

(No Model.)

2 Sheets—Sheet 1.

G. R. ELLIOTT.

PNEUMATIC DOOR CHECK AND CLOSER.

No. 265,920.

Patented Oct. 10, 1882.

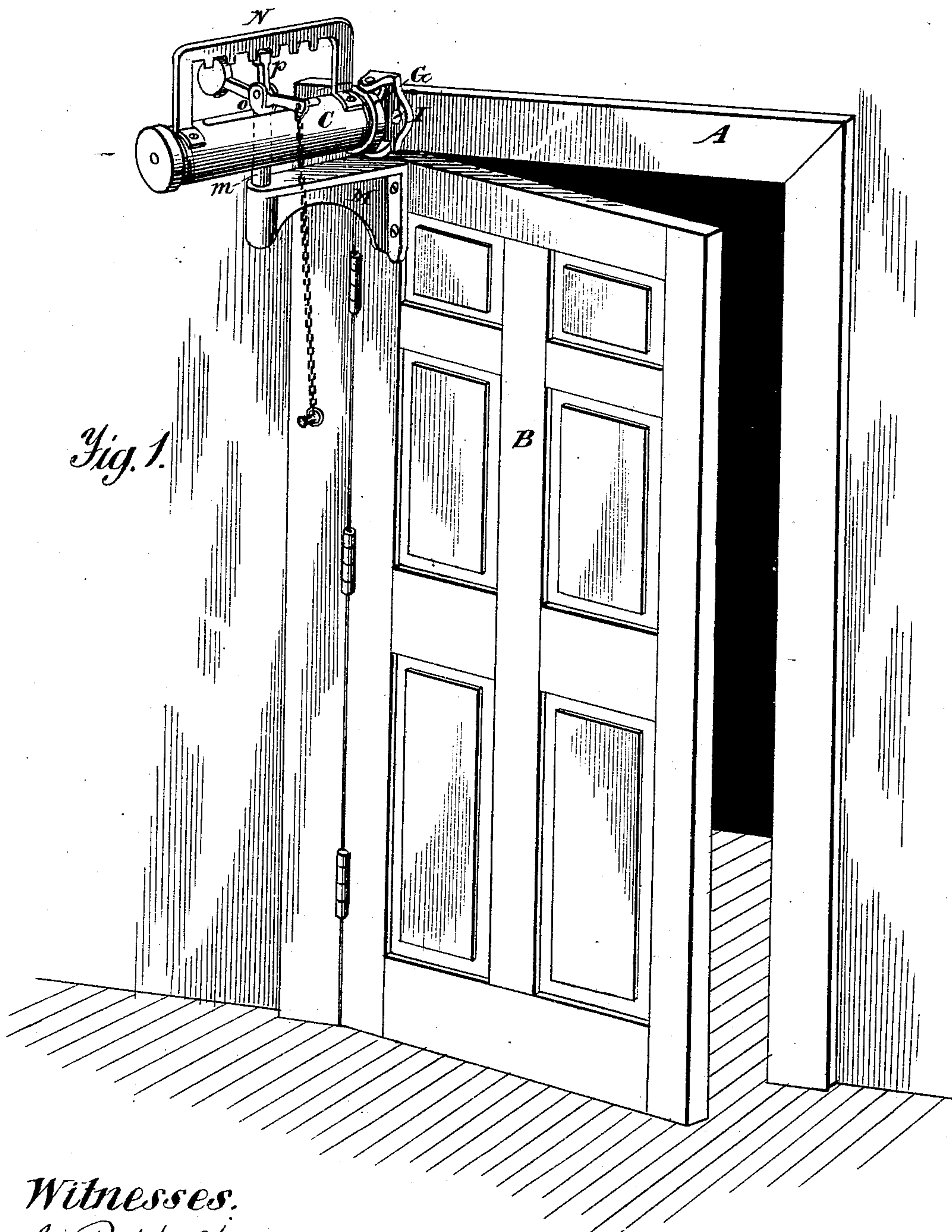


Fig. 1.

Witnesses.

A. Ruppert.

H. S. Wheelock

Inventor.

Gilbert R. Elliott

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Fig. 2.

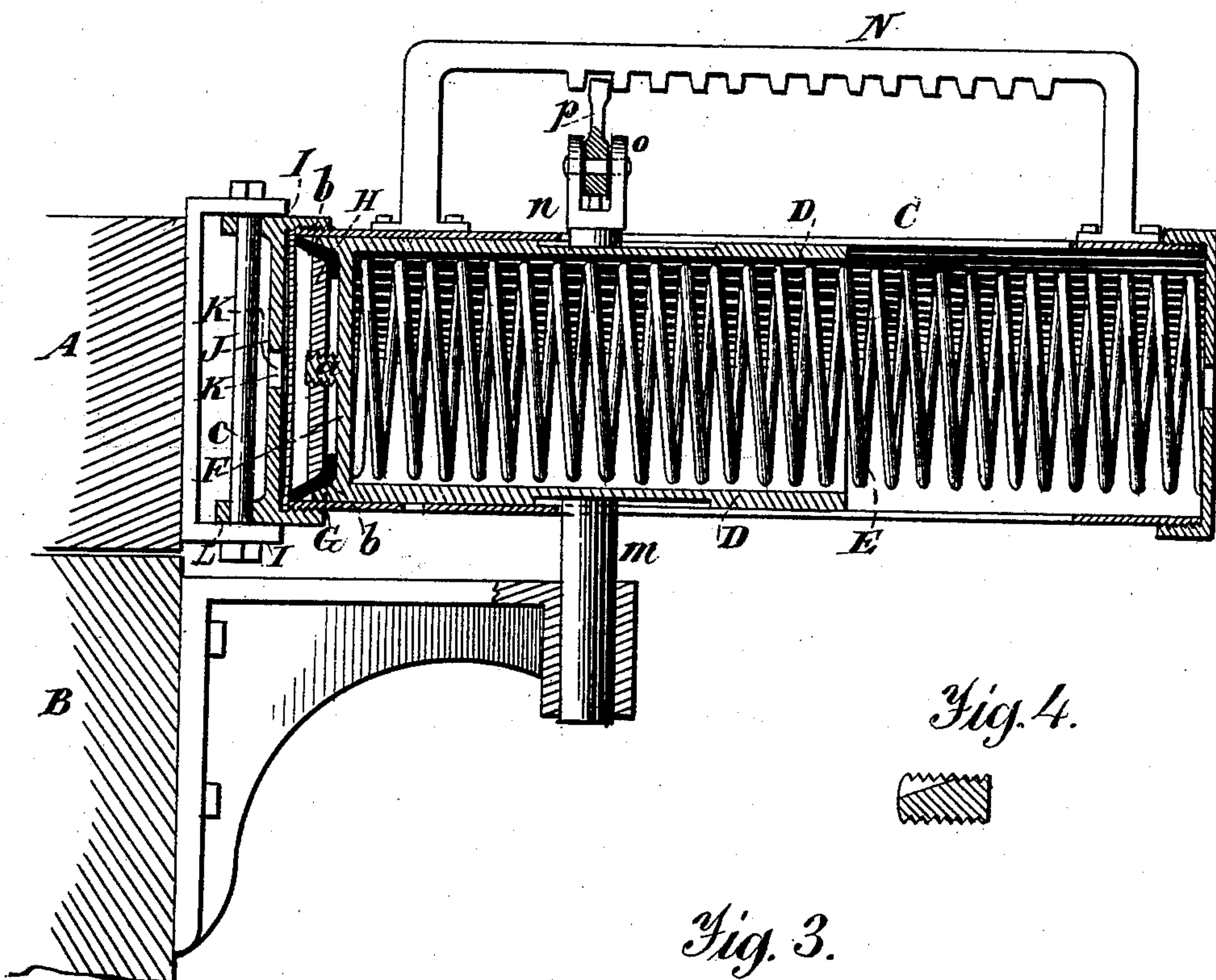
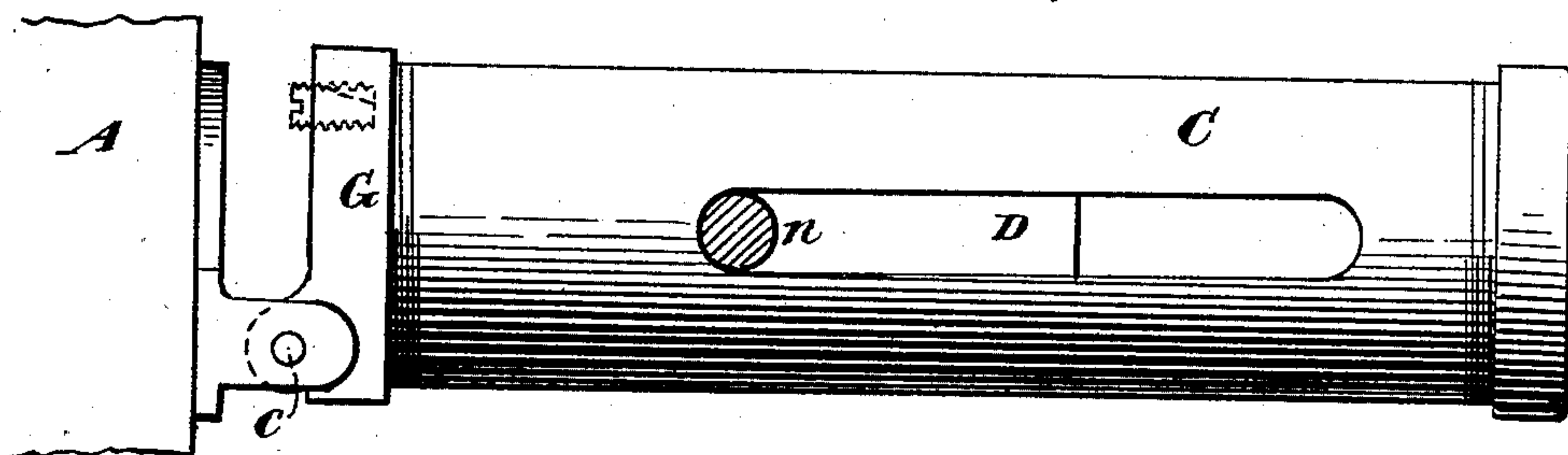


Fig. 4.



Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 265,920, dated October 10, 1882.

Application filed April 25, 1882. (No model.)

To all whom it may concern:

Be it known that I, GILBERT R. ELLIOTT, a subject of the Queen of Great Britain, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Door-Checks; and I 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this 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 slamming of the door against the jambs or door-frame, not only creating 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 devices alluded to as at present constructed is, that when they are attached to doors it is difficult to retain the door in an open position. 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 this end therefore my invention consists in certain arrangements of parts by means of which, when the door is opened, it automatically closes itself in such manner that it is prevented from slamming against the jambs, and thus avoiding the usual thud and jar and consequent noise.

It further consists in the combination, with the outer cylinder and the inner cylinder, the said cylinders being provided with projections and slots, of retaining or staying device, which will be fully hereinafter described, by which the door is held open or partly open to any de-

sired extent against the tension of the spring or other closing device.

Referring to the accompanying drawings, 55 and to the letters of reference marked thereon, and which form part of this specification, Figure 1 represents a perspective view of a door and frame with my invention attached. Fig. 2 shows a longitudinal section of my improved double concentric cylindrical apparatus, the bracket and rack being in side elevation; Fig. 3, an external horizontal view of the working cylinder and bracket and slotted screw in section. Fig. 4 is an enlarged 65 detail view of the slotted screw.

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

A is the joint or door-frame. B is the door. C is the outer cylinder, and D the inner cylinder or trunk, (see Fig. 2), which forms in this invention a very important part. 70

I will here remark that heretofore great difficulty has been experienced in properly retaining the piston in true line with its cylinder, even when the cylinder has a prolongation, but varying in diameter between the piston-bearing proper and the guiding portion of the cylinder, for the reason that the packing is so sensitive to the air that the packing becomes dry 75 while withdrawn from its proper bearing, and when reinserted it becomes leaky, and thus inoperative. These two difficulties I entirely avoid for the reason that the inner or trunk cylinder containing a spring has equal bearing 85 within the outer cylinder its entire length, and thus the piston cannot get out of line; and, secondly, it always being in close contact, its bearings are never exposed to the air, so that when once fitted it remains tight a long time. 90

E represents the spring, snugly fitting the bore of the inner cylinder, D, the trunk portion being so elongated that the spring, when compressed, retains a true line with the bore of the cylinder, and thus any shunting or twisting 95 of the spring is avoided. Experience has demonstrated that when a spring is frequently and constantly strained and twisted out of its normal condition it loses its true elasticity, and hence my spring-holding and trunk cylinder preserves the spring and thus avoids these objections. 100

F is the diaphragm or bottom of the trunk-cylinder, cast solid with it, and G is an annulus

or extension of the inner cylinder. The object of this annulus is to form a recess or pocket for the reception of the packing and also for the disk H, which holds the packing in position.

It will be observed that the recess formed by the annulus G tapers a little toward a knife-edge, for the purpose of permitting the expansion of the packing to fit the bore of the outer cylinder. A set-screw, *a*, or other device may be adapted to hold the two disks or diaphragms F and H together, and in this instance between them the piston-packing *b* (all of which snugly fits the bore of the outer cylinder) is placed. When the bottom of the outer cylinder, *c*, is fitted a casting, I, bored out and made to snugly fit air-tight the exterior of the outer cylinder, and centrally and transversely is cast with said casting a disk or diaphragm, J. Centrally through this disk or diaphragm J is located a hole, or, may be, a series of perforations, and upon the upper side of the disk J, I place a valve, K. This valve may be flap, clack, or vacuum valve, or may be an ordinary check-valve, the object being to allow air to enter through the air-port when the piston is drawn up and prevent its escape when the door is being closed, so that the air in the cylinder will form a cushion upon the door being closed. Below the disk on the casting is an annular flange, L, which fits into lugs or clutches, which are fastened to the door-jamb. Through these lugs or clutches I pass a pintle or rod, *c*, upon which, when the door swings, this apparatus swings upon said pintle to and fro with the door.

The outer case is provided with two or more slits or grooves a portion of its length, and the inner cylinder is provided with two projections, their purpose being as follows: I place upon the door a bracket-arm, M, which connects the door with the apparatus. Upon the outer projection of the bracket-arm I form a journal or socket. Into this journal the lower projecting pin, *m*, fits and upon which the apparatus turns when the door is opened or closed. Upon the pin or projection *n* on the upper side of the inner cylinder is formed a clutch or bifurcated lugs, *o*, in which works the staying device *p*, for holding the door in any desired position. The rack N is fastened to the outer cylinder at both ends, and of course moves with it. The features of the rack and staying device are described in an application now pending, numbered 58,599. The two projecting pins *m* and *n* work or slide in the longitudinal slots in the outer cylinder as the inner cylinder moves back and forth.

The operation of the staying device is fully described in the pending application, No. 58,599, and therefore I will now only give a brief outline of its operation. When the door is opened to the desired position the tooth of the stay meshes into the rack, which prevents the spring in the cylinder driving the piston home. When it is desired to shut the door the chain is pulled, which ungears the tooth, when the door auto-

matically closes. The weight will always prevent the tooth from engaging in the rack, except when the chain is pulled.

The object of screw shown in detail is the slot being tapering, as the screw is screwed in or out, the slot-port enlarges or diminishes as the escape of air from the cylinder is desired—that is to say, when the screw is unscrewed it enlarges the slot for the escape of a larger quantity of air, and as screwed in it diminishes for the escape of less quantity of air, so that, according to the weight of the door, the escape of air from the cushion-cylinder is more or less rapid.

All the parts of the apparatus are adapted to be readily taken apart when desired.

Having described my invention and at present the best means known to me for carrying the same into effect, what I claim as new, and desire to secure by Letters Patent, is—

1. A door-check consisting of the inner and outer hollow cylinders, the inner cylinder having at its bottom a piston adapted to fit the internal bore of the outer cylinder and containing a spring, and the casting I, having an annulus, the whole being arranged to preserve the said spring in a true line, in the manner set forth.
2. The inner and outer concentric cylinder, C D, the outer cylinder having slots and the inner cylinder provided with projections *m n*, the former forming a swivel or journal and the latter provided with means to hold the door in any desired position, the said projections being adapted to work in the said slots, as shown and described.

3. The combination, in a door-check, of the two concentrically-arranged cylinders, the outer one having slots and the inner one having projections to work in said slots, with the bracket-arm M, having a journal in its outer end, adapted to receive said stud or projection *n*, being also adapted to hold the door in position, in the manner set forth.

4. In a door-check, the concentric cylinders adapted to work one within the other, the inner having at its bottom a disk or diaphragm and stud cast thereon, an annulus, G, around said disk, a packing, *b*, between said annulus, and a disk or follower, H, adapted to secure said packing in position, and the spring E, all arranged as set forth.

5. A door-check having concentric cylinders, the inner one provided with a working-piston to fit the internal bore of the outer cylinder, the casting I, having a disk or diaphragm provided with an air-duct and a valve, said casting having also double flanges for the reception of the outer cylinder, and the pintle-rod *c*, all combined and arranged in the manner set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GILBERT R. ELLIOTT.

Witnesses:

H. S. WHEELOCK,
H. H. HUMMOND.