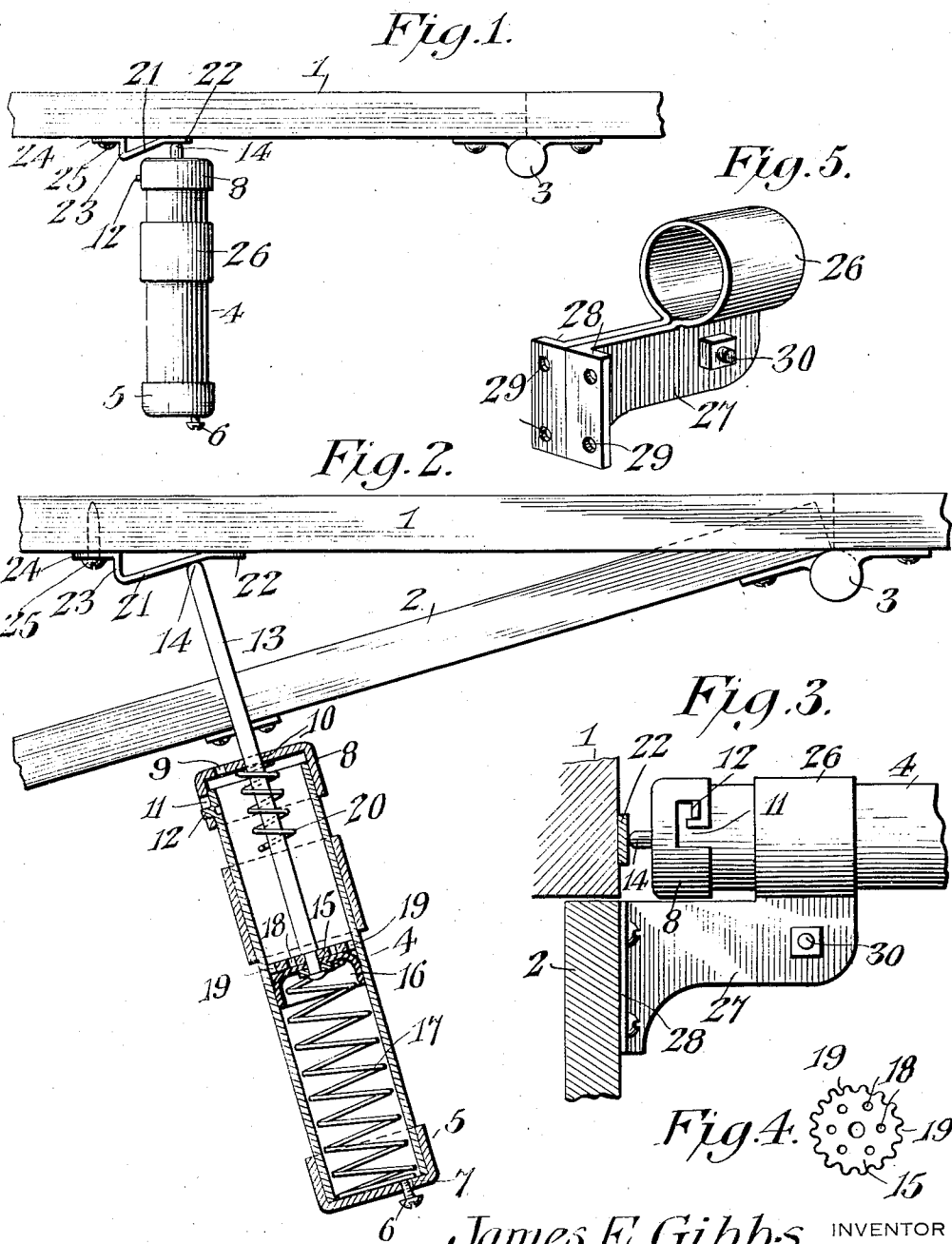


J. E. GIBBS.
DOOR CHECK.
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1,055,030.

Patented Mar. 4, 1913.



WITNESSES

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DOOR-CHECK.

1,055,030.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES E. GIBBS, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented a new and useful Door-Check, of which the following is a specification.

This invention has reference to improvements in door checks, and its object is to provide a check more especially adapted for screen doors, which may be constructed at little cost, and yet withstand the wear and tear of use as reliably as door checks of many times the cost of the device of the present invention. The door check is made of few parts which may be readily pressed into shape and when assembled will hold their positions by friction against any force short of that which will be destructive to the parts. Furthermore, the device is simplified by the omission of all valves and the provision of sustaining members which to a large extent prevent undue wear of rubbing parts. Furthermore, the device is so constructed that no special care is necessary in the application of the device to a door, and hence any person, even though unskilled in the use of door checks, may apply the device with a certainty of proper operation.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the further understanding that while the drawings illustrate a practical form of the invention it is susceptible of other practical forms wherefore the invention is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes mark no material departure from the salient features of the invention.

In the drawings:—Figure 1 is a plan view of a door frame showing the check applied, the door being closed. Fig. 2 is a plan view of the door frame and door partly open with the check shown in longitudinal section. Fig. 3 is a side elevation of one end of the check showing the bracket, the door frame and door being indicated in cross section, as is also the wear plate. Fig. 4 is a detail view of the metal member of the piston. Fig. 5 is a perspective view of the clamp bracket for holding the check cylinder.

Referring to the drawings, there is shown a door frame 1 and a door 2, the latter being assumed to be mounted on the frame by means of suitable hinges 3, which for the purposes of the present invention may be considered as spring hinges, for the invention is designed to be used in connection with doors which are constantly urged toward the closed position, and when opened and released will move to the closed position, the purpose of the check being to prevent slamming of the door.

The door check has a cylinder 4 which may be in the form of a simple open ended steel tube of suitable length, say about five or six inches, and from an inch to an inch and a quarter in diameter, although these dimensions are not at all mandatory, and may be changed as occasion demands. One end of the tube is provided with a cap member 5 which in practice is forced on to the tube by a suitable press, so as to resist without any fastening devices whatsoever all forces tending to remove the cap member from the tube under the exigencies of use, wherefore all special fastening devices are avoided and the construction of the device is cheapened to such extent. The cap member carries an air throttling means in the form of a screw 6 which may have one side flattened, as indicated at 7, to a progressively lessening degree toward the head of the screw, so that there is provided an air passage by the screw by way of the flattened portion 7, which passage is determined by the extent to which the screw is screwed into or unscrewed from the cap. The other end of the cylinder 4 is provided with a cap member 8 having a passage 9 therethrough for air and a central passage 10. The cap member 8 may be made removable, for which purpose it is provided with a bayonet slot 11, with which engages a projection 12 on the cylinder wall, which projection may be punched up or otherwise formed. By making the cap 8 to fit rather snugly on the cylinder 4 it may be placed thereon to an extent to cause the stud or projection 12 to enter the recess 11, and then the cap is given a partial turn and drawn lengthwise of the cylinder as though to remove it, thus causing the stud 12 to seat in the blind end of the recess 11 where it will be retained by the ordinary action of the device, for the cap 8 may be made to fit with some friction

to the corresponding end of the cylinder, wherefore accidental displacement of the cap is unlikely.

Extending through the passage 10 is a piston rod 13 having its outer or free end 14 rounded, while the other end has secured thereto within the cylinder a disk or plate 15 and to the face of said disk or plate toward the head 5 of the cylinder there is secured a cup leather 16 such as is commonly employed in small air pumps, while confined between the cup leather and the head 5 is a spring 17 of sufficient strength to force the piston toward the head 8 when the rod 13 is not subjected to a superior force. The plate or disk 15 is formed with perforations 18 between the center and edge of the disk and also with a peripheral series of notches or indentations 19. The cup leather 16 is secured against the disk 15 only at the center so that the marginal portions move freely away from the plate when the piston is propelled in one direction to an extent uncovering the perforations 18, while when the piston is propelled in the other direction the perforations 18 are closed by the cup leather. Surrounding the piston rod within the cylinder between the head 8 and the plate 15 is a spring 20 acting simply as a buffer spring.

Attached to the door frame 1 when the device is installed is a wear plate 21 having at one end a flat extension 22 at an angle to the wear plate and at the other end an angle extension 23 terminating in a foot 24 designed for the passage of a screw 25 by which the wear plate is made fast to the frame 1. The extension 23 is so disposed with relation to the foot 24 as to offset the corresponding end of the plate 21 from the door frame and the plate 21 is at such an angle to the extension 23 that the extension 22 and the foot 24 are in approximately the same plane, wherefore the plate 21 has the end connected to the extension 23 spaced away from the door frame, while the extension 22 rests against the door frame. The plate 21 is therefore at an angle to the door frame determined by the length of the extension 23.

In order to support the cylinder 4, a clamp sleeve 26 is provided and so constructed as to be capable of firmly embracing the cylinder. This sleeve is formed as an integral and connecting part of one end of each of two plates 27 shaped so that together they form a bracket, one end of which bracket is as long as the clamp sleeve, while the other end of the bracket extends beyond one end of the sleeve in the same direction as the axis of the sleeve for an appropriate distance, and these plates there terminate in oppositely directed angle flanges 28 disposed in a plane substantially at right angles to the body of the bracket and to a prolongation of the axis of the sleeve 26, which axis

the plane if prolonged would intersect in substantially perpendicular relation thereto. These angle extensions have holes 29 for the passage of screws or other fastening devices. The two plates 27 of the bracket at the ends where joining the sleeve or yoke member 26 are traversed by a bolt 30 so arranged that the internal diameter of the sleeve 26 may be contracted to firmly grip the cylinder 4 when so desired.

The inner diameter of the clamp sleeve 27 is slightly less than the external diameter of the cylinder 24, and when the bolt 30 is loosened, the sleeve 26 may be opened up sufficiently to admit the cylinder 4, after which the bolt may be tightened to draw the sleeve 26 into binding relation to the cylinder 4 and the latter may be adjusted lengthwise of the sleeve at any time on loosening the bolt. It will be observed that the sustaining bracket and clamp sleeve integral therewith are made of one piece of sheet metal, which may be readily bent into shape by appropriate machinery, so that the cost of the sustaining part of the check is reduced to a minimum, while at the same time provision is made for all necessary adjustments.

Let it be assumed that the door 2 is provided with means such as spring hinges 3 tending to maintain it closed, but yielding to an opening force. The bracket 27 is applied to the door at an appropriate distance toward the hinges, this distance being usually a little less than one foot, all that is necessary being to screw the bracket to the door so that the rod 13 will overhang the door, and then the plate 21 is made fast to the door frame in the path of the rod 13 in such manner that when the door is closed the end 14 of the rod 13 will engage the extension 22. The parts are so proportioned that when the door is opened the end 14 of the piston rod 13 will ride along the plate 21 as the spring 17 forces the piston rod out of the cylinder 4 until the full projection of the piston rod is attained, at which time the rod 13 has its end 14 close to the extension 23, but still upon the plate 21, so that when the door closes the rod 13 will engage the plate 21 near the extension 23 and the rounded end 14 of the rod 13 will move along the plate 21 as the closing movement of the door progresses.

It has been found heretofore necessary to make the backing plate 15 of the piston of considerably less diameter than the interior of the cylinder, so as to admit air to the rear face of the leather on the return or inactive stroke of the piston. This has resulted in a lack of support for the corresponding end of the piston rod, wherefore the leather becomes worn and the hole 10 also becomes worn. With the present arrangement the plate 15 may be made of sub-

stantially the same diameter as the internal diameter of the cylinder 4 leaving only enough clearance to prevent undue friction, while the notches or scallops 19 provide ample air space which is augmented by the passages 18. As the piston moves on the inactive stroke air passes about the plate 15 and around the leather into that end of the cylinder containing the spring 17, but when the active stroke of the piston begins the air within the space occupied by the spring 17 acts to expand the leather into tight engagement with the walls of the cylinder, wherefore the only escape for the air is through the passage provided by the groove 7 in the screw 6, and as this is a throttle passage, the air becomes compressed and so resists the closing movement of the door to an extent preventing slamming thereof, the screw 6 being adjusted in accordance with the strength of the spring hinges 3. The spring 17 is designed to move the piston on the inactive stroke, so that when the door is opened the spring 17 readily overcomes such little resistance as is offered by the movement of the leather along the cylinder, such leather being collapsed by the rush of air around it into that portion of the cylinder occupied by the spring 17. The air on the other side of the piston has free passage through the perforation 9 whether into the cylinder or out therefrom, and when the piston reaches the limit of its inactive stroke the spring 20 engages it and operates as an elastic buffer to finally arrest the movement of the piston before it shall strike the head 8 with a force productive of noise.

While the spring 17 is not intended to resist the closing of the door, it, of course, assists to a small amount in preventing the closing movement.

What is claimed is:—

1. A door check provided with an air cylinder and a piston adapted thereto, said piston having a cup shaped packing member and a backing member therefor in the form of a disk having peripheral notches and intermediate perforations, the cup member being connected to the backing member at the central portion of each and adapted to yield to uncover the perforations on the movement of the piston in one direction and expand into substantially air tight relation to the interior of the cylinder and cover both the perforations and notches of the back-

ing member when the piston is moved in the other direction.

2. A door check having an air cylinder with a head at one end forced on to the cylinder and held by frictional engagement, said head being provided with air throttling means, an air piston within the cylinder, a piston rod carrying the piston, and a head for the other end of the cylinder provided with a passage for the piston rod and a freely open air passage, the cylinder and last named head having coacting locking means for holding the head in readily removable relation to the cylinder.

3. A door check provided with an air cylinder, and means for supporting the air cylinder comprising a one piece member having an intermediate portion formed into a cylinder encircling clamp and the end portions matching to constitute a supporting bracket, said end portions being extended to one side of the cylinder and beyond one end of the latter in the same direction as a prolongation of a longitudinal axis of the cylinder and said bracket being provided with means for producing a clamping action of the clamping member upon the cylinder at will.

4. A door check comprising an air cylinder, a piston therein, a spring urging the piston in the inactive direction, a piston rod carrying the piston and projecting from the end of the cylinder remote from the spring, a one piece supporting member for the cylinder folded into a bracket with an intermediate clamp portion adapted to surround and hold the cylinder, the ends of the supporting member being brought together and provided with a connecting bolt and having the extremities each bent at an angle and provided with passages for fastening devices, said ends of the supporting members being extended beyond one end of the cylinder in the same direction as a prolongation of the longitudinal axis of the cylinder and the bent extremities lying in a plane substantially at right angles to the prolonged axis of the cylinder.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES EDWIN GIBBS.

Witnesses:

JOHN R. SIGGERS,
DAVID R. WAGNER.