

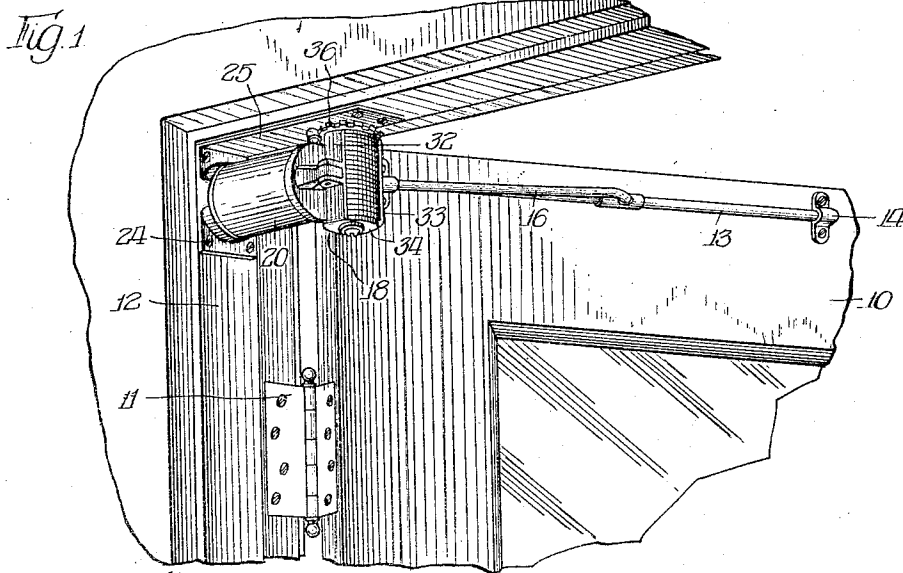
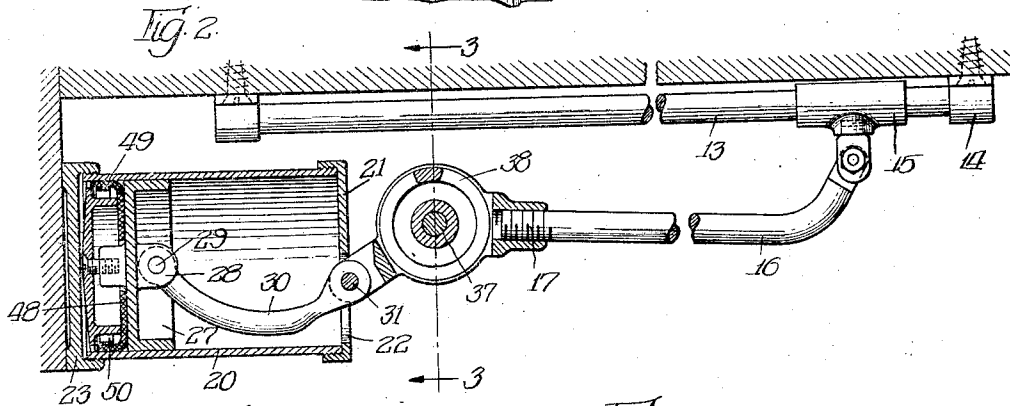
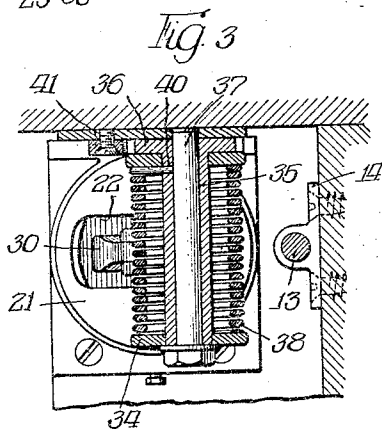
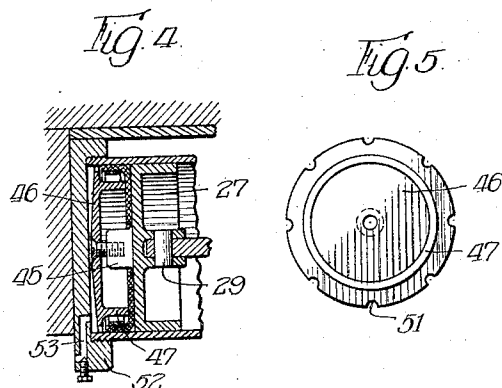
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AIR DOORCHECK

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AIR DOORCHECK

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The invention relates to door checks and has reference more particularly to the type of door checks employing spring means for closing the door and wherein the medium for checking the closing action of the door comprises air.

The invention contemplates a door check adapted to be located on the lintel or horizontal strip above the door at a point adjacent door and which will be operated by leverage means fastened to the door, the leverage means, for the purposes of allowing the door to swing, having a sliding movement thereon. Such type of checking means is primarily adapted for association with doors swinging in a single direction and closing against a door jamb or what are known as single acting doors.

An object of the invention is to provide a door checking device of the type described, which will operate to close the door by spring action and to check the closing action by means of an improved checking device, all the parts being so connected together and with the door as to give the desired closing and checking effect.

Another object is to provide a door check which will employ a leverage construction adapted to transmit the swinging action of the door to the spring means in the form of rotary motion and to the checking mechanism in the form of reciprocating motion and which will be secured to the door in such a manner as to have sliding movement thereon.

A yet further object of the invention is to provide an improved door checking mechanism which will employ air venting means for providing the checking action for the closing of the door and which will be so constructed that the closing may be adjusted and regulated as desired.

A yet further object is to provide a novel type of spring actuated mechanism which will operate to close the door against the action of the checking means, the spring mechanism being adjustable and adapted to exert tension uniformly during the closing movement of the door.

A still further object is to provide an improved door check adapted especially for cer-

tain classes of doors which will be highly efficient in operation, comparatively simple in construction, practical and cheap to manufacture and easy to install and one which will impart to the door an improved movement in closing and checking operations.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawing and claims appended hereto.

In the drawing, which illustrates an embodiment of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a perspective view showing the door check of the present invention as applied to the door jamb in actual use;

Figure 2 is a plan view of the device with the door in closed position, some of the parts being shown in cross section;

Figure 3 is a sectional view taken along line 3—3 of Figure 2 and looking in the direction of the arrows;

Figure 4 is a detail sectional view showing one end of the checking mechanism as provided with air venting means; and

Figure 5 is a detail view showing the cap member provided with semi-circular openings.

Referring to the drawing the conventional type of door 10 is shown hingingly supported as at 11 from a door jamb 12. Secured to the upper portion of the door adjacent the location selected for positioning the closing and checking mechanism is a guide member comprising a rod 13 supported in position upon the door by end clips 14. Adapted to slide upon the rod 13 when the door is opening and closing is a sliding member 15 which is positioned on the rod prior to the fastening of the same upon the door. The sliding block 15 is adapted to have pivotally secured to it an actuating arm 16, the outer end of which is threaded as at 17 to connect the arm with a yoke member designated in its entirety by 18.

The checking mechanism proper comprises a cylinder 20 having threaded upon its right

hand end, end cap 21 provided with an elongated aperture 22. The opposite or left hand end of the cylinder, as viewed in Figure 2, has also threaded to it an end cap 23 which, for allowing the cylinder to be firmly secured to the door jamb is provided with openings for the passage of screws 24. A base plate 25 is adapted to be similarly fastened to the lintel or horizontal strip above the door and is secured to the end cap 23 by any suitable means so that the members form a rigid right angle securing device. In assembling the device it is preferable to locate the end cap 23 in the position desired and fasten the same to the door jamb by the screws 24. The cylinder 20 can then be secured to the cap by reason of its threaded end as described. It is thus seen that the members 24 and 25 provide a rigid support to which the cylinder 20 is firmly secured.

Located within the cylinder so as to have loose fitting engagement therein is a piston 27 provided with integrally spaced apart ears 28 to which is pivotally secured as at 29 a piston rod 30. The outer end of the piston rod is also pivotally secured as at 31 to the yoke member 18. This member comprises a plurality of side strips 32 and 33 which are connected at each end by a circular portion 34. The yoke is mounted for pivotal movement upon a depending sleeve 35 which is provided at one end with a ratchet wheel 36. The sleeve 35 is mounted upon the base plate 25 by means of a bolt member 37. Located within the yoke is an elongated spring 38 composed of series of convolutions, the spring at one end being secured to the yoke and the other end being secured to the sleeve as at 40. This construction allows the yoke and sleeve to have rotating movements upon the securing bolt 37, the rotating movements of the sleeve being adapted to vary the tension exerted by the spring, thus to wind the spring, it is only necessary to rotate the sleeve in any desired direction and adjust the same by a pawl 41 which is adapted to have contacting engagement with the ratchet wheel 36. Upon the door being opened counter clockwise motion will be imparted to the arm 16 which will impart rotating movement to the yoke 18, the movement of the yoke being in turn imparted through means of the piston rod 30 to the piston 27 in the form of reciprocating motion. Opposing this motion of the piston in the right hand direction is the coil spring 38 which as described is operatively associated with the yoke 18. The spring therefore has stored in it sufficient energy during the opening of the door to exert pressure upon the arm 16 to cause the closing of the door to immediately take place.

For checking the closing movement as desired the piston 27 is provided with a stud 45 into which is threaded a cap portion 46 having a depending annular flange 47. A

leather washer 48 is interposed between the piston and the annular flange and thus secured in place the washer is formed with a depending annular portion 49 having engagement against the sides of the cylinder and which is normally held in engagement by a split circular ring 50. For allowing the air under pressure to come into contact with the leather washer so as to force the same against the sides of the cylinder the cap portion 46 is provided with openings 51 in its periphery as shown in Figure 5. This arrangement of the cap portion being provided with a depending flange, not only serves to secure the leather washer upon the piston, but reduces the dead air space when the piston is in its extreme left hand position as the air is confined substantially between the portions of the washer 49 and the flange 47. The leather washer is kept soft and pliable by treating the same with any suitable oil so that under operating conditions the washer will yield to the vacuum created in the front of the piston upon its rearward motion thereof and allow the air to go freely past the piston and cup. The split circular ring 50 around the inside of the flange 49 of the leather washer prevents the same from setting and tends to normally keep the flange against the sides of the cylinder.

The air venting means clearly shown in Figure 4 is located on the lower side of the end cap 23 and comprises a depending portion 52 provided with a duct or passage 53 which may be restricted in size to allow exhausting of the air into the atmosphere by adjustment of the regulating screw 54. The venting mechanism is accordingly located on the lower side of the door check so as to be readily accessible from the floor, thus allowing convenient regulation when desired.

Upon movement of the piston 27 to the right as the door is opened air will pass between the piston and the cylinder wall by reason of the loose fitting engagement of the former and the pliable condition of the leather washer 48. With the door in open position air will therefore be trapped within the cylinder 20 between the cap portion and the end wall 23. Air will also be drawn through the passage 53 due to the suction created by the piston, the latter having a loose fit merely to allow a free unrestricted movement in the opening of the door. The spring 38 will serve to close the door by tension exerted upon the arm 16 which action will continue at what is known as door closing speed until it is checked by the cushion of air trapped in the left hand end of the cylinder. This can be accurately regulated as desired by adjustment of screw 54 so as to allow escape of the air into the atmosphere, thus resulting in a suitable slowing down of the closing action to what is known as checking speed. However, the closing of the door will

continue under action of the spring 38 which movement can be controlled and regulated as desired.

It is thus seen that the present structure 5 insures a sturdy and reliable closing and checking device which is designed so that it permits convenient installation and one which employs a minimum number of parts thereby reducing the liability of the device in 10 failing to operate efficiently. The use of a plurality of end caps for closing each end of the cylinder allows one to be secured firmly to the jamb and also to be provided with air venting means while the other forms a closure 15 for the cylinder.

Still another important feature of the present invention results in increased efficiency of the air checking mechanism due to the particular mounting employed for the leather 20 washer. The depending flange not only serves to reduce the dead air space but in addition serves to firmly secure the washer to the piston head.

The construction comprising the coil 25 spring 38 enclosed within the yoke member 18 provides a compact and readily adjustable spring mechanism and the locating of the same upon the depending stud 37 serves to allow the spring to exert a substantially uniform 30 tension upon the door during the entire closing movement.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown, which is merely by way of illustration and not limitation, as various and 35 other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

40 I claim:

1. In a door check, a cylinder, a piston disposed in said cylinder, one end of said cylinder having a restricted passage for regulating the escape of air therefrom, a yoke 45 rotatably mounted on a stationary member located outside of and at the end of the cylinder opposite the restricted passage, a coil spring associated with the yoke, connections 50 from the yoke to the piston and from the yoke to a door, and means also rotatably mounted on the member for adjusting the tension of said coil spring.

2. In a door check, a cylinder having an 55 end cap, a piston disposed in said cylinder, said end cap having a restricted passage therein for regulating the escape of air from the cylinder, a yoke rotatably mounted on a stationary member located outside and at 60 the end of the cylinder opposite the restricted passage, a coil spring within the yoke and secured at one end thereto, a ratchet wheel rotatable on the member and having the other end of the spring secured thereto, said wheel 65 being rotatable to vary the tension of the

spring, and connections from the yoke to the piston and from the yoke to a door.

3. A door check comprising an air checking means including a cylinder for securement to a door jamb and a piston reciprocable 70 in the cylinder, a member depending from the lintel above the door at one end of the cylinder, a sleeve rotatable on the member and held in adjusted position by ratchet means, a yoke rotatable on the sleeve, a coil spring 75 within the yoke and secured at one end thereto and at the other end to the sleeve, and connections from the yoke to the piston and from the yoke to a door.

Signed at Pasadena, California, this 28 80 day of January 1931.

LEWIS C. NORTON.

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