H. K. FAIRALL.

DOOR CHECK.

APPLICATION FILED NOV. 22, 1909.

987,289. Patented Mar. 21, 1911.

Fig. 1.

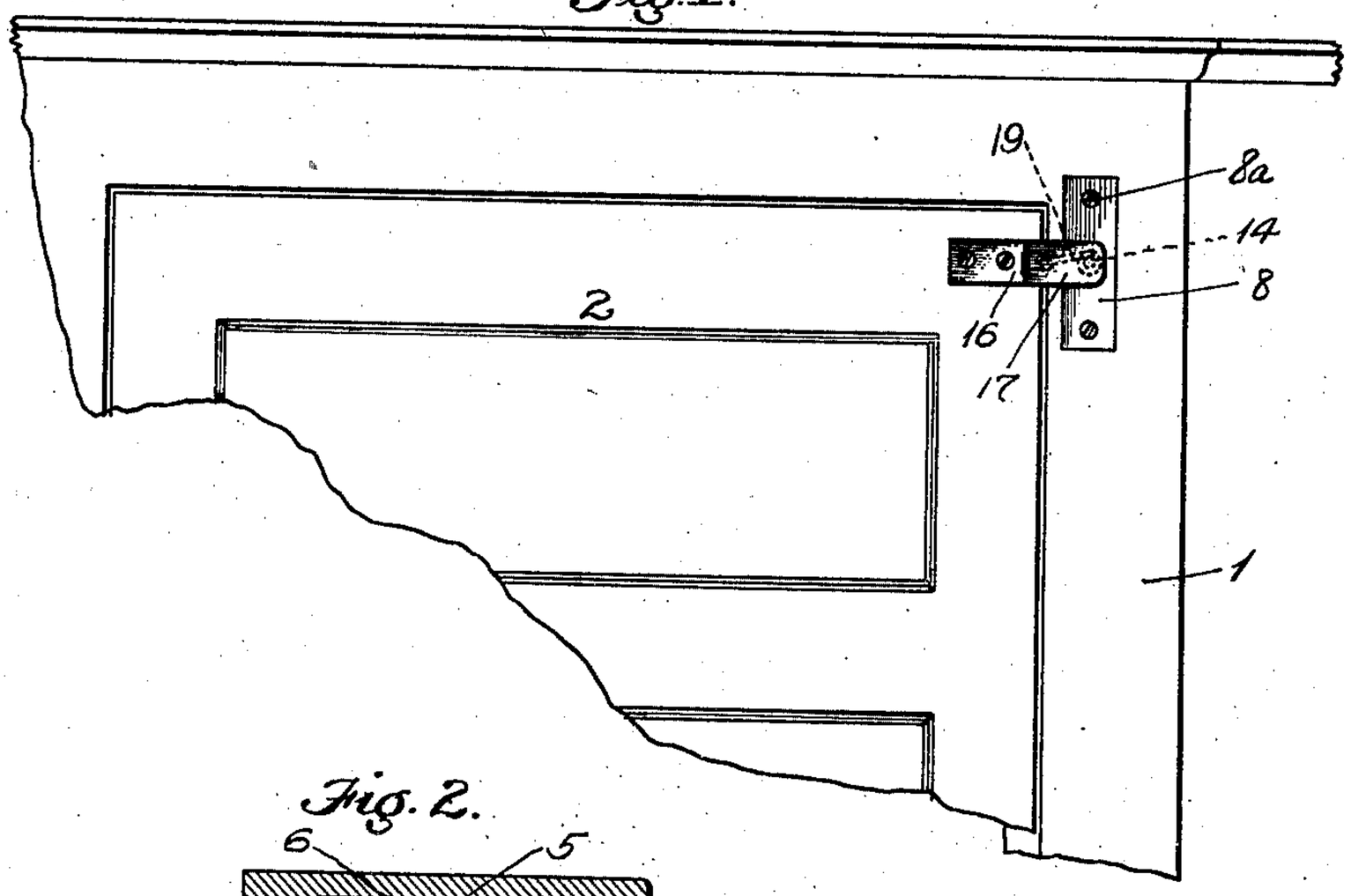


Fig. 2.

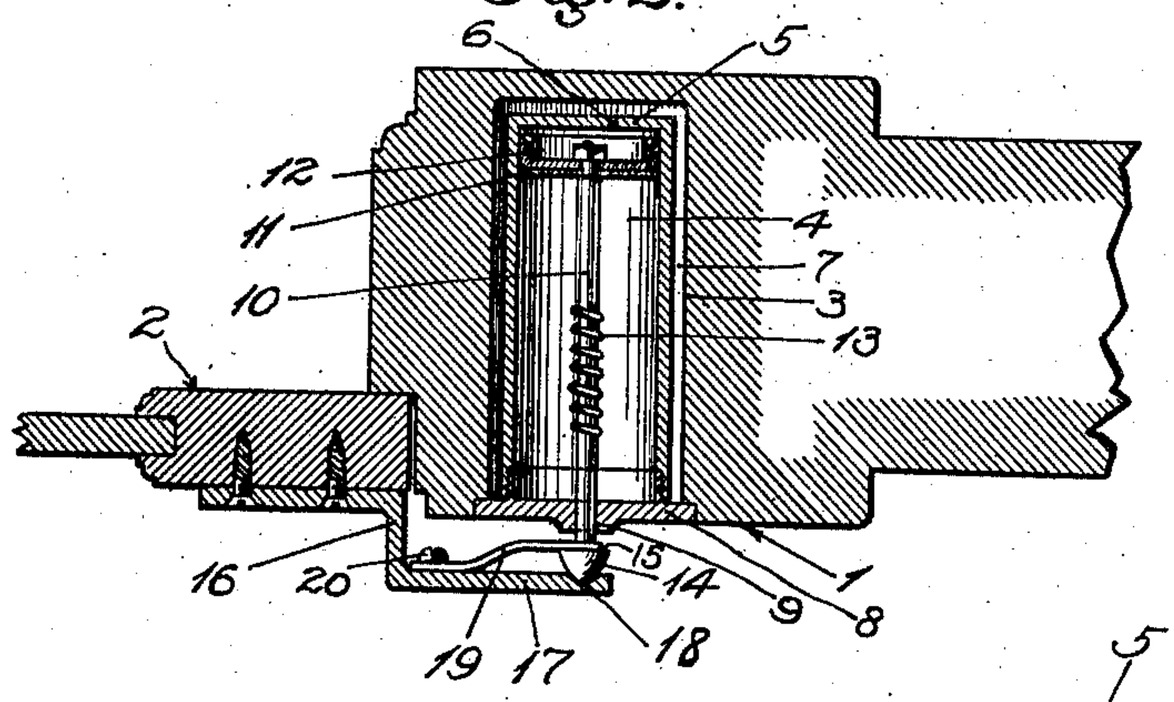
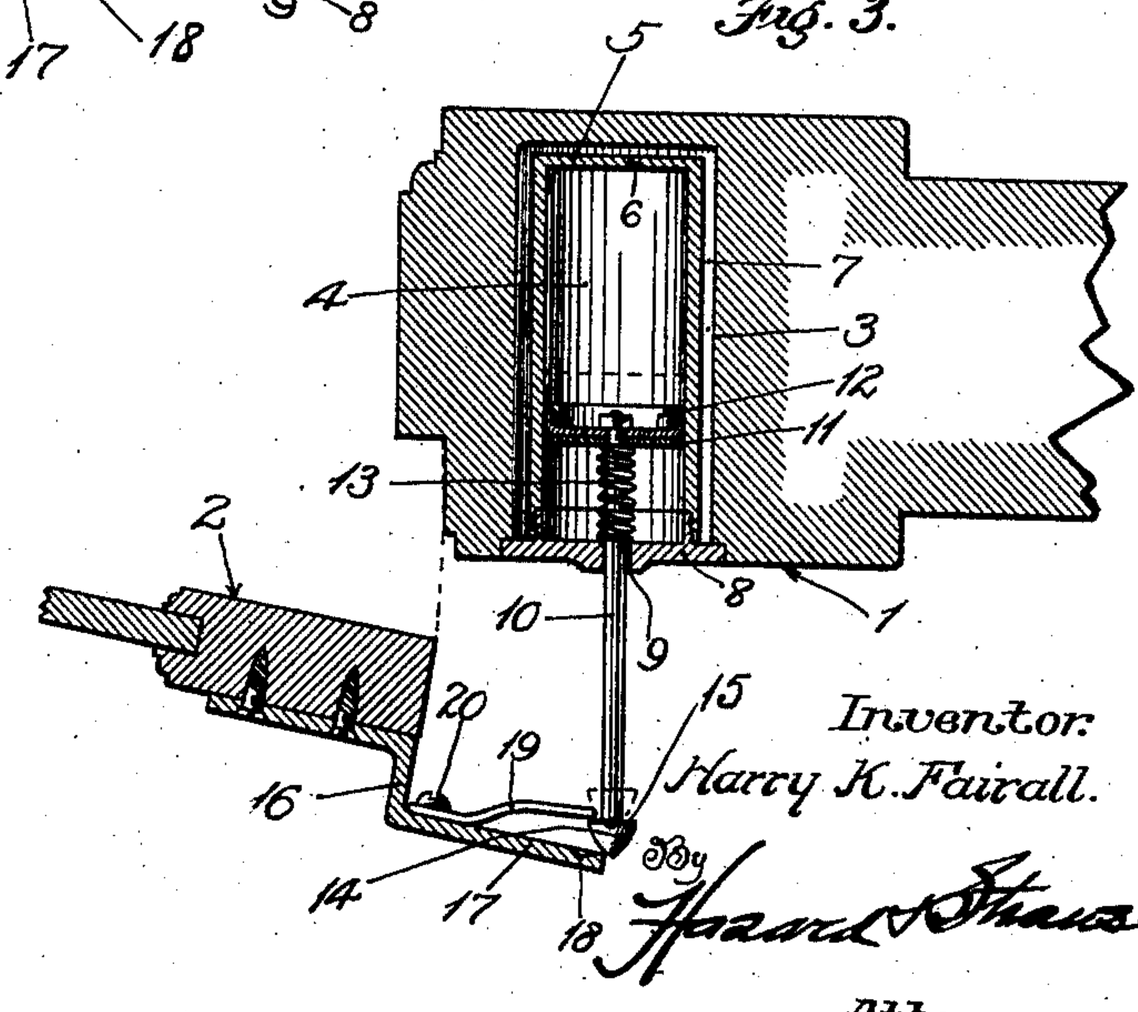


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DOOR-CHECK.

987,289. Specification of Letters Patent. **Patented Mar. 21, 1911.**

Application filed November 22, 1909. Serial No. 529,364.

To all whom it may concern:

Be it known that I, HARRY K. FAIRALL, a citizen of the United States, residing at Highlands, in the county of San Bernardino and State of California, have invented new and useful Improvements in Door-Checks, of which the following is a specification.

This invention relates to door checks such as are used for preventing the sudden closing or slamming of a door.

The device is especially useful in connection with a door which is closed by a spring or similar means.

The object of the invention is to produce a device of this class which is simple in construction and which will operate positively to check the closing movement of a door for the purpose suggested.

In its general construction the device comprises a member attached to the door frame and a bracket carried by the door. When the door is in its open position these parts become disconnected, but when the door is closed they come into operative relation with each other.

The invention consists in the construction and combination of parts, to be more fully described hereinafter, and particularly set forth in the claims.

In the drawing annexed hereto, which fully illustrates my invention, Figure 1 is a front elevation showing a portion of a door and door frame to which the invention is applied. Fig. 2 is a horizontal section taken through the door check, through the edge of the door and through the door jamb. This view shows the door in its closed position. Fig. 3 is a view similar to Fig. 2 but showing the door in the act of being opened, and at a point where it releases itself from the member carried by the jamb.

Referring more particularly to the parts, 1 represents the jamb of the doorway in which the door 2 is mounted to swing. This door is supposed to be mounted upon hinges attached at the left edge of the door.

In applying my invention, I provide a deep chamber 3 in the door jamb, which opens out upon the reveal of the door frame. Within this chamber 3 I provide a check cylinder 4. The inner end of this cylinder is formed with a head 5, and through this head a vent 6 is formed. As shown, the cylinder is of smaller diameter than the chamber 3 so that an air space 7 is formed around the cylinder. The vent 6 opens communication between the interior of the cylinder and this air space. The forward end of the cylinder is threaded and attached by this means to a face plate 8 which is recessed in the reveal of the door frame as indicated. This plate may be secured in position by screws or similar fastening devices 8^a.

The plate 8 forms the outer head for the cylinder and is formed with an opening 9 through which slides a plunger rod or piston rod 10. To the inner end of this rod 10, a head 11 is attached, said head being provided with a cup washer 12 which makes the head fit substantially air tight in the cylinder.

Around the rod 10, and between the plunger head 11 and a fixed head or plate 8, a coiled spring 13 is placed. It should be understood that this spring is not attached either to the head 11 or the head 8, and when the door check is in its closed position the spring may occupy a position such as that indicated in Fig. 2. In this connection, attention is called to the fact that this spring is much shorter than the distance between the heads 11 and 8, when the head 11 is in its innermost position, that is, when the door check is in its completely closed position.

The plunger rod or stem 10 is provided on its outer end with a retractor head 14, which is of substantially conical form, presenting an abrupt shoulder 15 on the side adjacent to the door jamb. To the free edge of the door 2 and adjacent to the plate 8, I attach a bracket 16, the outer portion of which is offset so as to present an arm 17 which projects horizontally across the face of the reveal adjacent to the plate 8. On its inner face and near its extremity, the arm 17 is provided with a recess 18 which is adapted to engage the point of the conical head 14, and on the inner side of the arm 17 there is secured a retractor 19 which is in the form of a leaf spring. The butt end of this spring is attached by screw 20 to the end of the arm 17 adjacent to the door, and the other end of the spring is offset inwardly toward the plate 8. The arrangement is such that the end of this spring is adapted to engage under or behind the shoulder 15.

The mode of operation of the door check will now be described.

As the door 2 is swung shut, the arm 17 will strike the conical head 14 of the plunger arm or stem 10, the point of the head being received adjacent to the recess 18. As the door closes, the head seats in the recess, and the arm 17 pushes the plunger inwardly. During this movement the head 11 compresses the air in the cylinder 4 and this checks the advance of the door. The air which is compressed in the cylinder finds an exit at the opening 6, so that it does not arrest the closing movement of the door, but simply checks it. Under the action of the force which is closing the door, the air will be gradually expelled from the inner end of the cylinder so that finally the plunger will come to rest with the head 11 lying near the inner end of the cylinder, as indicated in Fig. 2. When the arm 17 comes into contact with the head 14, the retractor 19 engages the conical face of the head 14 and is displaced laterally as it passes toward the rear side of the head. It soon passes the shoulder 15 and springs in behind the shoulder as indicated in Fig. 2. When the door is opened, this retractor 19 withdraws the plunger to a point such as that indicated in Fig. 3. The movement of the plunger under the action of the retractor is sufficient to compress the spring 13 as shown in this figure, so that as the swinging movement of the door progresses, the retractor 19 will release itself in a resilient manner from the head 14. After the plunger becomes released from the retractor the spring 13 returns it to an intermediate position in the cylinder. In this intermediate position the head 14 will lie directly in the path of the arm 17, so that when the door closes it will engage the head of the plunger as suggested above. In this way it will be seen that the spring 13 has a double function; it facilitates the disengagement of the retractor from the plunger head 14 by permitting an outward movement of the plunger, and it returns the plunger to a partially closed position so that the head of the plunger will certainly lie in the path of the arm as the door closes.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A door check comprising in combination, a plunger, mounted to slide inwardly with respect to the door frame and supported by the door frame, means including a checking device for resisting the inward movement of said plunger, a member constructed to be attached to the door adapted to engage said plunger to force the same inwardly, and a resilient retractor carried by said member and coöperating therewith to withdraw said plunger when the door is opened.

2. A door check comprising in combination, a checking cylinder adapted to be attached to the door frame, a plunger including a piston and piston rod extending from said cylinder, a bracket constructed to be seated in a door and adapted to engage the end of said rod as the door closes, means for partially withdrawing said rod when the door is moved to its open position, and a spring affording means for partially returning said plunger toward its innermost position.

3. A door check comprising, in combination a checking cylinder adapted to be seated in a door frame, a plunger having a head mounted to slide in said cylinder and having a rod projecting from said cylinder, said rod having a retractor head on the outer end thereof, a bracket adapted to be attached to the door having an arm adapted to engage said retractor head to force the same inwardly, a retractor carried by said arm and adapted to engage said retractor head so as to withdraw the same when the door is moved to its open position, said retractor being arranged to swing out of reach of said head to disengage itself therefrom.

4. A door check comprising, in combination, a check device adapted to be seated in a door frame and having a projecting plunger rod, said rod having a retractor head thereupon presenting a shoulder on the side thereof adjacent to said check device, a bracket adapted to be attached to the door to engage said head to force said plunger inwardly and a resilient retractor secured to said bracket and adapted to snap over said head and engaging said shoulder to withdraw said plunger rod when the door is opened.

5. A door check comprising, in combination a check device adapted to be mounted in a door frame and having a projecting plunger rod, said rod having a retractor head thereupon presenting a shoulder on the side thereof adjacent to said check device, a bracket adapted to be attached to the door, and adapted to engage said head to force said plunger inwardly, a resilient retractor supported by the door adapted to snap over said head to engage said shoulder to withdraw said plunger rod when the door is opened, and a spring for partially returning said plunger when released by said retractor.

6. A door check comprising in combination a check cylinder adapted to be seated in a door frame, a plunger having a head mounted to slide in said cylinder and having a rod adapted to project beyond the door frame, said rod having a retractor head of substantially conical form on the outer end thereof, an arm adapted to be attached to the edge of the door to engage said conical head to force said plunger inwardly, a re-

silient retractor supported by the door and coöperating with said head so as to snap into engagement therewith and to afford means for withdrawing said plunger when the door moves to its open position, and a spring disposed around said rod and adapted to return the plunger to an intermediate position when released by said retractor.

In witness that I claim the foregoing I have hereunto subscribed my name this 15th day of November, 1909.

HARRY K. FAIRALL.

Witnesses:
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