner of each door extending upward therefrom and across inward toward the center of the shaft, and a
15 single weight for two of said chains at each end of the doors, to which the opposite ends of the chains are connected at each side thereof.

20 5. The combination with an elevator shaft and car of a series of vertically moving horizontal doors, a single weight for each side of each door, the weights being placed in a vertical line one above the other, a chain for

each corner of each door which extends upward and downward to opposite sides of their respective weights, the connecting points of each weight being farther separated than the connecting points of the weight above, whereby the upper weights travel between the chains attached to the lower weights.

6. The combination with an elevator shaft and car, of a series of doors above and below the car, and a series of yielding stops for the doors.

7. The combination with an elevator shaft and car of a series of doors moving vertically with the car, and a series of spring supported stops which project into the shaft.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS G. LAMB.

Witnesses:

A. S. PATTISON,
GEO. E. FRECH.