

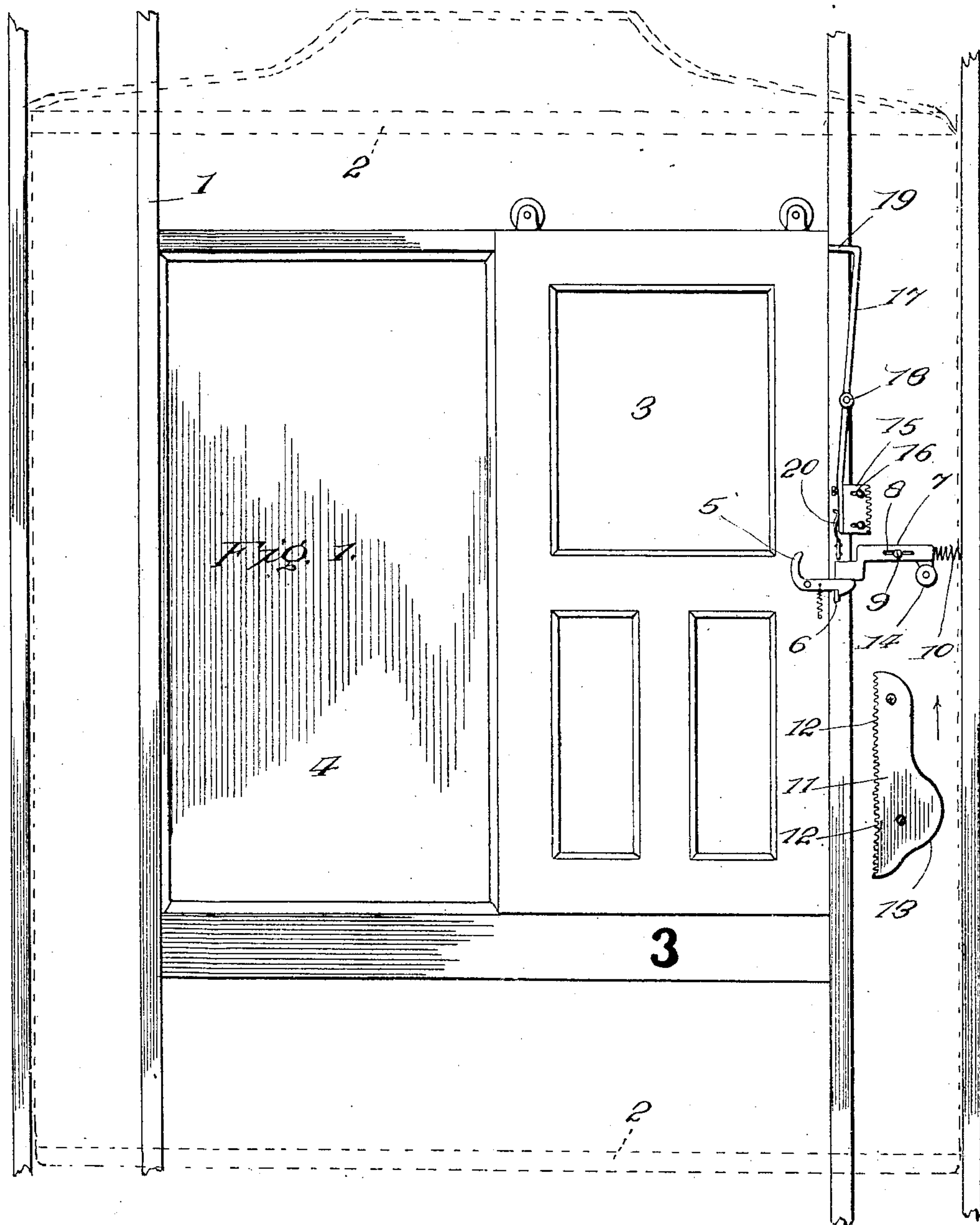
No. 803,634.

PATENTED NOV. 7, 1905.

J. W. SMITH, JR.  
SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED APR. 25, 1905.

2 SHEETS—SHEET 1.



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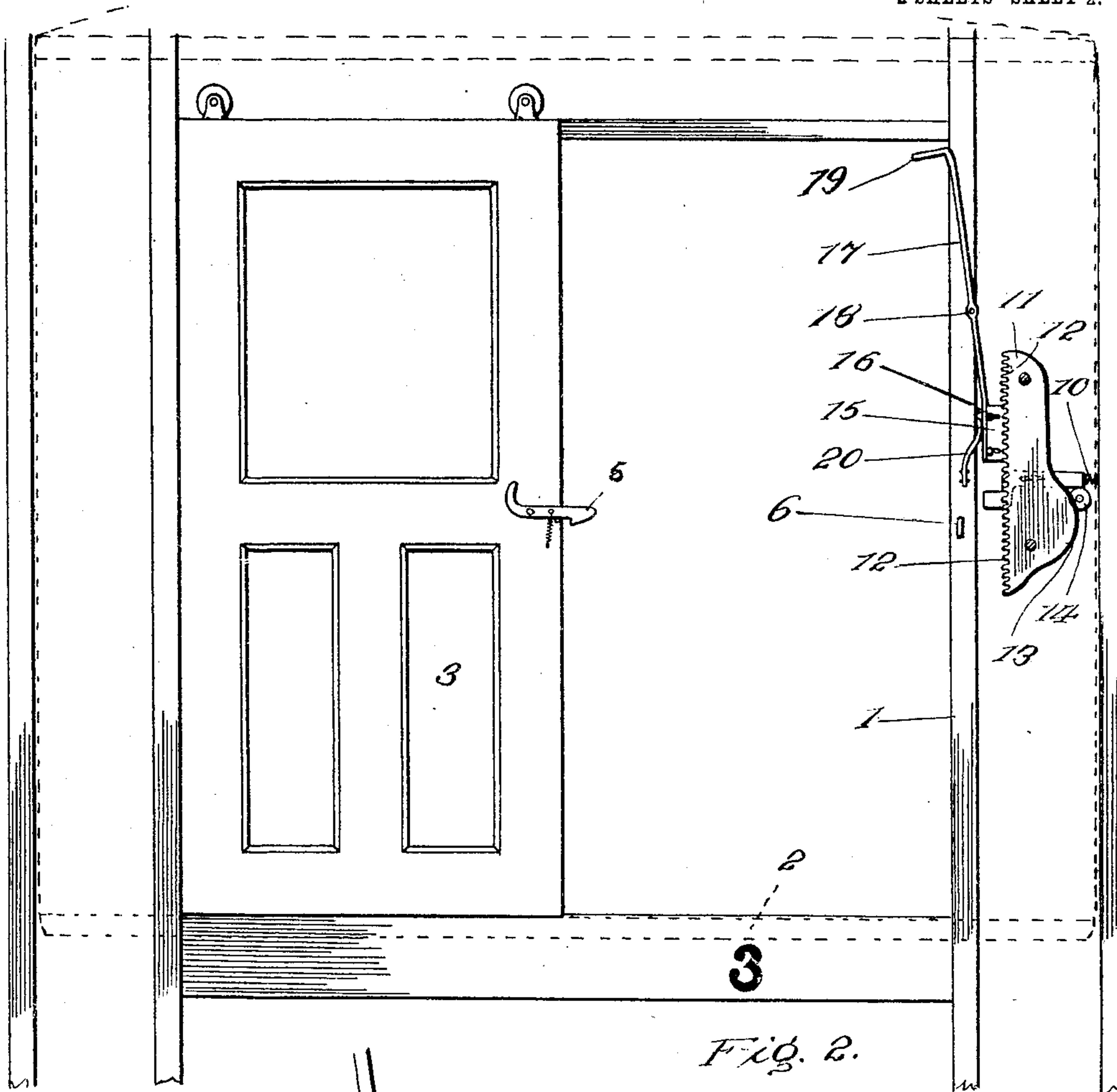


Fig. 2.

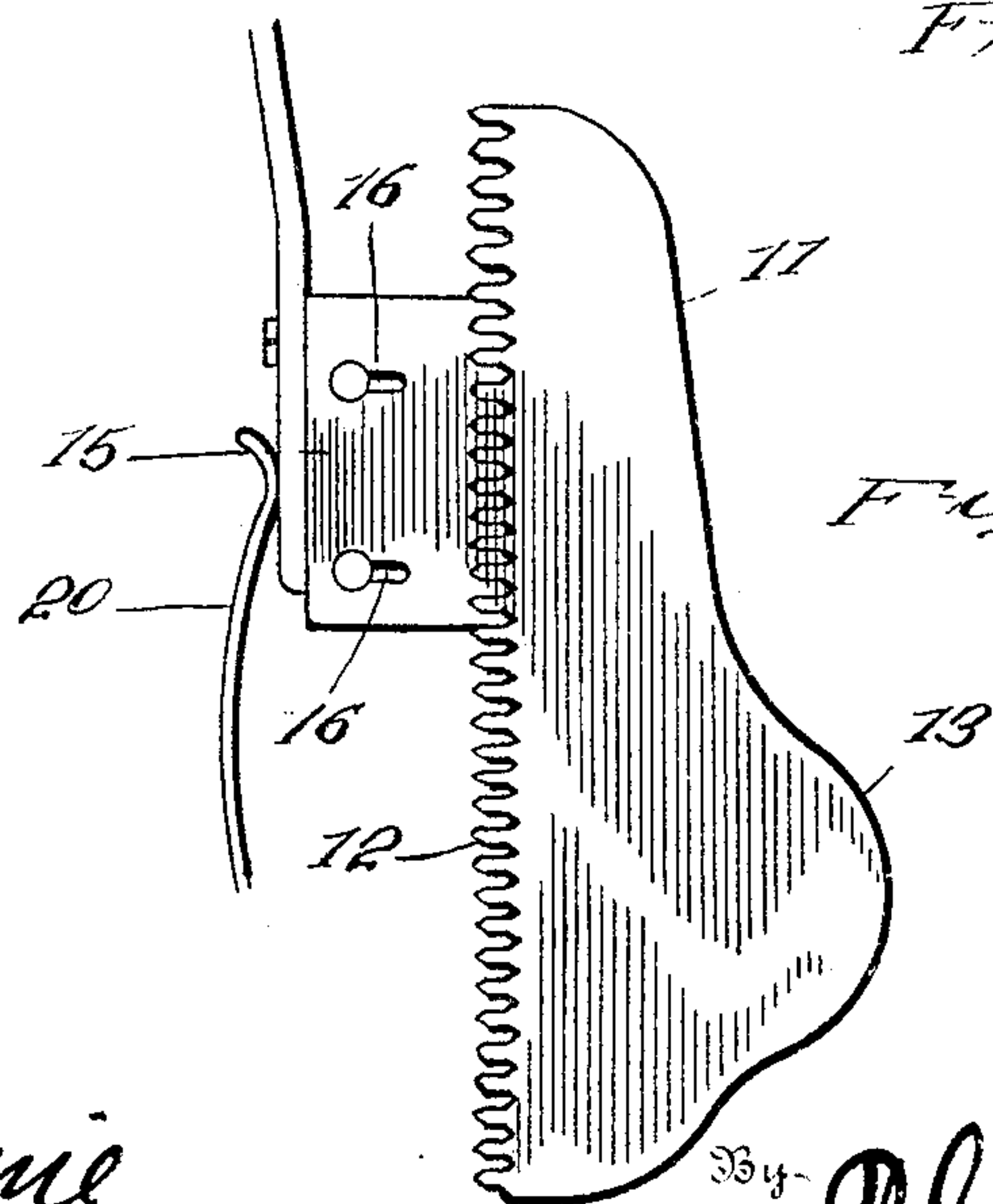


Fig. 3.

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# UNITED STATES PATENT OFFICE.

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TO WM. WIESE, OF BODAVILLE, KANSAS.

## SAFETY DEVICE FOR ELEVATORS.

No. 803,634.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed April 25, 1905. Serial No. 257,333.

*To all whom it may concern:*

Be it known that I, JAMES W. SMITH, Jr., a citizen of the United States, residing at Bodaville, in the county of Riley and State of Kansas, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

This invention is in line with that class of devices called "safety devices" for elevators and designed to increase the safety of transportation in the ordinary types of passenger elevator-cars at present in use.

This invention is applied to the shaft-casing and elevator-car and will prevent opening of the door of the shaft before the elevator-car has come to a stop; and, further, the practical embodiment of the invention will obviate all likelihood of starting of the car before the door has been closed, the above giving rise in many instances to serious accidents and loss of life.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a view, partially in section and partially in elevation, showing an elevator-shaft broken away and the positions of the parts of the safety device comprising this invention before the car reaches a landing preparatory to opening the door of the shaft. Fig. 2 is a view similar to Fig. 1, showing the position of the parts after the door has been opened. Fig. 3 is a detail view bringing out more clearly the form of the dog and toothed plate which coöperates therewith.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 indicates the casing of an elevator-shaft, which may be of any of the various constructions at present in use.

The numeral 2 denotes the elevator-car, and the numeral 3 a door to the shaft at one of the landings 4. The door 3 is adapted to be held closed by means of a suitable latch embodying the catch 5, which is pivotally mounted upon the door similar to many of those at present in use. The catch 5 is adapted to coöperate with a fixed catch 6, suitably secured to the

casing 1 of the elevator-shaft at one side of the door-opening.

Secured to the elevator-casing 1 at one side of the door-opening in which the door 3 is mounted is a lock member 7, consisting of a transversely-slidable lock-plate provided with a longitudinal slot 8, through which a pin or similar fastening 9, secured to the casing 1, passes in order to attach the member 7 thereto. One end of the member 7 is adapted to engage over the catch 5 of the door 3, being normally held in this position by means of a spring 10 bearing against its opposite end. The spring 10 is interposed between said end of the member 7 and the adjacent portion of the casing 1. When the lock member 7 is in engagement with the catch 5, it is impossible to open the door 3, since the latch means therefor cannot be operated by the conductor of the car for obvious reasons, the member 7 not being accessible, as it is housed or otherwise attached to the casing 1 and arranged between the car and said casing. The car 2, however, is provided with means by which when the floor of the car reaches the level of the landing 4 the lock member 7 will have been operated, so as to be disengaged from the catch 5, permitting the conductor of the car when the latter has stopped to disengage the catch 5 from the catch 6 in opening the door 3. The means carried by the car for accomplishing the above consists of a dog 11, fixedly secured to the elevator 2, said dog being provided at one edge with a plurality of longitudinally-arranged teeth 12 and at its opposite edge with a cam 13. When the car 2 is going up or down, the cam 13 is adapted to engage a roller 14, which is carried by the lock member 7 at one end, and the engagement of the parts 13 and 14 will force the lock member 7 out of engagement with the catch 5, as premised upon above. The cam 13 of the dog 11 engages the roller 14 just as the car reaches a landing either ascending or descending, and when the car is stopped at such landing the cam 13 will hold the lock member 7 out of engagement with the catch 5 against the tension of the spring 10, and as soon as the dog 11 assumes the position in which the lock member 7 is held from engagement with the catch 5 the toothed portion of the lock member is automatically engaged by a toothed member of plate 15, arranged above the member 7 and slidable transversely of said casing 1, to



which it is attached. The toothed plate 15 is also held in place upon the casing 1 by a pin-and-slot connection therewith, as shown at 16, and this toothed plate 15 is secured also to the lower extremity of the door-opening lever 17, which is pivotally mounted on the casing 1, as shown at 18. The upper extremity of the lever 17 is provided with a lateral extension 19, adapted to be projected from the casing 1, so as to positively engage the adjacent edge portion of the door 3 when the latter is being forced open by means of the lever 17. A spring 20 is interposed between a portion of the casing 1 and the lower extremity of the lever 17, which carries the plate 15, and the normal tension of this spring 20 is such that when the door is closed the member 19 of the lever 17 is bearing thereagainst under spring-pressure of the part 20, coöperating with the lower extremity. The door being closed, the normal position of the plate 15 is out of the path of movement of the dog 11, carried by the elevator 2.

The functions of the parts hereinbefore described will fully appear in the statement of the operation of the invention. As the dog 11, either in the ascending or descending movement of the car 2, coöperates with the lock member 7 by engagement of the cam 13 with the roller 14, the said lock member 7 will be forced out of engagement with the catch 5 as the car stops at the landing 4. The member 7 having been disengaged from the member 5, the conductor of the car may readily lift the catch 5, and as soon as this is done the tension of the spring 20, coöperating with the lever 17, will be sufficient to cause the member 19 to force the door open in a manner readily apparent. As the member 19 is forced toward the door in opening the same the lower end of the lever 17 is actuated by the spring 20 so as to carry the toothed plate 15 toward the dog 11, which has reached a position just opposite the plate 15 as soon as the car stops. The plate 15, with its teeth in engagement with the teeth 12 of the dog 11, will lock the dog from any movement, so that the car cannot ascend or descend until the member 15 has been disengaged from the member 11. The member 15 will not be disengaged from the member 11 until the door has closed again. Said door in its closing movement striking the extension 19 of the lever 17 and forcing said extension inwardly throws the plate 15 away from the dog 11, permitting the car to move when the door 3 is locked closed by the catch 5. The shape of the teeth of the plate 15 and the dog 11, as shown most clearly in Fig. 3, is such as to give the greatest possible interlocking engagement of these parts.

Having thus described the invention, what is claimed as new is—

1. In a safety device for elevators, the combination of the shaft-casing, the car mounted

therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, and means upon the casing for preventing movement of the dog when the door is open. 70

2. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, and spring-actuated means upon the casing for preventing movement of the dog when the door is open. 80

3. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, and means governed by the door for preventing movement of the dog when the door is open. 85

4. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car and having a cam for actuating the lock member aforesaid to permit opening of the door, and means upon the casing for preventing movement of the dog when the door is open. 90

5. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, a door-opener, and means carried by the door-opener for preventing movement of the dog after the door is opened. 100

6. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, a door-opener, and a movable plate carried by the door-opener to engage the dog and prevent movement thereof after the door is opened. 110

7. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a lock member upon the casing for holding the door closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, a door-opener comprising a spring-actuated bar arranged to force the door open, and means carried by the door-opener for preventing movement of the dog after the door is opened. 120

8. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a spring-actuated lock member upon the casing for holding the door 130



closed, a dog carried by the car for actuating the lock member aforesaid to permit opening of the door, and means upon the casing for preventing movement of the dog when the door is open.

5 9. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a catch for the door, a lock member upon the casing and normally engaging said catch to prevent operation thereof, a dog carried by the car and adapted to engage the lock member, and a door-opener coöperating with the dog.

10 10. In a safety device for elevators, the combination of the shaft-casing, the car mounted therein, a door, a catch for the door, a lock member upon the casing and normally engaging said catch to prevent operation thereof, a dog carried by the car and adapted to engage

the lock member, a door-opener comprising 20 a pivoted bar arranged to force the door open, a spring for actuating said bar, and a toothed sliding member carried by the bar to engage the dog.

11. In a safety device for elevators, the combination of the shaft-casing, the car movable therein, the door, means for preventing opening of the door except when the car reaches the landing, and an automatically-operating door-opener for preventing movement of the car 30 when the door is open, and permitting movement of the car when the door is closed.

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

JAMES W. SMITH, JR. [L. S.]

Witnesses:

W. D. AUCHARD,  
GEORGE BEEX.