(No Model.)

S. & W. PICKERING & J. E. NORTON.

DOOR CHECK AND SPRING.

No. 385,958. Patented July 10, 1888.

FIG: 2.

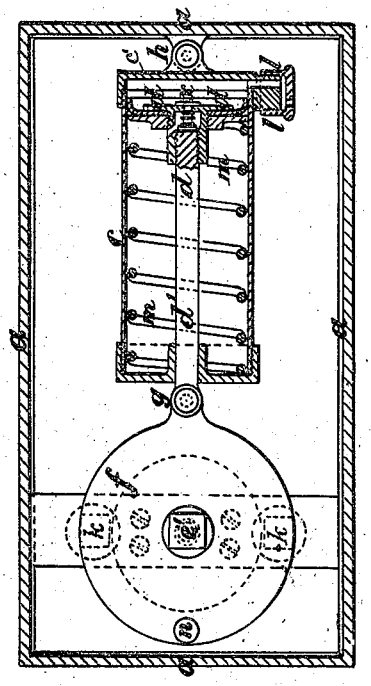


FIG: 4.

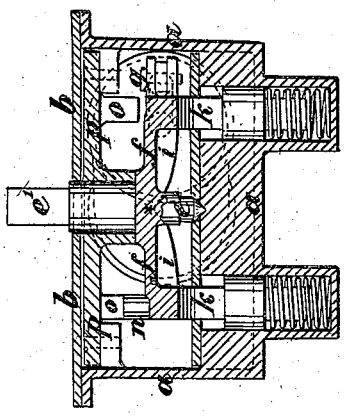


FIG: 1.

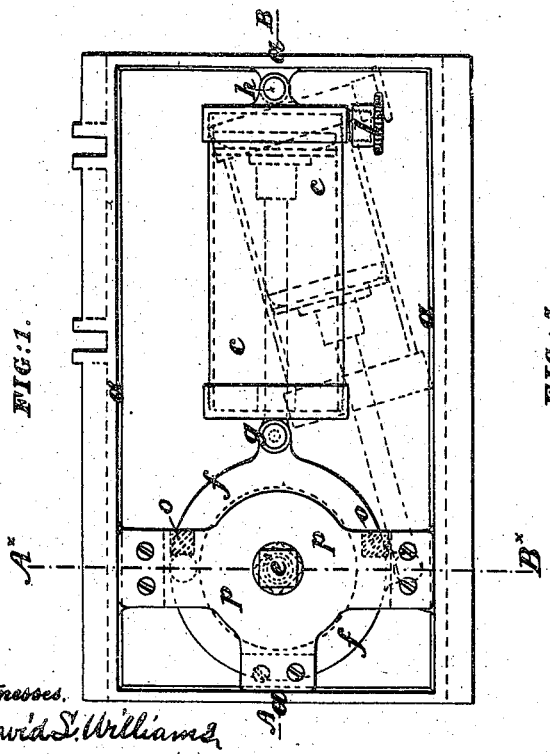
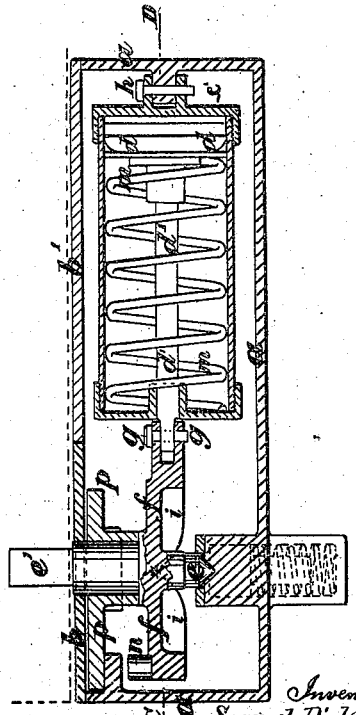


FIG: 3.



Witnesses.
David S. Williams
William D. Bowes.

Inventors,
Samuel Pickering,
William Pickering
and John E. Norton
by their Attys.
Howson and Sons

UNITED STATES PATENT OFFICE.

SAMUEL PICKERING, WILLIAM PICKERING, AND JOHN EDWIN NORTON, OF OLDHAM, COUNTY OF LANCASTER, ENGLAND; SAID SAMUEL PICKERING AND WILLIAM PICKERING ASSIGNORS TO JAMES HINDLE AND FRANCIS HINDLE, BOTH OF SAME PLACE.

DOOR CHECK AND SPRING.

SPECIFICATION forming part of Letters Patent No. 385,958, dated July 10, 1888.

Application filed February 16, 1887. Serial No. 227,802. (No model.) Patented in England December 1, 1885, No. 14,731.

To all whom it may concern:

Be it known that we, SAMUEL PICKERING, WILLIAM PICKERING, and JOHN EDWIN NORTON, subjects of the Queen of Great Britain, residing at Oldham, in the county of Lancaster, England, have invented an Improved Door Check and Spring, (for which we have obtained a British patent, No. 14,731, dated December 1, 1885,) of which the following is a specification.

This invention relates to that class of door-springs which consist of a swinging air-cylinder provided with a spring-piston.

Our object has been to construct a double-action spring which shall act silently, close the door gently, and not allow it to swing violently to and fro until the spring stops, but to stop it as soon as it is closed and hold it steadily in this closed position against the action of the highest wind, and thus our apparatus is especially applicable to heavy swing-doors for public buildings, hotels, and other places. It is also so constructed that it can be examined, adjusted, and repaired without disturbing the flooring or cement in which the casing is fixed.

In order that our invention may be clearly understood, we have annexed hereto a sheet of drawings, and have marked the same with figures and letters of reference corresponding with those in the following explanation thereof.

Figure 1 is a plan view of our improved door-check with the top plate removed. Fig. 2 is a horizontal section; Fig. 3, a longitudinal section; and Fig. 4, a transverse section through about the line A B on Fig. 1, and showing the position of the cam, hereinafter described, when the door is opened and the cylinder and spring-piston have assumed the position shown by dotted lines on Fig. 1.

a is the casing of the apparatus; *b* and *b'*, the top plates or covers thereof.

c is the swinging cylinder, and *d* the spring-piston.

The door is formed with a squared recess to receive the square end *e'* of a vertical pivot, *e e'*, upon which is cast or otherwise fixed a cam-plate, *f f*. The cam-plate *f f* is attached to the spindle *d' d'* of the spring-piston *d* by the pin *g g*, forming a pivotal joint, and the end of the cylinder *c c* farthest from the cam-plate *f f* swings upon a hinge, *h h*, attached to or forming part of one end of the casing *a a*. The cam-plate *f f* is provided beneath with a circular or annular double incline, *i i*, (see Figs. 3 and 4,) and the casing *a a* is so formed or fitted as to contain two spring-catches, *k k*, or bolts immediately beneath and bearing up against the said incline, so that when the door is in its closed position (see Figs. 1, 2, and 3) it is held there by these catches or bolts *k k* springing up into the notches * * of the double incline *i i*.

The piston *d d* is provided with a small air-valve, *x*, of suitable construction, so that when the door is opened and the cam pulls the piston up the cylinder *c c*, as shown dotted at Fig. 1, the air can escape through the valve, which, however, closes again when the cylinder returns, and the air is forced through an outlet air-valve, *l l*, of ordinary construction, placed at or near the end *c' c'* of the cylinder *c c*.

The rapidity of the return movement of the door is regulated by adjusting the valve to allow the air to escape more or less quickly. *m m* is the spring which closes the door. The casing *a a* is let into the flooring or cement, so that the covers *b b'* are flush with the surface. The part *b* of the cover closes over the cam and the pivot of the door. The part *b'* may be mounted on hinges, so that the cylinder and working parts can be readily inspected, adjusted, or repaired when required.

The action of the apparatus is as follows: When the door is pushed open, the cam-plate *f f* overcomes the pressure of the spring-bolts *k k* and revolves with the action of the door, pulling the spindle *d'* and the piston *d* with it and swinging the cylinder *c c* either to the right or to the left. This compresses the spring *m m*. The door can be opened until a projection, *n*, on the cam-plate *f f* comes against a suitable stop, as at *o o*, on the cross-plate *p p*. When the door is released, the spring *m m* expands and forces the piston *d d* back into the cylinder *c*. The air, however, between the said piston *d d* and the end *c'* of the cylinder

forms a cushion and prevents the door from closing too violently. As the air escapes through the valve *l l*, the piston gradually returns in the cylinder and pulls back the spindle and the cam, and consequently slowly closes the door. The cylinder resumes its central position, and the spring-bolts *k k* will then hold the door in the closed position, resisting the side pressure of any ordinary wind that may blow against it.

It is evident that as the cylinder *c c* can swing either to the right or to the left and the incline on the cam-plate *f f* is double the door-spring is a double-acting one—that is to say, the door can be opened either inward or outward.

We are aware that door-checks have heretofore been let into the floor so as to be entirely out of sight and to let the door swing in either direction, and that a pivoted air-cylinder has been used with a piston operated from a plate connected to the door.

We claim as our invention—

1. The combination of a door, a swinging air-cylinder, and a spring-piston therein with a cam connected to the door and having inclines and notches and spring catches or bolts, substantially as set forth.

2. The combination of a spring-piston and swinging air-cylinder with a cam provided with a projection and a fixed stop to limit the action or opening of the door, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SAMUEL PICKERING.
WILLIAM PICKERING.
JOHN EDWIN NORTON.

Witnesses:
W. H. VAUDREY,
JNO. HUGHES.