July 10, 1956 B. A. QUINN 2,753,587

STOP FOR PNEUMATIC DOOR CHECK

Filed Jan. 2, 1953

Fig. 1

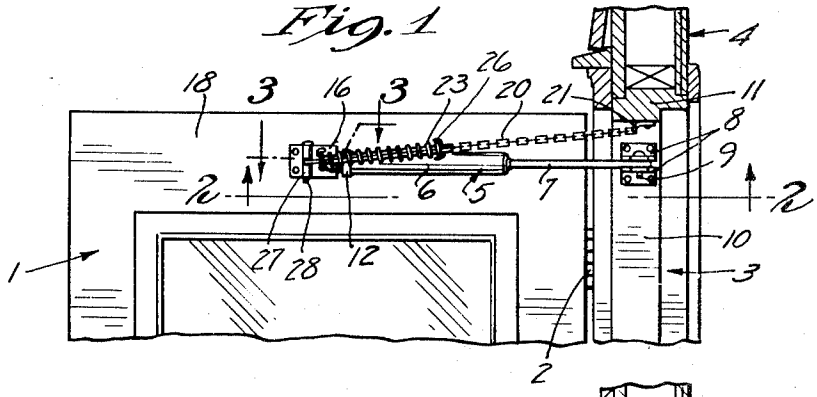


Fig. 2

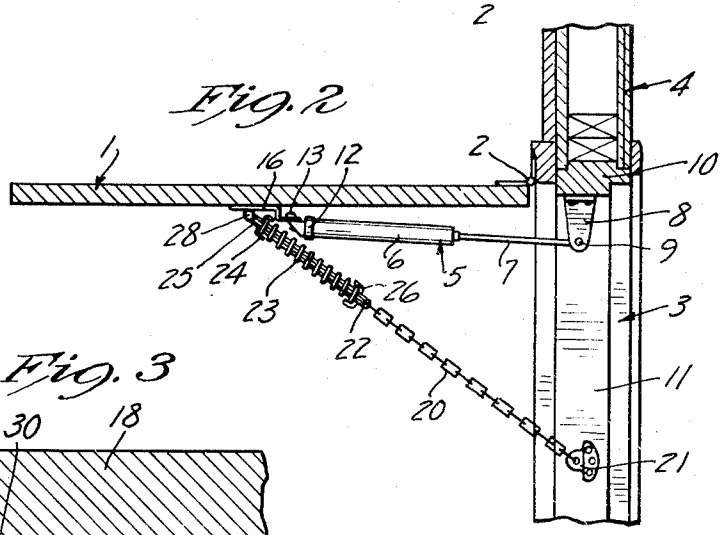


Fig. 3

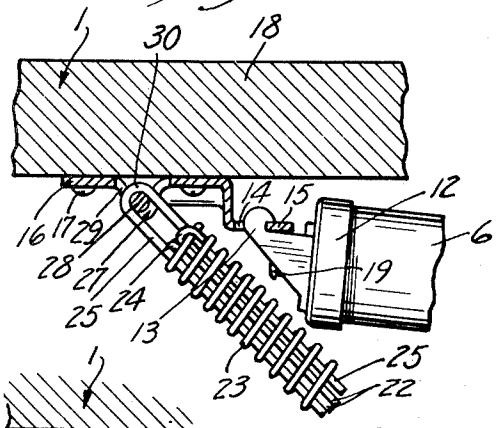


Fig. 4

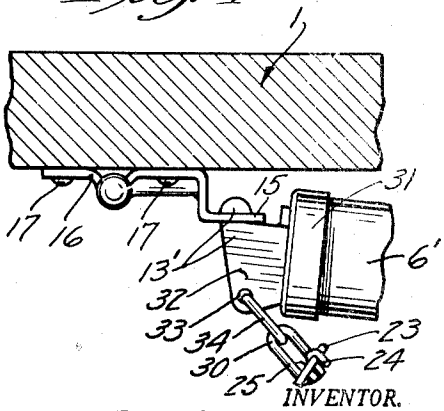
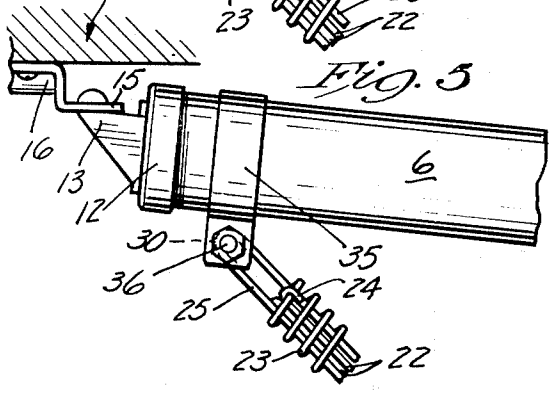


Fig. 5



INVENTOR.

Bert A. Quinn

BY

Merchant & Merchant

ATTORNEYS

United States Patent Office 2,753,587 Patented July 10, 1956

2,753,587

STOP FOR PNEUMATIC DOOR CHECK

Bert A. Quinn, St. Paul, Minn.

Application January 2, 1953, Serial No. 329,237

1 Claim. (Cl. 16—66)

My present invention relates to door closers of the pneumatic piston cylinder type commonly referred to as door checks primarily for use with storm or screen doors. Door checks of the variety herein described are usually light in weight and are most effective to close a door when the door is disposed between its closed position and a partly open position. As the door is swung open beyond substantially right angles to the door frame, the door check becomes less effective and resilient means such as an elastic snubber is usually used to aid in the closing of the door, or at least to move the door in a closing direction to a point where the door check becomes effective.

Usually the snubber, which is in the nature of a coil spring, is attached at its opposite ends to the door and door frame independently of the door check. The primary object of my invention is the provision of novel means for anchoring one end of the snubber to a portion of the door check adjacent the door whereby to provide a relatively strong anchor for the snubber and to reduce to a minimum the number of anchoring elements which must be screw threaded or otherwise anchored to the door.

Another object of my invention is the provision of means above described which can be manufactured at relatively low cost and which is rugged in construction and durable in use.

The above and still further highly important objects and advantages of my invention will become apparent from the following detailed specification, appended claim and attached drawing.

Referring to the drawing, which illustrates the invention, and in which like characters indicate like parts throughout the several views.

Fig. 1 is a fragmentary view partly in side elevation and partly in vertical section, taken through a door opening and illustrating a preferred embodiment of my invention;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary view partly in plan and partly in horizontal section taken on the line 3—3 of Fig. 1;

Fig. 4 is a view corresponding to Fig. 3 but showing a modified form of the invention; and

Fig. 5 is a view corresponding to Fig. 3 but showing a still further modified form of my invention.

Referring with greater detail to the preferred form of my invention illustrated in Figs. 1 to 3 inclusive, the numeral 1 indicates a door hingedly mounted as indicated at 2 to a door casing 3. The door casing 3 is shown as being contained in a wall, a fragment of which is indicated at 4.

A pneumatic cylinder and piston type of door closer or door check is indicated in its entirety by the numeral 5 and is shown as comprising an elongated cylinder 6 and a piston plunger rod 7 extendable and retractable from one end thereof. The door check 5 is of a type

commonly used for closing screen or storm doors and is shown and described in greater detail in my pending application for United States Letters Patent, Serial No. 264,050, filed December 29, 1951, and entitled "Lubricating Means for Pneumatic Door Checks, Closers and the Like" on which Patent No. 2,646,589 was issued on July 28, 1953.

Preferably and as shown, the plunger rod 7 has its free end pivotally secured to a pair of anchoring brackets 8 by means of a pivot pin or the like 9. The brackets 8 are rigidly anchored to the side frame element 10 of the door casing 3 in closely spaced relation to the lintel 11 thereof.

The free end of the cylinder 6 is provided with an end cap or the like 12 that is formed with a hook-like member 13 that extends through a slot 14 in an outwardly projected portion 15 of an anchoring bracket or the like 16. The bracket 16 is rigidly secured, by means of screws or the like 17, to the top rail 18 of the door 1 at substantially the same level as the brackets 8. As clearly shown in my pending application, above identified, a coil spring is interposed between one end of the cylinder 6 and the piston movably mounted within the cylinder and associated with the plunger rod 7 to bias the cylinder 6 and plunger 7 in a door closing direction. The end cap 12 of the cylinder 6 is also provided with an air vent, the size of which is controlled by an adjustment screw or the like 19, also as clearly shown in said pending application.

As above indicated, this type of door closer or door check is usually most effective to resist door opening movements and to impart closing movements to the door between the door closed position and open position substantially 90° therefrom. Beyond this degree of movement, further compression of the spring within the cylinder 6 is almost negligible. In the event of a high wind, a user's hold upon the door is frequently broken and the door caused to swing violently toward a full open position toward the outer surface of the wall 4, thus causing damage to the door check 5 or cause one or the other of the mounting brackets to be at least partially torn away from anchoring engagement with its cooperating door or door frame element. For this reason, the door is usually provided with a coil spring or other form of elastic snubber to urge the door in a door closed direction after the door has been opened to a predetermined degree. A preferred form of elastic snubber is shown as comprising a link chain 20 one end of which is secured to an anchoring bracket 21 rigidly secured to a portion of the lintel 11 of the door frame remote from the anchoring brackets 8, see particularly Fig. 2. The opposite end of the chain 20 is secured to the closed end of a rigid U-shaped link 22 which extends longitudinally through the interior of a coil compression spring 23 and which at its opposite end is formed to provide rearwardly directed hooks 24 which engage the adjacent end of the spring 23. A second generally U-shaped rigid link 25 extends longitudinally through the hollow center of the spring 23 and terminates at its open end in a pair of rearwardly directed hooks 26 that engage the adjacent end of the spring 23. The bracket 16 is formed intermediate its ends to provide a vertically extended channel 27 which opens toward the door 1 and which contains a retainer pin or the like 28. Intermediate its ends the channel 27 is provided with a slot 29 extending transversely therethrough. The closed end of the U-shaped link 25 forms a loop 30 that extends through the slot 29 and embraces the pin 28 so as to be anchored against outward movements with respect to the bracket 16. Thus, when the door is opened to a predetermined degree, the spring 23 is compressed between the hooks 24 and 26 whereby to effectively yieldingly hold the door against

accidental swinging movement to more than a predetermined amount, such amount being determined by the combined lengths of the chain **20**, the links **22** and **25**, and the spring **23**, together with the position of the anchoring bracket **21** relative to the hinge **2**.

In the modified form of the invention illustrated in Fig. 4, the door check cylinder **6'**, identical with the cylinder **6**, is provided with an end cap **31** having a hook-like element **13'** secured to the bracket **16**. In this form of the invention, the hook-like element **13'** is formed to provide an outwardly directed lug **32** having a transverse opening **33** therein through which a rigid link **34** extends. The link **34** is connected to the looped end **30** of the U-shaped link **25** of the elastic snubber above described.

In the form of the invention illustrated in Fig. 5, the door check cylinder, end cap and mounting bracket, together with the elastic snubber used in connection therewith, are identical to corresponding elements illustrated in Figs. 1 to 3 inclusive and are identified by like reference characters. In the form of the invention illustrated in Fig. 5, a split clamping band **35** is axially slidably mounted on the cylinder **6** and is frictionally locked against sliding movements by a nut-equipped clamping screw **36**. The looped end **30** of the rigid link **25** embraces the clamping screw **36** and yielding tension is placed directly upon the cylinder **6** by the elastic snubber through the clamping screw **36** and the band **35**. With this device, the amount by which the door may be opened before the snubber is effective may be varied, simply by loosening the clamping band **35** and sliding the same on the cylinder **6** to a desired position and thereafter tightened.

The above described arrangements eliminate the necessity for a plurality of anchoring brackets secured to the door and present a neat appearance in use. Adjustment of the length of the snubbers in the arrangement illustrated in Figs. 1 to 4 inclusive may be had by adding or subtracting a number of links in the chain **20**. Thus if adjustment is required, there is no necessity for moving anchoring brackets on the door as is the case where the usual anchoring brackets are utilized, with resultant unsightly holes remaining in the door rail.

The several forms of my invention illustrated have been tested in commercial use and have been found to be completely satisfactory for the accomplishment of the objectives set forth; and while I have shown and described several forms which the invention may take in practice, it will be understood that the same is capable of further modification without departure from the spirit and scope of the invention as defined in the claim.

What I claim is:

In a door check, a pneumatic cylinder and a cooperating plunger extensible and retractable from one end of the cylinder, pivot means for mounting the free end of the plunger to a door frame, a mounting bracket on the free end of said cylinder for connecting the same to a door hinged to said frame, said mounting bracket being pivotally connected at one end portion to the adjacent end of said cylinder and defining a vertically extending channel intermediate its ends, said channel opening toward the door, said bracket further having a horizontally disposed slot extending through said channel intermediate the ends thereof, an anchoring pin in said channel and extending longitudinally thereof, and an elongated snubber comprising, a link chain, means at one end of said chain independent of said pivot means for anchoring the same to the door frame in spaced relation to said pivot means laterally of said door frame, a pair of elongated links defining loops one of which is secured to the other end of said chain and the other of which extends through said slot and about said anchoring pin, and a coil compression spring encompassing portions of said links and interposed between the opposite ends thereof, said snubber permitting free opening movement of said door to a predetermined angle with respect to the door frame and checking said opening movement of the door beyond said angle.

References Cited in the file of this patent

UNITED STATES PATENTS

578,962	Bayer	Mar. 16, 1897
624,002	Ensign	May 2, 1899
955,728	Watrous	Apr. 19, 1910
1,122,199	Gadbois	Dec. 22, 1914
1,169,538	Heber	Jan. 25, 1916
2,071,660	Schulz et al.	Feb. 23, 1937
2,311,790	Tharp	Feb. 23, 1943
2,543,565	Billingsley	Feb. 27, 1951
2,585,413	Simpson	Feb. 12, 1952