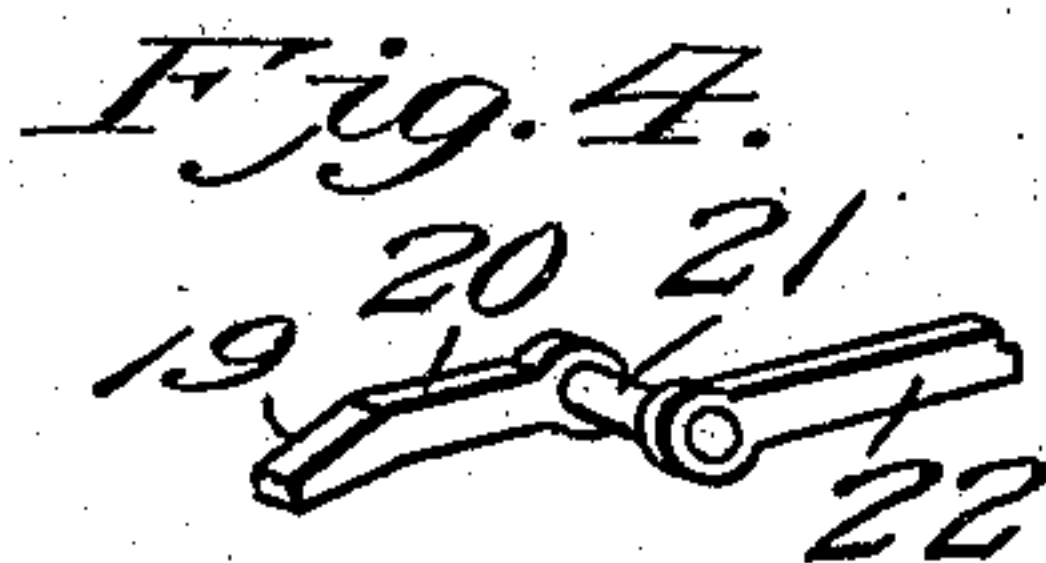
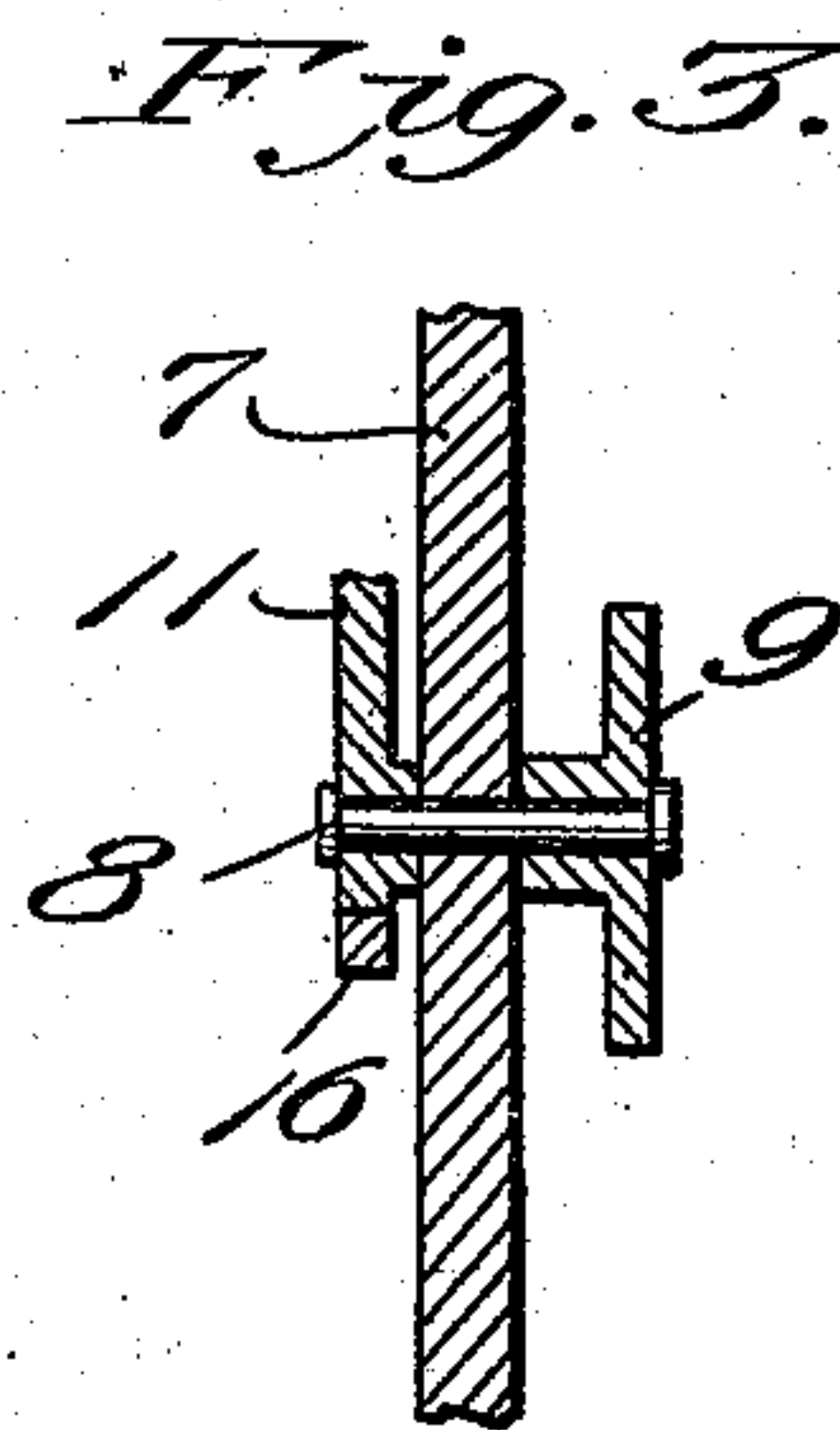
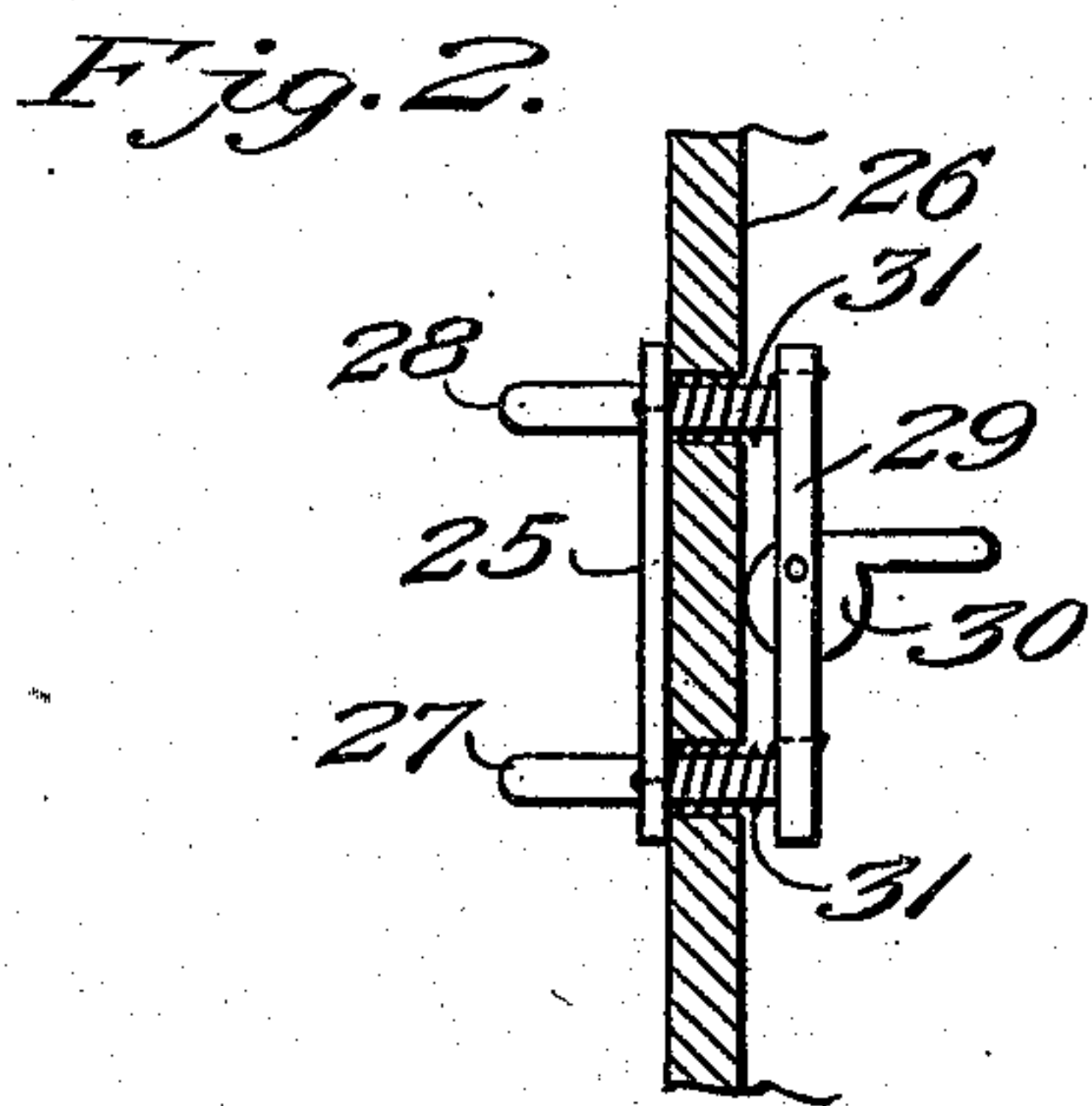
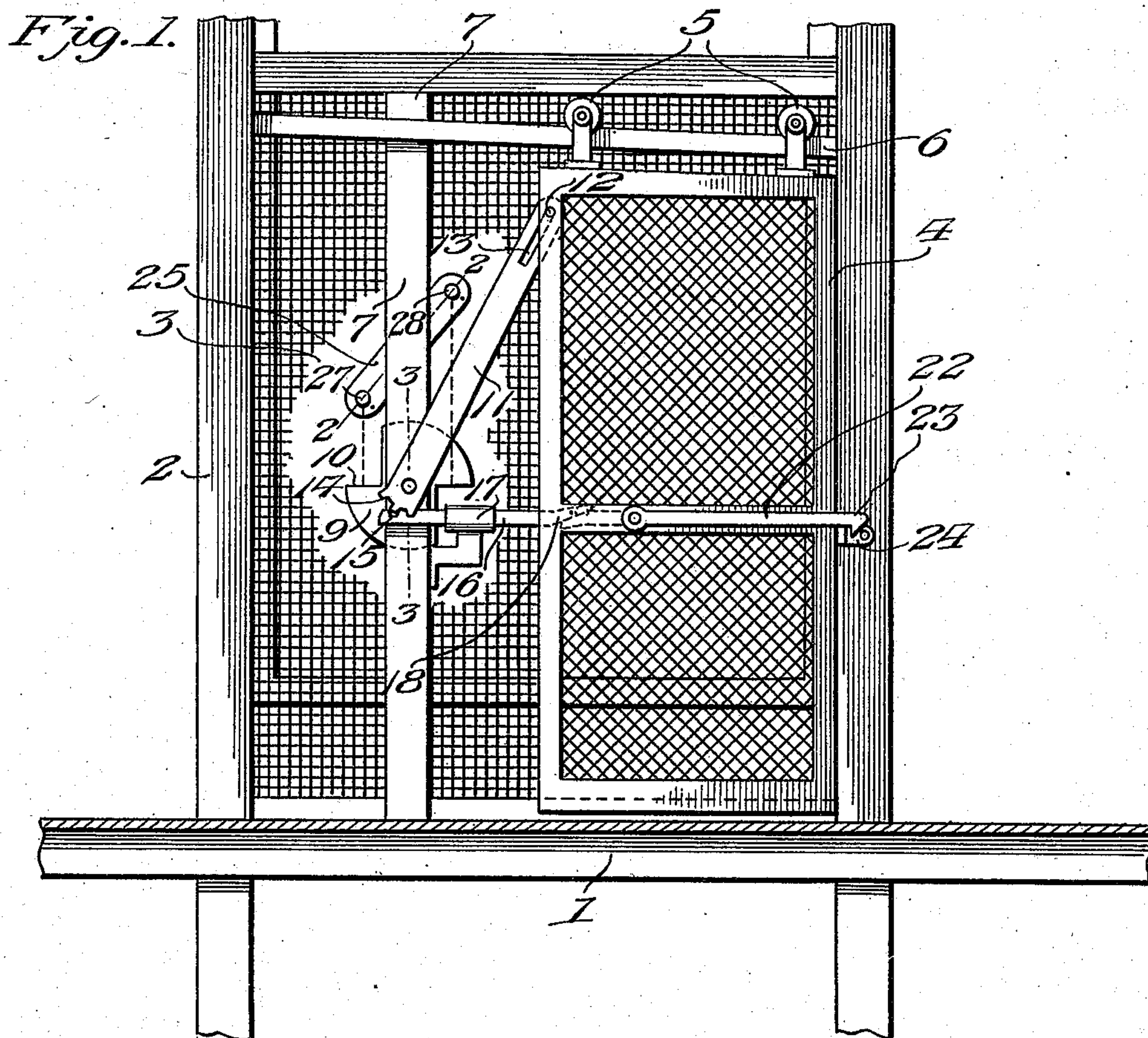


No. 840,754.

PATENTED JAN. 8, 1907.

M. N. DAVIS.
ELEVATOR DOOR OPENING DEVICE.

APPLICATION FILED. APR. 4, 1906.



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UNITED STATES PATENT OFFICE.

MARK N. DAVIS, OF BALTIMORE, MARYLAND.

ELEVATOR-DOOR-OPENING DEVICE.

No. 840,754.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed April 4, 1906. Serial No. 309,879.

To all whom it may concern:

Be it known that I, MARK N. DAVIS, a citizen of the United States of America, residing at Baltimore, in the State of Maryland, have
5 invented new and useful Improvements in Elevator-Door-Opening Devices, of which the following is a specification.

This invention relates to door-opening devices, and particularly to devices of this
10 character designed for automatically opening elevator-doors, the object of the invention being to provide simple and effective means under the control of the elevator operator whereby the doors at the successive floors or
15 landings may be conveniently opened as the car approaches and stops, the construction also being such that the car may pass any landing without opening the door, the latter being adapted to automatically close by gravity as the car leaves the floor or landing.

In the accompanying drawings, Figure 1 is a front elevation of a portion of an elevator-shaft with the door and operating mechanism at a landing and showing a car having the
25 controlling devices thereon arranged to actuate the operating mechanism as the car which is descending reaches the floor of the landing. Fig. 2 is a section through the front wall of the car on line 2 2 of Fig. 1. Fig. 3 is a
30 section through a part of the operating mechanism on the line 3 3 of Fig. 1. Fig. 4 is a detail of the latch and its releasing-arm.

Referring to the drawings, 1 designates the floor of a landing, 2 the frame or casing of the
35 elevator-shaft, and 3 an elevator-car.

The door 4, guarding the entrance to the shaft, is supported at its upper end by wheels or rollers 5 from an inclined track 6, so arranged as to adapt the door to automatically
40 close by gravity.

A bar or standard 7 is fixedly arranged at the front of the shaft parallel with the inner edge of the door and has journaled therein a shaft 8, on the inner end of which is rigidly
45 mounted an operating disk or wheel 9, said disk or wheel being notched or otherwise formed to provide a plurality of contact-shoulders 10. An operating-lever 11 is fixed adjacent its lower end to the outer end of the
50 shaft 8 and has a slip-joint connection at its upper end with the inner rail of the door, said joint being embodied in the present instance in the form of a pin 12, disposed adjacent the upper end of said rail and engaging a longitudinal slot 13 in the upper end of the lever.

The lower end of the lever is formed with rack-teeth 14, engaging corresponding teeth 15 on a latch-controlling bar 16, said bar being slidably mounted in a guide 17, carried by the standard 7, and provided with a beveled
60 end or lip 18, adapted to normally lie in contact with a similar lip or portion 19 on a latch-actuating arm 20. The arm 20 is connected with a short rock-shaft 21, journaled upon the door, and to this shaft is attached
65 the inner end of a latch-bar 22, provided at its outer or free end with a beveled hook 23 to engage a keeper 24 on the shaft-frame, whereby the door is normally locked in closed position.

It will be understood by this construction
70 that when the wheel or disk 9 is turned in one direction or the other motion will be imparted to the lever 11 to slide the bar 16 forward, whereby the arm 20 will be depressed
75 to swing the latch-bar out of engagement with the keeper, at which time the lever will communicate motion to the door, whereby the latter will be opened.

A bearing-plate 25 is fixed to the front
80 wall 26 of the car and is provided with openings for the passage therethrough of wheel-operating striker pins or plungers 27 and 28, fixed at their inner ends to a connecting bar or plate 29, disposed on the inside of the car,
85 and having journaled thereon a cam-controlling member 30, adapted to engage the wall 26. Coiled springs 31 surround the plungers between the plate 25 and the connecting
90 member 29 and are suitably attached to the former, said springs serving normally to force the plungers 27 and 28 to projected position.

It will be observed that the plate 25 and coöperating parts are disposed in a diagonal
95 or inclined position upon the wall 26, so as to set the pins 27 and 28 in different horizontal and vertical planes, thus locating the pin 27 in advance of the pin 28 on the downward
100 movement of the car and the pin 28 in advance of the pin 27 on the upward movement of the car. The pins are properly arranged to engage the contact-shoulders 10 on the operating disk or wheel 9, so that by the
105 arrangement described the pins may be projected to actuate said wheel on the upward or downward movement of the car.

It will thus be understood that as the car approaches the landing 1 the pin 27 will engage the underlying shoulder 10 of the
110

wheel 9 and rotate the latter to the left, thereby releasing and swinging the door to open position through the action of the lever in an obvious manner. When the car ascends, the pin 28 will operate in like manner upon a different contact portion of the wheel to open the door. After the door has been opened the pins 27 and 28 may be retracted by adjusting the cam-controlling device 30 to allow them to clear the wheel and by means of said cam-controlling device the pins may be held retracted to allow the car to pass any landing without opening the door.

It will thus be seen that my invention provides a simple and effective construction of mechanism whereby the car operator may effect the opening of the doors at the different landings in a convenient manner.

Having thus described the invention, what I claim is—

1. In a door-opening device for elevators, the combination with a shaft and a door closing an entrance thereto, of door-operating means comprising a pivoted lever, an oscillatory wheel or disk for actuating said lever, a releasing device operated by the lever for retracting the latch of the door, and a car provided with members for engaging and operating said wheel or disk on the upward or downward movement of the car.

2. In a door-opening device for elevators, the combination with a shaft and a door closing an entrance thereto, of a swinging latch carried by the door, an arm connected with the latch and having a beveled portion,

a sliding latch-releasing bar having a cooperating beveled portion and rack-teeth, a lever pivotally connected with the elevator frame and door and provided with rack-teeth engaging the teeth on the releasing-bar, an operating wheel or disk connected with said lever, and a car provided with members for engaging said wheel or disk on the upward or downward movement of the car.

3. In a door-opening device for elevators, the combination of a sliding door, a lever pivotally connected with the elevator frame and door, an oscillatory disk or wheel for actuating said lever, said disk or wheel being provided with a plurality of contact portions, controllable devices on the elevator-car for operating the wheel, and door-lock-releasing mechanism controlled by the lever.

4. In a door-opening device for elevators, the combination of a sliding door, lock-releasing and opening mechanism therefor embodying an oscillatory disk or wheel provided with a plurality of contact portions, cooperating contact devices on the car arranged in different horizontal and vertical planes to effect the actuation of the disk on the upward or downward movement of the car, and means for projecting and retracting said contact devices.

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

MARK N. DAVIS.

Witnesses:

HERZ. WERNING,

HARRY C. MATHIEU.