(No Model.) 2 Sheets—Sheet 1.

E. I. BLOUNT.

DOOR CHECK.

No. 435,678. Patented Sept. 2, 1890.

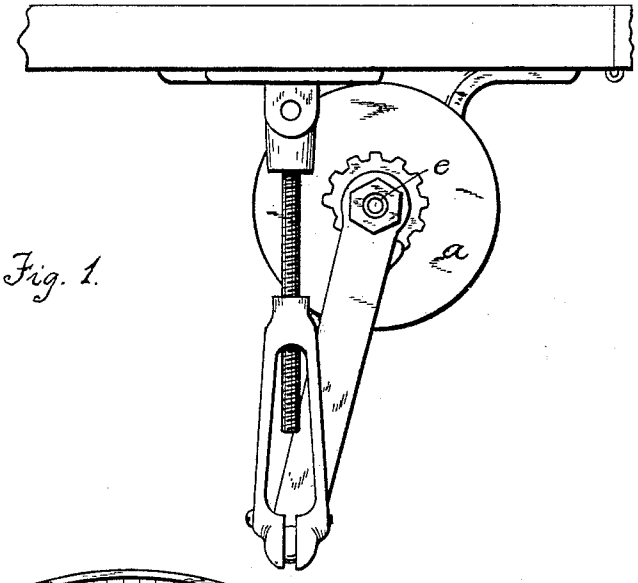


Fig. 1.

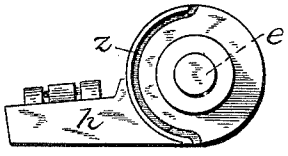


Fig. 3.

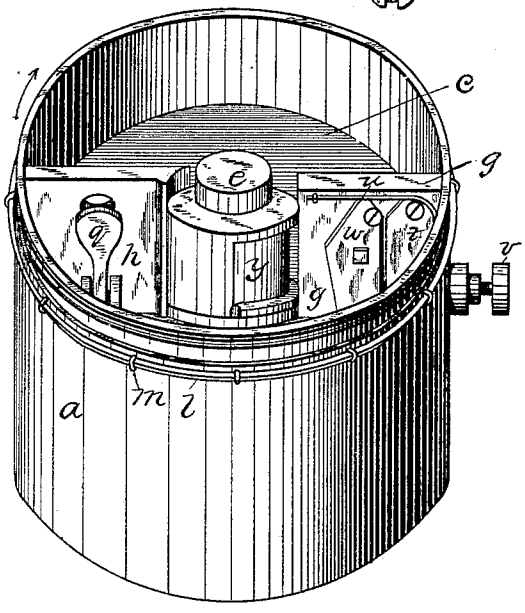


Fig. 2.

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

E. I. BLOUNT.

DOOR CHECK.

No. 435,678. Patented Sept. 2, 1890.

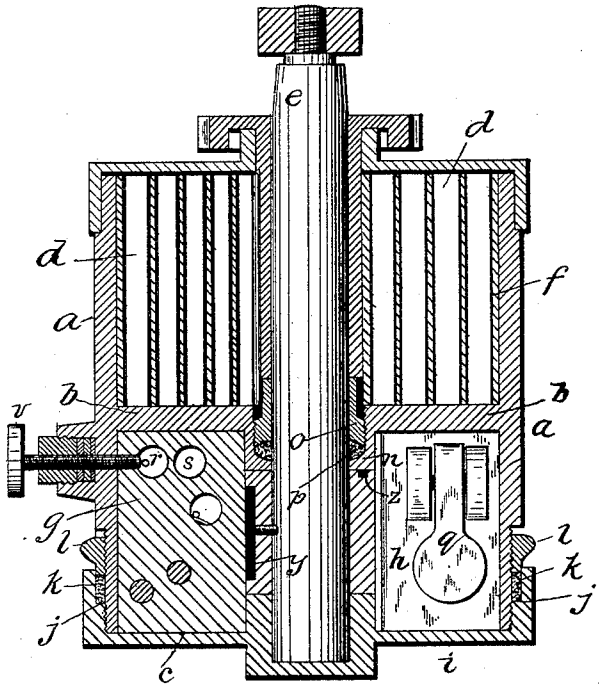


Fig. 4.

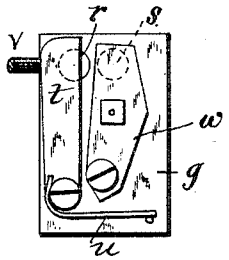


Fig. 5.

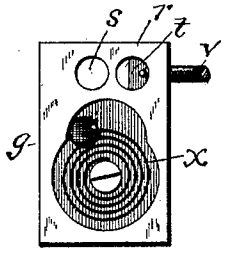


Fig. 6.

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UNITED STATES PATENT OFFICE.

EUGENE I. BLOUNT, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO THE BLOUNT MANUFACTURING COMPANY, OF MAINE.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 435,678, dated September 2, 1890.

Application filed April 19, 1890. Serial No. 348,606. (No model.)

To all whom it may concern:

Be it known that I, EUGENE I. BLOUNT, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification.

My invention relates to door-checks of the kind or class in which liquid is employed as an element to resist the free action of the door-closing spring.

It is the object of my invention to provide such improvements in door-checks of the kind mentioned as will more certainly protect the liquid-chamber against leakage than heretofore.

It is also the object of my invention to provide improved means for regulating the valves and liquid-ports in the operation of the door-check.

To these ends my invention consists in providing the cap screwed upon the outer end of the liquid-chamber with an offset on its inner upper edge, placing packing in the said offset, and arranging a ring upon the cylinder above the cap, so that it may be screwed down upon the said packing, thereby rendering the connection between the cap and the cylinder thoroughly liquid-tight.

My invention also consists in enlarging or chambering the upper portion of the neck or bearing connected with or formed in the partition of the cylinder dividing the liquid and spring chambers, and through which the oscillatory shaft passes, placing packing in the said chamber around the said shaft, and providing a nut having its lower face inclined inwardly, which nut is adapted to be screwed down around the oscillatory shaft upon the said packing, so as to make it impossible for liquid in the liquid-chamber to leak between the oscillatory shaft and its bearing.

My invention also consists in providing the partition in the liquid-cup with a duplex valve controlling the ports through which the liquid flows in the act of closing the door.

My invention also consists in the construction and relationship of parts and features in door-checks, whereby the same are rendered more efficient than heretofore.

My invention will first be described in connection with the accompanying drawings, and the letters of reference marked thereon, forming a part of this specification, and then be pointed out in the appended claims.

In the drawings, Figure 1 is a top plan view of my improved door-check attached to a door and door-casing. Fig. 2 is a perspective view of the cylinder and a part of its equipments inverted, the cup on the end of the liquid-chamber being removed. Fig. 3 is a top plan view of the wing or piston connected with the oscillatory shaft at right angles thereto and adapted to operate in the liquid-chamber. Fig. 4 is a vertical central sectional view of the cylinder and its equipments. Fig. 5 is a view of one side, and Fig. 6 of the opposite side, of the partition in the liquid-chamber.

The same letters designate the same parts or features, as the case may be, in all of the views.

In the drawings, *a* designates the cylinder divided by the partition *b* into a liquid-chamber *c* and a spring-chamber *d*, into or through which cylinder there extends an oscillatory shaft *e*, adapted to be actuated by the spring *f*, to close the door through the medium of arms or levers connecting the said shaft with the door, as will be understood by those skilled in the art upon an inspection of Fig. 1 of the drawings. As is herein shown, the cylinder *a* is vertically arranged with the spring-chamber uppermost, though a reversed or other arrangement may be made of the cylinder, as circumstances may suggest or require.

Affixed in the liquid-chamber *c* is a partition *g*, extending from the side and top and bottom of the chamber to the oscillatory shaft *e*, and connected with the said shaft and extending at right angles thereto is a wing or piston *h*, adapted, as the shaft is oscillated, to be moved in the chamber from one side of the partition to the other. Valves and ports are provided in the said partition and wing or piston, so that the liquid in the chamber will flow with comparative freedom from one side of the partition and wing to the other when the door is being opened, but offer quite considerable resistance to the movement of

the wing or piston by the spring *f* in closing the door. This pressure of the wing upon the liquid renders it necessary to make the chamber *c* quite liquid-proof. To attain the last-mentioned end at the point between the cap *i*, screwed upon the lower end of the cylinder and the cylinder-body, I offset the upper inner face of the cap *i*, as at *j*, and provide an annular packing-strip *k*, adapted to fit in said offset, and, it may be, to extend above the upper edge of the cap, and construct and arrange a ring *l* above the packing, so that it may be screwed down thereon with great force by means of a spanner operating on the ribs or projections *m*, or by other suitable means. The neck or bearing *n* for the oscillatory shaft *e*, connected with the partitions *b*, I enlarge or chamber in its upper part, into which and around the said shaft is tapped a nut *o*, the lower face of which is inclined inwardly and upward, so as that it may act upon a packing *p* in the lower part of the chamber around the shaft to form a liquid-tight connection at that point. The upper end of the nut *o* is squared or otherwise constructed to enable it to be engaged by a wrench or other means, and be turned thereby. The wing *h* is provided with a valve *q*, adapted to operate over a port formed in the said ring, allowing the liquid in the chamber *c* to flow freely through said port as the wing moves in the direction of the arrow in Fig. 2, and the door is being opened, but closing said port as the wing moves in the opposite direction in the act of closing the door.

Ports *r s* are formed in the partition *g*, the extent to which the former is opened or closed being controlled by a valve *t*, adapted to be moved in one direction by a spring *u* and in the opposite direction by a screw *v*, tapped into the cylinder and operating against the valve or a pin or projection thereon, though it is obvious that the screw might be made to engage the said valve and move it in both directions, and the extent to which port *s* is opened being controlled by the valve *w*, operated upon by a temperature-spring *x*, as is described and claimed in my application for a patent Serial No. 305,674, filed April 2, 1889. It will thus be seen that the partition *g* is provided with a duplex valve, one being automatically operated by the temperature of the liquid and the other controlled mechanically through the medium of the thumb-screw *v*. As the spring *f* operates to close the door and to move the wing or piston *h* in a direction opposite to that indicated by the arrow in Fig. 2, the port in the said wing will be closed by the valve *q*, as stated, so that the escape of the liquid from one side of the partition *g* to the other will be through the comparatively small ports *r s*, and consequently the liquid will flow through said ports slowly, and the resistance of the liquid to the action of the spring will be comparatively great. By this means a slow closing of the door without "slam" or jar is effected. By means of the mechanically-operated valve *t* the port or ports in the partition *g* may be adjusted to suit circumstances, while the valve *w* is operated automatically in accordance with the temperature and consequent consistency of the liquid in the liquid-chamber.

In order to effect a partial closing of the door with a comparatively quick motion I cut away a portion of the hub of the wing *g*, as at *y*, for a part of the distance around said hub, so that when the door is fully opened an aperture or port will be formed at the cut-away point *y*, between the hub and adjacent edge of the partition *g*, through which port *y* the liquid may freely flow from one side of the partition to the other until the door approaches a closed position, when the cut-away point *y* will have passed the partition and the hub will operate in quite close proximity to the partition, so that the only escape of liquid will be through the ports *r s*, while the door is being brought to fully closed position. The upper end of the wing-hub on the side opposite to that at which the said hub is cut away, as at *y*, is provided with a groove *z*, so that any liquid that might leak or be squeezed through between the upper face of the hub and the part with which it moves in contact may not be forced up into the spring-chamber *d*, but run out through the said groove *z*.

It is obvious that changes may be made in the form and arrangement of parts comprising my invention without departing from the nature or spirit thereof.

I do not herein claim the subject-matter of my pending application for patent filed April 2, 1889, Serial No. 305,674, which comprises a door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached at right angles to the said shaft to operate on the liquid, and a suitable port to permit the flow of liquid as the shaft is oscillated.

Having thus explained the nature of my invention and described a way of making and using the same, I declare that what I claim is—

1. The combination, with the cylinder *a*, of the screw-cap *i*, a ring *l*, having a screw-threaded connection with the cylinder, and an interposed packing, as set forth.

2. The combination, with the cylinder *a*, of the screw-cap *i*, offset, as at *j*, a ring *l*, having a screw-thread connection with the cylinder, and a packing *k*, arranged in the offset of the cap and interposed between the same and the ring *l*, as set forth.

3. The combination, with the cylinder *a*, and the oscillatory shaft *e* therein, of the partition *b*, provided with the chambered bearing for the said shaft, the nut *o*, tapped in said chamber and having its lower face or end upwardly and inwardly inclined, and the packing *p*, as set forth.

4. A door-check embracing in its construction a cylinder adapted to hold suitable liquid,

an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, a duplex port in said partition, and a duplex valve controlling said duplex port, as set forth.

5. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, two ports in said partition, a mechanically-operated valve to control one of said ports, and an automatically-operated valve to control the other of said ports, as set forth.

6. A door-check having a liquid-chamber provided with a partition *g*, having two ports, a valve for controlling one port, a temperature-spring for automatically controlling said valve, and a mechanically-operated valve for controlling the other port, as set forth.

7. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, a port and clapper-valve *q*, to control said port, in and connected with the said wing, and two ports in said partition, a valve for controlling one port, a temperature-spring for automatically controlling said valve, and a mechanically-operated valve for controlling the other port, as set forth.

8. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, and a hub connected with said wing and partially cut away, as at *y*, as set forth.

9. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, and a hub connected with said wing and provided on its upper end or face with the groove *z*, as set forth.

10. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with said shaft, a wing or piston attached to the said shaft at a right angle thereto, and a hub connected with said wing, partially cut away, as at *y*, and provided on its upper end or face with a groove *z*, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of April, A. D. 1890.

EUGENE I. BLOUNT.

Witnesses:
ARTHUR W. CROSSLEY,
A. D. HARRISON.