(No Model.) 2 Sheets—Sheet 1.

# T. GROTTKE.

## SAFETY DOOR FOR DUMB WAITER SHAFTS.

No. 598,369. Patented Feb. 1, 1898.

Fig 1.

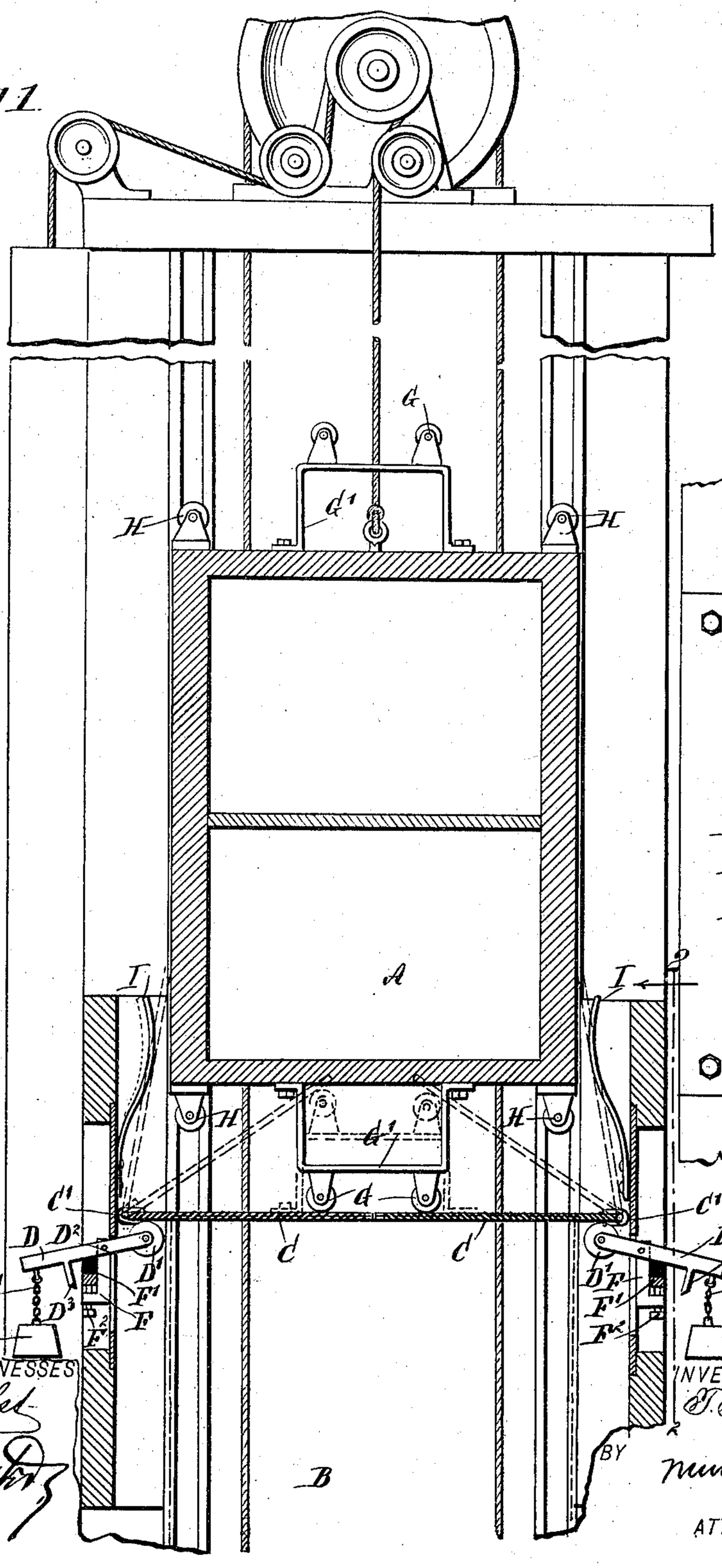
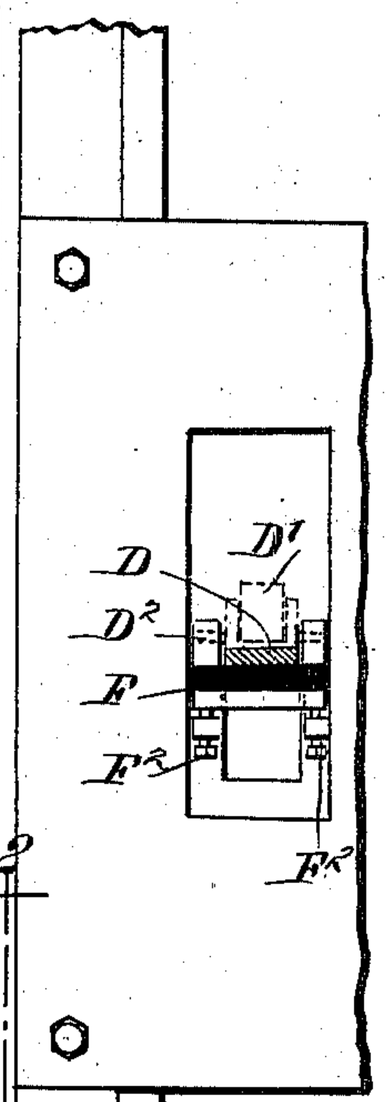



Fig 2.

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(No Model.) 2 Sheets—Sheet 2.

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## SAFETY DOOR FOR DUMB WAITER SHAFTS.

No. 598,369. Patented Feb. 1, 1898.

Fig 3.

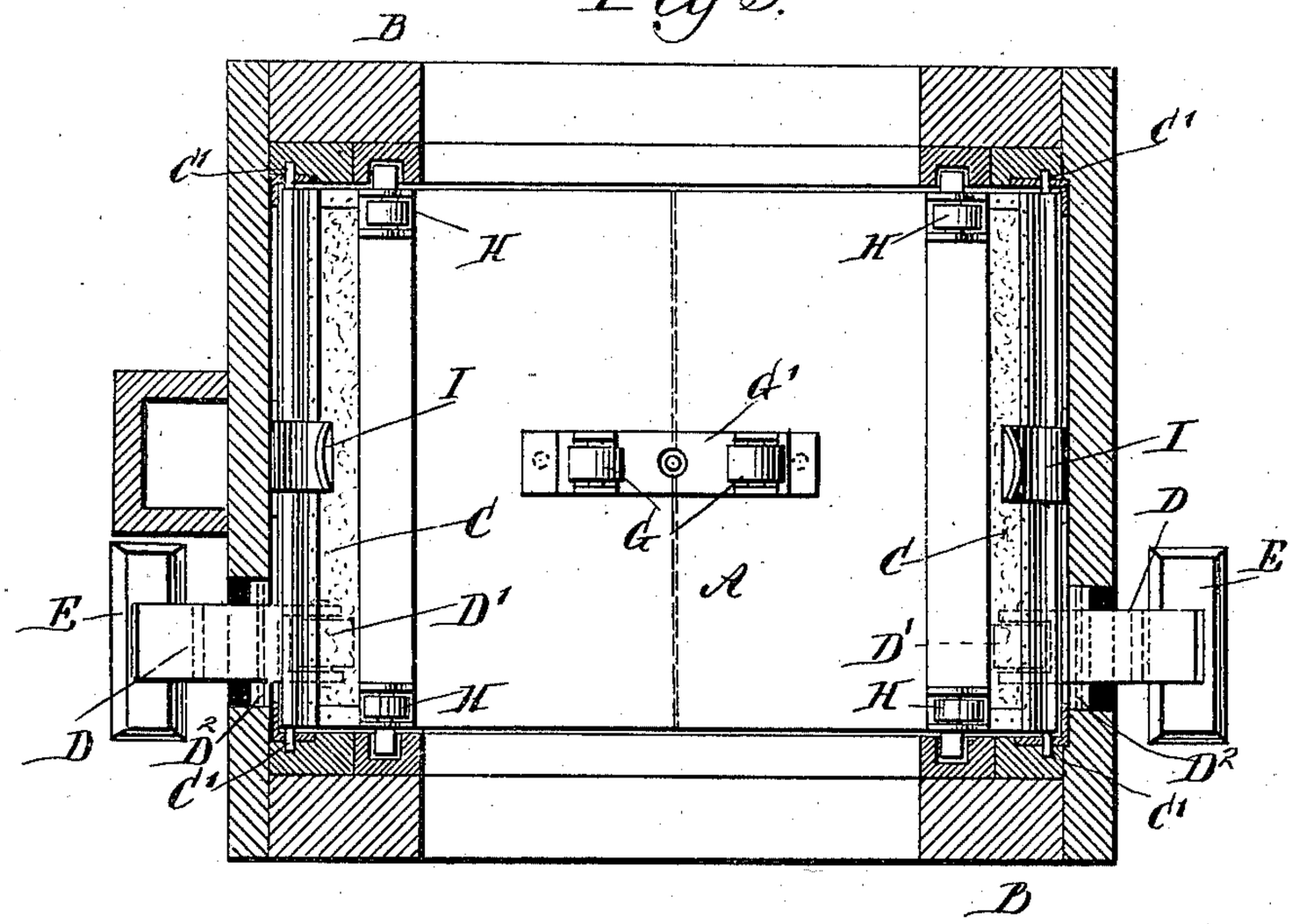
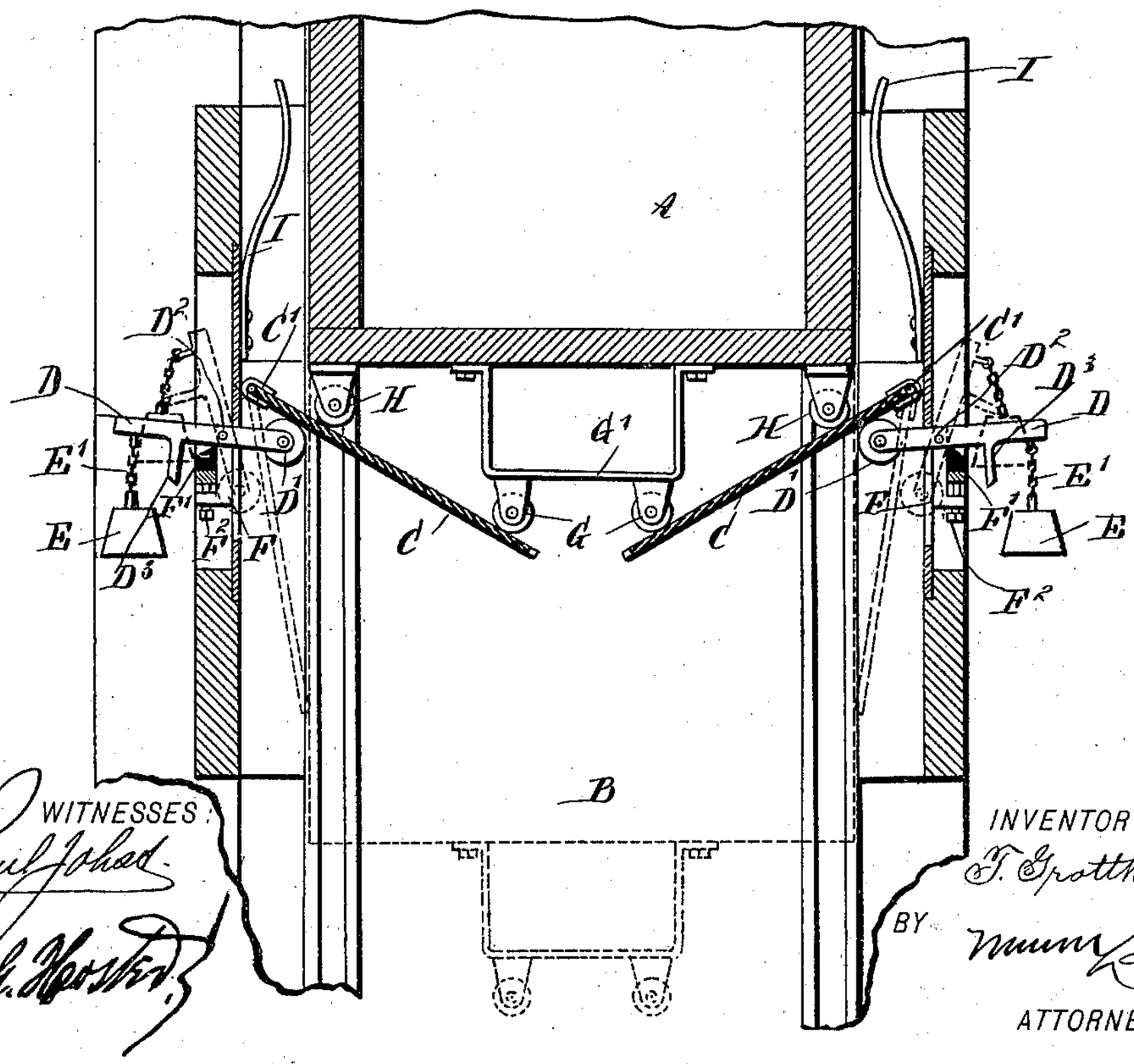



Fig 4.

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# UNITED STATES PATENT OFFICE.

THEODORE GROTTKE, OF WEST HOBOKEN, NEW JERSEY.

## SAFETY-DOOR FOR DUMB-WAITER SHAFTS.

SPECIFICATION forming part of Letters Patent No. 598,369, dated February 1, 1898.

Application filed October 23, 1897. Serial No. 656,173. (No model.)

*To all whom it may concern:*

Be it known that I, THEODORE GROTTKE, of West Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Safety-Door for Dumb-Waiter Shafts, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved safety-door for dumb-waiter shafts and the like, arranged to close the shaft at each floor of a building to prevent fire from spreading therein and to allow the cage to open the doors noiselessly on its ascent and descent.

The invention consists of certain novel features and parts and combinations of the same, as hereinafter more fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a vertical section of part of the same on the line 2 2 of Fig. 1. Fig. 3 is a sectional plan view of the improvement, and Fig. 4 is a sectional side elevation of the same with the parts in a different position.

The cage A is arranged to ascend and descend in a shaft B in the usual manner, and the said shaft is normally closed at each floor of the building by a pair of doors C, normally extending in a horizontal position, with their pivots C′ arranged in opposite sides of the shaft, as plainly indicated in the drawings, so that the doors are readily swung up and down to allow the cage A to pass in its ascent or descent. The doors C are preferably made of asbestos or like fire-proof material, held in a suitable frame carrying the pivots C′, so that fire in the shaft is not liable to spread from one floor to the other by way of the shaft.

The doors C are normally held in a horizontal position by resting on friction-rollers D′, journaled on the inner ends of levers D, connected at their outer ends by chains E′, with weights E sufficiently heavy to counterbalance the levers D and the doors C to hold the said doors in a horizontal position. Each lever D is fulcrumed at $D^2$ in a bracket F, attached to the side of the shaft B within an opening in the timber in the floor, the said lever being so arranged that its friction-roller D′ engages the door C out of the path of the cage A, so that the latter does not come in contact with the said lever.

The downward-swinging motion of the lever D is limited by an elastic buffer F′, held on the bracket F and adapted to be vertically adjusted by set-screws $F^2$, so as to bring the buffer into proper position for holding the lever D at rest and supporting the door C in a horizontal position. (See Fig. 1.)

Near the outer end of each lever D is formed a lug $D^3$, adapted to be engaged by the chain E′ at the time the outer end of the said lever is swung upward and the inner end downward upon the descent of the cage A, as is plainly indicated in dotted lines in Fig. 4, so that the weight E does not strike and bind against the side of the shaft, but freely dangles from the end of its lever when the latter is nearly in a vertical position. By this arrangement the lever readily swings back to its former position (shown in Fig. 1) after the cage has passed this floor, as hereinafter more fully described.

On the top and bottom of the cage A are arranged two sets of friction-rollers G and H, placed at different levels, as is plainly indicated in Fig. 1, with the friction-rollers G, journaled in brackets G′, attached to the top and bottom of the cage A, near the middle thereof, so that the friction-rollers engage the doors near their inner adjacent free ends at the time the cage ascends or descends. The other set of friction-rollers H are journaled on the top and bottom of the cage, near the sides thereof, and the said friction-rollers do not move in contact with the doors C until the latter have been partly opened by the other set of friction-rollers G, located at a different level. Now it is evident that when the cage A ascends the friction-rollers G at the top of the cage first move in contact with the two doors C, near their inner free ends, to impart an upward-swinging motion to the said doors, and when the latter have been partly opened the other friction-rollers H at the top of the cage engage the doors C, so as to swing the latter fully open—that is, out of the path of the cage A, so as not to retard the ascent of the

latter. When the doors C swing into this position, they rest against springs I, attached to the sides of the shaft B. When the doors C swing upward, as described, the levers D are not disturbed in their position and remain dormant. When the lowermost friction-rollers H have passed the free ends of the open doors C, then the latter swing back downward to their former position, owing to their own gravity, the doors being started by the action of the springs I, which when slightly compressed upon the doors move into an open position, as above explained. The doors C in swinging downward by their own gravity strike their supporting friction-rollers D′ to slightly move the levers D, which, however, return to their normal resting position by the action of their weights E, to finally support the doors C in a horizontal closed position. When the car descends, then the lowermost friction-rollers G come in contact with the doors C to partly open the same, and, finally, the friction-rollers H at the bottom of the cage A swing the doors C downward into an open position, so that the said cage can pass. (See dotted lines in Fig. 4.) When the doors swing downward, they impart a swinging motion to their supporting-levers D, so that the latter move into the position shown in dotted lines in Fig. 4, and when the friction-rollers H at the top of the cage have passed the free ends of the open doors then the latter are caused to swing upward back to their normal position by the action of the weighted levers D on the said doors. The latter finally come to rest in a horizontal position to keep the shaft closed at this floor until the doors are again opened on the next ascension of the cage.

The several friction-rollers D′, G, and H are preferably covered with rubber or other suitable elastic material, so as to render the opening and closing of the parts as noiseless as possible.

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

1. In devices of the class described, the combination of an elevator-shaft, a door hinged to one side of said shaft, and a counterbalancing-lever fulcrumed independently of the door and normally supporting the same in an approximately horizontal position, to close the shaft, substantially as shown and described.

2. In devices of the class described, the combination of an elevator-shaft, a cage, two sets of door-openers at the top and the bottom of the said cage, the two sets of openers being arranged at different levels, one being near the middle of the cage and the other at or near the sides thereof, doors fulcrumed on opposite sides of the cage and normally closing the shaft, and adapted to be successively engaged by the said sets of openers on the ascent or descent of the cage, to swing the doors open in an upward or downward direction, according to the line of travel of the cage, and counterbalancing-levers fulcrumed independently of the said doors in the sides of the shaft, and loosely engaging the doors forward of their fulcrum and outside of the path of the cage, substantially as shown and described.

3. In devices of the class described, the combination of an elevator-shaft, a cage, two sets of door-openers at the top and the bottom of the said cage, the two sets of openers being arranged at different levels, one being near the middle of the cage and the other at or near the sides thereof, doors fulcrumed on opposite sides of the cage and normally closing the shaft, and adapted to be successively engaged by the said sets of openers on the ascent or descent of the cage, to swing the doors open in an upward or downward direction, according to the direction of travel of the cage, and counterbalancing-levers fulcrumed independently of the said doors in the sides of the shaft, and loosely engaging the doors forward of their fulcrum and outside of the path of the cage, the levers being free to swing in one direction, and held against movement in the opposite direction, substantially as shown and described.

4. In devices of the class described, the combination of an elevator-shaft, a door hinged in the said shaft, a counterbalancing-lever fulcrumed independently of the door, and normally supporting the same in an approximately horizontal position, to close the shaft, and a stop for limiting the swinging motion of the lever in one direction, substantially as shown and described.

5. In devices of the class described, the combination of an elevator-shaft, a door hinged to one side of the said shaft, a counterbalancing-lever fulcrumed independently of the door, and provided at its inner free end with a friction-roller engaging the door, to normally support the same in an approximately horizontal position to close the shaft, a projection near the outer end of the said lever, a chain on the outer end of the lever, and adapted to abut against the said projection, and a weight held on the said chain, substantially as shown and described.

THEODORE GROTTKE.

Witnesses:
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ROBERT B. KEELER.