(No Model.) 2 Sheets—Sheet 1

G. R. ELLIOTT.

PNEUMATIC DOOR CHECK AND CLOSER.

No. 265,919. Patented Oct. 10, 1882.

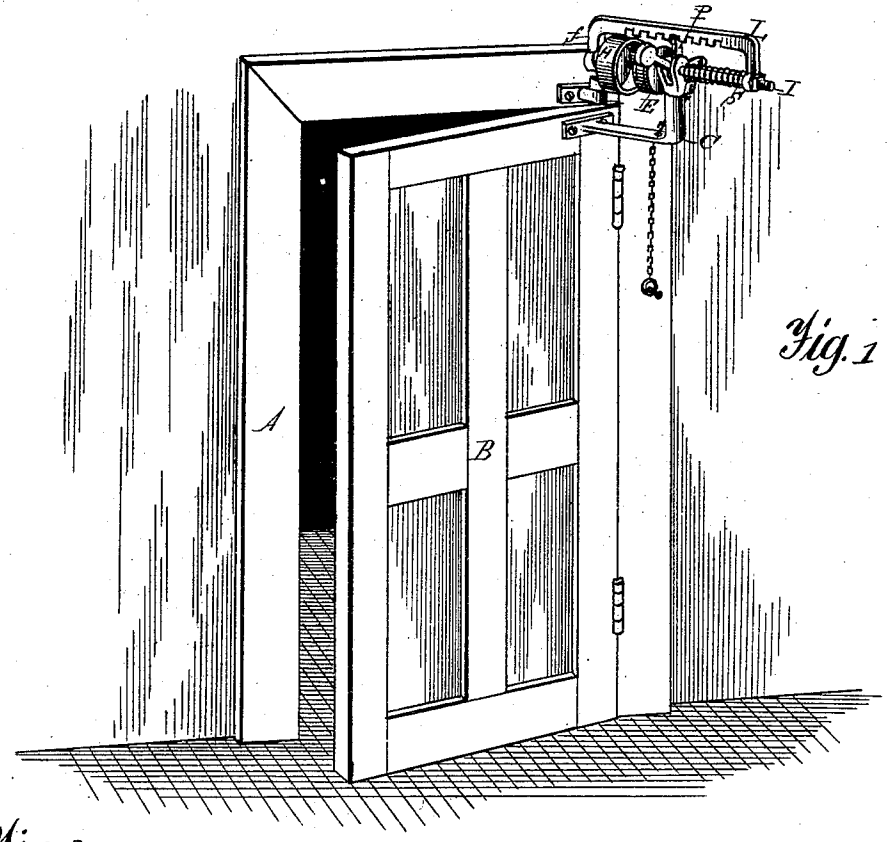


Fig. 1

Fig. 2

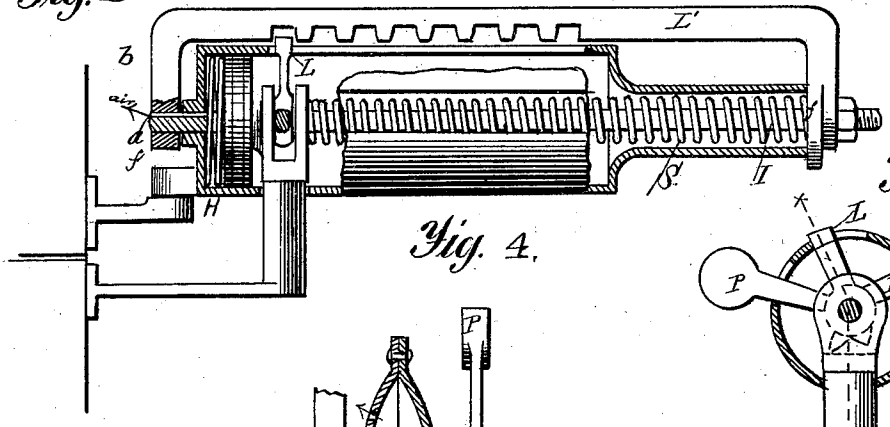
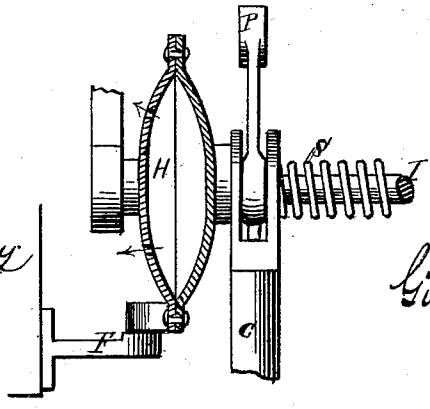


Fig. 4.

Fig. 3



Witnesses.
Thomas E. Clary
Chas. W. Elliott

Inventor:
Gilbert R. Elliott

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

G. R. ELLIOTT.

PNEUMATIC DOOR CHECK AND CLOSER.

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Fig. 7.

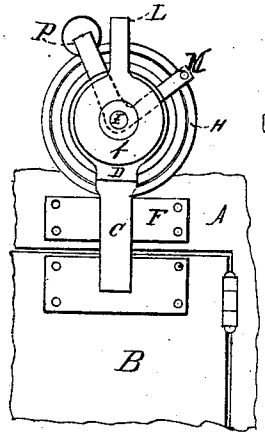


Fig. 5.

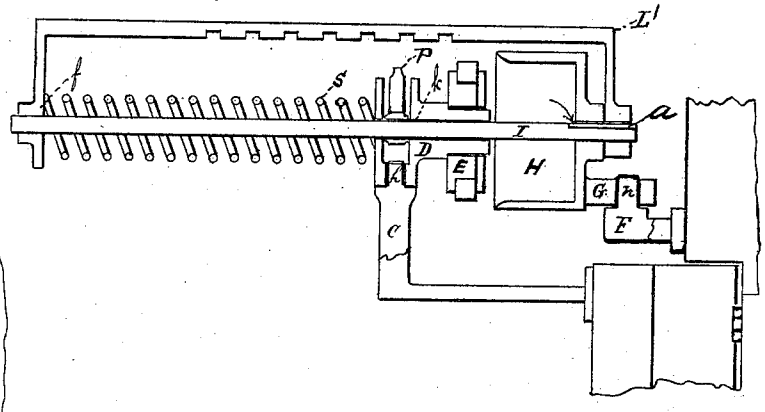
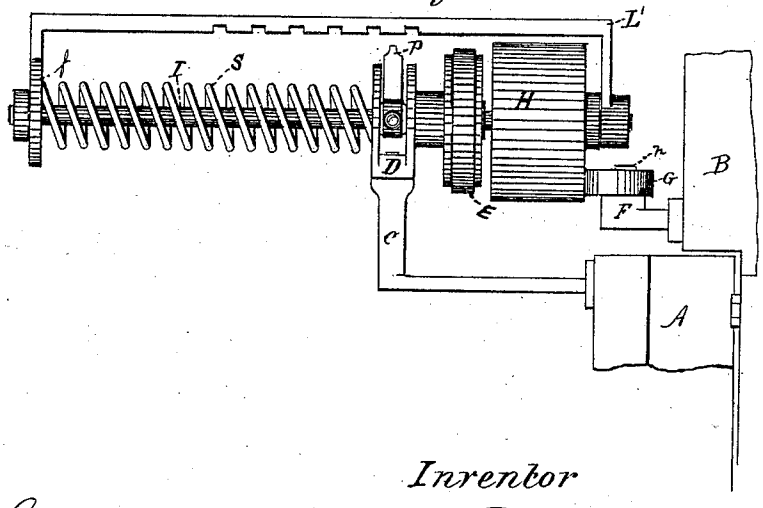


Fig. 6.



Witnesses

Charles W. Elliott

Thomas E. Clary

Inventor

Gilbert R. Elliott

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GILBERT R. ELLIOTT, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE ELLIOTT PNEUMATIC DOOR CHECK COMPANY, OF NASHUA, NEW HAMPSHIRE.

PNEUMATIC DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 265,919, dated October 10, 1882.

Application filed April 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, GILBERT R. ELLIOTT, of Boston, Massachusetts, have invented new and useful Improvements in Door-Checks, of which the following, reference being had to the accompanying drawings, is a specification.

This invention relates to door stops or checks, and also to devices for retaining the door in any desired or fixed position when open.

It is well known that many devices have been made and adopted for the purpose of closing doors automatically after being opened—such as spring-hinges, spiral springs, weights, and other contrivances—which, as far as I am aware, have not given entire satisfaction and are in many ways objectionable. It is also well known that where such devices have been in use great annoyance is caused by the slamming of the doors against the jambs or door-frames, not only causing very disagreeable noise, but also frequently, where the doors are very heavy, loosening the plastering and often jarring the whole side of the building. A further objection to the class of devices alluded to as at present constituted is that where they are attached to doors it is difficult to retain the door in an open position. Therefore, to overcome the objections above referred to and to improve and simplify the construction, cheapen the first cost, and to make an effective door check and stay are the objects of my invention.

To these ends therefore my invention consists in certain arrangements of parts, consisting of a combined spring and piston with an outer spring, by means of which, when the door is opened, it automatically closes itself in such a manner that it is prevented from slamming against the jamb, avoiding the usual thud or jar.

It also consists in the means, herein described, by which the door is held open and prevented from slamming by means of a cushioning device, or held partly open or ajar to any desired extent against the tension of the springs or other closing devices.

Referring to the accompanying drawings, and to the letters of reference marked thereon, and which form part of this specification, Figure 1 represents a perspective view of my improved door-check in position, the cylinder or covering being removed, the door being kept partly open by means of the retaining device. Fig. 2 shows a side elevation partly in section; Fig. 3, an end view, plainly showing the weight and lever which hold the door in position when open. This figure also shows an end sectional view of the cage or casing which incloses the apparatus. Fig. 4 represents a modification of the invention, as will be explained farther on. Fig. 5 shows a longitudinal section of the apparatus. Fig. 6 is a side elevation without the cage or casing, and Fig. 7 represents an end elevation of the apparatus.

Like letters of reference denote like parts in all the figures.

B is the door, and A the door-jamb.

H is an air-cylinder, which is preferably beveled on its inner wall outward for the purpose of the ready admission of the piston. This is an important feature in the working of the invention, for it often happens that the rod gets out of line from various causes—such as twisting or straining the door, &c.—and when so out of line with the mouth of the open cylinder it would strike its edge, and thus fail to operate; but when the mouth of the cylinder is open when the piston reaches it it eases itself into the cylinder, the beveled inclination being its guide.

E is the piston-head, mounted upon rod I. This rod I extends entirely through the apparatus and performs the function of a bolt. It also carries the spring and locking device.

C is a bracket-arm, attached to the door at one end and mounted on the rod at the other end. The weight-lever P, locking-lever L, and releasing-lever M are clutched between the jaws formed on the right-angled portion of the bracket-arm C. This clutch D is pivoted on the upper end of the bracket-arm, so that when the apparatus turns it turns upon this pivot. In this case one end of the hub of the clutch forms also the hub of the piston. The other side of the hub of the clutch forms a bearing for the end of the working spring S.

Spanning the apparatus longitudinally is an angle-iron bent at right angles at each of its

ends. On these ends is formed a hub which fits the ends of the rod I, and which is rigidly fastened to said rod. The inner edge of this angle-iron L′ is serrated or notched and adapted to receive the end of the lever L, which is thrown into it by the weight when necessary to hold the door open to any desired position. At the outer end of the cylinder I place another arm-bracket, F, upon which is also placed a pivot somewhat like that of the pivot of a hinge, as seen in section at *h*, Fig. 5. One end of this arm is fastened to the door-jamb, and a projection, G, extending from the cylinder has a journal or socket that fits over said pivot *h*, and which turns upon it.

If desired, a cage or cylinder is placed around the spring and the working mechanism. This casing or cylinder may be a prolongation of the air-cylinder. It may be reduced at its outer end, as shown at Fig. 2. It must have notches to correspond with the notches in the rock or angle iron; or it may have longitudinal slits for the levers to slide in as the piston slides back and forth.

The rod I has an air-port or ground cut on its lower end, which air-port extends into and communicates with the cylinder. This port *a* is for the gradual escape of air from the cylinder when it is used for an air-cushion. (See arrow.)

It sometimes happens that the packing of the piston becomes dry or loose, and thereby leaks, rendering the air-cushion inoperative, so that the door would slam as hard with it as without. To provide for such an emergency I place a flat or other spring in the bottom of the air-cylinder, so that when the air fails to form a cushion the spring satisfactorily performs the function. (See Fig. 2.) Where doors are very heavy and are apt to shut with great force, then the spring and air-cushion both will be found useful. Of course the spring *b* will be interposed between the piston and the bottom of the cylinder, Fig. 2. The spring alone without the cylinder and piston would produce good results as a cushioning device.

A modification of the cushioning device is shown by Fig. 4, made up of two elastic diaphragms concave on their inner surfaces, and when put together, form an air-chamber. One of the diaphragms is bored for the ingress and egress of the air. It is evident that when the door is rapidly closing, and these two diaphragms are being forced together, the air within their chambers will form a good cushion, and thus prevent the door from slamming. This I regard as a very simple and effective door stop or check, and which may be made very cheaply and easily manipulated.

The door-retaining device may be utilized as a bolt or lock by springing up the stop when the door is closed.

The operation of this device is apparent to all, and may be stated as follows: The door is opened to the desired position against the spring, and ordinarily when let go it will instantly slam and create a great noise and jar. To prevent this, in the old way a weight is placed on the floor to keep the door open; but with my device a rack is located above or along the spring, and as the spring recedes a catch is carried with it. When the door is opened to the desired position the tongue or catch springs into the notches in the rack, and thus securely retains the door in the required position. When it is desired to close the door after being retained in position or not, and to prevent it from slamming, I place a cushioning device upon the end of the spring-rod, and when the door is near its terminal point it is gradually and softly arrested by means of the said cushioning device, and automatically eased to its place against the door-jamb. Thus all noise, jar, or thud is prevented. In this way the door may be softly and noiselessly opened and closed without the annoyance of the "slam-bang" of the old method. The weight automatically retains the door in position, and when it is desired to release the door the chain is pulled and the door instantly closes.

The rod retaining device is especially useful when the exit of people takes place at churches and at other buildings, and takes the place now occupied by a person. It is also very useful in summer, when it is required to let the door stand open.

It is evident that modifications within wide limits may be made without departing from the spirit of my invention. I do not therefore desire to be confined to the precise form shown and described.

Having now described the best method known to me at present, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the door-spring-check cushioning device consisting of the spring-rod and air-cylinder and piston with the door-retaining device, in the manner shown.

2. The door-check, consisting of the spring-rod and spring, the air-cylinder and its piston, and the auxiliary spring-cushion, combined with the door and jamb-fastening mechanism, substantially as described.

3. The combination, in a door-check, of the air-cylinder and piston and their inclosing casing or cage, and means for forcing the door to, the weighted lever *p*, the catch-lever, and the releasing-lever, all arranged and described for joint operation.

4. In a door-check, the air-cylinder, having beveled mouth, as described, its piston and rod I, and springs, the said rod having an air groove or port at its lower end, and the bracket-arms C and F, said arms being adapted to retain the checking apparatus in position and to serve as pivots for said apparatus, all combined to operate in the manner described.

5. The combination, in a door-check, of the air-cylinder, the piston, the rod I, and spring S, the auxiliary spring *b* in said cylinder, the rack L′, and the locking mechanism, with the bracket-arms C F, all operating together to

retain the door in any desired position when open and to prevent its slamming when being closed, in the manner shown and described.

6. The door-check consisting of the rod I, spring S, locking devices P L M, the bracket-arms C F, and the air-chamber H, combined and arranged to operate as set forth.

7. The combination of the door-check with the air-chamber, the spring-rod and spring, the cage or casing, the rack L, and the bracket-arms F C with their pivotal projections or journals, said casing being provided with longitudinal slots, substantially as shown and described.

Signed at Boston, Massachusetts, this the 13th day of March, 1882.

GILBERT R. ELLIOTT.

In presence of—

CHARLES W. ELLIOTT,

THOS. E. CLARY.