

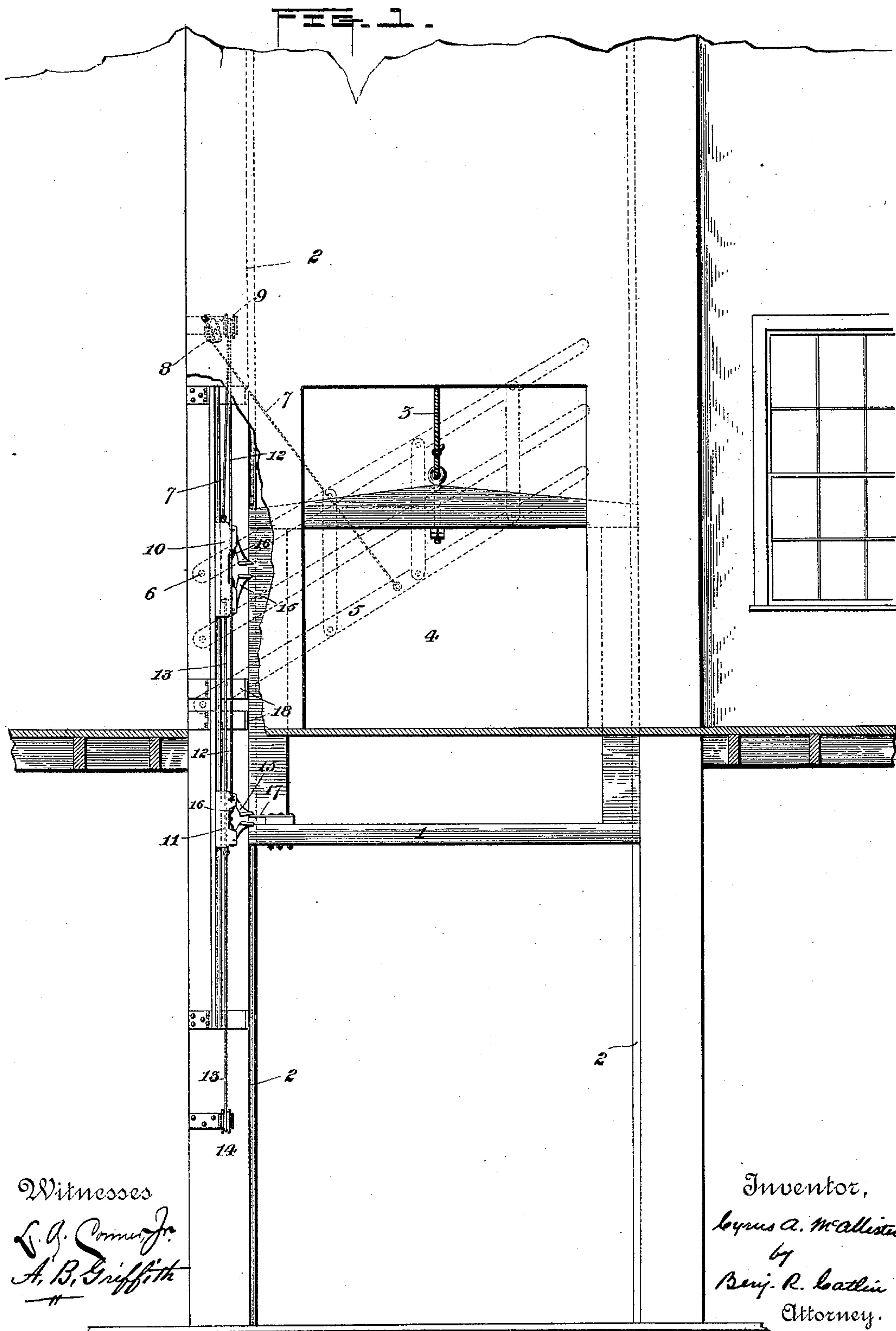
(No Model.)

2 Sheets—Sheet 1.

C. A. McALLISTER,  
ELEVATOR HATCHWAY.

No. 397,197.

Patented Feb. 5, 1889.



(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

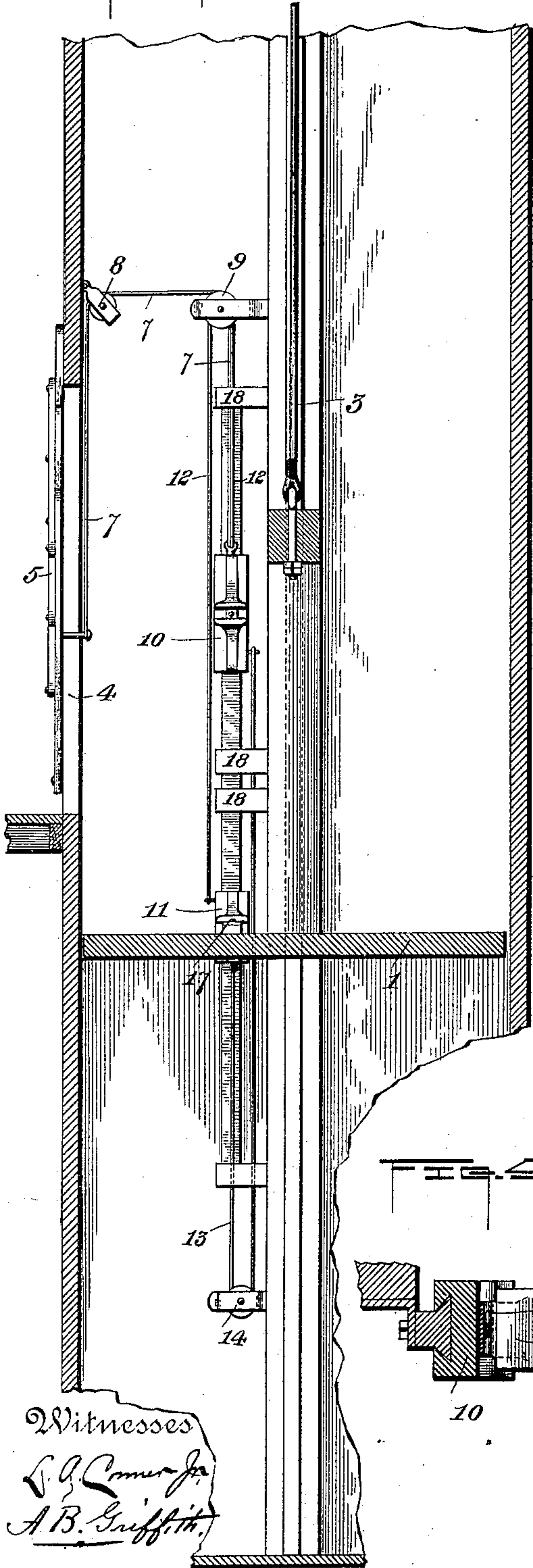
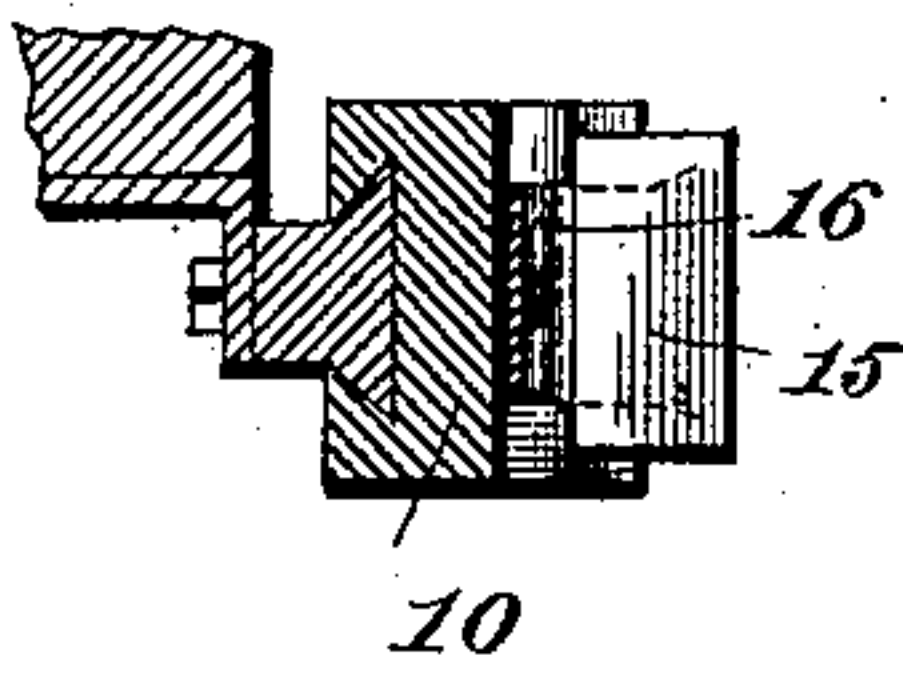
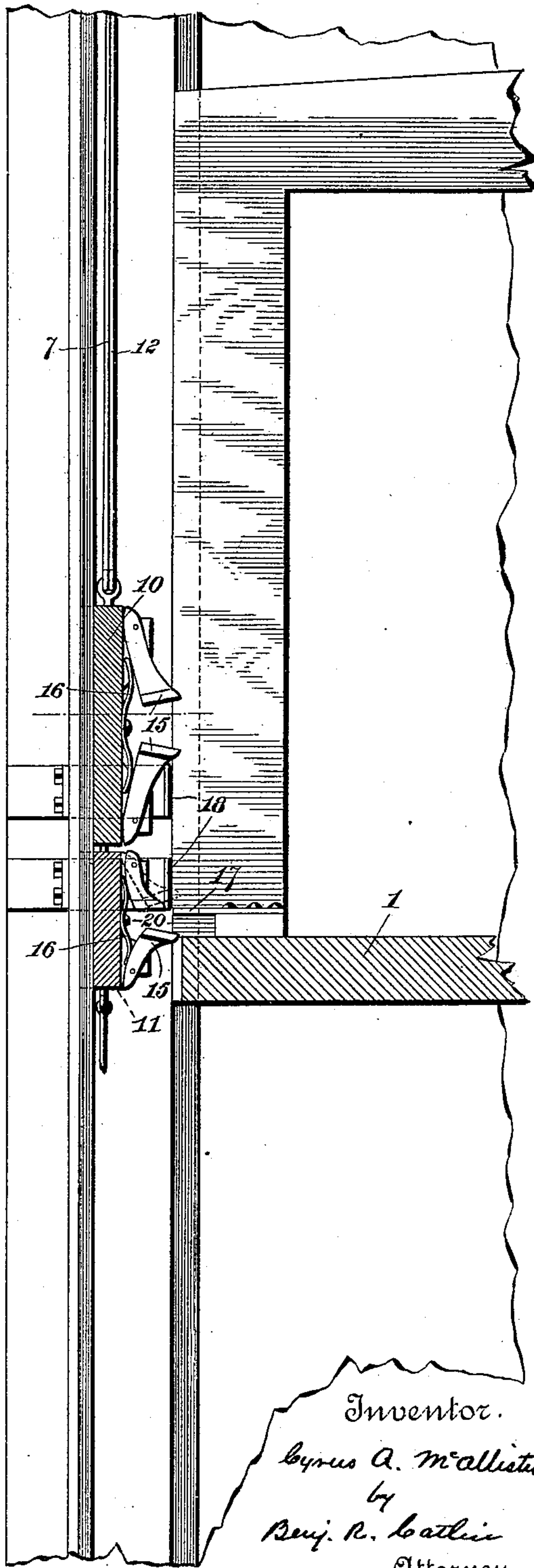


FIG. 4.



Witnesses  
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FIG. 3.



Inventor.  
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# UNITED STATES PATENT OFFICE.

CYRUS ABROM McALLISTER, OF ROCHESTER, NEW YORK.

## ELEVATOR-HATCHWAY.

SPECIFICATION forming part of Letters Patent No. 397,197, dated February 5, 1889.

Application filed May 25, 1888. Serial No. 275,039. (No model.)

*To all whom it may concern:*

Be it known that I, CYRUS ABROM McALLISTER, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Devices for Automatically Opening and Closing Elevator-Hatchways; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

The object of the invention is to provide means for opening and shutting a gate or door for an elevator-hatchway that will automatically operate with ease and certainty; and it consists in the constructions and combinations hereinafter described and pointed out.

In the accompanying drawings, Figure 1 represents a side view of an elevator-well extending through two floors of a building, a part of the wall of the elevator-well being broken away and the view being taken on the side opposite a hatchway and gate. Fig. 2 represents a vertical section of the same transverse to the gate and looking toward the mechanism for opening and closing the same. Fig. 3 is an enlarged sectional view showing the counterbalanced weights that move the gate and a part of the elevator or elevator-car carrying a spring weight lifting and depressing finger, and Fig. 4 represents a cross-section of a weight.

An elevator or car is represented at 1, and guides or ways for the same at 2.

3 indicates a hoisting-rope secured to the elevator, which latter may be raised or lowered in any approved way.

4 is a doorway or hatchway, and 5 a gate for closing the same. This gate is preferably made of vertical and horizontal bars having pivoted or journaled connections with each other, and at least one horizontal bar has a similar connection with the wall or door-frame, as at 6, the construction being such that the body of the gate can be raised and lowered by turning it upon the pivot or journal fixed in the wall or frame, as indicated in dotted

lines in Fig. 1. This construction is well known and need not be further described.

A cord, 7, is secured to the gate and extended over a swiveled pulley, 8, and thence over a pulley, 9, fixed in a bracket secured to a post of the elevator-well, and thence down to a weight, 10, in such manner that the falling of the weight raises the gate, as indicated in Fig. 1. Weight 10 is counterbalanced by a weight, 11. The former has attached to it a cord, 12, which runs over pulley 9 and thence down to weight 11, to which it is also fastened. The weights are also similarly connected by cord 13, passing under pulley 14.

The weights above described have each a dovetailed connection with a suitably-shaped way or guide formed on a post secured by brackets or otherwise to a post of the well. I may, however, form the guide or way on the well-post itself by suitably enlarging the same, or by forming a suitable extension thereon. The weights being connected by cords, (or chains,) as above specified, slide up and down on the ways, counterbalancing each the other, the smaller weight being aided by the gate in this particular through the medium of cord 7. In practice weight 10 is made sufficiently heavy to raise the gate alone, but not heavy enough to raise both the gate and weight 11.

The action of cords 12 and 13 around pulleys 9 and 14 is such that they are always made taut by the said counterbalancing.

The weights are constructed to be moved as follows: Spring-actuated catches 15 are pivoted to the weights, so as to project near the path of the elevator or elevator-floor. 16 indicate the springs which normally force these catches outwardly. My preferred form is represented as a plate-spring fastened at its middle to the weight with its free ends bearing against the catches.

A spring lifting and depressing device, 17, is secured to the elevator, preferably to the floor, and arranged to normally engage a catch (in its upward or downward movement) on one of the weights.

18 18 are releasing plates or pins rigidly secured to a post and arranged in the path of the catches 15 in such manner that when one of the latter is carried by the movement of a weight against a plate, 18, the latter engages the inclined plane of the catch, causing a com-



pression of the spring on the opposite side, so that the catch is forced back by the plate or pin toward the weight, thereby releasing the spring-finger 17. This allows the spring-finger 5 and the elevator to which it is fastened to move independently of the weight until said finger engages another catch.

Referring to Fig. 1, it will be seen that the spring-plate 17 is in engagement with the upper catch on weight 11. This would be the situation in the upward movement of the elevator as it approaches the floor immediately above at the moment when the opening of the gate is desirable to allow passage into or out of the elevator. At this time the engagement of spring-plate 17 with catch 15 has caused the weight 11 to be raised and the counterbalancing-weight 10 to be lowered, and the lowering of weight 10 has commenced the elevation of the gate by its pull upon cord 7, which passes over pulleys 8 and 9, the latter being swiveled to lie in different planes, according to the movement of the gate and the consequent changes in the direction of that part of the cord 7 which extends from the gate to said pulley. As the elevator continues to ascend, the opening of the gate will be completed; but when the upper catch, 15, has ascended to the next releasing-plate 18 said catch will be moved by the plate toward the weight, thereby releasing plate 17, which continues to move upward without the weight 11. Thereupon the plate 17, moving up with the elevator and past plates 18, located just above the floor, and past the lower catch, 15, on weight 10, engages the upper catch thereon and begins to raise such weight, with the effect to allow weight 11 to descend and the gate to close, the counterbalancing-weight being lifted, as just specified.

The operation will be understood from Fig. 3, which shows in dotted lines the position of catch 15 on weight 11 at the moment that said weight has been raised to its highest elevation and weight 10 moved to its lowest position, at which time the gate is open, having been raised through the medium of cord 7 by the superior gravity of the upper weight, to which said cord is attached. The full lines show the position of the parts at the next moment when the upper catch on weight 11 has been moved out of the way by a plate, 18, and the elevator is ascending to carry finger 17 by said catch, and also by the lower catch, 15, of weight 10 and into engagement with the upper catch on the latter weight, whereby the continued ascent of the elevator will lift it, thereby lowering (by gravity) weight 11 and closing the gate. In the descent of the elevator the gate is opened and closed in like manner by a reverse movement of the same operating devices. The upward movement of the elevator, spring-plate 17, and weight 10 continues until the latter are released by another releasing-plate 18, suitably placed above. A similar arrangement of de-

vices can be used in connection with each floor.

It will be understood from the above description that the raising of weight 11 and of the gate lowers the counter-balance 10, and that when the gate is raised the weights are adjacent to each other, as shown in Fig. 3, and that to provide for moving the upper catch of weight 11 and the lower catch of weight 10 out of the path of plate 17 two adjacent releasing-plates 18 are required. A single one of extra width, however, could be used with the same effect. In the reverse operation the same plates cause the same catches to move out of the path of spring-finger 17 in such manner that it is released from weight 10 when the latter is at the bottom of its path and is made to immediately engage with the lower catch of weight 11.

The devices described insure the automatic timely opening and closing of a gate or door giving entrance and exit to and from the elevator. They operate with great certainty and without noise or unnecessary expenditure of power, and are believed to be new and valuable improvements in elevators.

It is obvious that the gate may be made solid and provided with a single pivot or journal; also, that the location of the pulley 7, the length of the cords, and the location and size or length of the lifting and releasing plates and of the catches and other details may be varied to some extent without materially departing from the invention. I have illustrated my preferred form, but propose to make minor changes, according as required under various circumstances.

In some cases a single weight, one cord, and pulleys may be used together with a catch, depressing-finger, and releasing device whereby the gate may be opened, the gate being made sufficiently heavy to lift the weight and close by gravity upon the release of the catch.

I am aware that gates for closing elevator-hatchways have been counterbalanced with weights arranged to be depressed by the car and automatically released, and that various arrangements of pulleys, weights, and gates, whereby the latter can be automatically opened and closed, have been heretofore known, and I do not broadly claim such devices, but only the matter particularly pointed out.

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

1. The combination, in an elevator, of the weight and gate with a counterbalancing-weight, pulleys, and cords passing over said pulleys and connected each to both weights, a weight-lifting plate, and a releasing-plate, all constructed and arranged substantially as specified, whereby one weight may be made to overbalance the gate, and may subsequently be itself overbalanced by the other weight acting with the gate.



2. In combination with a movable gate or door, a cord and pulleys, a counterbalancing-weight provided with two spring-actuated catches, 15, a lifting-plate secured to the elevator-car, and a releasing-plate secured to the well-frame, substantially as specified, whereby the weight may be lifted or depressed positively, as desired.

3. A weight for use in counterbalancing an elevator-door, consisting of a body provided with pivoted catches, and a spring, 16, secured to the body and having its free ends arranged to normally press against the catches, substantially as specified.

4. The combination of the pivoted gate, the swiveled pulley-block near the front of the elevator-well, a counterbalancing-weight, a fixed pulley, a cord connecting the gate and the weight, the cord running over both the

fixed and movable pulley, a second weight, fixed pulley, and connecting-cord, all substantially as specified.

5. The combination of the elevator-car, spring-plate, weights 10 and 11, provided with spring-actuated catches 15 and constructed and arranged to move on guides, cords connecting the weights, the pulleys, and a gate connected by a cord with one of the weights, substantially as specified, whereby the weights may be alternately raised and depressed and the gate opened and closed.

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

CYRUS ABROM McALLISTER.

Witnesses:

MARTIN W. HUDSON,  
WILLIAM GUENTHER.