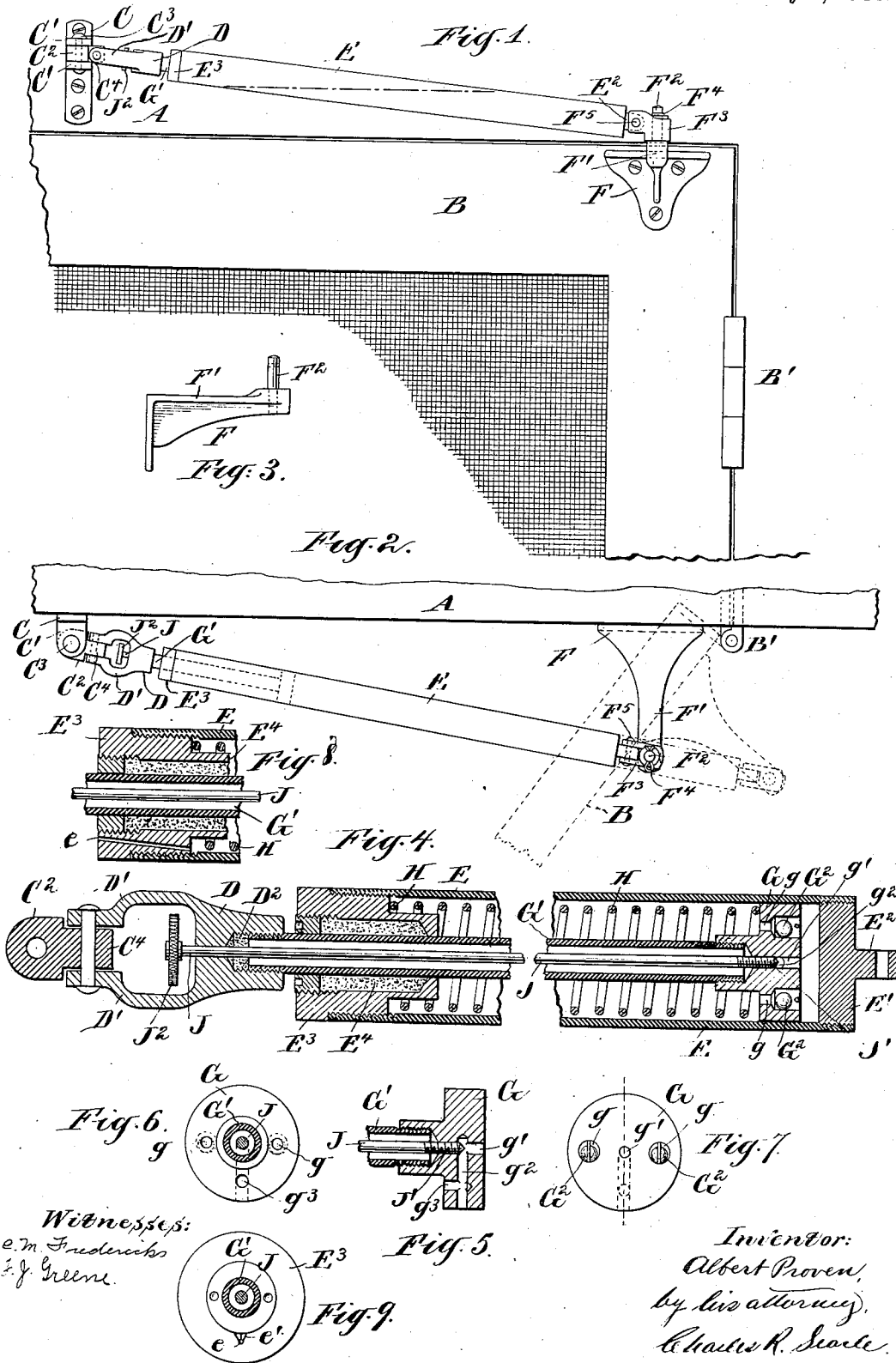


A. PROVEN.
DOOR CLOSER AND CHECK.
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991,889.

Patented May 9, 1911.



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UNITED STATES PATENT OFFICE.

ALBERT PROVEN, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO RICHARD PATTISON, OF NEW YORK, N. Y., AND WILLIAM D. NEVINS AND ALBERT PROVEN, BOTH OF JERSEY CITY, NEW JERSEY.

DOOR CLOSER AND CHECK.

991,889.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed May 17, 1910. Serial No. 561,806.

To all whom it may concern:

Be it known that I, ALBERT PROVEN, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Door Closers and Checks, of which the following is a specification.

The invention relates to that class of closers and checks in which the closing movement is induced by the expansion of a spring and checked by the slow escape of liquid.

The object of the invention is to provide a simple mechanism for this purpose, of few parts, easily applied to either right or left-hand doors, and in which the telescopically arranged members connecting the door and its casing are mounted in an inclined position and constructed to serve as a piston and cylinder, the lower portion of the latter forming a liquid chamber, and also serving to inclose a long helical spring acting expansively upon the piston to close the door.

The invention consists in certain novel features and details of construction and arrangement by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show an approved form of the invention.

Figure 1 is an elevation showing the improved closer and check in position on a left-hand door. Fig. 2 is a corresponding plan view, showing in dotted lines the position of the parts when the door is in the partly open condition. Fig. 3 is a side view of the bracket to be attached to the door. The remaining figures are on a larger scale. Fig. 4 is a horizontal section through the tube or cylinder, piston, and connected parts. Fig. 5 is a section through the piston taken on the line 5—5 in Fig. 7. Fig. 6 is a view of the front or upper face of the piston, with certain portions in section. Fig. 7 is a corresponding view of the rear or lower face of the piston. Fig. 8 is a vertical section through an end portion of the tube and inclosed parts. Fig. 9 is an elevation showing the same end, partly in section.

Similar letters of reference indicate the same parts in all the figures.

A is the lintel or upper portion of a door-casing and B is the door hinged to the casing at B¹. On the lintel is fastened a casing-bracket C having outwardly extending lugs C¹ between which is received a block C² pivoted thereto at C³ to swing horizontally and having an arm C⁴ received between the arms D¹ of a yoke D pivoted to the arm C⁴ to swing vertically thereon.

On the door near the hinge line is fastened the door-bracket F having an outwardly extending arm F¹ carrying a vertical pin F² serving as a pivot for a bifurcated block F³ mounted thereon and secured by a washer and cotter-pin F⁴.

E is an angularly disposed tube closed at the rear end by a screw-plug E¹ having a lug E² received between the arms of the block F³ and secured thereto by a horizontal pin or rivet F⁵.

The tube incloses a checking-piston G having a tubular piston-rod G¹ screwed into the yoke D at the outer end and passing through a stuffing-box E⁴ in a screw-plug E³ serving to close the front or upper end of the tube.

Between the plug E³ and piston G, and encircling the piston-rod G¹, is a helical spring H exerting its force expansively to drive the piston to the lower end of the tube in opposition to the forward movement of the piston induced by the opening of the door, and serving to close the latter when released.

The casing-bracket C and door-bracket F are, by reason of their points of attachment, so located as to hold the tube in an angularly disposed position with the lower end, at the bracket F, considerably below the other, and the checking liquid with which the tube is partially filled lies by gravity in such lower end which thus performs the function of a checking-cylinder. The level of the liquid is indicated by the dotted line in Fig. 1 and should not reach to the plug E³.

The piston G immersed in the liquid is provided with counterbored openings *g g* in which are seated the ball-valves G² G² which permit the liquid to pass freely when the piston moves toward the upper end of the tube as in opening the door but prevent the flow in the opposite direction, compelling

it to pass through the axial opening g^1 and radial passage g^2 which communicates with the front face of the piston through the channel g^3 .

- 5 The flow through the axial opening g^1 is controlled by a screw-valve J^1 at the inner extremity of a valve-rod J extending through the tubular piston-rod G^1 and yoke D and having a head J^2 between the arms D^1 of the yoke, by which the rod may be turned and the screw-valve J^1 advanced or retracted as required to vary the return flow and correspondingly control the speed of the door-closing movement. A stuffing-box D^2 in the yoke prevents the escape of checking-liquid around the rod.

- Thus arranged the act of opening the door increases the distance between the casing-bracket C and door-bracket F , as indicated by the dotted lines in Fig. 2, and induces a corresponding movement of the tube or cylinder E relatively to the piston and compresses the spring H , the checking-liquid flowing freely through the passages in the piston during this movement. When the door is released the expansive force of the spring against the piston returns the parts to the original positions, closes the door and checks the closing movement by the slow escape of the liquid through the axial passage g^1 and branches g^2 g^3 .

In applying the device to a right-hand door the parts are attached in the same relative positions but reversed.

- 35 It is essential that the tube shall lie sufficiently inclined to insure the required volume of liquid in the lower end serving as the liquid chamber; this correct position is assured by making the lower end of the casing-bracket of such length that when applied above the door the pivot C^3 will have the required elevation. To permit reversal and insure the required space for the lower end of the tube to clear the arm F^1 of the door-bracket F , the block F^3 is so shaped as to provide the desired clearance and prevent its seating upon the pin F^2 if wrongly applied.

- The universal joints formed by the pivoted block C^2 and yoke D at one end, and pivoted block F^3 and lug E^2 at the other, permit the required angular movement of the inclined tube and its inclosed piston in following the movements of door.

- 55 By employing two oppositely placed valves G^2 G^2 in the piston, one or both will be always presented in position to permit the liquid in the upper portion of the tube to pass freely during the opening movement of the door, and the necessity for carefully placing the piston with a valve at the bottom, as would be the case if one alone were used, is thus avoided and quick release assured.

- 65 To permit the return of any liquid that

may escape through the stuffing-box E^4 , the inclined passage e is drilled through the plug E^3 below the piston-rod, and the outer face of the plug is scored or grooved as at e^1 to lead the liquid into said passage e whereby it is conducted to the interior of the tube.

By utilizing the inclination of the tube to produce a liquid chamber I am able to attain the advantages of a liquid door check and provide space for a long helical spring with its attendant advantages in a simple device having but few parts and presenting a neat and attractive appearance.

Modifications may be made in the forms and proportions of the parts without departing from the invention, and although the invention is shown as applied to a screen door, for which, and analogous light work, it is eminently well adapted, it will be understood that it may be constructed and arranged for heavier service.

I claim:—

1. In a door closer and check, a tube, means for attachment of one end of said tube to a door casing and to the door, the lower portion of said tube adapted to contain checking-fluid and serve as a liquid chamber, a piston movable in said tube and a piston rod extending from said piston axially of the tube, and means for affixing one end of said piston rod to the door casing to cause said tube to lie in a vertically inclined position, said piston being valved and ported.

2. In a door closer and check, a tube, means for attaching the lower end thereof to a door, a valved and ported checking piston in said tube, a piston rod extending from said piston axially of the tube and through the upper end of the latter, means at the outer end of said piston rod for attachment to a door casing above the point of attachment of the lower end of said tube to cause said tube to lie in a vertically inclined position, and a helical spring inclosed in said tube and encircling said piston rod.

3. In a device of the character set forth, an angularly disposed tube having the lower end thereof closed and adapted to contain checking-liquid, a piston in said tube a plug in the upper end of said tube, a piston rod extending from said piston through said plug, the latter having grooves in its outer face and an inclined passage, said passage leading from the exterior below said piston rod to the interior of said tube whereby escaping liquid is returned to the tube.

4. In a device of the character set forth, an angularly disposed tube, the lower end thereof closed and adapted to contain checking-liquid, a ported and valved piston in said tube, a plug in the upper end of said tube and having a stuffing-box therein, a hollow piston-rod extending from said pis-

ton through said stuffing-box, a yoke at-
tached to the outer end of said piston-rod
and adapted to be pivotally and operatively
connected to the door frame, a valve-rod ex-
5 tending from said piston through said pis-
ton-rod and yoke, and a stuffing-box in said
yoke surrounding said valve-rod.

In testimony that I claim the invention
above set forth I affix my signature; in pres-
ence of two witnesses.

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Witnesses:

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