July 8, 1958 H. W. FALK 2,841,813

DOOR CHECK

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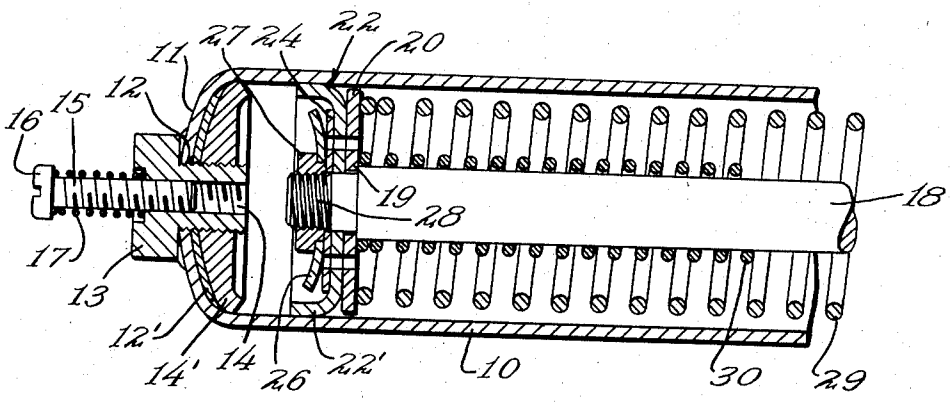


Fig. 1

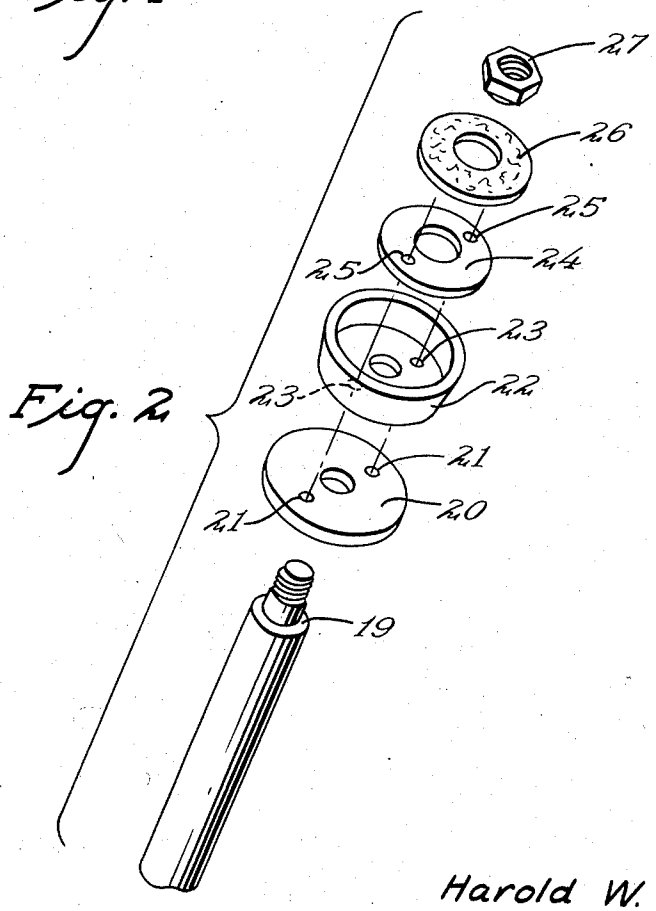


Fig. 2

INVENTOR

Harold W. Falk

BY Robert M. Dunning

ATTORNEY

United States Patent Office

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DOOR CHECK

Harold W. Falk, St. Paul, Minn., assignor to Wright Products, Inc., St. Paul Park, Minn., a corporation of Minnesota

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2 Claims. (Cl. 16—66)

This invention relates to door checks and more particularly to a new and useful improvement in the provision of air escape mechanism in combination with plunger seal structure in door checks of the character embodied in my co-pending application Serial Number 399,544, filed December 21, 1953 and entitled "Door Check," issued November 12, 1957, as Patent 2,812,533.

Inasmuch as door checks of the character presently used oftentimes easily develop faults and do not at all times maintain a proper expansion of the plunger or leather piston and the passage of air therethrough is usually too free or blocked causing either failure of the piston to operate when slightly worn or otherwise does not operate properly to close and check a door from slamming, improvements are necessary.

Accordingly it is an object of this invention to provide a new and useful improvement in plunger or piston structure in door checks.

Another object of this invention is to provide a new and useful improvement of the air flow in door checks.

Another object of this invention is to provide a new and useful improvement in the combined arrangement of the air valve passageways in door check structures.

The invention accordingly consists in the features of construction and combination of elements with arrangement of parts which will be exemplified in the following description of the accompanying drawing wherein:

Figure 1 is a partial cross-sectional view showing the combination and arrangement of elements embodied in this new and useful improvement in door checks.

Figure 2 is an exploded view showing the alignment of air passageways in the combination of elements embodied in Figure 1.

In the following description like parts will be similarly indicated.

Referring to the drawing the complete details of the door check and their attaching parts have been omitted and only the feature of the improvement provided is described herein. The casing 10 of the door check is a conventional tubular housing rounded at one end 11 and open at the opposite end (not shown). The rounded end 11 is provided with an aperture 12 into which is threaded an air valve assembly comprising bushing 13 provided with tapped bore 14 threaded to receive screw 15 loosely and thereby provide a bleed valve carrying slotted head 16 to facilitate adjustment of the screw 15 and correspondingly the rate of air leakage. A spring 17 placed under tension about the screw 15 between bushing 13 and screw head 16 serves to maintain the threads of the screw 15 in frictional engagement with the threads of the bore 14. By reason of the spring compression the screw 15 will remain in an adjusted position to govern the rate of air leakage into and from the casing 10. Interiorly of the casing 10 the bushing 13 is fastened with a backing nut 14' and an annular gasket 12' is held by the bushing 13 between the locking nut 14' and the end 11 of casing 10.

A piston rod 18 is reciprocal within the casing 10.

Inasmuch as the frame attaching end of this piston rod and the open end of casing 10 are conventional they have not been shown.

On the inner end rod 18 and seated against shoulder 19 is a metal washer 20 provided on opposite sides with apertures 21. Abutting the washer 20 is a flexible, for example, leather plunger or piston 22 likewise provided on opposite sides with apertures 23. Resting against the inner circumference or center of the piston 22 is a second metal washer 24 also provided with apertures 25. A flexible washer 26, for example, of leather of substantially the same size as washer 24 and without apertures is next secured to the rod 18 by nut 27 which is turned down on the screw threads 28 to lock the flexible washer 26, washer 24, piston 22, and washer 20 against the shoulder 19. When installed the washer 26 is normally dished or concave as shown in Figure 1. The washers 20 and 24 serve to reinforce the piston 22 on rod 18.

As illustrated in the drawing the apertures 21, 23 and 25 of washer 20, piston 22 and washer 24 respectively are positioned in direct alignment to provide for air passageways from the area behind the plunger 22. These air passageways in conjunction with the flexible washer 26 permit the free passage of air from behind the piston 22 when rod 18 is withdrawn from casing 10 as by opening a door or the like. When the rod 18 is pushed back into the casing 10 by the operation of the spring 29 and buffer 30, in the manner described in my above mentioned patent, the flexible washer 26 is gradually pushed against washer 24 closing the apertures 21, 24 and 25 to the back passage of air into casing 10. The air pressure thus builds up in the space between nut 14' and piston 22 expanding the walls 22' of piston 22 and forcing air out through the bore 14.

With the device as illustrated the washer 26 in combination with the air passageways 21, 23 and 25, permits the door to close rapidly almost to its closed position and then gradually stop it just in time to keep the door from slamming against the door jamb irrespective of even considerable age and wear on the piston 22. In the door closing operation, the flexible washer 26 is gradually pushed against its adjacent washer 24. This permits rapid closure of the door to almost its closed position and then stops it just in time to keep the door from slamming against the door jamb. This flexure is due to the building up of pressure ahead of piston 22 during its closing stroke.

In accordance with the patent statutes, I have described the principles of construction and operation of my door check, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A door check comprising in combination a tubular casing having an integral rounded end provided with an aperture therethrough, an adjustable air valve in the said aperture at one end of said casing, spring means on said adjustable valve to hold the said valve in pre-adjusted position, a piston rod within said casing, a pair of spring means encircling said piston rod, a flexible plunger mounted between non-flexible washers on the innermost end of said rod, a plurality of aligned air passageways provided by apertures in said plunger and said washers, and a flexible washer secured to said piston rod and overlying said air passageways externally of said non-flexible washers so that upon withdrawal of said piston rod from said casing said air passageways are opened and upon movement of said piston rod a sufficient distance into said casing said air passageways are

closed, said flexible washer normally being concave in a direction away from said apertures.

2. A piston structure and arrangement for a door check consisting of a piston rod, a flexible piston mounted on and adjacent the one end of said piston rod, apertures in said piston, a pair of reinforcement washers on each side of said piston, apertures in said washers in alignment with the said apertures in said piston, and a flexible washer secured on the end of said piston rod externally of said pair of reinforcing washers for closing said apertures after said piston has moved a sufficient distance into the door check, said flexible washer normally diverging away from its adjacent reinforcement washer in the region of said apertures to permit movement of said piston through said distance.

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