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H. VAN BLARCOM & H. B. HITZ.

DOOR CHECK.

APPLICATION FILED JULY 26, 1902.

NO MODEL.

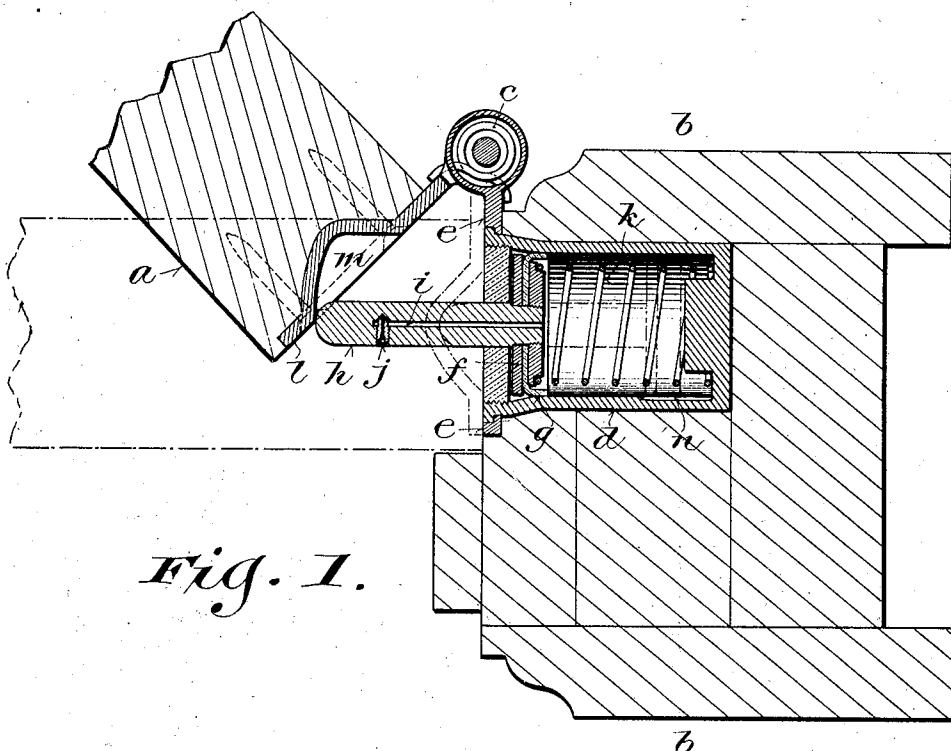


Fig. 1.

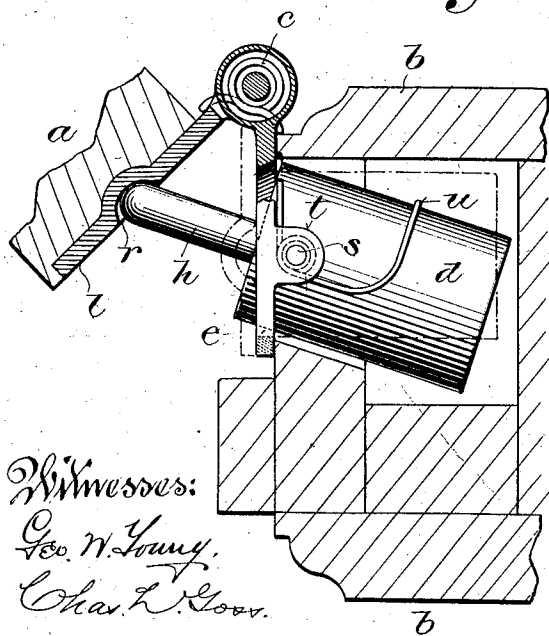


Fig. 3.

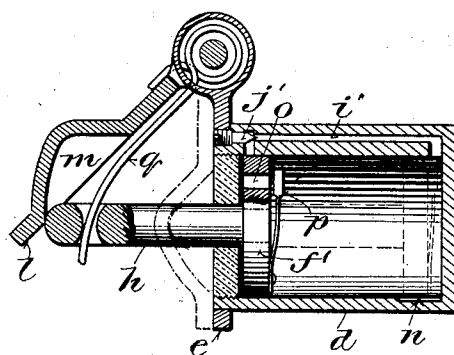


Fig. 2.

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By Order of the Trustees of the

At Norway.

UNITED STATES PATENT OFFICE.

HOWELL VAN BLARCOM AND HENRY B. HITZ, OF MILWAUKEE, WISCONSIN.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 769,201, dated September 6, 1904.

Application filed July 26, 1902. Serial No. 117,074. (No model.)

To all whom it may concern:

Be it known that we, HOWELL VAN BLARCOM and HENRY B. HITZ, citizens of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The main objects of this invention are to produce a door-check that can be easily attached to a door and its frame or casing, that will be out of the way and concealed when applied, that can be readily adjusted for doors of different sizes or weights or for varying conditions, that will be simple in construction and effective in operation, and that will permit a door to completely close and latch.

It consists in certain novel features of construction and in the novel arrangement and combinations of parts hereinafter described, and defined in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a horizontal section of a preferred form of our improved door-check as applied to a door and door-frame. Fig. 2 is a similar view of a modified form without the door and door-frame; and Fig. 3 is a view, partly in horizontal section and partly in plan, of still another modification in connection with a portion of a door and door-frame.

Referring to Fig. 1, *a* designates a portion of a door, and *b* one side of the frame or casing to which the door is hinged. In this case the door-check is applied to one of the hinges, although it may be made and used separately. The check is usually employed with doors which are provided with springs for closing them, although it may be used to advantage with doors which do not have closing-springs. In the present instance the hinge to which the check is applied is provided with a closing-spring *c*. *d* is a cylinder secured at one end to the hinge-leaf *e*, which is attached to the casing or frame *b*. It is let into an opening formed therefor in the door-frame, so as to be out of the way and completely concealed except as to its outer head or end, which is

flush with the leaf *e* of the hinge. *f* is a piston, shown as provided in the present instance with flexible cupped packing *g*, which is fitted in said cylinder and serves as a valve, being adapted to expand and form a tight joint with the cylinder when the piston is moved inward and to contract, permitting air contained in the cylinder to pass freely by the piston, when it is moved outward. The piston is provided with a stem *h*, projecting outwardly therefrom through and guided in an opening in the outer cylinder-head. An opening or passage *i* is formed in the stem *h* for the escape of air or fluid from the inner end of the cylinder *d* when the piston *f* is thrust inward by the closing of the door. This passage is restricted more or less, as may be required for the proper operation of the check, by means of an adjustable pin-valve or plug *j*. The passage *i* may terminate short of the outer end of the stem *h*, and the pin-valve *j* may be inserted in a lateral opening intersecting said passage, as shown, or the passage *i* may be extended completely through said stem and the valve *j* inserted in its outer end. A spiral spring *k* interposed between the piston *f* and the inner end of the cylinder *d* tends to force said piston outward. The leaf *l* of the hinge to which the door *a* is attached is formed with a recessed cam *m*, which is so arranged and formed that it will exert a direct axial thrust against the outer end of the stem *h* when the door is being closed, thereby avoiding lateral strain on said stem and preventing it and the piston from binding in the cylinder and outer cylinder-head. Without this cam or some equivalent provision to insure a direct end thrust in an axial direction on the piston-stem the device in the several forms shown in the drawings would be altogether impracticable or operate so imperfectly as to be practically useless on account of the side thrust of the leaf-hinge or striking-plate against the piston-stem and the consequent cramping of said stem in the cylinder-head. To permit the door to completely and promptly close and latch, the cylinder *d* is formed at its inner end with a relief groove or passage *n*, which permits the compressed air or other fluid confined between the piston and the inner head of

the cylinder to freely escape past the piston as the piston approaches the limit of its inward movement and the door is nearly closed.

In some cases it is convenient and desirable to apply and use the door-check apart from a hinge, and in such cases the check-cylinder and the recessed cam or striking plate are formed and attached separately to the door and its frame or casing. It may also be practicable and in some cases desirable to reverse the arrangement of the device, inserting the check-cylinder in the door and attaching the recessed cam or striking plate to the door-frame. The arrangement of the operating-stem and cam-plate may also be reversed, the stem being attached to the door and the cam to the piston.

Referring to Fig. 2, which illustrates a modification of the device in which air, oil, or other liquid may be employed, the passage *i* for the escape of fluid from the inner end of the cylinder when the door is closed is formed in the cylinder lengthwise thereof and opens into the same at both ends. The adjustable restricting valve or plug *j*' is located in the outer end of this passage and is accessible through an opening in the fixed leaf *e* of the hinge, in which it is shown as threaded. In this case a metallic piston *f*' is shown as fitted without packing in the cylinder. An opening *o* is made through the piston, and an inwardly-opening check-valve *p* closes this opening when the piston is thrust inward. In place of the spiral spring *k* (shown in Fig. 1) within the cylinder for moving the piston outward a spring *q*, coiled around the hinge-pin and engaged at one end with the movable leaf of the hinge and at the other with an opening in the piston-stem *h*, is employed.

Referring to Fig. 3, showing another modification of the device, in place of the laterally-extended cam *m*, as shown in Figs. 1 and 2, a rounded recess or depression *r* is formed in the movable leaf *l* of the hinge, and to hold the piston-stem *h* in the proper relation to this recess or depression, so that the leaf *l* will exert a direct axial thrust on said stem when the door is closed, the cylinder *d* instead of being fixed to the other leaf *e* of the hinge is pivotally connected therewith by vertical trunnions *s* on the cylinder and perforated ears *t* on the hinge, so that the cylinder, piston, and stem will oscillate horizontally on a vertical axis. A spring *u*, coiled around the trunnions *s* and bearing against the hinge and cylinder, tends to swing the outer end of the stem *h* toward the hinge-pin and to hold it when the door is opened in position to be engaged by the depression *r* in the movable leaf *l*.

The terms "outer" end and "inner" end as employed herein referring to the cylinder are intended to designate the end of the cyl-

inder adjacent to the door-jamb and the end opposite, respectively.

We claim—

1. In a door-check the combination of a cylinder, a piston fitted in said cylinder and having a stem extending through one end of the cylinder, which is adapted to be let into the door-jamb, one of the members of the check having a restricted escape-passage leading out from the pressure side of the piston, a spring tending to thrust said piston and its stem outward, and a plate adapted to be let into the hinged edge of the door and recessed to engage the outer end of said stem and exert a direct axial thrust thereon when the door is closed, said plate and stem being unattached to each other, substantially as described.

2. The combination with a door and its frame or casing of a concealed cylinder and recessed cam-plate let into and secured in opposing faces of the jamb and door on the hinged side of the door, a piston fitted in said cylinder and provided with a stem projecting outwardly into the path of the recess in said plate, said stem and recessed cam-plate being unattached to each other, and one member of the check having a restricted escape-passage leading out from the pressure side of the piston, a spring tending to thrust and hold said piston and its stem outward, and a valve permitting the free passage of air from the outer into the inner end of the cylinder when the piston is moved outward, substantially as described.

3. In a door-check the combination with a hinge having a recess in one leaf, of a cylinder secured to the other leaf of said hinge, a piston fitted in said cylinder and having a stem projecting therefrom into the path of the recess in the opposing hinge-leaf, one member of the check having a restricted escape-opening leading out from the pressure side of the piston, and a spring tending to move said piston outward, substantially as described.

4. The combination with a hinge provided with a closing-spring and having a recessed cam in one leaf, a cylinder attached to the other leaf and having a relief groove or passage at its inner end, a piston fitted in said cylinder and provided with a stem which projects therefrom into the path of said cam and has an adjustably-restricted escape opening or passage leading out from the pressure side of the piston, and a spring interposed between the piston and inner end of the cylinder and tending to move the piston outward, substantially as described.

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

HOWELL VAN BLARCOM.
HENRY B. HITZ.

Witnesses:

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