E. WYLDE & C. SCHENCK.

DOOR CONTROLLING DEVICE.

APPLICATION FILED MAY 17, 1912.

1,044,115.

Patented Nov. 12, 1912.

3 SHEETS—SHEET 1.

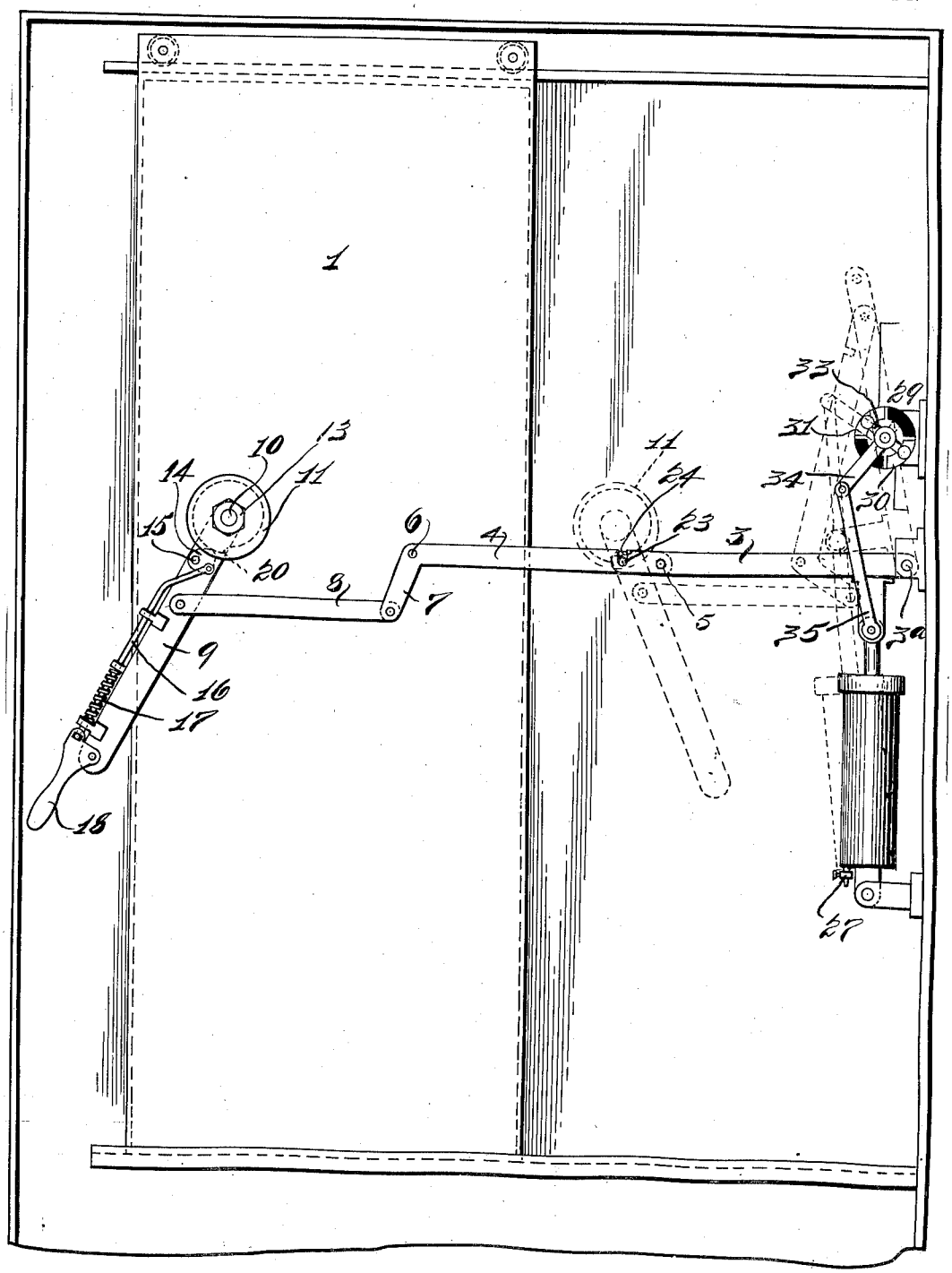

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Fig. 1.

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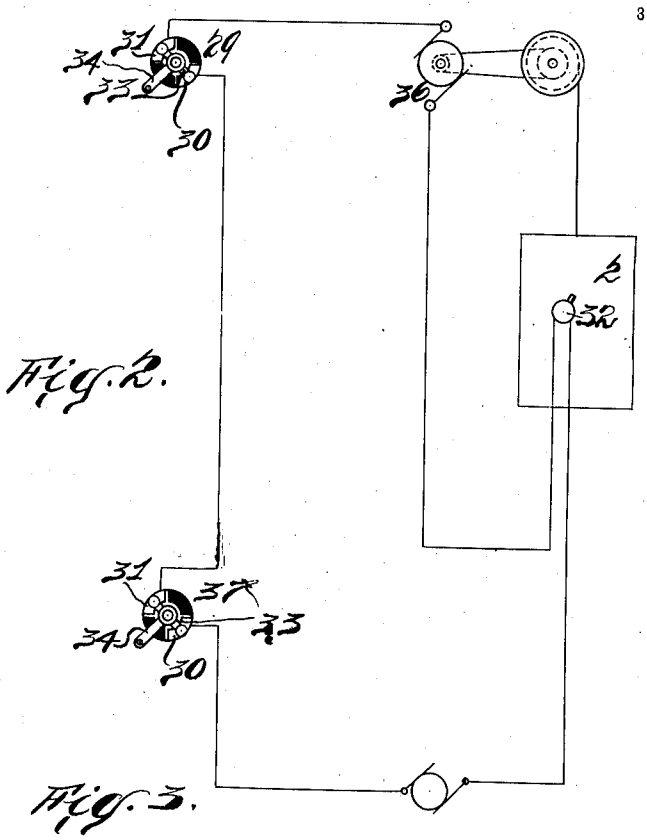
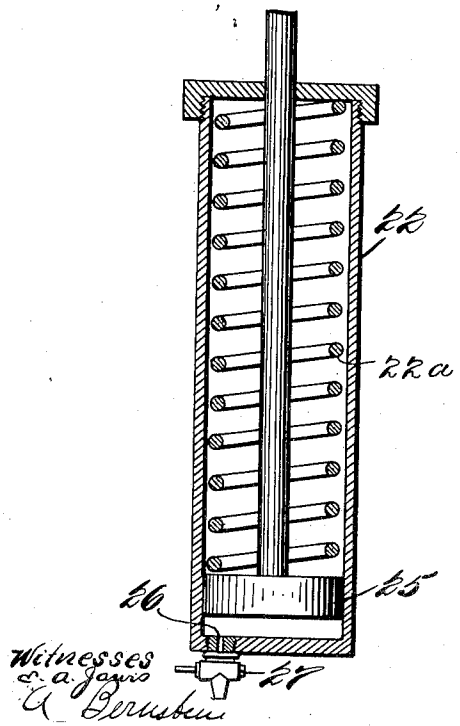


Fig. 2.

Fig. 3.



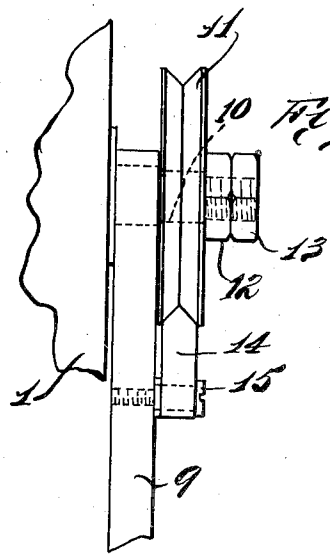


Fig. 4.

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3 SHEETS—SHEET 3.

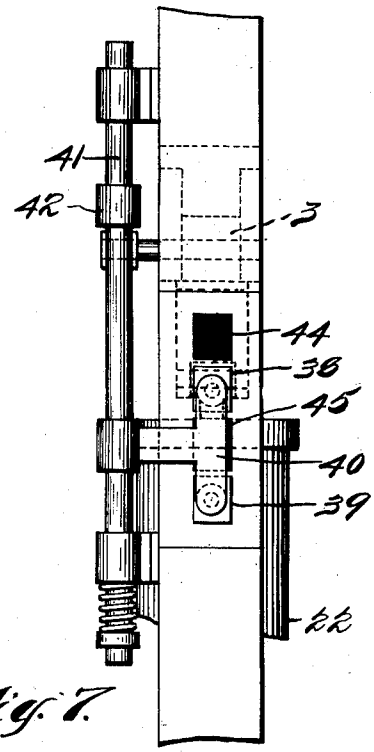

Fig. 7.

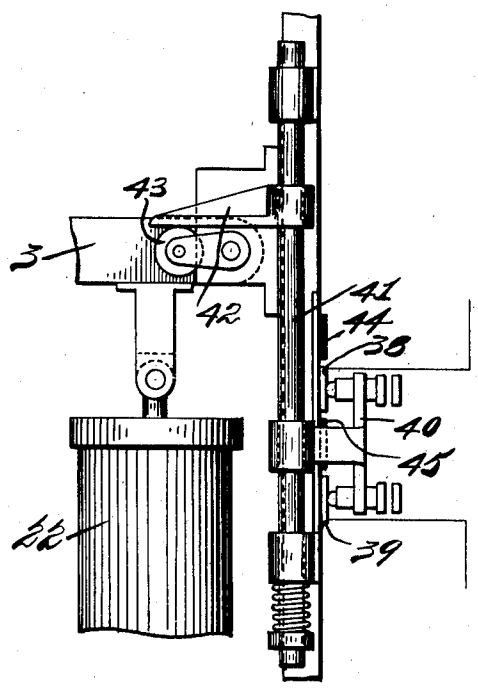

Fig. 6.

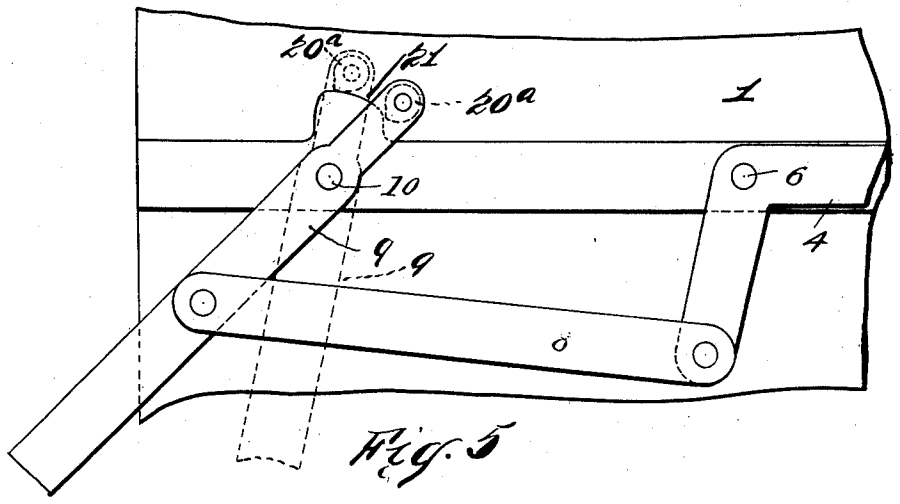

Fig. 5.

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UNITED STATES PATENT OFFICE.

EDWARD WYLDE, OF NEW YORK, N. Y., AND CHARLES SCHENCK, OF CHICAGO, ILLINOIS, ASSIGNORS TO ELEVATOR SUPPLY & REPAIR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DOOR-CONTROLLING DEVICE.

1,044,115. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed May 17, 1912. Serial No. 697,921. REISSUED

To all whom it may concern:

Be it known that we, EDWARD WYLDE and CHARLES SCHENCK, citizens of the United States, residing at New York city, New York, and Chicago, Illinois, respectively, have invented certain new and useful Improvements in Door-Controlling Devices, of which the following is a clear, full, and exact description.

Our invention relates to a door-controlling device, and our object is to provide a construction which will prevent an unauthorized opening of the door even though the door is not entirely closed.

Our invention will be set forth in the claims.

In the preferred embodiment of our invention shown in the drawings, Figure 1 is a side elevation of a portion of the mechanism; Fig. 2 is a diagrammatic view of a preferred form of circuit which may be used when the door-controlling construction is combined with an elevator; Fig. 3 is a detail view of the dash-pot; Fig. 4 is a detail, and Figs. 5, 6 and 7 are modifications.

1 is a door or gate which, in the present embodiment, is horizontally slidable and is located, for example, at one of the floors and allows access to the elevator 2 moving up and down in the well or hatchway of a building.

In the embodiment shown in the drawings, we have provided an automatic closing means for the door which, as illustrated, comprises a toggle consisting of levers 3 and 4 pivoted together at 5. Lever 3 is pivoted on a stationary pivot 3^a, and lever 4 is pivoted to the door at 6. Pivoted to the lateral extension 7 of the lever 4, is a link 8, which is also pivoted to a lever 9, which lever is pivoted on a fixed stud 10 carried by the door. It will be obvious that when the door is open, as illustrated in dotted lines, the movement of the toggle will cause the door to close and conversely the movement of lever 9 toward the right will break the toggle and open the door. The toggle and levers described may therefore be considered to be either a means for opening the door, or a means for closing.

In order to prevent an unauthorized opening movement of the door when the same has been partially closed, we have provided two parts freely movable past each other during the closing movement, but adapted automatically to engage on a reverse movement. In the preferred embodiment shown in Fig. 1 of the drawings, one of these parts is a grooved wheel 11 normally fixed on the stud 10 by the lock-nuts 12 and 13, which also allow the wheel to be adjusted if desired. The other part of the locking device is, in this embodiment, a cam 14 pivoted at 15 to the lever 9. Connected to this cam is a sliding rod 16 carrying coil spring 17, which normally presses the rod and cam toward the wheel. 18 is one means of moving the cam which, in the present embodiment, is a handle. It will be obvious that when the door is moving to the left in its closing movement, the grooved wheel 11 and the cam 14 will move freely past each other (except of course for the slight friction between the two, which is inconsiderable), but after the cam is past the point 20, any attempted movement of the door in the reverse direction will cause the V-shaped portion of the cam to engage the groove in the wheel and lock the two together, thereby preventing the movement of the door in its opening direction.

In Fig. 5 we have shown a modification of this device, in which the lever 9 carries on its end a freely pivoted cam 20^a which, as the lever is moved in one direction, freely passes across the stationary surface 21. As the door is opened the lever is thrown across until the cam 20^a rides entirely off from the surface 21; and as the door is closed the cam rides over the surface until, when the

door is nearly closed it rides back onto the surface, as indicated in dotted lines. In such position if the door is given a reverse movement in the opening direction, the cam 20ª will bite against the surface 21 and prevent the reverse movement of the door.

It will be observed that in both of these locking constructions illustrated, there are two parts which are freely movable past each other during the closing movement of the door, but adapted automatically to engage on an attempted reverse movement. Therefore if the elevator operator does not completely close the door, it cannot be opened from the outside of the shaft sufficiently to allow a person to pass through.

In order to automatically close the door, we have provided a spring-pressed dash-pot 22, the piston of which is connected to the lever 3 of the toggle, so that when the operator releases the handle 18 after having opened the door, the force of the spring 22ª will cause the toggle to shut and force the door to its closed position, as illustrated in Fig. 1. The toggle slightly passes the dead center in order to lock the door closed and is stopped from further movement by any suitable construction, such as a pin 23 on link 3, which engages a slot 24 on the link 4. In order to cushion the closing movement, the piston 25 fits closely in the dash-pot casing and forces the air out of a restricted opening 26, thereby giving a well known cushioning effect, which may be varied as desired by a suitable valve 27.

In the operation of high speed elevators in a building, it is important to save all the time possible, and if an operator cannot start his car until the door is entirely closed, much time is lost. It is therefore desirable to prevent the starting of the car until the door is partially closed, but to permit the car to be started before the door is entirely shut. We have provided an electric switch controlled by the door-operating mechanism and which prevents the starting of the elevator until a predetermined point in the closing movement of the door is reached. Such a switch is illustrated, for example, in Fig. 1 at 29, in which the segments 30 and 31 are in the electric circuit with the controller 32 in the car, and with a switch arm 33 bridging the same and operable by suitable links 34, 35 from the power-operating mechanism. In Fig. 2 we have shown the same diagrammatically, in which 36 indicates any suitable device for raising and lowering the elevator, such as a motor. 29 is a switch on one of the floors, and 37 is another similar switch at another floor operated by the door mechanism on that floor. It will be obvious that when either door is open, its switch is open and the car cannot be started, but as the door closes, the switch arm 33 is thrown to close the circuit.

In Figs. 6 and 7 we have shown a modification of such a switch, in which the stationary contact plates 38 and 39 are in the electric circuit and are connected by a bridge contact 40 carried on a vertically movable spring-pressed rod 41. The rod has an adjustable toe 42, which is engaged and elevated by a roller 43 when the door is opened and which causes the terminals of the bridge contacts 40 to pass over onto the dead segments 44 and 45, thus breaking the circuits as in the other illustrations.

It will be obvious that by the safety-lock arrangement, previously described, the operator may start the car from the floor without waiting for the complete closing of the door, because the door cannot be opened even though it were slightly ajar and with the toggle somewhat broken. The cushioning effect of the dash-pot is to cause the door to move somewhat slowly as it approaches the closed position, and as the operator may safely start his car before waiting for the complete closure, a material amount of time is saved which would otherwise be lost. This is particularly important in the operation of high speed elevators. The value of such a construction will be evident to any person familiar with the practical needs of high speed elevator service.

We are aware that our invention may be embodied in devices widely differing from those preferred embodiments shown in the drawings and without departing from the scope of the claims herein made. We therefore do not desire to be limited to the constructions illustrated and described.

What we claim is:—

1. In a door-controlling mechanism, a movable door, a locking device preventing the opening movement of said door when the same has been partially closed and comprising two parts freely movable past each other during the closing movement but adapted to engage on a reverse movement of the closing door, and automatic means for closing said door and moving one of said two parts independently of said door.

2. In a door-controlling device, means for opening a door, means for closing a door, said closing means being arranged to permit the free movement of the door in either direction when opened beyond a predetermined point and adapted to prevent a movement of said door in a direction to reopen the same when said door is reaching its closed position.

3. In a door-controlling device, a door, mechanism for opening and closing said door, and means for positively checking an opening movement of the door when the

door passes a predetermined point in its closing movement, said mechanism being arranged to permit the free movement of said door when open beyond said predetermined point.

4. In a door-controlling device, a hand-operated member, means actuated thereby to open the door, returning means for returning the door to its closed position, a check device preventing the reopening of said door by a force applied to the door when the door has become partially closed, said check device being arranged to be controlled by said hand-operated member.

Signed this 9th day of May, 1912.

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