

(No Model.)

2 Sheets—Sheet 1.

F. J. WOOD.
PNEUMATIC DOOR CHECK AND SPRING.

No. 443,702.

Patented Dec. 30, 1890.

Fig. 1.

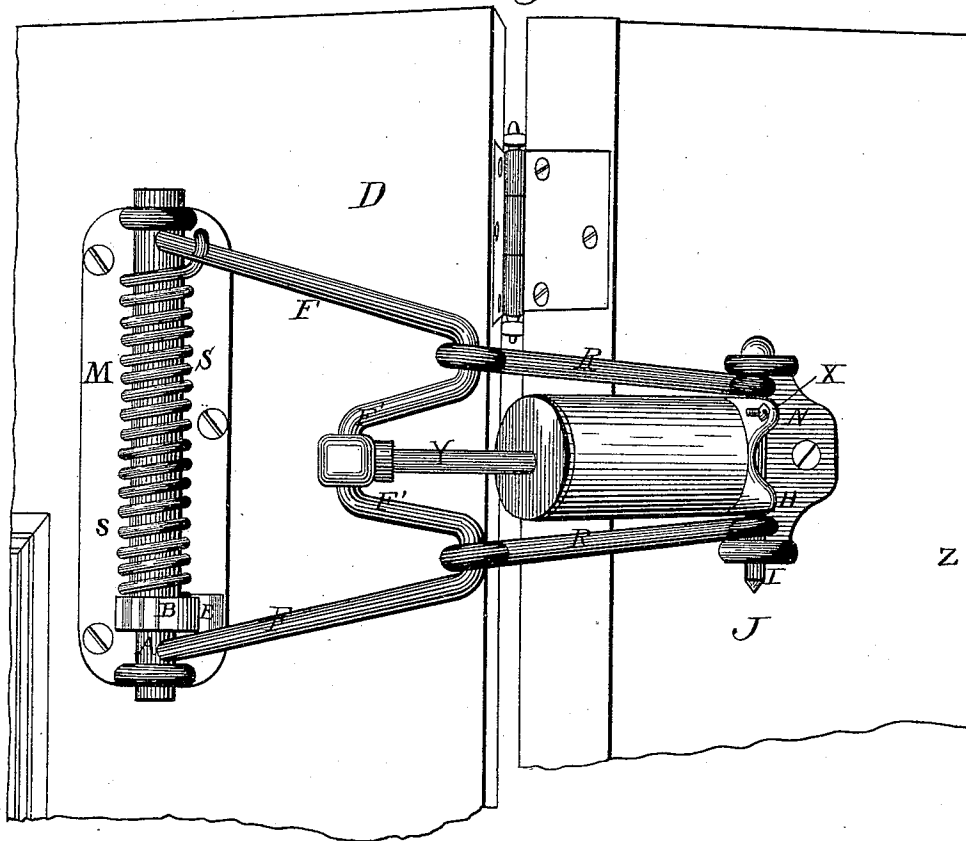
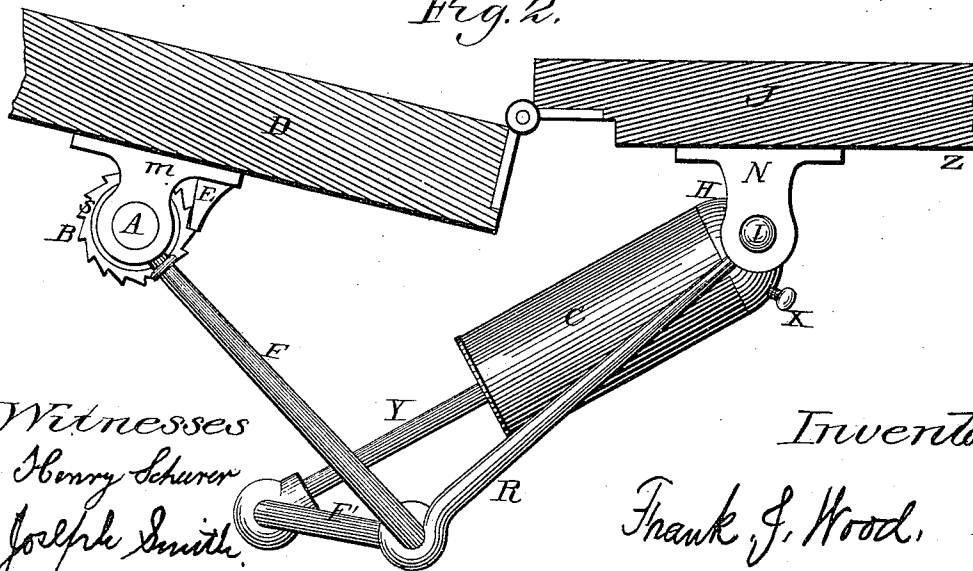


Fig. 2.



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Fig. 3

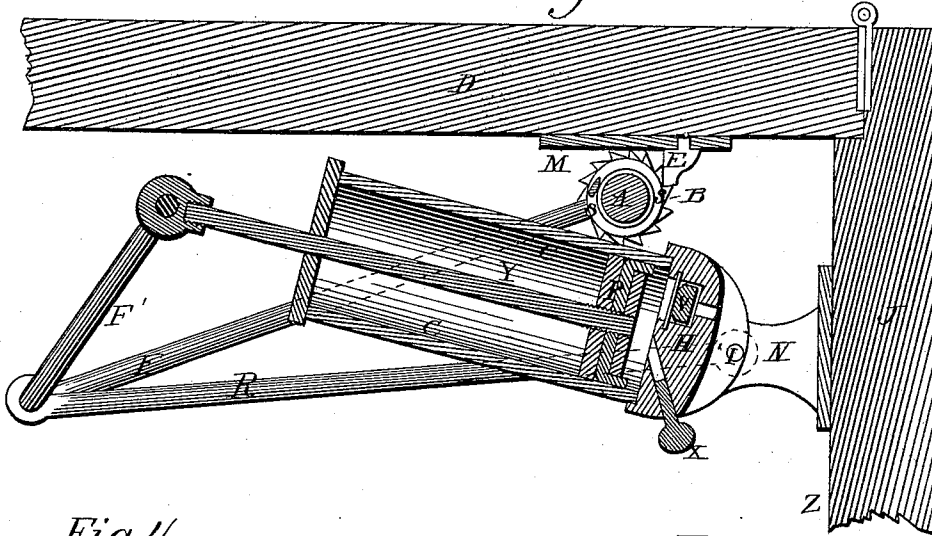


Fig. 4

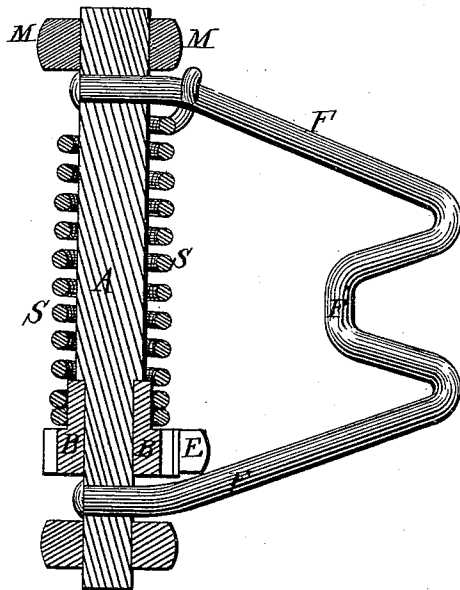
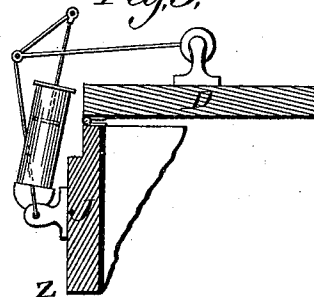


Fig. 5



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UNITED STATES PATENT OFFICE.

FRANK. J. WOOD, OF LOS ANGELES, CALIFORNIA.

PNEUMATIC DOOR CHECK AND SPRING.

SPECIFICATION forming part of Letters Patent No. 443,702, dated December 30, 1890.

Application filed November 8, 1889. Serial No. 329,711. (No model.)

To all whom it may concern:

Be it known that I, FRANK. J. WOOD, of Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Pneumatic Door Checks and Springs Combined, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to an apparatus for automatically closing the door without slamming it; and the object is to greatly cheapen and simplify the construction and improve its efficiency. I attain this object in the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view. Fig. 2 is a semi-sectional view, with the door in the position shown in Fig. 1. Fig. 3 is a sectional view of the checking-cylinder, and also shows the position of the different parts when the door is closed. Fig. 4 is a sectional view of the spring and spring connections. Fig. 5 shows the position of the different parts of the device when the door is swung back to the wall.

A is a shaft, which supports and around which is coiled and which is actuated by the spring S. The shaft A also supports and has secured to it the double-crank arm F F'.

B is a ratchet-wheel, in the center of which turns the shaft A. The door-closing power of the spring is communicated to the door through the ratchet B, the pawl E, and the bracket M.

C is a cylinder, which is supported and turns on the bracket N.

D is a door hung on the jamb J.

E is a pawl that engages the teeth of the ratchet B.

F F' is what I shall call a "double-crank arm," and it is secured to and receives its motion from the shaft A. It is bent so that it forms a double crank or lever, the fulcrum of which is at the points where the double-crank arm connects with the stay-rods R R.

H is a cylinder-head, which, with the stay-rods R R, swings on and is connected to the bracket N by means of the pin I.

M and N are brackets, which are secured to the door and jamb, respectively, and form supports for the different parts of the device.

P is a piston, which moves in the cylinder C, and which may be of any good construction.

R R are stay-rods which connect the double-crank arm F F' with the pin I, mounted in the bracket N, secured to the jamb J.

S is a coiled spring, one end of which is connected to the door by means of the ratchet B, the pawl E, and the bracket M, and the other end is connected to the jamb J by means of the shaft A, the double-crank arm F F', the stay-rods R R, and the bracket N.

V is a valve which freely admits air to the cylinder, but prevents its escape.

X is a vent-regulating screw, which admits of regulating the speed at which the door closes. By screwing on or unscrewing on the screw X the size of the orifice by which the air escapes from the cylinder C decreases or increases.

Y is a piston-rod, which connects the piston P with the crank F'.

The operation is as follows: When the door is being opened, the double-crank arm F F', from being connected to the jamb J by the stay-rods R R, turns the shaft A in the bracket M. This tightens the spring S. The crank F', by means of the piston-rod Y, pulls outwardly on the piston P, which draws air into the cylinder through the valve V. When the door is being closed, the tightly-coiled spring S, in uncoiling, being connected to the door and the jamb in the manner above described, exerts a twisting or rotary motion to the door D, which motion is in the direction which closes the door. While the door is closing, the crank F' is pushing the piston P inwardly in the cylinder, the valve V closes, an air-cushion is formed, and the door is prevented from slamming, and the door will slowly close after the air in the cylinder has escaped through the vent which is regulated by the screw X.

By referring to the drawings it will be seen that my device is placed on the side of the door toward which the door closes, which, as a rule, is outside of the room to which the door gives access, and with the fact of its necessarily being in the recess formed by the door frame or casing it is to a great extent not noticed. It being obvious that the spring exerts a twisting strain to the door, and there

being no dead-centers to the closing-power of the spring, like there are in some mechanisms in which the spring has a rectilinear motion, then, as will be seen by referring to Fig. 5, it will close the door from a position in which the door is swung all the way back to the wall—that is, in the same plane as the door when closed—which is a novel feature in a door-check combined with a spring that is placed on the side of the door toward which it closes; also, in further demonstrating its greater efficiency, I can say that as the width of the jamb of a door-opening is usually about the thickness of an ordinary wall or partition it is obvious that no part of my device protrudes beyond the thickness of the wall, and, therefore, is inside the door opening or recess when the door is closed, and a screen or other door could be hung on the jamb J at the edge Z, and as it would swing in an opposite direction from the door D it is evident that no part of the check or spring would come in contact with a door hung at Z. A door check and spring of this form needs no changing or adjusting of parts to attach it to either a right or a left handed door, it being equally adapted to be attached to either.

By examining the drawings it will be seen that in this form of a door check and spring the different parts can be made with the cost of skilled labor and finishing of parts reduced to a minimum. The different parts can be rough brass castings and common wire bent into shape, with the exception of the cylinder, which can be a piece of brass tubing soldered onto two rough cast-brass cylinder-heads of the form shown in the drawings. Of course there would have to be some holes drilled; but there would be no necessity for

such costly work as turning on a lathe or cutting on a shaping or planing machine. For the foregoing reasons the construction of a door-check of this form is much cheaper and more simple and the efficiency greater than others heretofore made.

I do not claim, broadly, that a pneumatic checking-cylinder combined in the same mechanism with a spring and placed on the side of the door toward which it closes is new; nor do I claim as new the vent-regulating screw X, nor the valve V, nor the tightening-ratchet B as a means of tightening the spring S as being new; but

What I do claim, and wish to secure by Letters Patent, is—

In a pneumatic door check and spring, the combination of the bracket M, adapted to be secured to a door, the shaft A, mounted in said bracket, the double-crank arm F F', secured to the shaft, the ratchet-wheel B, mounted on one end of said shaft, the pawl E, mounted in the bracket M to engage the ratchet-wheel and the spring S on the shaft A and having one end secured to the ratchet-wheel and the other end connected to the double-crank arm, with the bracket N, adapted to be secured to a door-jamb, a pin I on said bracket, stay-arms R R, loosely mounted on said pin and connected to the crank-arm F F', an air-cylinder pivotally secured to the pin I, a piston within the cylinder, and a piston-rod connecting the piston and double-crank arm, substantially as and for the purpose described.

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Witnesses:

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