July 3, 1928. 1,675,980

H. J. LEBHERZ

SILENT DOOR CLOSER

Filed Oct. 15, 1927

Fig. 1

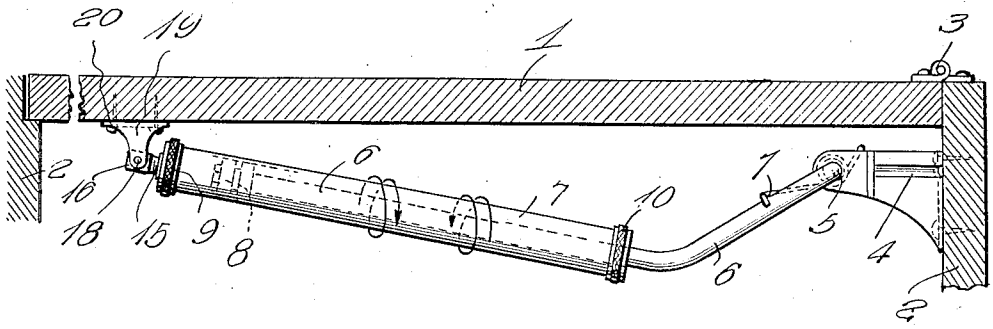


Fig. 2

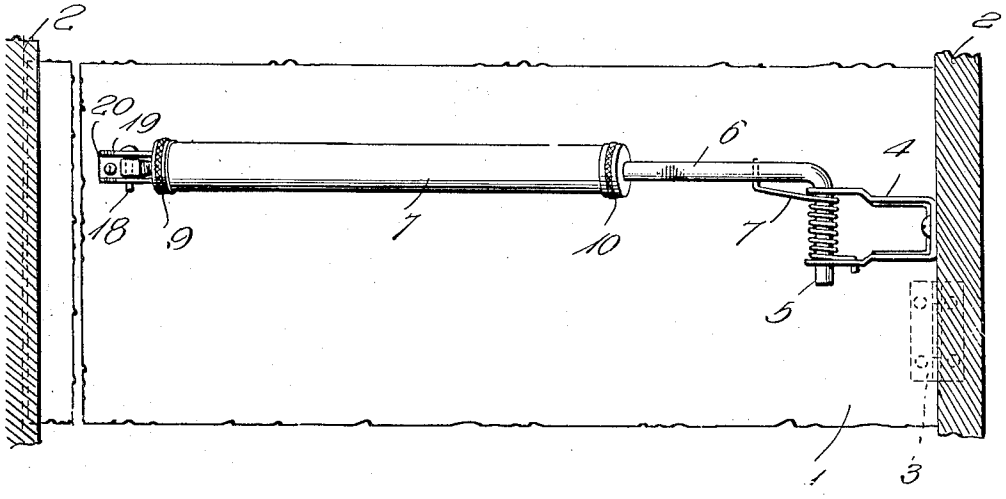


Fig. 3

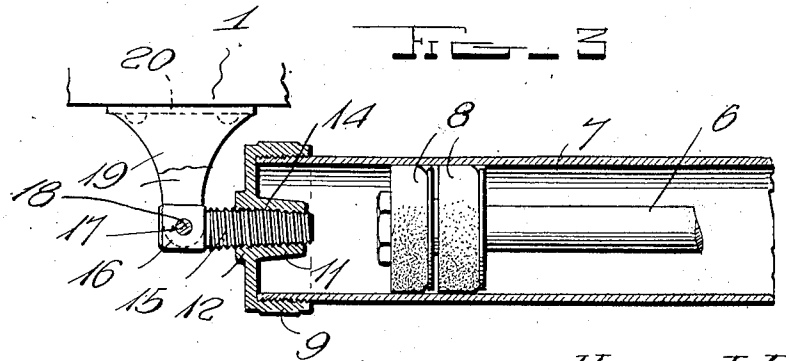
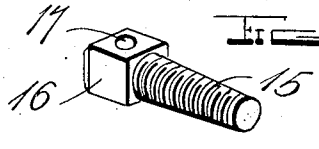


Fig. 4



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UNITED STATES PATENT OFFICE.

HARRY J. LEBHERZ, OF FREDERICK, MARYLAND, ASSIGNOR TO THE EVEREDY COMPANY, OF FREDERICK, MARYLAND, A CORPORATION OF MARYLAND.

SILENT DOOR CLOSER.

Application filed October 15, 1927. Serial No. 226,450.

My invention relates broadly to attachments for doors and more particularly to a construction of door check and closer.

One of the objects of my invention is to provide means for regulating the pressure of air within a pneumatic door check for controlling the movement of a door in order that the door check may be applicable to both heavy or light doors, insuring the closing of the door without slamming independently of the weight of the door.

Another object of my invention is to provide a construction of air regulating valve having a pneumatic door check which is readily adjustable to control the escape of air from the door check and which is capable of manufacture, production and assembly inexpensively from a minimum number of parts.

Other and further objects of my invention reside in the construction of a valve for a pneumatic door closer as described more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is a plan view showing the assembly of the door check and closer with reference to a door and door jamb; Fig. 2 is a side elevation of the door check and closer illustrated in Fig. 1; Fig. 3 is an enlarged cross-sectional view through a portion of the pneumatic door closer showing the position of the valve in the end of the pneumatic cylinder which constitutes the door closer; and Fig. 4 is a detailed view of the screw device forming the adjustable plug valve structure, the screw device being tapered for permitting variation in the area of the air port from the interior of the cylinder to the outside thereof.

My present invention is an improvement over the construction of pneumatic door check and closer shown in my application Ser. No. 215,925, filed August 27, 1927.

In the production of the pneumatic door check and closer of the general design set forth in my aforesaid application, I have found the construction of valve to be extremely important in meeting various service requirements which are encountered under different conditions. That is to say, the pneumatic door check and closer may be applied to relatively heavy doors as well as to relatively light doors, and under these different conditions provision must be made for the passage of air from the pneumatic door check at relatively different rates of speed.

Referring to the drawings in detail reference character 1 designates a door to which the pneumatic door check and closer of my invention is applied. The door jamb is represented at 2, with a hinged connection 3 between the door and the door jamb. A bracket 4 is shown secured to the door jamb 2 having projecting arms adapted to receive the end 5 of the rod member 6 extending from the pneumatic door check and closer. A spring device 7 extends between the arm 6 and bracket member 4 for exerting the required pressure upon the arm 6. The arm 6 extends in the form of a piston rod to a position inside of cylinder 7 and carries pistons 8 thereon. Cylinder 7 is screw threaded at opposite ends and receives end caps 9 and 10 as illustrated. The cap 10 is apertured to permit the passage of arm or rod 6 therethrough allowing free reciprocatory movement of the pistons 8. The cap 9 is screwed fast to the end of cylinder 7 and may be rotated by revolving the cylinder 7 as a whole, as represented by spiral lines in Fig. 1. The cap 9 is provided with a central boss 11 which extends into the cylinder 7 with an outwardly extending boss 12 on the cap 9, the bosses being interiorly threaded as represented at 14 for receiving the screw threaded plug 15. The screw threaded plug 15 has a head 16 thereon apertured as represented at 17 to permit a pin member 18 to be passed therethrough and through the arms 19 of the bracket member 20. The bracket member 20 is fastened to the door 1. A swivel connection is therefore provided between the end of the pneumatic door check and closer and the bracket 20. The screw device serves as a connecting link between arms 19 of the bracket 20 and also as a relief valve.

As represented more particularly in Fig. 4 the screw threaded plug 15 is tapered from a relatively large diameter to a relatively smaller diameter. By advancing or retracting the screw threaded plug 15 into the end cap 9 the passage of air from the interior of the cylinder 7 to the exterior thereof may be regulated. The position of the tapered plug 15 in the cap 9 gives sufficient variation in pressure of air transfer or leakage to cover the range of heavy and light doors to which

the door check or closer may be applied. After the pneumatic door check and closer has been installed it is a simple matter to secure the required adjustment of air pressure by manually revolving the cylinder 7, advancing or retracting the end cap 9 with respect to the screw threaded plug 15 to that position at which the period over which the air escapes from the cylinder 7 may be correct.

The structure of my invention has been found to be extremely practical in manufacture, production and use, and while I have described a preferred embodiment of my invention I desire that it be understood that modifications may be made and that no limitations upon my invention are intended other than are imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a pneumatic door check and closer a pneumatic cylinder, a reciprocatory piston operative therein, an end cap secured to said cylinder, a central portion on said end cap having internal screw threads therein and a screw threaded plug engaging the screw threads in said central portion of said end cap and having means for establishing a pivotal connection with a door at the end thereof.

2. A pneumatic door check and closer comprising a pneumatic cylinder pivotally connected with a door jamb, a screw threaded cap closing one end of said pneumatic cylinder, a plug screw threaded into said screw threaded cap and pivotally connected with the door hinged with respect to said door jamb, said screw threaded plug being tapered to engage said end cap and being adapted to be advanced or retracted with respect to said end cap for varying the area of the discharge port from the exterior to the interior of said cylinder.

3. In a pneumatic door check and closer, a pneumatic cylinder a piston and piston rod operative in said pneumatic cylinder, means for establishing connection between said piston rod and a point on a door jamb, a bracket member carried by a hinged door, an end cap secured to said pneumatic cylinder and having an inwardly extending circular portion cast integral therewith, a tapered plug engaging the screw threads in said end cap, and a pivotal connection between said tapered plug and said bracket member, said tapered plug being advanced or retracted with respect to said screw threads in said end cap for regulating the movement of air from the outside to the inside of said pneumatic cylinder upon movement of said piston rod.

4. A valve structure for a penumatic door check and closer comprising a cylinder, a piston operative in said cylinder, an end cap secured to one end of said cylinder and having an inwardly extending central portion, screw threads on the interior of said central portion, a tapered screw threaded plug arranged to engage the screw threads in said end cap, a head extending from said plug, said tapered plug having a relatively large diameter adjacent said head and a relatively smaller diameter interiorly of said cylinder, a pivotal connection between the head of said screw threaded plug with a door whereby the advancing or retracting of said screw threaded end cap with respect to said screw threaded plug operates to vary the passage of air to said pneumatic cylinder around the screw threads of said plug for controlling the swinging movement of the door.

In testimony whereof I affix my signature.

HARRY J. LEBHERZ.