Sept. 1, 1942. J. W. MURPHY 2,294,683

DOOR CHECK

Filed July 25, 1939

Fig. 1

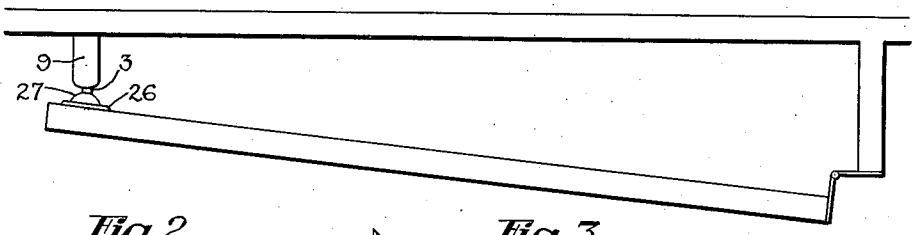


Fig. 2

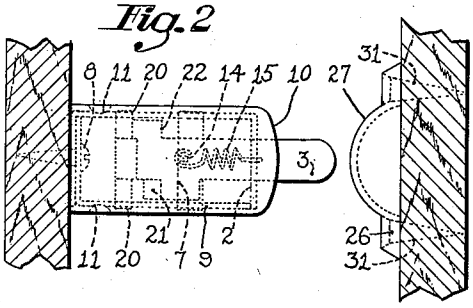


Fig. 3

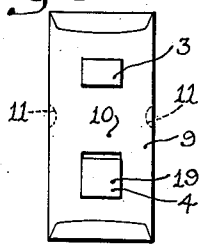


Fig. 4

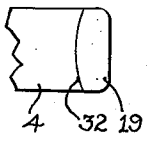


Fig. 5

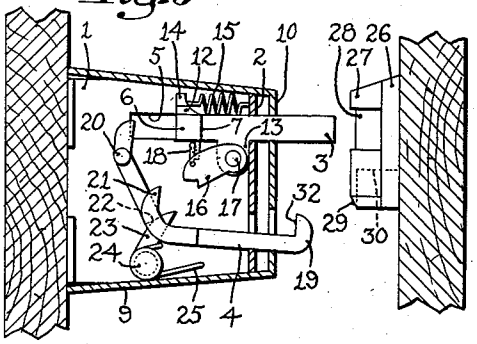


Fig. 7

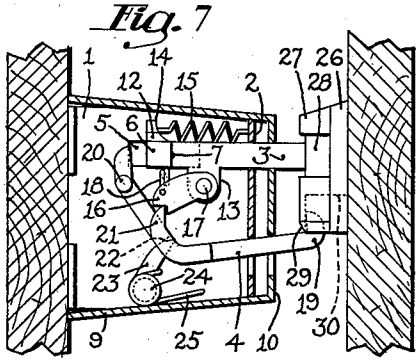


Fig. 6

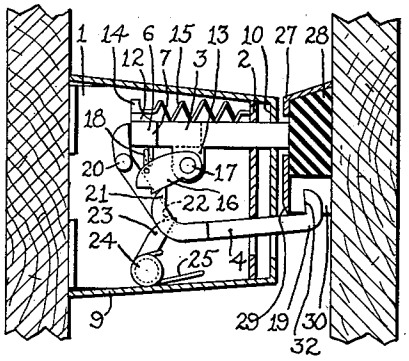
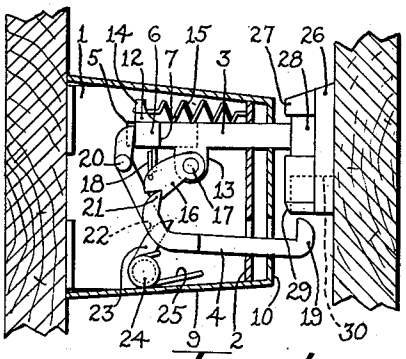


Fig. 8



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DOOR CHECK

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3 Claims. (Cl. 292—99)

The present invention relates generally to connecting devices, more particularly to connecting devices which are automatic and positive in their operation, and most particularly to connecting devices of the character described, which can be operated by manipulations of the objects connected. While the present invention is herein shown embodied in an improved door check, which is particularly adapted to be used for holding open door-like structures, such as doors, transoms, porthole covers and toilet seats, and for holding closed secret panels, covers of compartments beneath railroad coaches wherefrom no hardware may protrude, Pullman berths and safety guards enclosing machinery, the present invention, in suitable embodiments, is also adapted to be used in maintaining open weight-uncompensated sliding windows and doors and similar structures.

The primary object of the present invention is to provide an improved door check which will engage positively a door when the door is impacted thereagainst, and which will release positively from engagement therewith the door when a second impulse is imparted to the door, and thereby, to the door check.

Another object of the present invention is to provide an improved door check which is adapted to be used with any door regardless of the magnitude of the angle formed by the open checked door with the wall adjacent thereto.

Another object of the present invention is to provide an improved door check, of which that part, carried by the door, presents no hooks nor other protruding parts wherewith garments, worn by frequenters of the room, can become entangled, and of which that part, secured to the baseboard or wall of the room, is so constructed as to minimize the possibility of entanglement with garments, worn by frequenters of the room.

Another object of the present invention is to provide an improved door check which has few moving parts and which is characterized by simplicity and ruggedness of construction and ease and economy of manufacture.

The attainment of these and other objects of the present invention and the advantages attendant upon its use will readily become apparent when consideration is given to the following description thereof, and to the accompanying drawing thereof, which forms a part of the specification, and wherein:

Fig. 1 is a plan view of the improved door check, showing a door held in engagement thereby, and showing the acute angle of substantial magnitude formed by and between the engaged door and the wall adjacent thereto.

Fig. 2 is a plan view, partly in detail, of the two structures constituting the improved door check, one of which structures is secured to the baseboard or wall of the room, and the other of which structures is carried by the door.

Fig. 3 is a vertical elevation of the front face of that structure of the improved door check which is secured to the baseboard or wall of the room.

Fig. 4 is a plan view of the engaging hook at the engaging end of the latching member of the improved door check, showing the curvature of the inner face of the engaging hook.

Figs. 5, 6, 7 and 8 are side elevations, partly in detail, of the two structures constituting the improved door check, with a lateral wall of the outer covering shell removed from that structure of the improved door check which is secured to the baseboard or wall of the room, and with a lateral wall of that structure of the improved door check removed, showing, at the various stages of the operation of the improved door check, the relative positions of its parts, which will be set forth in detail in the course of the description of the operation of the improved door check.

In the drawing, 1 is a casing consisting of a substantially rectangular metal frame, having, in its front wall 2, an upper aperture and a lower aperture, through which protrude a plunger 3 and a latching member 4, respectively, and provided, in its lateral walls, with two horizontally disposed slots (one shown) 5, to serve as guides for the ends 6 of the crosshead 7 at the rear, or inner, end of the plunger 3. The casing 1 is secured to the baseboard or wall of the room by means of the screws 8, and is provided with an outer covering shell 9, having, in its front wall 10, an upper aperture and a lower aperture, registering with the upper aperture and the lower aperture, respectively, of the casing 1, through which protrude the plunger 3 and the latching member 4, respectively, and having the dimples 11 formed in its lateral walls, to engage in depressions formed in the lateral walls of the casing 1, to maintain the outer covering shell 9 in engagement with the casing 1, but readily removable therefrom.

The plunger 3 consists of a member, preferably rectangular or non-circular in cross section, the front, or outer, end of which is rounded in the manner shown in Fig. 2, and the rear, or

inner, end of which is provided with the crosshead 7, whose ends 6 are rabbeted to fit into the horizontally disposed slots 5 in the lateral walls of the casing 1 and to provide the shoulders 12 to prevent lateral displacements of the plunger 3. Thus the plunger 3, by virtue of its close fit in the non-circular upper aperture in the front wall 2 of the casing 1, by virtue of the engagement of the ends 6 of the crosshead 7 in the horizontally disposed slots 5 in the lateral walls of the casing 1, and by virtue of the engagement of the shoulders 12 of the crosshead 7 between the inner faces of the lateral walls of the casing 1, is constrained to movement along a single dimension. The plunger 3 is also provided with a downwardly projecting ear 13, which serves as a stop means, contacting the inner face of the front wall 2 of the casing 1, to limit the outward movement of the plunger 3. The crosshead 7 of the plunger 3 is provided with the prong 14 to serve as means for the attachment to the crosshead 7 of the spring 15, whose other end is secured to the front wall 2 of the casing 1. Thus the plunger 3, by means of a force applied to its front, or outer, end, can be impelled into the casing 1 against the tensional force exerted by the spring 15, until the ends 6 of the crosshead 7 make substantial contacts with the rear, or inner, ends of the horizontally disposed slots 5 in the lateral walls of the casing 1; and, upon the release of the force impressed upon the front, or outer, end of the plunger 3, the plunger 3 emerges from the casing 1 in a progressive manner, until its outward progress is arrested by the contact of its downwardly projecting ear 13 with the inner face of the front wall 2 of the casing 1. The downwardly projecting ear 13 of the plunger 3 carries the dog 16, mounted upon the pivot pin 17 to oscillate in a vertical plane, while the spring 18, one end of which is secured to the dog 16 and the other end of which is secured to the plunger 3, serves to maintain the dog 16 in a median position, from which it can be displaced slightly in clockwise and counterclockwise rotations.

The latching member 4, V-shaped in the disclosed embodiment of the present invention, is provided with a hooklike engaging end 19, and is pivoted in the casing 1 upon the pivot pin 20 at a point adjacent its rear, or inner, end, thus forming a lever of the first class having a short action arm. The latching member 4 is so positioned in the casing 1 that its short action arm will become contacted by the crosshead 7 of the plunger 3 when the plunger 3 is impelled into the casing 1, and the latching member 4 will become rotated in a counterclockwise direction by the inward movement of the plunger 3 in the casing 1, the amplitude of the rotation of the latching member 4 being determined by the vertical dimensions of the lower apertures in the front wall 2 of the casing 1 and the front wall 10 of the outer covering shell 9, respectively. The latching member 4 is provided with the shoulder 21 and with the cam surface 22. A detent 23 is pivoted in the casing 1 upon the pivot pin 24 to oscillate in a vertical plane, and is held in constant contact with the cam surface 22 of the latching member 4 by the spring 25 whose ends are secured to the detent 23 and the casing 1.

That part of the improved door check, which is carried by the door and which is termed herein a strike, consists of the plate 26, whose central portion is struck out to form a domed semicylindrical wall 27, wherein is formed an aperture into which is inserted a rubber bumper 28 to receive resiliently the rounded front, or outer, end of the plunger 3 when the improved door check is being used to engage the door, while the lower edge of the domed semicylindrical wall 27 forms a lip 29, behind which is the recess 30, into which the hooklike engaging end 19 of the latching member 4 can enter, to become engaged with the lip 29. The edge of the lip 29 is beveled for a purpose to be stated presently. The plate 26 of the strike is secured to the door by means of the screws 31. Attention is called to the fact that the curvature of the inner face of the lip 29 of the domed semicylindrical wall 27 of the plate 26 is complementary to the curvature of the inner face 32 of the hooklike engaging end 19 of the latching member 4, while the outer face of the hooklike engaging end 19 of the latching member 4 is provided with a rounded bevel.

The mode of operation of the improved door check will be readily discerned from consecutive considerations of Figs. 5, 6, 7 and 8. In Fig. 5, the two structures constituting the improved door check are shown in the disengaged state: the plunger 3 protrudes from the outer covering shell 9 and the casing 1 to the greatest extent possible, and the latching member 4 is in its lower position, resting upon the lower edges of the apertures in the front walls 10 and 2 of the outer covering shell 9 and the casing 1, respectively, and is held in that position by the detent 23 operating upon the cam surface 22 of the latching member 4. When the door is swung toward the casing 1, the rubber bumper 28 makes contact with the rounded front, or outer, end of the plunger 3, the plunger 3 is impelled into the casing 1, the dog 16 passes by, and escapes engagement with, the shoulder 21 of the latching member 4, and the crosshead 7 of the plunger 3 makes contact with the short action arm of the latching member 4 and tilts the latching member 4, by counterclockwise rotation thereof, up into the engaging position, wherein it is held by the detent 23 operating upon the cam surface 22 of the latching member 4, as is shown in Fig. 6. In this counterclockwise rotation of the latching member 4, the hooklike engaging end 19 of the latching member 4 has entered the recess 30 within the lip 29 of the domed semicylindrical wall 27 of the plate 26, but it has not as yet engaged the strike. Now, as the door is impelled away from the casing 1 by the plunger 3, emerging from the casing 1 under the tensional force of the spring 15 exerted upon the crosshead 7 of the plunger 3, the hooklike engaging end 19 of the latching member 4 engages the lip 29 of the domed semicylindrical wall 27 of the plate 26, and the lower edge of the dog 16 makes sliding contact with the upper edge of the shoulder 21 of the latching member 4 and is rotated slightly in a clockwise direction, until its lowest point passes by the highest point of the shoulder 21 of the latching member 4, whereupon it is rotated, in a counterclockwise direction, by the spring 18 into the position shown in Fig. 7. In Fig. 7, the improved door check is in the engaged state: the door is held positively by and between the hooklike engaging end 19 of the latching member 4, in engagement with the lip 29 of the domed semicylindrical wall 27 of the plate 26, and the rounded front, or outer, end of the plunger 3, with the plunger 3 exerting upon the rubber bumper 28 the pressure developed by the tensional force of the spring 15 acting upon the crosshead 7 of the plunger 3, which maintains

the inner face of the lip 29 of the domed semicylindrical wall 27 of the plate 26 in intimate contact with the inner face 32 of the hooklike engaging end 19 of the latching member 4. If now the door is impelled toward the casing 1, the dog 16 engages with the shoulder 21 of the latching member 4, forcing the latching member 4 downwardly, in clockwise rotation, and thus withdrawing the hooklike engaging end 19 of the latching member 4 from the recess 30 within the lip 29 of the domed semicylindrical wall 27 of the plate 26, as is shown in Fig. 8. If now the door is permitted to be impelled away from the casing 1 by the plunger 3, emerging from the casing 1 under the tensional force of the spring 15 exerted upon the crosshead 7 of the plunger 3, the dog 16 escapes from engagement with the shoulder 21 of the latching member 4, and, under the stress of the spring 18, executes a slight clockwise rotation, thereby regaining the position shown in Fig. 5.

Should the latching member 4 become accidentally rotated into the engaged position, when the improved door check is in the disengaged state, no complication in the operation of the improved door check is introduced thereby, for, as the door approaches the casing 1, the rounded outer face of the hooklike engaging end 19 of the latching member 4 makes contact with the beveled edge of the lip 29 of the domed semicylindrical wall 27 of the plate 26 and is snapped down into the disengaged position well before the dog 16 can become engaged with the shoulder 21 of the latching member 4.

Since the curvature of the inner face of the lip 29 of the domed semicylindrical wall 27 of the plate 26 is complementary to the curvature of the inner face 32 of the hooklike engaging end 19 of the latching member 4, the improved door check can be utilized upon doors which form with the walls of their rooms acute angles of substantial magnitudes, as well as upon doors which, when engaged, are substantially parallel with the walls of their rooms.

Without further elaboration, the foregoing description so fully explains the present invention that others may, by applying knowledge current at the time of application, readily adapt it for use under various conditions of services and for purposes other than the checking of doors, including the purposes set forth in the initial paragraph of the specification. And while it is believed that, from the foregoing description, the character of the present invention and the advantages attendant upon its use will be readily discerned, it is to be understood that what is herein shown is merely illustrative of one embodiment of the present invention, and that such changes in the construction, arrangement and proportion of the present invention as fall within the scope of the appended claims may be adopted when desired.

Having thus described my invention, what I claim as new is:

1. For engagement with a strike adapted to be carried by a door, a door check comprising, in combination, a casing adapted to be secured to the baseboard or wall of a room, a latching member pivoted in the casing and provided with a shoulder, plunger means reciprocable in the casing and adapted to actuate directly the latching member to engage the strike upon inward movement of the plunger means by the door, and an oscillatable dog carried by the plunger means and adapted to engage the shoulder of the latching member to disengage the latching member and the strike upon inward movement of the plunger means by the door.

2. For engagement with a strike adapted to be carried by a door, a door check comprising, in combination, a casing adapted to be secured to the baseboard or wall of a room, a latching member pivoted in the casing and provided with a cam surface and a shoulder, a detent pivoted in the casing and adapted to maintain the latching member in any one of a plurality of positions by engagement with the cam surface thereof, plunger means reciprocable in the casing and adapted to actuate directly the latching member to engage the strike upon inward movement of the plunger means by the door, and an oscillatable dog carried by the plunger means and adapted to engage the shoulder of the latching member to disengage the latching member and the strike upon inward movement of the plunger means by the door.

3. For engagement with a strike adapted to be carried by a door, a door check comprising, in combination, a casing adapted to be secured to the baseboard or wall of a room, a latching member pivoted in the casing and provided with a cam surface and a shoulder, a detent pivoted in the casing to maintain the latching member in any one of a plurality of positions, a first spring means operating between the detent and the casing to maintain the detent in constant contact with the cam surface of the latching member, plunger means reciprocable in the casing and adapted to actuate directly the latching member to engage the strike upon inward movement of the plunger means by the door, an oscillatable dog carried by the plunger means to engage the shoulder of the latching member to disengage the latching member and the strike upon inward movement of the plunger means by the door, and a second spring means operating between the oscillatable dog and the plunger means to maintain the oscillatable dog in a median position about which it can be oscillated.

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