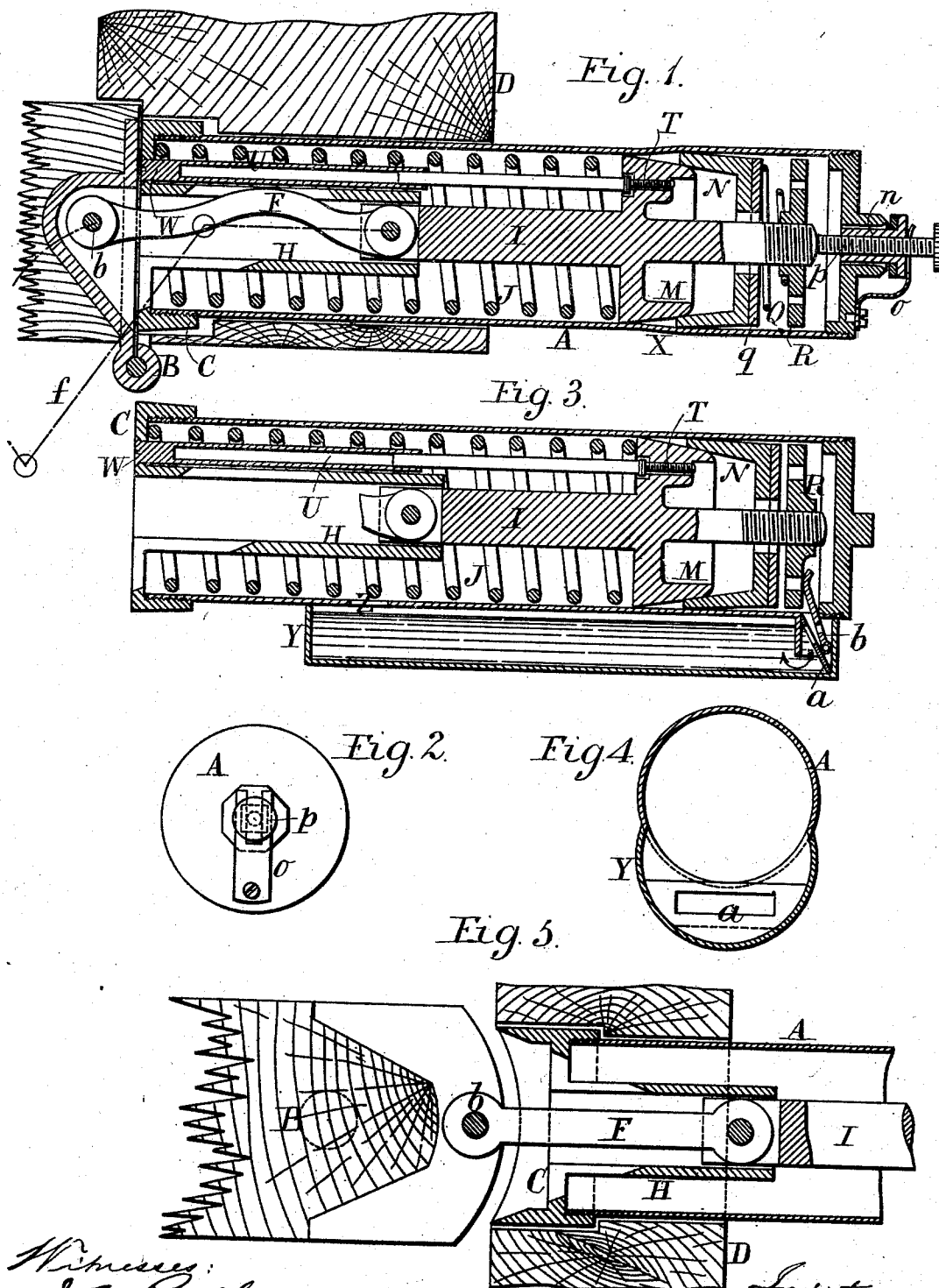


(No Model.)

S. S. ALLIN.
COMBINED DOOR CHECK AND SPRING.

No. 505,744.

Patented Sept. 26, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

SAMUEL SEALY ALLIN, OF LONDON, ENGLAND.

COMBINED DOOR-CHECK AND SPRING.

SPECIFICATION forming part of Letters Patent No. 505,744, dated September 26, 1893.

Application filed May 31, 1892. Serial No. 435,093. (No model.) Patented in England April 30, 1891, No. 7,497; and February 22, 1892, No. 3,429; in France March 8, 1892, No. 219,963; in Germany March 11, 1892, No. 66,127; in Belgium March 16, 1892, No. 98,831; in Switzerland April 23, 1892, No. 4,913; in Austria-Hungary August 23, 1892, No. 21,767 and No. 36,284; in Italy January 7, 1893, LXV, 168, and in Canada June 26, 1893, No. 43,379.

To all whom it may concern:

Be it known that I, SAMUEL SEALY ALLIN, a citizen of England, residing at 52 Woodstock Road, Bedford Park, Chiswick, London, England, have invented certain new and useful Improvements in Check-Springs for Doors, (for which I have obtained Letters Patent in Great Britain April 30, 1891, No. 7,497, and February 22, 1892, No. 3,429; in Austria-Hungary August 28, 1892, No. 21,767 and No. 36,284; in Canada June 26, 1893, No. 43,379; in France March 8, 1892, No. 219,963; in Germany March 11, 1892, No. 66,127; in Italy January 7, 1893, Vol. LXV, 168; in Belgium March 16, 1892, No. 98,831, and in Switzerland April 23, 1892, No. 4,913,) of which the following is a specification.

My invention relates to check springs for doors of the kind wherein a piston linked to the door is urged by a spring in a direction to close the door, but is resisted by fluid in a cylinder so as to effect the closing gradually without shock. Check springs operating in this way are usually visible on the door or door frame, where they are objectionable as being unsightly.

One object of my invention is to avoid this objection by fitting the check spring in the door jamb in a position where it is not seen.

I provide also means of holding the door open and of regulating the fluid resistance so that the door may be made to close more or less slowly, and yet to make the last part of its movement with sufficient force to engage the latch.

I shall describe the construction of the check spring which I adopt, along with certain modifications to suit special conditions, referring to the accompanying drawings.

Figure 1 is a longitudinal section and Fig. 2 an end view of the check spring adapted for air resistance. Fig. 3 is a longitudinal section and Fig. 4 is a transverse section of the cylinder adapted for the resistance of a liquid such as glycerine. Fig. 5 is a part section showing the spring check applied to a door swinging both ways.

Referring to Fig. 1, A is a cylinder fixed in the jamb D to which is hung a door by the

hinge B. From the plate C which covers the mouth of the cylinder A projects inward a tube H forming a guide for the piston stem I which is connected by a link F to a pin b fixed in a recess of the door hinge. When the door is so far opened that the link F takes a position such as is indicated by the dotted line f nearly in line with the axis of the hinge, the door remains open. The position of the pin b and the length of the link F are such that the door, when it begins to close, is subject to comparatively little spring force, the force acting at a disadvantageous leverage.

To the stem I is attached a piston consisting of two parts, the one M of conical form externally, fitting into the other internally coned part N which is of leather or such like flexible material and is free to move on the stem but is urged toward M by a light spring Q bearing on a washer q the force of this spring being adjustable by screwing more or less forward a nut R. This nut is preferably made of the same diameter as the cylinder A so that it serves to guide the piston stem.

Between the part M of the piston and the cover C of the cylinder is placed a helical spring J under sufficient strain to effect the closing of the door. When the door is opened it is resisted by this spring but the part M of the piston being withdrawn from N, air can freely pass into the space of the cylinder behind N. On letting go the door the spring J presses the part M of the piston into the part N expanding the lip of N so that it fits closely to the internal surface of the cylinder A and the air imprisoned behind it becomes compressed, retarding the movement of the piston inward and so retarding the closing of the door. In order to regulate this retardation by allowing more or less air to pass the piston I make a hole through M and fit it with a screw plug T which is grooved or flattened on the side and has a long stem entering a tube U having a head W notched so that it can be turned by a screw driver. The stem of the plug T and the tube U being of section not circular, by applying a screw driver to turn the tube U the plug can be more or less unscrewed so as to allow passage of air along its

flat side or groove, or it can be screwed home with a packing washer under its head to close completely the passage through the piston. The screw-driver head W may be removed leaving the tube U open at the end and the stem of the screw T may be so far elongated as to project beyond the end of the cylinder when the door is opened so that it can be turned by a screw-driver or key.

Though it is desirable to retard the door during the greater part of its closing movement it is generally desirable also to have the last part of the movement unimpeded, so that the door can close with sufficient force to latch itself. In order to provide for this I make the end part of the cylinder A from some point such as X of a little larger diameter than the rest of the cylinder, so that when the piston moves along this enlarged part, air can find its way from behind it, thus relieving the pressure acting against the piston. A like result can be attained by fitting in the bottom of the cylinder a plug valve *n* which is usually kept closed by a spring *o* but which is opened allowing escape of air when the stem of the piston meets the stem *p* of the plug *n*. By screwing the stem *p* more or less forward the escape of air can be made to take place sooner or later during the closing of the door.

When liquid such as glycerine is used to retard the piston, I provide as shown in Figs. 3 and 4 a reservoir for the liquid under the cylinder A and communicating in front with the cylinder by a hole Z which is always open, and behind by a hinged valve *b* having a small hole through it, this valve being situated behind a partition *a* which extends nearly to the bottom of the reservoir Y. As the piston is drawn forward in opening the door, liquid can flow freely from the partition *a*, past the valve *b* which is open into the cylinder A behind the piston. But when the piston moves back in closing the door, the valve *b* closes and the liquid can only pass through the small hole in the valve, the movement of the piston being thus checked. As the piston approaches the end of its instroke the nut R meeting the projecting end of the valve *b* opens the valve, thus relieving the resisting pressure and allowing the door to make the last part of its closing movement with sufficient freedom to become latched. Such liquid as may pass the piston flows back into the reservoir Y through the hole Z.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. In a doorcheck and closer, the combination with a cylinder of a piston working in

said cylinder and having an opening T therein, a screw plug fitting said opening to regulate leakage through the piston, and an extensible shaft connected with said screw plug and extending to the exterior of the cylinder, whereby said plug may be turned exteriorly of the cylinder, substantially as described.

2. In a door check, and closer, the combination with a cylinder, and a piston working therein, of a pin located in a recess of the door, and a rod connecting the pin with the piston rod and having a bend to clear the hinge-knuckle when the door is opened to right angles, the construction being such that when the door is opened the line of connection formed by the bent connecting rod passes through the hinge pin and the door is held open, substantially as described.

3. In a door check and closer, the combination with a cylinder of a piston constructed in two parts, one of said parts being rigidly secured to the piston rod and the other of said parts being movable on said rod, substantially as described.

4. In a door check and closer, the combination with a cylinder, of a piston constructed in two parts one of which parts is exteriorly conical and rigid with the piston rod, and the other of which parts is interiorly conical and movable upon said rod, substantially as described.

5. In a door check and closer, the combination with a cylinder, of a piston constructed in two parts, one of said parts being rigid with the piston rod and the other of said parts movable on said piston rod, and means for regulating the leakage through one of the parts of said piston, substantially as described.

6. In a door check and closer, the combination with a cylinder, and a piston working therein and having a stem, of a spring-valve located in the bottom of the cylinder, and an adjustable screw stem operated by the stem of the piston to open said valve for the escape of air and the sudden closing of the door at this time, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 22d day of April, A. D. 1892.

SAMUEL SEALY ALLIN.

Witnesses:

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