

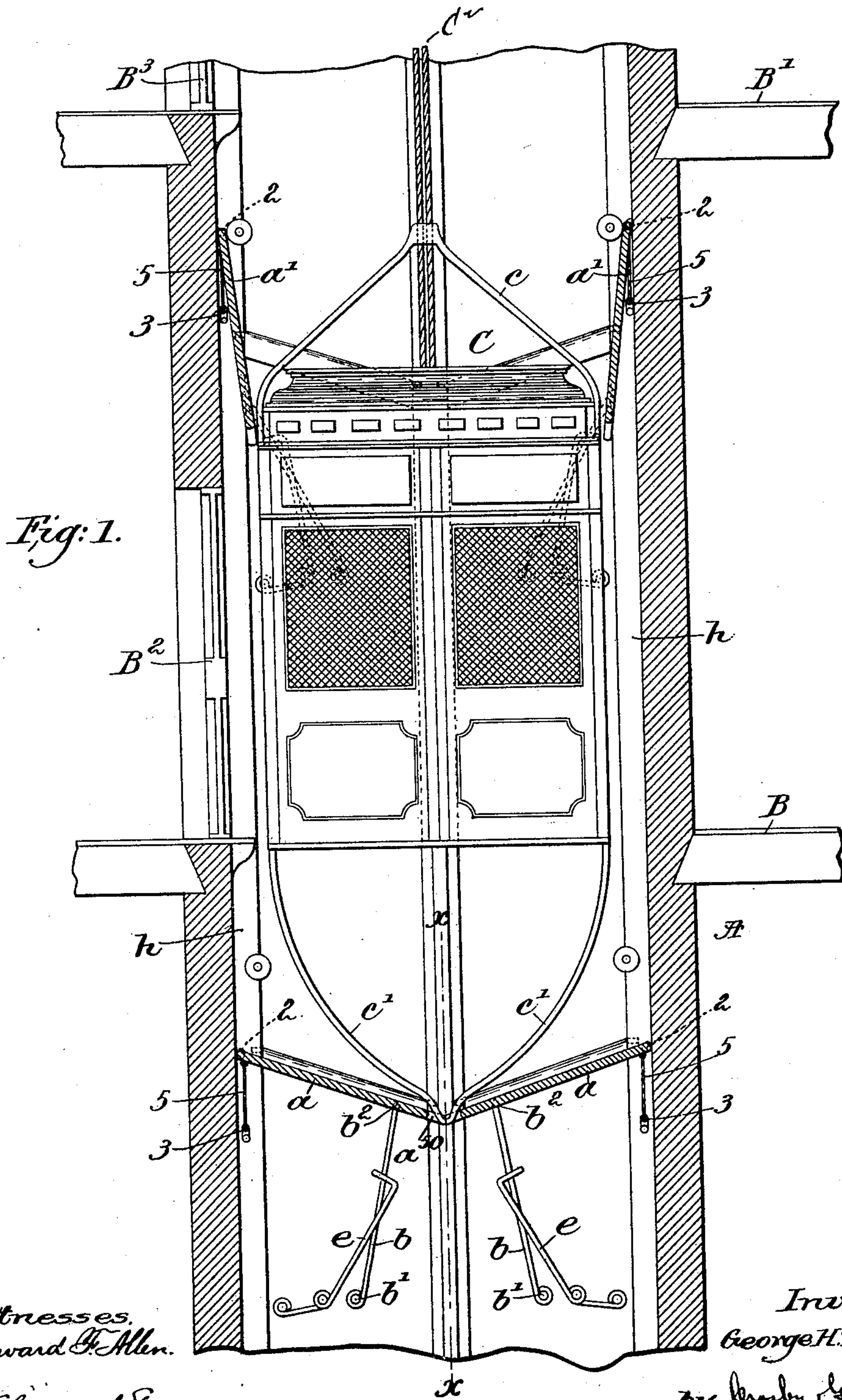
(No Model.)

2 Sheets—Sheet 1.

G. H. TUTTLE.
ELEVATOR.

No. 591,578.

Patented Oct. 12, 1897.



Witnesses.
Edward F. Allen.

Thomas F. Drummond.

Inventor:
George H. Tuttle.

by Crosby & Sugan,
Attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig: 2.

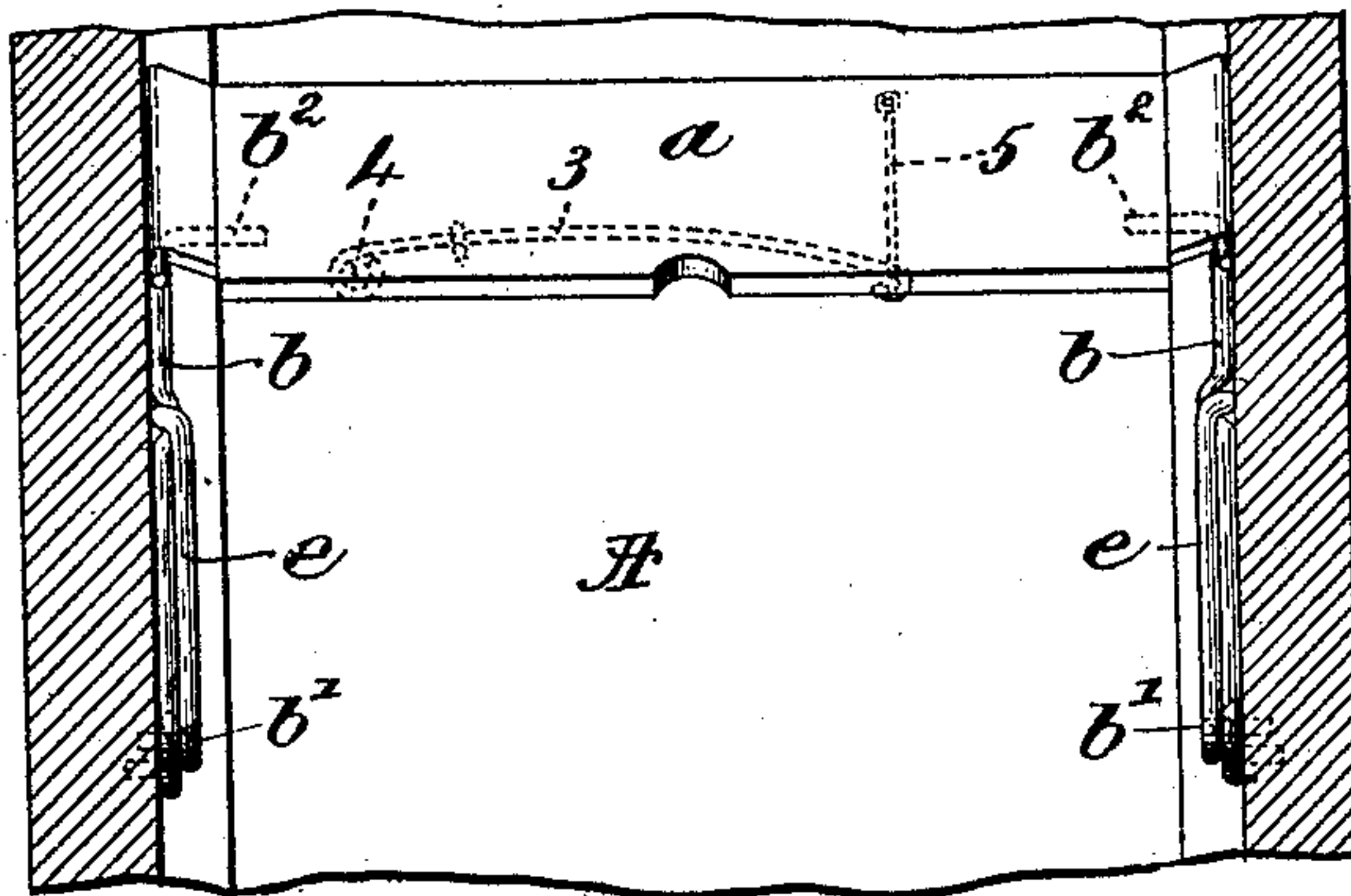


Fig: 3.

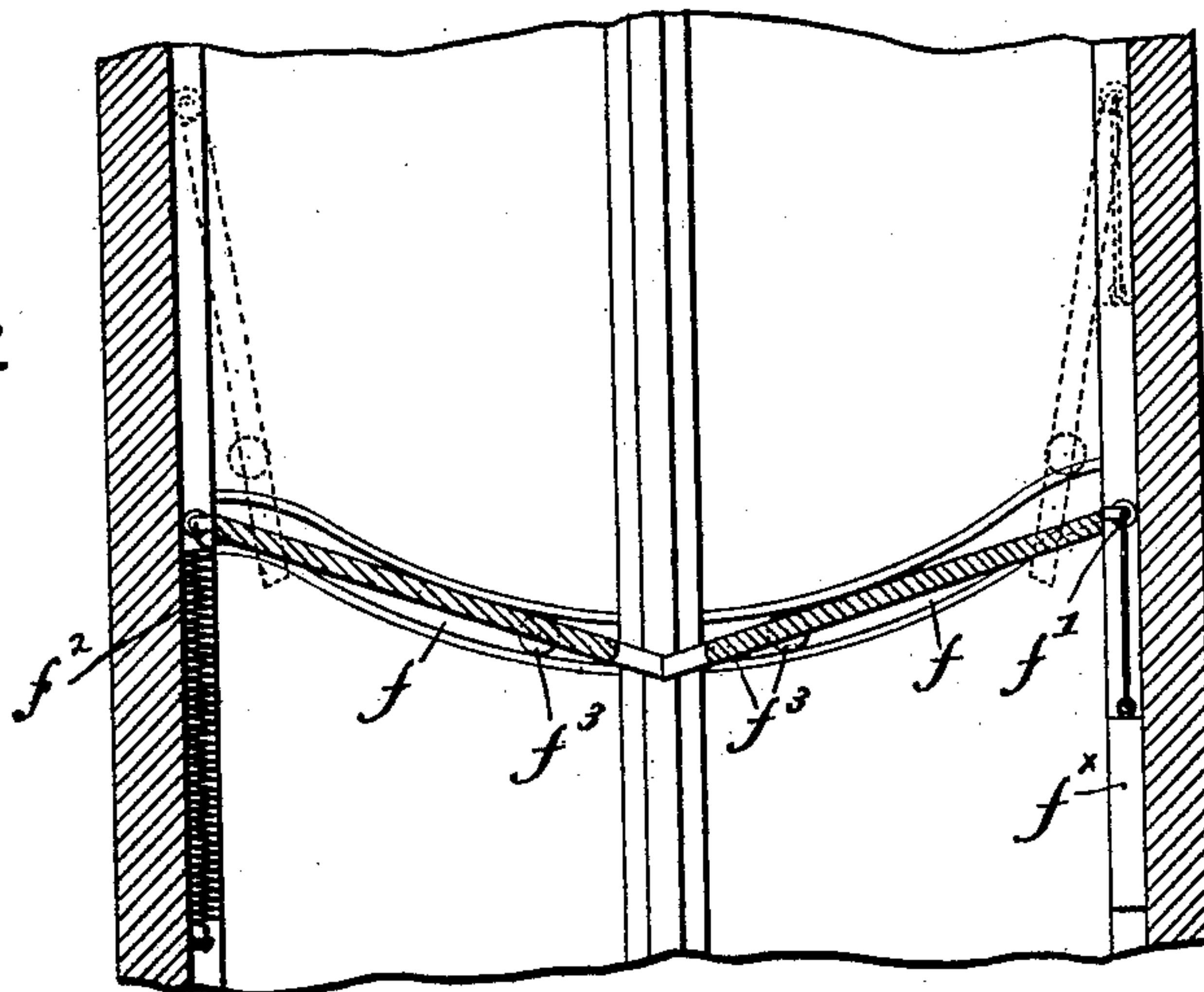
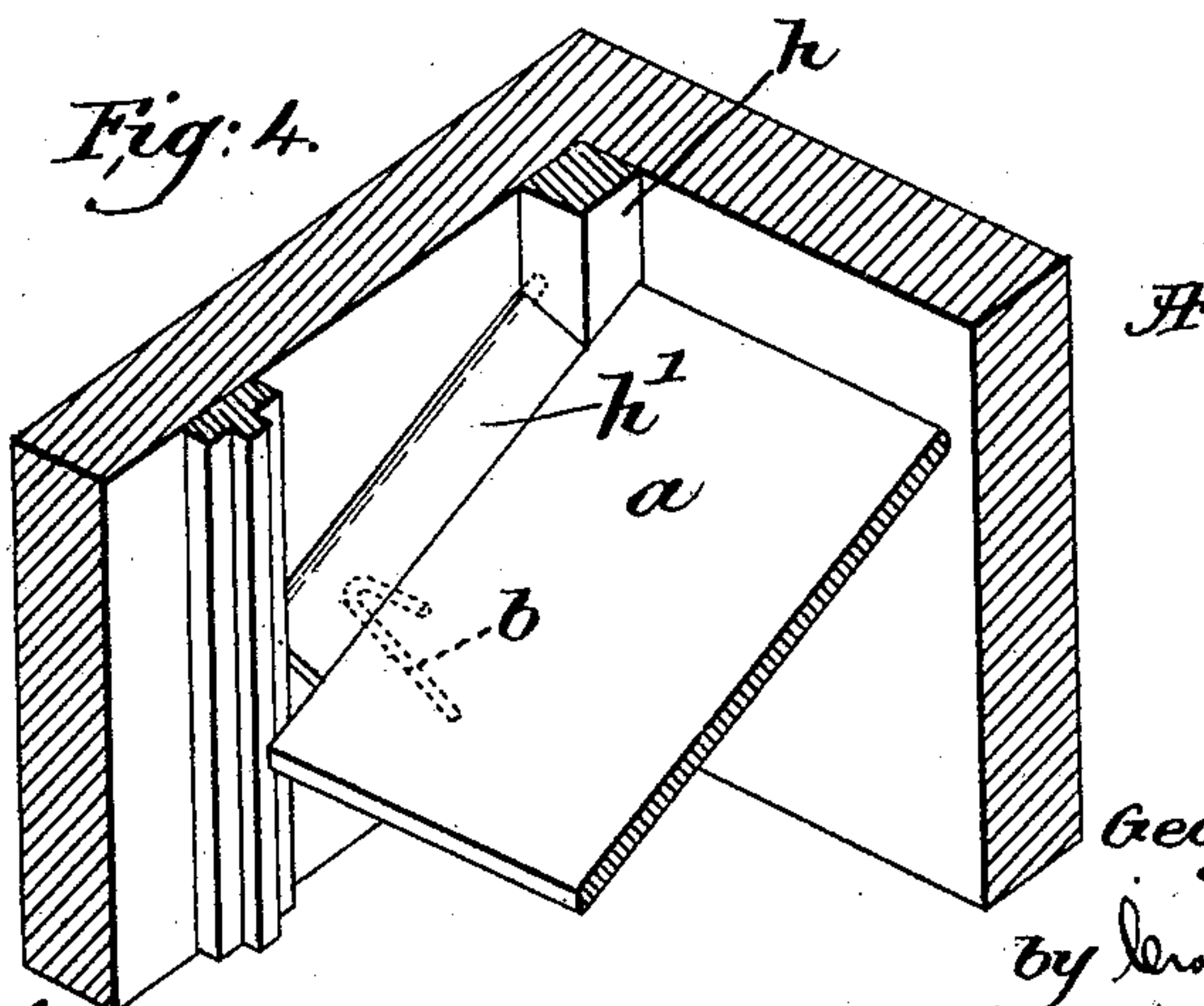


Fig: 4.



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UNITED STATES PATENT OFFICE.

GEORGE HENRY TUTTLE, OF BRAINTREE, MASSACHUSETTS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 591,578, dated October 12, 1897.

Application filed December 13, 1896. Renewed September 4, 1897. Serial No. 650,663. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HENRY TUTTLE, of East Braintree, county of Norfolk, State of Massachusetts, have invented an Improvement in Elevators, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Elevators used in buildings are made to pass from floor to floor either through a hole in the floor or in a so-called "well," with doors leading out from it at the different floors.

In the use of elevators if a building catches fire the flame has free course up the well, and to avoid this doors have been provided to close the well at the floor-levels.

My invention comprehends an improved manner of supporting the doors so that they may be slid by the elevator in going up or down and be made to occupy a position substantially vertically inside the elevator-well, my improved devices being so constructed as to be readily applied in any elevator-well without disturbing any of the floor-timbers of the building.

In my invention, which is herein shown applied within a well to act as fire-doors, the doors occupy a normally-inclined position, their inner edges meeting substantially at the center of the well, and the elevator-carriage is provided at top and bottom with suitable wedges to enter between and separate the doors, the doors as they are separated sliding outwardly and upwardly and finally standing in substantially a vertical position just inside the vertical walls of the elevator-well. During this movement the doors will be guided, preferably, in their movement by radius-bars, on the upper ends of which they are pivoted, and as the doors separate their outer edges slide or roll upwardly against the inner walls of the well or a suitable surface therein.

When the doors are separated and turned up, the weight of the doors has been carried outside the line of the pivots of the radius-bars to the well end of the doors on the radius-bars, and consequently the doors will remain open; but to close them automatically when the wedges leave the doors I have provided a suitable spring, or it may be a weight, which

is connected to the bars or doors to normally close them after they shall have been opened.

In my invention the power required to open and close the doors is but very little, and the operation may be carried on substantially noiselessly and quickly.

Where a corner-post stands in the well, the doors are shorter than the width of the well, and at each end of the doors I provide auxiliary hinged doors to close the spaces between the ends of the doors and the sides of the well.

Figure 1 shows an elevator-carriage in a well provided with my improved doors. Fig. 2 is a partial section on the line $x x$, Fig. 1, looking toward the right. Fig. 3 refers to a modification to be described, and Fig. 4 is a perspective detail of one of the auxiliary doors.

The elevator-well (marked A) has surrounding it suitable floors B B', proper doors, as B² B³, leading to the well at each floor.

The carriage C, of any usual or suitable construction, has at its top a wedge c and at its bottom a like wedge c' .

The wire ropes C² are and may be actuated in usual manner.

The fireproof doors arranged in the well are marked $a a'$, and they are composed, each door of the pair, of some preferably substantially fireproof material, such as metal or wood covered with metal. When these doors are closed, as represented by the doors a , the well is substantially closed, but when opened the doors stand in nearly a vertical position entirely within and against the inner side walls of the well, as represented by the doors a' . These doors, in order that they may be slid easily aside and into substantially vertical position, are or may have some of their weight supported by devices which shall act as guides and supports.

In Fig. 1 the radius-bars b , pivoted at b' , are jointed at their upper ends at b^2 to the ends of the doors near their inner edges, a bar at each end of each door, each radius-bar having its pivot b' located away from said inner side walls outside of the path of movement of the outer edge of its door and having its upper end b^2 normally out of vertical alignment with the pivot end b' and leaning toward the center of the wall, as shown at a in

Fig. 1. By this arrangement when the doors slide open the upper ends b^2 of the radius-bars swing past the line of said vertical alinement, thereby transferring the weight or center of gravity of the doors entirely outside of said pivotal points b' and between the said points and the said inner side walls. The outer ends of the doors may be provided with suitable rollers 2 in order that said outer edges as they are slid upwardly may travel with the minimum of friction. A suitable spring 3 (best shown in Fig. 2) is attached to the interior of the well by screw 4, or otherwise, and has its free end connected by cord 5 to the outer edge of the door, one for each door, said springs aiding in restoring the center of gravity of said doors to its normal position and in sliding the doors together after the passage of the wedges and carriage beyond them.

When the doors are removed from the position shown by a , Fig. 1, into the position shown by a' , the weight of each door passes the vertical plane of the pivots b' of the radius-bars of the respective doors, and the doors, then in the position a' , would remain open after passage of the carriage; but by adding to the apparatus suitable springs e , acting on the radius-bars, which springs are flexed in opening the doors, the doors will be quickly closed by the said springs when no longer held open by the carriage or its attachments.

In Fig. 3 the interior of the well is shown as provided with a curved guideway f , and the roller f' at the outer edge of the door is held against a part fixed at the interior of the well, and a spring f^2 , like the spring 3, or a suitable equivalent, which might be a weight f^x , as represented at one side of the well, Fig. 3, might be hung at the outer edge of the door.

Suitable rollers f^3 at the opposite ends of the door enter the guideways, one at each side of the well, said rollers having the same function as the radius-bars described. Now as a wedge c or c' (shown only in Fig. 1) enters between the doors, usually in the cable-opening a^{50} , they are separated and the rollers f^3 travel back in the supporting-grooves f , while the outer edges of the door are forced upwardly, they finally assuming the dotted-line position, Fig. 3. The spring f^2 or the weight f^x may be sufficiently heavy to close the doors after the passage of the carriage.

In some elevator-wells there are corner-posts, and I have shown herein such a post in one corner of the well and marked it h . When such a corner-post is employed, I make the doors of less length, and to fill the space substantially the width of the corner-post when the doors are closed I have pivoted or hinged to the inner wall of the well an auxiliary door h' , and it is so located that the upper end of the radius-bar, just before the door comes into its closed position, meets the said down-hanging door and, acting against its

lower edge, turns the door up so as to close the said space. This is one important part of my invention. The upper end of the radius-bar may be suitably bent aside to pass about the post when the door has been slid into its substantially vertical position.

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

1. The combination with an elevator-well, of fire-doors, having swinging supports for their opposite ends near their inner edges, said doors being unsupported at their outer edges except by said well, and adapted to slide freely upwardly at their outer edges against a fixed part of the interior of the well, as the doors are forced apart by the elevator-carriage provided with suitable wedges, substantially as described.

2. An elevator-well, a pair of sliding doors therein, which when closed occupy a position inclined one toward the other with their outer upwardly-extended edges loosely supported by and against the interior of the well, said doors always having their outer edges uppermost both when in open and in closed position, and means to sustain and guide the said doors near their inner or contiguous edges, substantially as described.

3. The pivoted radius-bars, combined with the sliding doors pivoted on the said bars, said doors being inclined upwardly from their inner edges outward, and having their outer edges resting loosely against the interior of the elevator-well, said doors always having their outer edges uppermost both when in open and in closed position, and adapted to be forced bodily upward by the elevator against said well in sliding engagement therewith for opening and closing said doors, substantially as described.

4. The pivoted radius-bars, combined with the sliding doors pivoted to the upper ends of said bars, said doors being inclined upwardly toward their outer edges, and having their outer edges resting loosely against the interior of the elevator-well, said radius-bars being pivoted at their lower ends outside of the path of movement of said outer edges and having their said upper ends out of vertical alinement with their said lower ends and toward the center of the well, whereby their said upper ends may swing past the vertical lines passing through the pivots of the radius-bars in the opening of the doors, substantially as described.

5. The pivoted radius-bars, combined with the sliding doors pivoted on the said bars, and having their outer edges resting loosely against the interior of the elevator-well, said radius-bars being pivoted at their lower ends outside of the path of movement of said outer edges and having their said upper ends out of vertical alinement with their said lower ends and toward the center of the well, whereby their said upper ends may swing past the

vertical lines passing through the pivots of the radius-bars in the opening of the doors, substantially as described.

5 6. The pivoted radius-bars, combined with the sliding doors pivoted on the said bars, and having their outer edges inclined upwardly and resting loosely against the interior of the elevator-well, and devices connected to the outer edges of said doors to aid in lowering the same in closing them, substantially as described.

5 7. An elevator-well, a pair of sliding doors therein, which when closed occupy a position inclined one toward the other with their outer upwardly-extended edges loosely supported by and against the interior of the well, said doors always having their outer edges uppermost both when in open and in closed position, and means to sustain and guide the said doors near their inner or contiguous edges, combined with an elevator-carriage having an attached wedge, the said wedge forcing said doors into sliding engagement along the wall of said well and thereby moving the said doors apart and turning them upwardly at their outer edges into substantially vertical

position against the inner wall of the well, substantially as described.

8. A pair of fire-doors located in an elevator-well, and radius-bars to which the said doors are pivoted at their opposite ends near their inner edges, the outer edges of said doors being supported against or within the elevator-well, combined with an auxiliary door hung within the well at the end and independent of the sliding door, and adapted to be lifted substantially in line with the sliding door as the latter is put into its closed position, and adapted to fall by gravity against the wall of the well when the sliding door is opened, being then entirely unsupported at its swinging ends, the closing of the auxiliary door stopping the space between the end of the sliding door and the wall of the well, substantially as described.

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

GEORGE HENRY TUTTLE.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.