

(No Model.)

C. E. GRIFFING & J. W. ASHBORN.

DOOR SPRING AND CHECK.

No. 370,468.

Patented Sept. 27, 1887.

Fig. 1.

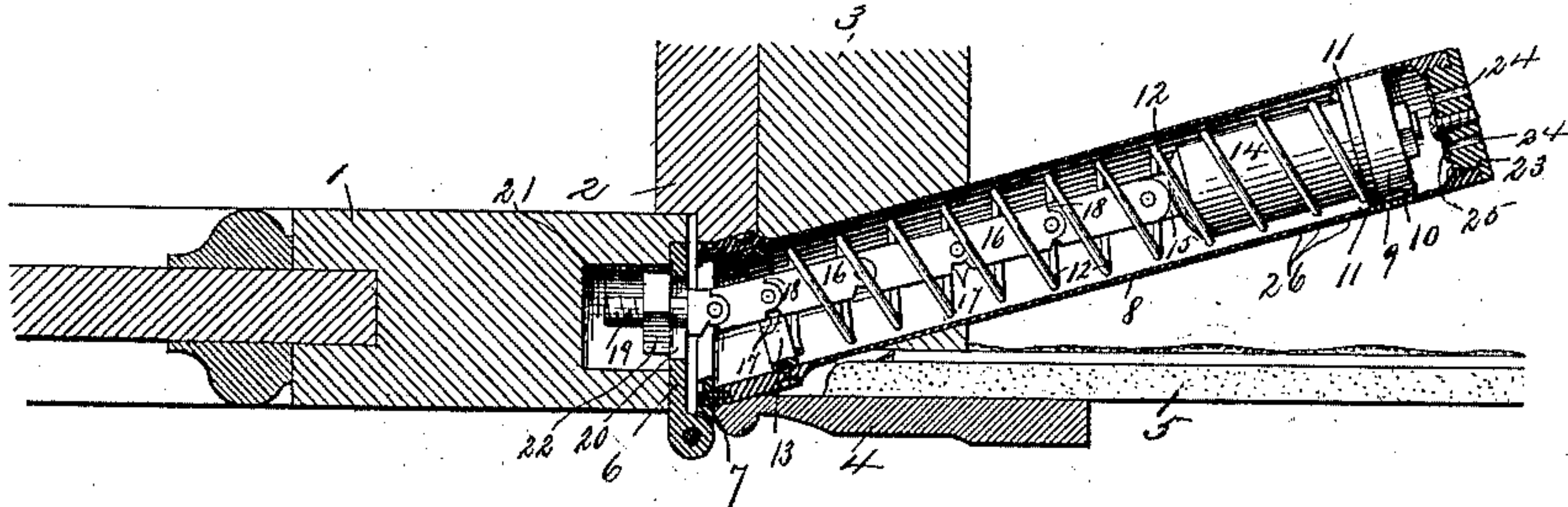


Fig. 2.

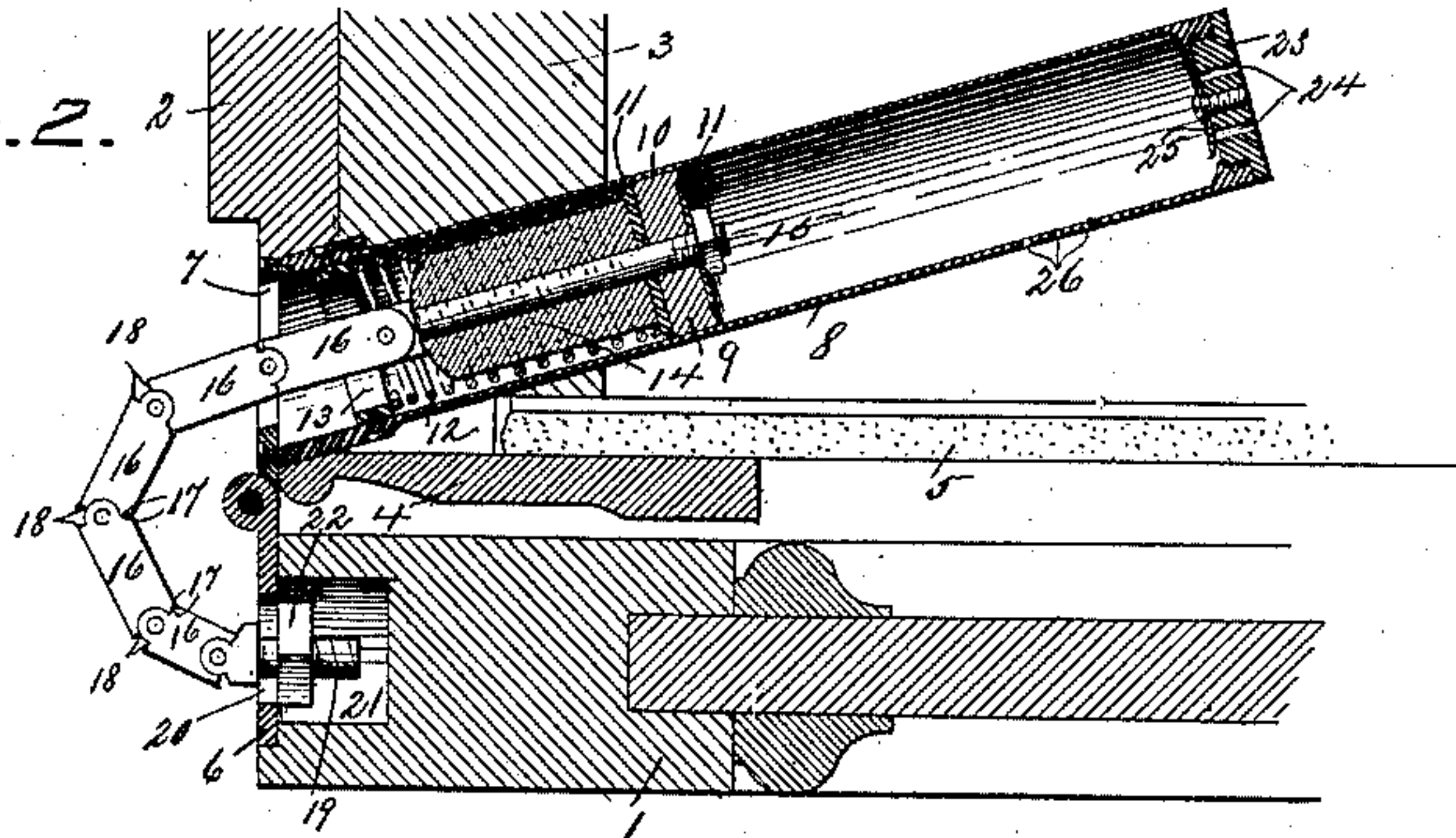


Fig. 3.

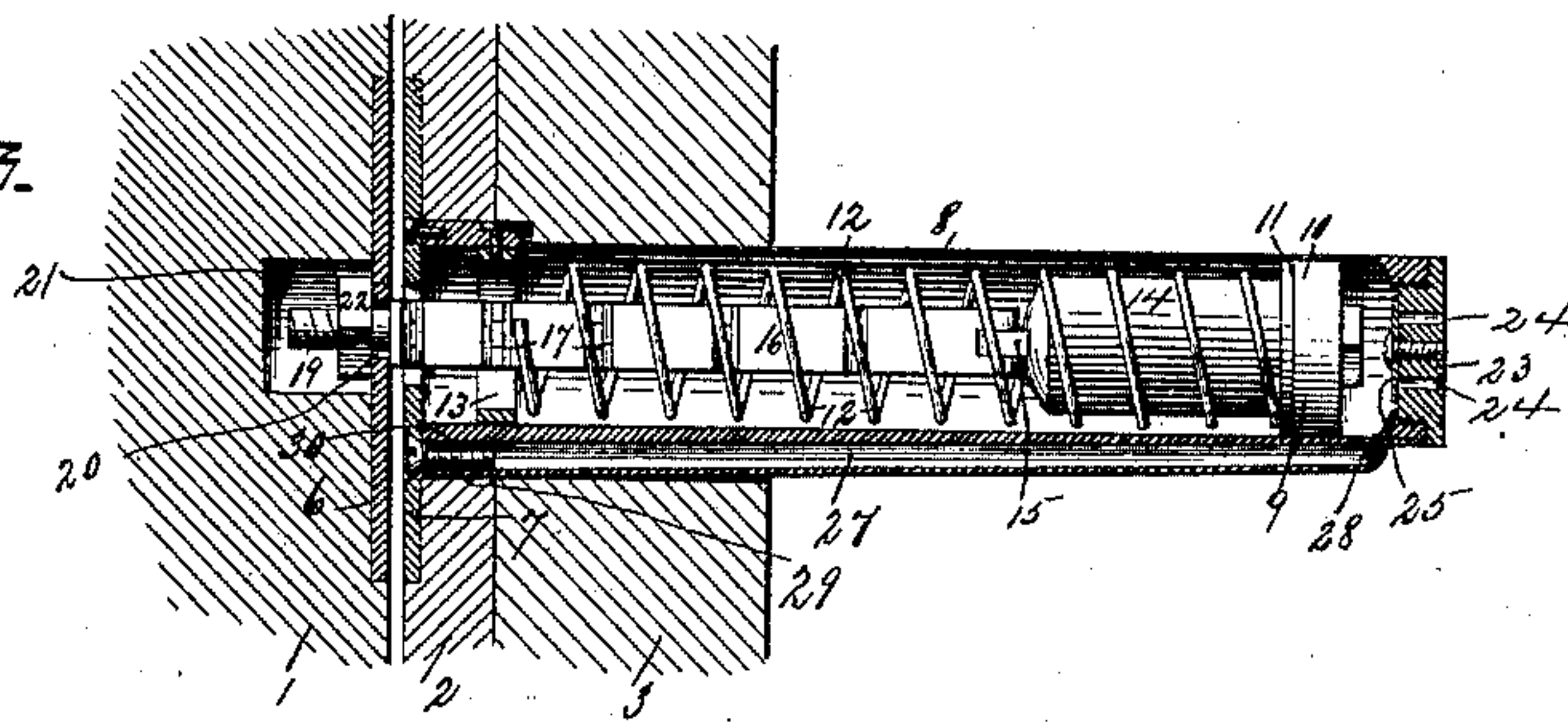
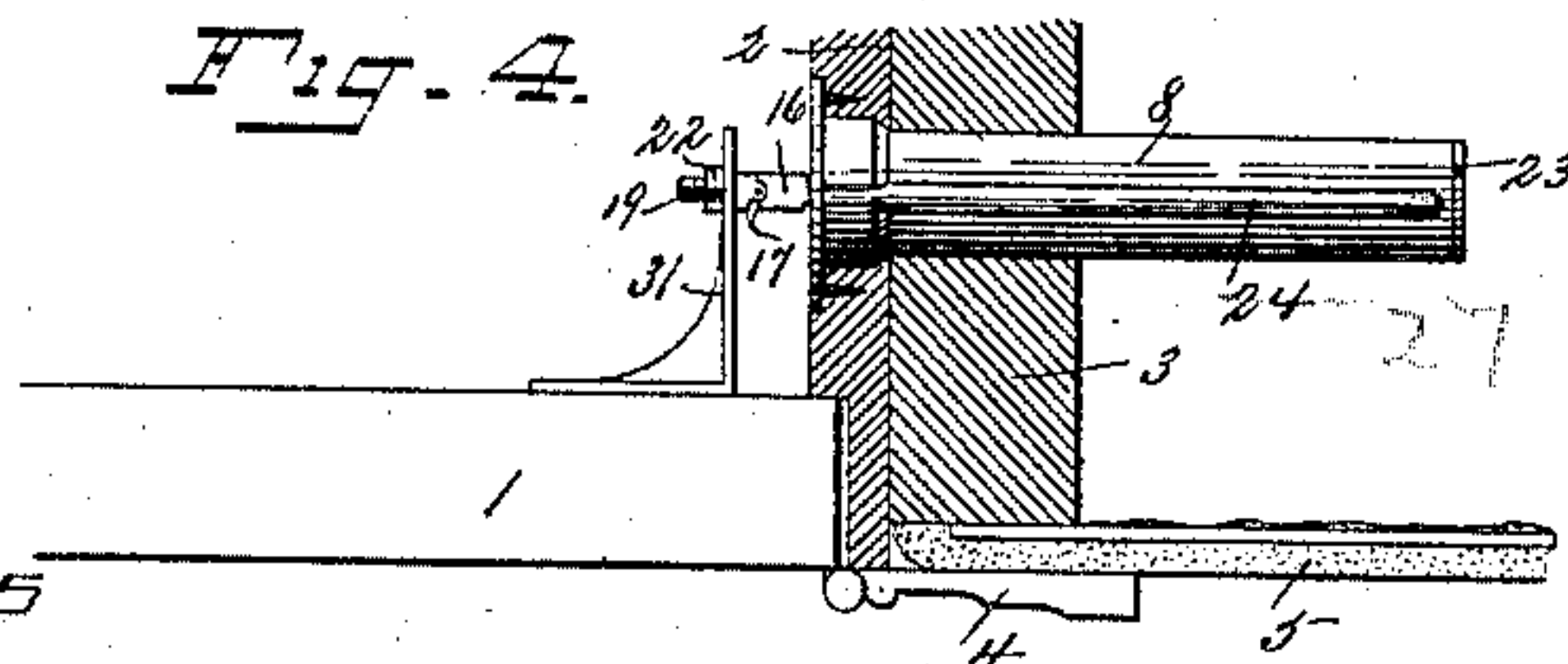


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES E. GRIFFING AND J. WILSON ASHBORN, OF DANBURY, CONNECTICUT; SAID ASHBORN ASSIGNOR OF ONE-HALF HIS RIGHT TO DANIEL M. BENEDICT, OF SAME PLACE.

DOOR SPRING AND CHECK.

SPECIFICATION forming part of Letters Patent No. 370,468, dated September 27, 1887.

Application filed May 2, 1887. Serial No. 236,782. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. GRIFFING and J. WILSON ASHBORN, citizens of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Door Springs and Checks; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to the class of door-springs which have a pneumatic check combined therewith, and has for its object to provide a device of this class which shall be simple in construction, economical in cost, readily adjusted, and practically impossible to get out of order, an important feature of our improved construction being that the mechanism is entirely out of sight, being let into the jamb and studding of the wall and connected at or near the edge of the door. With these ends in view we have devised the simple and novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to indicate the several parts.

Figure 1 is a horizontal section of a door, the jamb, stud, and casing, and our improved door spring and check, showing the door in the closed position; Fig. 2, a similar view showing the door in the open position, and Fig. 3 a vertical section corresponding with Fig. 1. In these figures our invention is shown as applied in connection with—that is, made integral with—one hinge of the door. Fig. 4 is a plan view of another form of our invention, in which it is applied independently of the hinge, the jamb, stud, &c., being in section and the door being in the closed position.

1 denotes the door, 2 the jamb, 3 a stud, 4 the casing, and 5 the wall. These parts may all be of any ordinary or preferred construction, as they form no portion of our invention. In the form illustrated in Figs. 1, 2, and 3 we have shown our invention as applied in connection with one of the hinges. 6 denotes the door-leaf of the hinge, and 7 the jamb-leaf.

8 denotes a tubular case which is rigidly

secured to the jamb-leaf of the hinge. As shown in Figs. 1 and 2, this case is attached to the jamb-leaf, at an acute angle to the plane of the leaf, inclining inward. This is in order that the case shall lie within the recess between the walls, which would not be practicable if the case were attached to the leaf at a right angle thereto, as it would then be impossible to conceal the case.

9 denotes a piston within this case, consisting of a disk or disks, 10, of leather or other suitable material, with metallic washers 11 on opposite sides thereof.

12 is a spring which bears against the outer metallic washer and against a collar, 13, at the outer end of the case. This collar is made detachable, and is secured in place by set-screws for convenience in assembling.

14 is a block which we ordinarily use within the spring to prevent the latter from doubling or buckling in use.

15 is a rod passing through the block, the disks, and the washers, and provided with a head hinged to the inner member of a connection consisting of pivoted links 16.

The peculiarity of this portion of our invention consists in providing these links with shoulders or stops 17 upon one side and with shoulders or stops 18 upon the other side. Supposing the door, as shown in Figs. 1 and 2, to open inward, the stops 17 upon the side of links 16 corresponding with the inner side of the door are so formed and located relatively to each other as to permit the door to be thrown entirely open, as shown in Fig. 2, these stops just coming in contact with each other when the door is in the open position, so that the link-connection is perfectly rigid, as shown in Fig. 2. The stops 18 upon the opposite sides of the links are so formed and arranged relatively to each other as to just come in contact with each other when the chain is passing straight into the case as the door swings to the closed position, as in Fig. 1. This is in order to hold the chain perfectly rigid in this position and insure that it shall not double or buckle and come in contact with the spring or the case.

At the outer end of the link-connection is a threaded rod, 19, which passes through a

slot, 20, in the door-leaf of the hinge. A recess, 21, is provided at the edge of the door, into which rod 19 passes, where it is secured by a nut, 22, engaging the threaded rod. At the inner end of the case is a screw-plug, 23, provided with apertures 24. 25 is a flap-valve covering these apertures, but adapted to lift inward to permit the entrance of air into the cylinder when the piston moves outward, as when the door is opened. 26 denotes apertures in the case a short distance above the inner end, which permit the ready escape of air when the door is swung toward its closed position.

It will of course be understood that the spring is sufficiently strong to draw the door quickly toward the closed position from any position in which it may be placed. The effect of our stop-link connection is to insure a steady pull upon the door at all times, tending to draw it toward its closed position. As shown in Fig. 2, when the door is thrown to its farthest open position the connection curves over from the jamb to the door and is made perfectly rigid by the engagement of stops or shoulders 17 with each other. As a matter of fact, the farther open the door is thrown the more the spring will be compressed, and, owing to the direction in which the power of the spring is exercised that is producing a direct pull upon the door, the greater will be the tendency to throw the door to the closed position. When the door is opened, air enters the case through apertures 24 in the screw-plug, the flap-valve 25 being lifted by the air as it enters. When the door is released, the spring acts to draw it quickly toward its closed position. Valve 25 of course instantly closes down upon apertures 24, so that escape of air at the end of the case is cut off. Apertures 26, however, in the side of the case are made sufficiently large to give free escape to the air until the door has nearly reached the closed position. As soon as the piston has passed these apertures in moving inward, the air at the inner end of the case forms a cushion, which checks the door.

In order that the rapidity with which the door closes after having reached this point may be perfectly under control at all times, we have provided a tube, 27, lying by the side of the case or made integral therewith. The inner end of this tube communicates with the inner end of case 8 through a small aperture, 28. The outer end of the tube terminates in the jamb-leaf of the hinge, as represented in Fig. 3, and in the face-plate of the case, as represented in Fig. 4. 29 denotes a screw entering from the face of the jamb-leaf of the hinge, which engages the outer end of this tube. The screw is provided with a groove, 30, to allow the air to pass out. By turning the screw in or out

the escape of air from the tube may be perfectly regulated, so that the final movement of the door in closing is under perfect control.

In Fig. 4 we have illustrated our invention as applied to a door independently of the hinges. In this form case 8 is set straight into the jamb and rod 19 is connected to a bracket, 31, upon the outer side of the door in the same manner that it is connected to the door-leaf of the hinge in Figs. 1, 2, and 3.

In Fig. 4 we have shown tube 27 on the upper side of case 8, instead of upon the under side, as in the other figures. This, however, and the various other details of construction are not of the essence of our invention and may be varied to an almost unlimited extent without departing from the principle thereof.

We claim—

1. A combined door spring and check consisting, essentially, of a case having apertures and a valve to control the entrance and escape of air, a piston, a spring bearing against said piston, and a collar at the outer end of the case, and a pivoted link-connection having stops, as shown, which is connected to the piston and to the door, substantially as described.

2. The combination, with a hinge and a case attached to one leaf thereof, of a piston within said case, a spring acting to force the piston inward, and a pivoted link-connection having stops between said piston and the other leaf of the hinge, substantially as described.

3. The case having apertures 26, and the piston, spring, and pivoted link-connection, in combination with a tube leading from the inner end of the case to the face of the jamb, and a slotted screw engaging the outer end of said tube, whereby the escape of air therefrom may be regulated, substantially as described.

4. The combination, with a hinge-leaf, of a case secured thereto and inclined inward at an acute angle to the plane of the leaf, a piston and spring within said case, and a pivoted link-connection secured to said piston and to the opposite leaf of the hinge, as and for the purpose set forth.

5. The combination, with a hinge and a case attached to one half thereof, of a piston within said case, a spring acting to force the piston inward, a block, 14, within said spring, for the purpose set forth, and a pivoted link-connection having stops between said piston and the other leaf of the hinge.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES E. GRIFFING.
J. WILSON ASHBORN.

Witnesses:

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T. H. BENEDICT.