W. P. BLACKWELL.

DOOR HOLDER.

APPLICATION FILED MAY 10, 1913.

1,102,859.

Patented July 7, 1914.

2 SHEETS—SHEET 1.

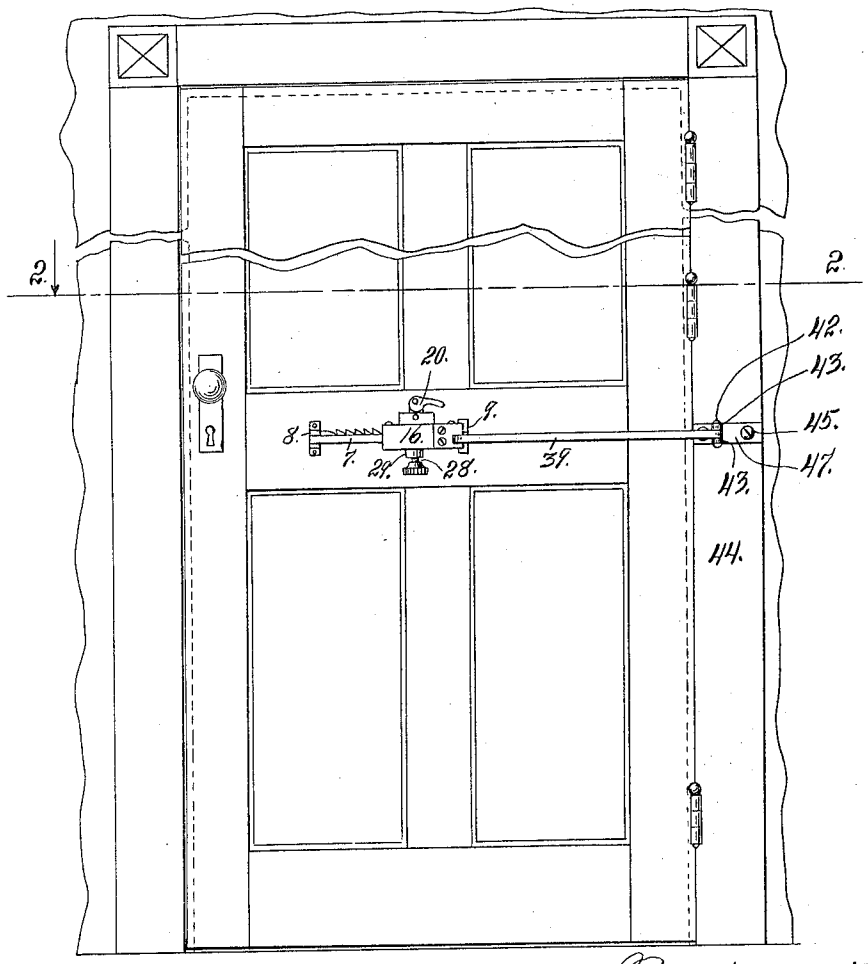


Fig. 1.

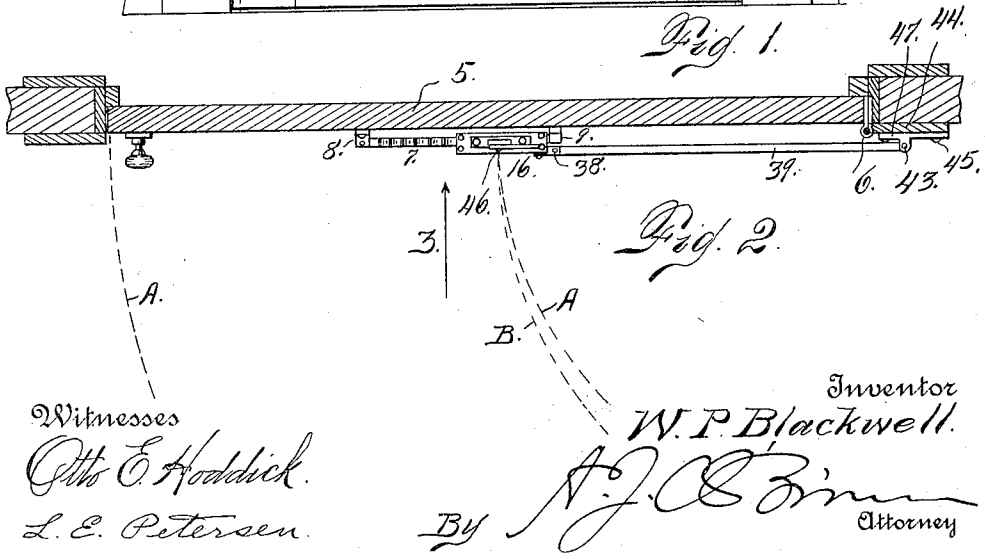


Fig. 2.

Witnesses

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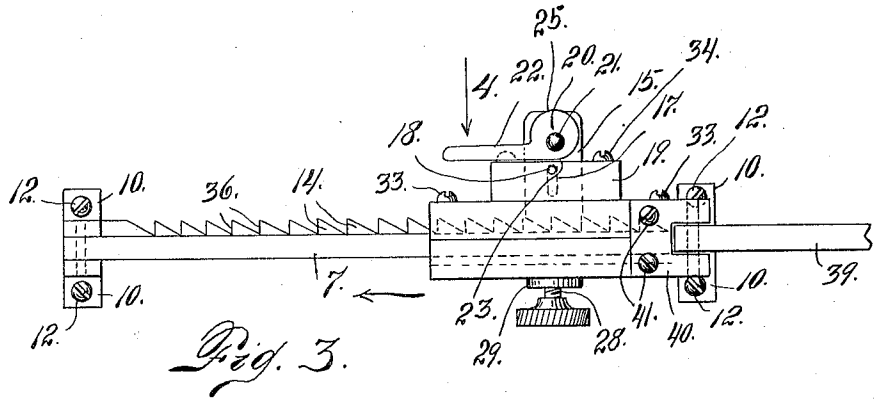


Fig. 3.

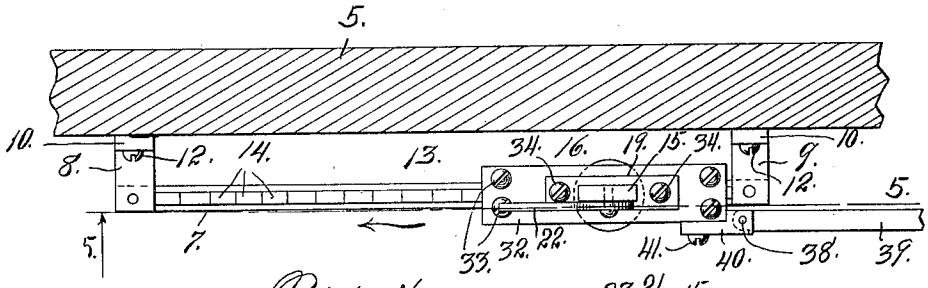


Fig. 4.

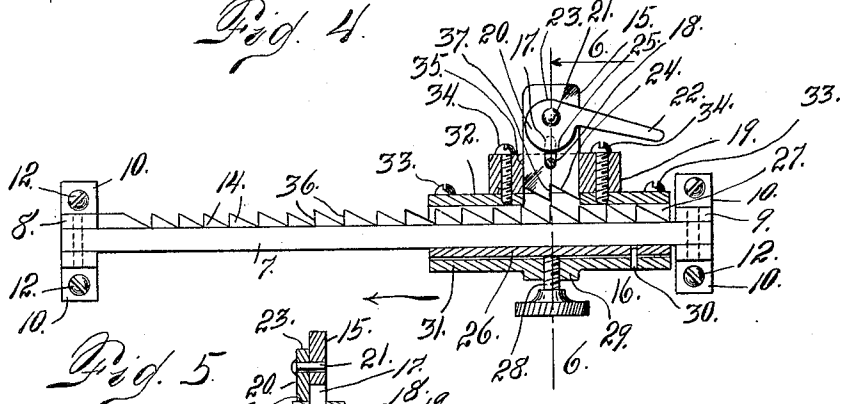


Fig. 5.

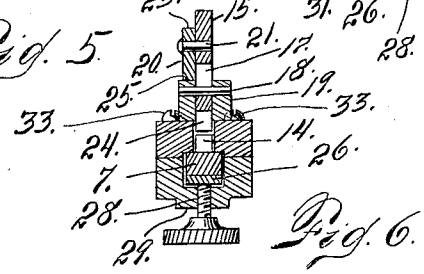


Fig. 6.

Witnesses

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UNITED STATES PATENT OFFICE.

WELLINGTON P. BLACKWELL, OF DENVER, COLORADO.

DOOR-HOLDER.

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Application filed May 10, 1913. Serial No. 766,789.

To all whom it may concern:

Be it known that I, WELLINGTON P. BLACKWELL, citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Door-Holders; and I do 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 and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in door holders, my object being to provide a construction of this class which may be advantageously employed for locking a door open in any desired position and which shall be of simple and economical construction.

My improved device is purely mechanical and in this regard is radically different from the door stops and closers in which a fluid is employed for regulating the opening and closing movements.

My improved device consists of a ratchet bar, mounted on the door and coöperating with a block slidable on the ratchet and equipped with a vertically movable pawl normally adapted to engage the teeth of the ratchet, the said block being pivotally connected with one extremity of an arm, the opposite extremity of the said arm being pivoted to the casing adjacent the door and beyond the axis of the hinges, whereby during the opening and closing movements of the door the block is caused to move on the ratchet bar by virtue of the diverging arcs in which the block and the corresponding parts of the ratchet bar travel during the movement of the door.

Provision is made for locking the pawl or dog out of engagement with the ratchet bar. As illustrated in the drawing, this is accomplished by a small cam lever pivotally mounted on the upper portion of the pawl and adapted to engage an adjacent part of the block. During the opening movement of the door, assuming that the pawl is in engagement with the ratchet face of the bar, the door may be opened freely as the pawl will move freely from one ratchet tooth to another. The door, however, cannot be closed until the pawl is raised to permit the movement of the block upon the ratchet bar in the opposite direction from that which it travels during the door's opening movement.

Another feature of the invention consists in the employment of a vertically movable friction plate which is actuated by a vertically disposed screw, the throw it into or out of engagement with the lower face of the ratchet bar or the face opposite the toothed face of said bar. By turning the adjusting screw in the proper direction, the friction plate will be caused to engage the aforesaid face of the ratchet bar and lock the door in the adjusted position, independently of the ratchet and pawl by causing the friction plate to engage the said bar with the necessary force for the purpose. This is not a positive lock and consequently will allow the door to move if considerable force is applied, thus preventing the breaking of any of the parts.

Having briefly outlined my improved construction, I will proceed to describe same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In this drawing—Figure 1 is a front view of a door equipped with my improvement which is shown in elevation and on a relatively small scale. Fig. 2 is a section taken on the line 2—2, Fig. 1, looking downwardly. Fig. 3 is an underneath view of the door-holder, shown in detail, being a view looking in the direction of arrow 3, Fig. 2. Fig. 4 is a top plan view of the door-holder, being a view looking in the direction of arrow 4, Fig. 3, with the door shown in horizontal section. Fig. 5 is a section taken on the line 5—5, Fig. 4. Fig. 6 is a cross-section taken on the line 6—6, Fig. 5.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a door of ordinary construction, the same being hinged at 6. To this door on the inside surface thereof is secured a bar 7, whose opposite extremities are provided with brackets 8 and 9, having flanges 10, perforated to receive screws 12, which are threaded into the door whereby the bar is supported in operative position thereon. This bar, as shown in the drawing, is supported by the brackets some distance from the surface of the panel to which it is attached, a space 13 being

left between the bar and the door, the bar being arranged parallel with the surface of the panel to which it is applied. The upper surface of the bar 7 is toothed, as shown at 14, to engage a vertically movable pawl or dog 15, mounted on a block 16, the block being slidable on the bar in both directions when the pawl is supported above the plane of the ratchet teeth of the bar. The pawl is provided with a vertical slot 17, through which passes a pin 18 stationary in the upper reduced part 19 of the block. Pivotally connected with the upper part of the pawl 15 is a cam 20, its pivot 21 being secured to the pawl. This cam is provided with an arm 22 for convenience of manipulation, the said arm being of such length as to extend beyond the upper reduced part 19 of the block when at either limit of its movement. When the pawl is in engagement with the ratchet teeth 14 of the bar, the cam is in the position shown in Figs. 3 and 4, whereby its point 23 of minimum eccentricity is in engagement with the top shoulder of the block part 19. When it is desired, however, to lift the toothed extremity 24 of the pawl out of engagement with the ratchet teeth, the cam is thrown to the position shown in Figs. 1, 2, 5 and 6 of the drawing, whereby its point 25 of maximum eccentricity is brought into engagement with the top shoulder of the block part 19. When in this position the block slides freely on the bar without resistance or interruption, except so far as may result from the slight friction due to the sliding engagement of the cooperating parts. Provision is, however, made for frictionally locking the block upon the ratchet bar by the employment of a plate 26, which is located within the opening 27 of the block through which the ratchet bar passes, the said plate having sufficient range of vertical adjustment to permit its being forced into engagement with the under surface of the ratchet bar by a slight movement of a screw 28 in the direction to lift the friction plate into engagement with the adjacent face of the bar. This screw is threaded in the central reinforced part 29 of the body of the block and its inner extremity bears against the lower surface of the friction plate. When the screw is loosened by slightly unscrewing it from the block, the friction plate will fall away from the adjacent surface of the ratchet bar, whereby the block and bar are adapted to move freely, the one upon the other. The friction plate is connected with the lower part of the block 16 by means of a pin 30, which is fast in the block and loose in the friction plate, whereby the plate may move freely either up or down, for the purpose stated.

As illustrated in the drawing, the block 16 is composed of a hollow casing 31, through which the ratchet bar passes and in which is also located the friction plate 26. The opening 27 through this block is closed at the top by a plate 32, which is secured in place by means of fastening screws 33. The reduced top part 19 of the block is secured to the top plate or cap 32 by fastening screws 34. This top part 19 is provided with a vertical slot or opening 35, which is open at the top to receive the pawl 15, which slides freely therein. When the cam is in the position shown in Figs. 3 and 4, whereby the pawl is allowed to fall so that its toothed extremity 24 engages the teeth 14 of the ratchet bar, the block may slide freely on the bar in the direction which the block takes during the opening movement of the door, the said travel of the block being in the direction of the arrows in Figs. 3, 4 and 5. However, the block is locked against reverse movement on the bar by virtue of the fact that the teeth of the ratchet have vertically-disposed faces 36, adapted to engage an oppositely-disposed vertical face 37 formed on the coöperating pawl.

Pivotally connected with the block 16 by means of a pin 38 is an arm 39, the said block being equipped with an auxiliary plate 40 and the same being secured to the body of the block by a fastening screw 41. The arm 39 at its extremity remote from the pin 38, is pivotally connected with the frame 44 of the door, as shown at 42. The hinge pin has a vertically-disposed axis and is passed through lugs 43 perforated to register with a lug formed in the adjacent extremity of the said arm. These lugs are formed on a plate 47 secured to the door frame or casing by fastening screws 45. By virtue of this arrangement, when the door is closed the arm 39 occupies a position parallel with the adjacent surface of the door, the pivot of the arm 39 at its outer extremity, however, being considerably off-set in a forward direction from the axis of the door hinges, whereby during the opening and closing movement of the door, the axes in which the block and the part of the ratchet bar 16 which it engages when the door is closed, diverge from each other, as indicated by the dotted lines A and B in Fig. 2, the dotted line A indicating an arc struck from the axis of the door hinges while the dotted line B indicates an arc struck from the pivot pin 42 of the arm 39, both of said arcs commencing at a common point 46, when the door is in the closed position.

Now, if it is assumed that the door is closed and that the cam 20 is in position to release the pawl 15, as shown in Figs. 3 and 4, and if we also assume that the screw 28 is released to allow the friction plate 26 to fall away from the adjacent face of a ratchet bar 7, the door may be opened freely, in

which event the block 16 will slide upon the ratchet bar, in a direction away from the hinge pin of the arm 39. When, however, the parts are in this position, while the pawl will slide freely over the ratchet face of the bar when the block is traveling in the aforesaid direction, the pawl will serve to lock the door against the closing movement by virtue of the engagement of the vertical face 37 of the toothed extremity of the pawl, with one of the vertical faces 36 of the ratchet teeth. When, however, it is desired to close the door, the cam 20 must be adjusted, as shown in Figs. 1, 2, 5 and 6, whereby the pawl will be lifted and maintained out of engagement with the ratchet face of the bar. When this is true, the door may be moved freely to the closed position.

Should it be desired, when the pawl is disengaged from the ratchet bar, to fasten the door in any open position, the set-screw 28 may be adjusted to lift the friction plate 26 into engagement with the lower face of the ratchet bar. This frictional engagement will lock the door in the open position with sufficient security for all practical purposes, while at the same time if considerable force is applied the door may be moved in either direction by virtue of the sliding movement permitted between the engaging surfaces of the friction plate and a ratchet bar. The screw, however, may be tightened sufficiently to make considerable pressure necessary in order to move the door under the conditions assumed. Again, if the pawl is in position to engage the ratchet face of the bar during the opening movement of the door, by the adjustment of the set-screw 28, the friction plate may be caused to engage the ratchet bar and lock the latter automatically against further opening movement while the pawl positively locks the door against further closing movement.

From the foregoing description, it will be understood that my improved door-holder is adapted to efficiently perform the door-holding movement under all conditions that can possibly arise in the use of the ordinary door for which my improvement is intended.

I claim—

1. The combination with a door suitably hinged and a support adjacent thereto, of a ratchet bar secured to the door, a block normally slidable on the bar during the opening movement of the door, the bar being toothed and the block carrying a vertically movable pawl toothed to coöperate with the toothed part of the bar, an operative connection between the block and the said stationary support to cause the block to move with relation to the bar during the movement of the door, and means carried by the pawl and coöperating with the block to support the pawl out of operative relation with the toothed part of the bar, substantially as described.

2. The combination with a hinged door and a stationary part adjacent thereto, of a bar secured to the door and having ratchet teeth formed on its upper surface, a block slidable on the bar, a vertically movable pawl carried by the block and having its lower extremity toothed to coöperate with the toothed face of the bar, a cam pivotally mounted on the pawl above the block and adjustable to support the pawl out of engagement with the toothed face of the bar, and an operative connection between the block and the stationary support adjacent the door to cause the block to move in respect to the bar during the movement of the door, substantially as described.

3. The combination with a door, of a bar secured to the door and having its upper face provided with ratchet teeth, a pawl vertically movable in the block and having its lower extremity toothed to coöperate with the teeth of the bar, means carried by the block independent of the pawl for retarding the movement of the block on the bar, and means connected with the block for causing the latter to move in respect to the bar during the movement of the door, substantially as described.

4. The combination with a door and a stationary support adjacent the latter, the door being suitably hinged, of a bar secured to the door and having its upper face provided with ratchet teeth, a pawl carried by the block and coöperating with the teeth of the latter, a friction plate carried by the block and movable toward and away from the lower face of the bar, a set screw threaded in the block for adjusting said plate and an arm pivotally connected with the block at one extremity and with the stationary support adjacent the door at its opposite extremity and beyond the axis of the door's hinges, substantially as described.

5. The combination with a swinging member, of a bar secured to the member and having its upper face provided with ratchet teeth, a pawl vertically movable in the block and having its lower extremity toothed to coöperate with the teeth of the bar, means carried by the block independent of the pawl for retarding the movement of the block on the bar, and means connected with the block for causing the latter to move in respect to the bar during the movement of the member, substantially as described.

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

WELLINGTON P. BLACKWELL.

Witnesses:
A. J. O'Brien,
C. M. Wardby.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."