No. 663,844. Patented Dec. 18, 1900.

G. ASHLEY.

DOOR CHECK AND CLOSER.

(Application filed Apr. 30, 1900.)

(No Model.)

Fig. 1.

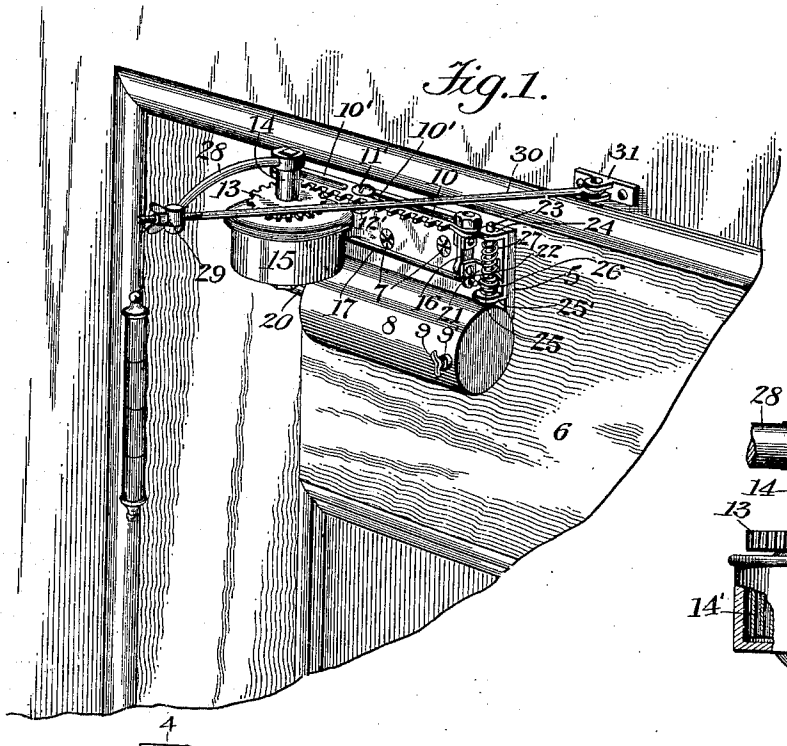


Fig. 4.

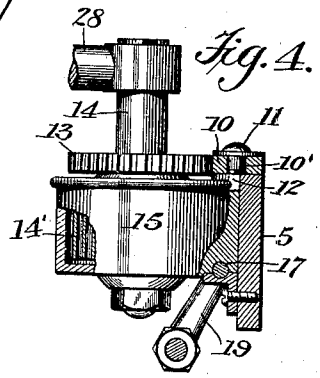


Fig. 2.

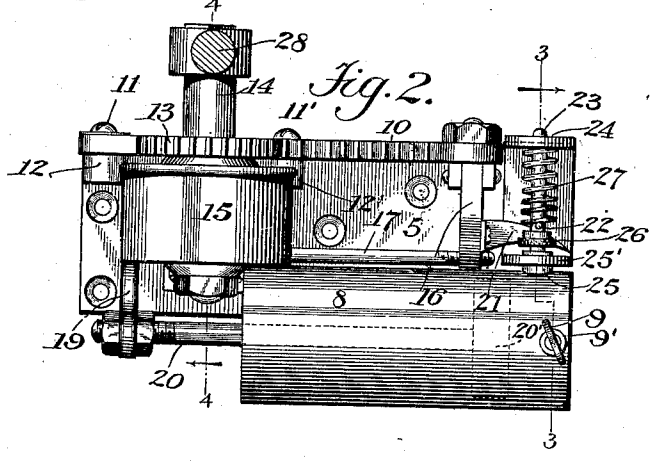


Fig. 3.

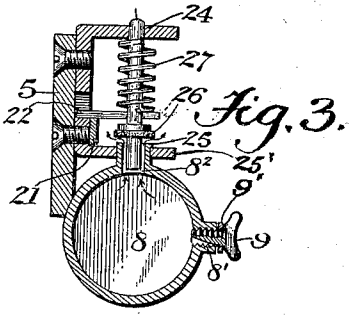
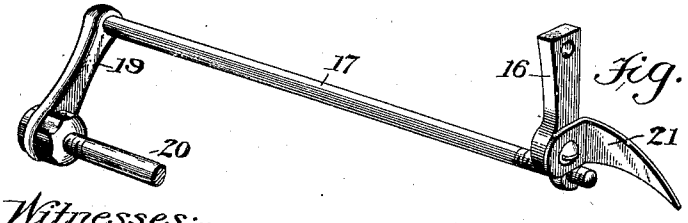


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE ASHLEY, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR OF TWO-THIRDS TO ALFRED W. HADLEY AND GEORGE ASHLEY, JR., OF SAME PLACE.

DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 663,844, dated December 18, 1900.

Application filed April 30, 1900. Serial No. 14,812. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ASHLEY, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in a Combined Door Check and Closer, of which the following is a specification.

My invention relates to door checks and closers, particularly of the "pneumatic" type; and it has for its object the provision of improved instrumentalities whereby those devices are rendered more efficient in operation and whereby the door will always be fully closed against wind-pressure or other natural causes.

Heretofore with some kinds of pneumatic door-closers trouble has arisen on account of the failure completely to shut the door, especially when it is forced to close against the pressure of a strong wind, and consequently much annoyance is caused by the inrush of air, and drafts detrimental to sound hygienic conditions are produced. With my invention this defect is entirely obviated and the door will be slowly and completely shut against any pressure not more forcible than the power of the spring employed in connection with the pneumatic cushion.

Referring to the drawings, Figure 1 is a perspective representation of my invention, showing the same applied to a door. Fig. 2 is a plan view. Fig. 3 is a cross-section on line 3 3, Fig. 2, looking in the direction of the arrow. Fig. 4 is a section on line 4 4, Fig. 2, looking toward the left, the case containing the spring being partially in section. Fig. 5 is a detail in perspective hereinafter mentioned.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, 5 designates the bed-plate of my improved door closer and check, which may be attached to a door (designated by 6) in any desired way—for instance, by screws 7 passing through said bed-plate.

Attached to or, as shown, integral with the bed-plate 5 is a pneumatic cylinder 8, and this cylinder is perforated at 8′ and 8^2, Fig. 3, for a purpose hereinafter described, a channeled screw or other suitable device 9, having a washer 9′, being provided for either partially or wholly closing the perforation 8′, as circumstances may require.

Mounted on the bed-plate 5 is a rack, (designated by 10,) which may be fitted for movement back and forth on said bed-plate in any desired way. As shown, however, this rack is slotted at 10′ and is fitted over screws or other projections 11 11′, threaded into lugs 12 12′, projecting from the bed-plate. In engagement with this rack 10 is a wheel 13, secured to a shaft 14, to which one end of a spring 14′ is attached in the usual manner, the other end of said spring being connected to a fixed part—for instance, the spring-case 15—as is usual.

Projecting at an angle to one end of the rack 10 is a cross-bar 16, and attached to this cross-bar is a rod 17, connected at its rear end to an arm 19, which is rigidly secured in any suitable manner to the rod 20 of the piston 20′, operating and guided in an opening in the end of the pneumatic cylinder 8. Carried by this cross-bar 16 is a wedge or other suitable cam-shaped projection 21, which when the door is closed is normally in engagement with a pin or other projection 22, projecting from a spring-actuated rod 23, movable in a bearing formed in an arm 24 of a U-shaped bracket either attached to or forming a part of the bed-plate 5.

As will be obvious by reference to Fig. 3, the pneumatic cylinder 8 is provided with a tubular projection 25, having an air-vent 8^2, which projection passes through an opening in the arm 25′ of bracket 24, and the spring-actuated rod 23 is fitted at its end with a disk valve 26, which is normally held by the coiled or other suitable spring 27 in contact with the end of the tubular projection or vent 25 to close the same and prevent the exit of air from the cylinder 8. Screw 9, entering the opening 8′ of the cylinder 8, is preferably cut away or channeled in order that by adjusting said screw the exit of air from the cylinder may be regulated as desired and the door be caused to close either slowly or rapidly by the spring contained in the case or chamber 15.

Any other suitable valves may be substituted for the screw 9 and the disk valve 26

without departure from the scope of my invention, and the details of the means for actuating the valve 26 may be widely varied and still be within the purview thereof.

Connected to the shaft 14 in any suitable manner is a crank-arm 28, attached at one end, preferably by an adjustable connection 29, to a rod 30, mounted for swinging movement in a bracket 31, secured to the door-casing.

In operation as the door is swung from its closed position (shown in Fig. 1) to an open position the spring within the chamber 15 is wound up and when the door is released immediately exerts its pressure upon the shaft 14 and connections 28 and 30 to close the door. This pressure of the spring is at first rapidly exerted and then more slowly as the air is compressed in the pneumatic cylinder 8, and just before the closing movement of the door is completed the rack 10, which is all the while being forced forward by gear 13, carries the wedge or cam 21 into a position where it will come in contact with and force back the spring-actuated disk valve 26, thereby immediately releasing the compressed air within the cylinder and permitting the spring to expand suddenly and exert its full force upon and close the door.

The pressure of the spring upon the door may be nicely regulated by manipulating the valve 9, which, when partially open, allows more or less air to escape from the pneumatic cylinder 8, and thus reduces the pressure of the air-cushion against the piston contained in said cylinder.

Many changes may be made in the construction of my improved device, and the rack and its connected parts may be of different constructions from those shown without departure from my invention.

Having described my invention, I claim—

1. A combined door check and closer comprising a base-plate, a pneumatic cylinder, and a spring case or barrel secured to said base-plate; a piston in said cylinder; a shaft journaled in bearings of the spring-case and carrying a gear; a spring connected at one end to said shaft and at the other end to said case; a rack mounted for sliding movement on the bed-plate and having a cross-bar; a cam-shaped projection carried by said cross-bar; means for connecting the cross-bar with the piston-rod; and a valve normally closing a port in the cylinder and adapted to be withdrawn by said cam-shaped projection.

2. A combined door check and closer comprising a base-plate carrying a pneumatic cylinder, said cylinder having air-relief ports; a piston in said cylinder; a rack mounted for sliding movement on the base-plate; means for actuating the rack; a cam-shaped projection movable with the rack; means connecting the rack with the rod of the piston; and air-relief valves one of which is actuated by said cam-shaped projection.

3. A combined door check and closer comprising a base-plate; a rack movable back and forth on guides of said base-plate; gearing for actuating said rack; a cross-bar projecting from one end of said rack; a pneumatic cylinder having an air-relief port; a piston within said cylinder; an arm connected to the rod of said piston; a rod connecting said arm with the cross-bar of the rack; a cam-shaped projection carried by the cross-bar of the rack; and a spring-actuated valve normally closing the relief-port in the cylinder and adapted to be withdrawn by said cam-shaped projection.

4. A combined door check and closer comprising a base-plate; a rack reciprocatory on said base-plate; a gear in engagement with said rack and spring-actuated in one direction; a pneumatic cylinder carried by the base-plate and having an air-relief port; a piston within said cylinder; devices connecting the rod of said piston with the rack; a cam-shaped projection movable with the rack; a spring-actuated valve normally closing said air-relief port; and a pin carried by said valve with which the cam-shaped projection engages to withdraw said valve.

5. A combined door check and closer comprising a pneumatic cylinder having air-relief ports; a piston in said cylinder; a channeled screw located in one of said ports; a spring-actuated valve for closing the other of said ports; a sliding rack having a cross-bar; a cam-shaped projection carried by said cross-bar and adapted to withdraw said spring-actuated valve; means for connecting the cross-bar with the rod of the piston; and means for actuating the rack.

6. A combined door check and closer comprising a base-plate; a pneumatic cylinder secured to said base-plate and having air-relief ports; an adjustable valve for regulating the emission of air from one of said ports; a spring-actuated valve for normally closing the other of said ports; a piston within the cylinder; a rack mounted for sliding movement on the base-plate and carrying a cross-bar; a rod attached to said cross-bar; an arm connecting said rod with the piston-rod; and a cam-shaped projection carried by the cross-bar of the rack and adapted to withdraw the spring-actuated valve.

7. A combined door check and closer comprising a base-plate; a pneumatic cylinder located on said base-plate and having air-relief ports; a channeled screw threaded in one of said ports and carrying a washer; a spring-actuated valve mounted in bearings of the base-plate and adapted to close the other of said air-relief ports; a piston located within the cylinder; a movable rack carrying a cross-bar at one end; a cam-shaped projection on said cross-bar and adapted to withdraw the spring-actuated valve; a rod secured to said cross-bar; means connecting said rod with the end of the piston-rod; and a spring-controlled device for actuating the rack in one direction.

8. The combination, with a door and its cas-

ing, of a bed-plate secured to one of said parts; a pneumatic cylinder carried by the bed-plate and having an air-relief port; a sliding valve mounted in bearings of said bed-plate and spring-actuated normally to close said air-relief port; a piston located within the pneumatic cylinder; a rack mounted for sliding movement on the bed-plate and having a projecting arm; a cam-shaped projection carried by said arm and adapted to withdraw the spring-actuated valve; a rod connecting the arm projecting from the rack with a device attached to the end of the piston-rod; a spring case or barrel mounted on the bed-plate; a shaft carrying a pinion in engagement with the rack; a spring secured to said shaft and to the interior of said case; and means for connecting said shaft with the door-frame.

9. The combination, with a door and its casing, of a bed-plate secured to the door; a pneumatic cylinder having an air-relief port carried by said bed-plate; a piston within said cylinder; a rack having an angularly-projecting bar; a cam-shaped device secured to said bar; a bracket attached to the bed-plate; a spring-actuated valve mounted in bearings of the bracket and normally closing the air-relief port in the cylinder; a shaft, spring-actuated in one direction; a gear carried by said shaft and in engagement with the rack; a crank secured to the shaft; and a rod or link connecting said crank with the door-casing.

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