April 8, 1952 E. SCHWARZKOPF 2,592,073

DOOR STOP MECHANISM

Filed Dec. 31, 1946

Fig. 1

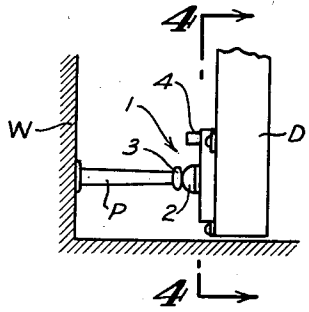


Fig. 2

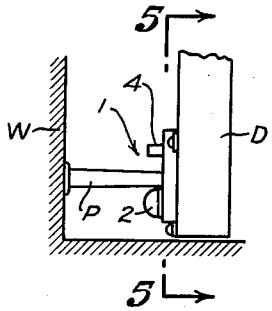
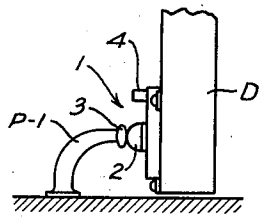


Fig. 3



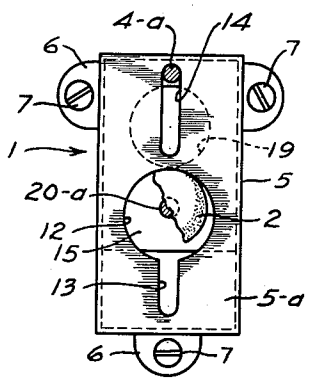


Fig. 4

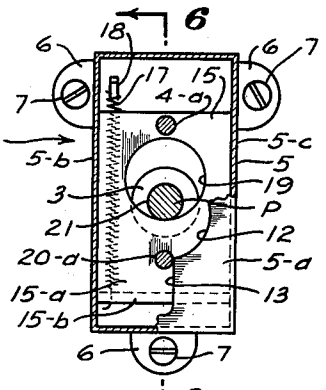


Fig. 5

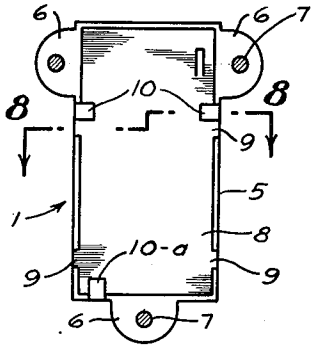


Fig. 7

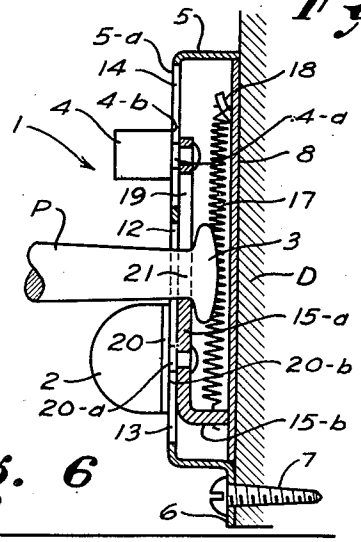
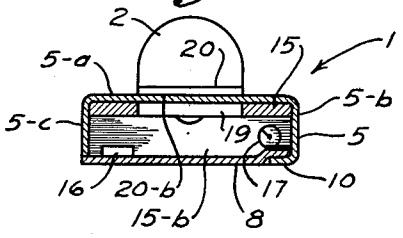


Fig. 6

Fig. 8



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DOOR STOP MECHANISM

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11 Claims. (Cl. 292—175)

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This invention relates to mechanism restricting the movement of a door.

It is an object of this invention to provide a device adapted to limit the opening movement of a door, or the like, and which may serve optionally to retain the door open.

It is another object of this invention to provide a simple and inexpensive device of this character, and one which may be installed readily for use with existing structures without requiring alterations thereof.

It is another object of this invention to provide a device adapted to retain the door positively in open position, without relying on frictional contacts for this purpose.

It is still another object of this invention to provide, such a device adapted for operation by the foot, when it is desired to hold the door open.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of one embodiment of the invention. For this purpose there is shown a form in the drawings accompanying and forming part of the present specification. The form will now be described in detail illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of this invention is best defined by the appended claims.

In the drawing:

Figure 1 is a side view of the device of the invention in use as a stop;

Fig. 2 is a similar view, but showing the device performing its holding function;

Fig. 3 is a view similar to Fig. 1, showing an alternative arrangement of the device;

Fig. 4 is a sectional view on an enlarged scale, taken as indicated by line 4—4 of Fig. 1;

Fig. 5 is a similar view, taken as indicated by line 5—5 of Fig. 2;

Fig. 6 is a transverse sectional view on a further enlarged scale, taken as indicated by line 6—6 of Fig. 5;

Fig. 7 is an elevation showing the back of the device; and

Fig. 8 is a cross sectional view on an enlarged scale, taken as indicated by line 8—8 on Fig. 7.

Referring to Fig. 1, the device of the invention is indicated generally by the numeral 1, and is shown, as mounted on that side of a door, or the like D, which swings toward a wall, or partition W when the door opens. It is common to provide a bumper post P on the wall W to prevent the door striking the wall, such posts usually having a cushion of rubber, or the like, which contacts the door.

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In the present instance, such a cushion indicated at 2 is provided on the device 1 for engaging the post P, the head 3 of the post being of button-like form. The cushion 2 is movably mounted on the device 1, and normally occupies a position, so that it will contact the head 3, the device thus, operating merely to stop movement of the door by bumping the head 3, in a conventional manner.

However, the device 1 is so arranged that the cushion 2 may be moved from its normal position, to cause the head 3 to be engaged by lock mechanism provided in the device 1, which secures the door D to the post P, and against closing movement. This lock mechanism is operated optionally to engage, and to release the head 3 by appropriate pressure, conveniently exerted by the foot, on a projection, or pin 4. After the post P is freed from the device 1, the cushion 2 returns to its normal position upon release of pressure from pin 4.

It is generally preferable to have the post P on the wall W, but obviously it could be mounted on the door D if preferred, in which case the device 1 would be secured to the wall, the mode of operation being unchanged.

In Fig. 3, a modified form of bumper post P–1 adapted for floor mounting, when it is desired to stop the door D at a point not adjacent a partition is shown. This form of post has a button head 3 as before, and cooperates with the device 1 in a manner substantially identical with that just described.

Referring to Figs. 4 to 8 of the drawing, the device 1 comprises a rectangular casing 5, which may be formed conveniently of light sheet metal, and is provided with mounting ears 6 for accommodating screws 7, which secure the device to the door "D." The back of the casing 5 is closed by a cover 8 secured in place as by a number of positioning lugs 9 on the cover, which cooperate with bent-over retaining lugs 10 on the casing 5. (Figs. 7 and 8.)

The front wall 5–*a* of the casing 5 is provided with an intermediate circular aperture 12 from which a slot 13 extends downwardly. Another vertically extending slot 14 is provided in the wall 5–*a* above the aperture 12. A movable element 15 (Fig. 8), is accommodated in the casing 5, and comprises a plate 15–*a* or a width substantially equal to the inside width of the casing 5, so as to be guided for vertical movement by the

side walls 5–*b* and 5–*c* of the casing 5 (see Figs. 5 and 8).

The plate 15–*a* is maintained in sliding contact with the front casing wall 5–*a*. For this purpose the operating projection, or pin 4, which passes through the slot 14, and is secured to the upper end of the element 15, has a reduced portion 4–*a* adjacent the plate 15–*a* providing a shoulder 4–*b* spaced from the plate a distance slightly greater than the thickness of the wall 5–*a*, and engaging the outer face of the wall.

The lower end of the element 15 is provided with a bent portion, or foot 15–*b* for stiffening the plate 15–*a*, and which is adapted to support the element 15 by slidably engaging the cover 8. This bent portion, or foot 15–*b*, has an opening 16 (see Fig. 8), providing clearance for the raised portion of cover 8 necessitated by the fastening lug 10–*a*, to permit movement of the element 15 to the lower end of the casing 1. Additionally, the element 15 has one end of a tension spring 17 secured thereto, the other end of the spring 17 being secured to a hook 18 struck from the cover 8. The spring 17 urges the element 15 upwardly to cause the upper end thereof, to engage the upper end of the casing 1.

The movable element 15 has an opening 19 adapted to register with the aperture 12, when the element 15 is at the lower limit of its movement, as well as means providing a surface for contacting the bumper head 3, when the element 15 is in its upper position. As shown, this means comprises the resilient rubber cushion 2 carried by a member 20 secured to the element 15. The member 20 has a reduced portion 20–*a* of suitable size to be accommodated in the slot 13, and of a length to space the face 20–*b* of the member 20 a distance from element 15, slightly greater than the thickness of the wall 5–*a*. In this way, the member 20 cooperates with pin 4 to maintain the element 15 in sliding contact with the wall 5–*a*.

The device 1, and the bumper P, or P–1 are so mounted that the head 3 is positioned in substantial alignment with the aperture 12, when the door D reaches its limiting position. With the element 15 in its upper, or normal position, the aperture 12 is covered (Fig. 4), and the cushion 2 is positioned to engage the bumper head 3 (Figs. 1 and 3). In this condition, the device functions as a conventional door stop, merely limiting the opening movement of the door, and obviating damage that might arise due to violent opening of the door.

When it is desired to retain the door open, the element 15 is depressed, by pressure on the projection 4, so that the cushion 2 is moved downwardly, aperture 12 is uncovered, and opening 19 brought into substantial alignment therewith. Then as the door reaches the bumper P, or P–1, the bumper head 3 passes through aperture 12, and opening 19 into the casing 1. As clearly shown in Fig. 6, the bumper head 3 is quite thin, so that in this position a reduced portion, or neck 21 of the bumper extends through the opening 19, and aperture 12. Then upon release of the pressure on the projection 4, the element 15 moves upwardly to bring the lower edge of opening 19 against this neck 21. In this way the bumper head is latched, the movable wall 15 operating as the catch. Thus, movement of the door away from the bumper is prevented by the engagement of head 3 with the inside of the element 15. Downward pressure on pin 4 will position the element 15 to permit passage of the head 3 through opening 19, when it is desired to release the door.

The inventor claims:

1. In a door stop mechanism adapted to cooperate with a post that is relatively movable with respect thereto: a supporting frame; a plate mounted on said frame and movable with respect thereto; a bumper supported on the plate, said bumper in one position of said plate limiting advancement of said post, said plate having a latching surface adapted to be engaged by said post; and manually operable means for moving said plate to render effective either the bumper or the latching surface.

2. In a door stop mechanism adapted to cooperate with a post that is relatively movable with respect thereto: a wall having an aperture alignable with said post; a plate slidable with respect to said wall, said plate having a bumper surface thereon, said bumper surface in one position of said plate being alignable with said aperture for limiting advancement of said post, said plate having an opening therethrough; and resilient spring means and an operator optionally positioning respectively said bumper surface or said opening in substantial alignment with said aperture.

3. In a door stop mechanism: a wall having an aperture; a plate slidable with respect to said wall, said plate having a bumper surface thereon and an opening therethrough; resilient spring means and an operator optionally positioning respectively said bumper surface or said opening in substantial alignment with said aperture; a bumper post relatively movable in a path toward and away from said apertured wall and in alignment with said aperture, said bumper post being adapted optionally to contact said surface or pass through said aperture and said opening; and said opening forming means providing a latching surface urged in latching relation by said spring means for optionally restraining said bumper post from movement with respect to said wall.

4. In a door stopping mechanism: a pair of cooperating members, one of said members being adapted to be mounted on the door, the other member being adapted to be so mounted as to be engageable by said one member when the door reaches a limiting position; one of said members comprising a casing having an aperture; a plate guided for sliding movement by said casing in a direction transverse to the direction of movement of said door, said plate having an opening; an operator secured to said plate for facilitating movement of said plate with respect to said casing from a first position to align substantially said opening and said aperture to permit passage of said other cooperating member; resilient spring means connected to said plate to urge said plate toward said first position; and a cushion carried by said plate and covering said aperture when said plate is in first position.

5. In a door stop adapted to cooperate with a bumper head that is relatively movable in a path toward and away from said door stop: a wall having an aperture adapted to be aligned with said bumper head in said path of relative movement; a plate; means guiding said plate for movement in a direction substantially parallel to said wall to cover and uncover said aperture; and a cushion secured to said plate and adapted to be aligned with said aperture to contact said bumper head and limit movement thereof when said plate is in aperture closing position, said plate when in aperture uncovering position permitting

free passage of said bumper head through said aperture.

6. In a door stop adapted to cooperate with a bumper head that is relatively movable in a path toward and away from said door stop: a wall having an aperture adapted to be aligned with said bumper head in said path of relative movement; a plate; means guiding said plate for movement in a direction substantially parallel to said wall to cover and uncover said aperture; a cushion secured to said plate and adapted to be aligned with said aperture to contact said bumper head and limit movement thereof when said plate is in aperture closing position, said plate when in aperture uncovering position permitting free passage of said bumper head through said aperture; resilient spring means urging said plate to aperture covering position; and an operator secured to said plate for facilitating movement of said plate to uncover said aperture.

7. In a door stop adapted to cooperate with a bumper head that is relatively movable in a path toward and away from said door stop: a wall having an aperture adapted to be aligned with said bumper head in said path of relative movement; a plate having an opening; means guiding said plate for movement in a direction substantially parallel to said wall; said plate being movable to align substantially said opening and said aperture, or to cover substantially said aperture; a cushion secured to said plate and adapted to be aligned with said aperture and engageable with said bumper head for limiting relative advancement thereof when said plate is in aperture closing position, said plate when in a position aligning said opening and said aperture, permitting free passage of the head in either direction, through said opening, misalignment of said opening and said aperture after passage of the head in one direction, through said opening serving to prevent passage of the head in the opposite direction; resilient spring means urging said plate to a misaligned position and to aperture covering position; and an operator secured to said plate for facilitating movement of said plate to align said opening with said aperture.

8. In a door stop adapted to cooperate with a bumper head that is relatively movable in a path toward and away from said door stop: a wall having an aperture adapted to be aligned with said bumper head in said path of relative movement; a cushion having a surface adapted to be aligned with said aperture and engageable with said bumper head for limiting relative advancement thereof; a plate mounting said cushion for movement therewith; means guiding said plate for movement in a direction substantially parallel to said wall, said plate in one position aligning said cushion and said aperture; said plate having an opening displaced from said cushion and located in a direction therefrom in the path of movement of said plate, said opening cooperating with said aperture optionally to permit, or prevent passage of said head through said aperture in accordance with the position of said plate; and an operator secured to said plate for facilitating movement of said plate.

9. In door stop mechanism: a pair of cooperating members that are relatively movable in a path toward and away from each other; a frame upon which the first of said members is adapted to be supported; a plate guided for movement by said frame in a direction transverse to the direction of relative movement of said members; a bumper mounted on said plate and movable therewith to a position wherein it is interposed in said path of relative movement of said members to limit relative advancement of said members; and said plate having an edge adapted to latch said second member, said edge being displaced from said bumper and located in a direction therefrom in the path of movement of said plate.

10. In a door stop mechanism adapted to cooperate with an enlarged head of a bumper post that is relatively movable in a direction toward and away from said mechanism: a frame; a plate guided for movement by said frame in a direction transverse to the direction of relative movement of said head and said mechanism; a cushion secured to said plate, said cushion in one position of said plate forming an abutment interposed in the path of relative movement of said head and said mechanism for limiting relative advancement of said head and said mechanism; resilient spring means secured to said plate biasing said plate toward said one position; latching means carried by said plate and positionable for engagement with said head when said plate is moved from said one position to another position, said latching means when operative preventing relative retraction of said head and said mechanism; and manually operable means secured to said plate for facilitating movement of said plate from said one position to said other position for conditioning said latching means for cooperation with said head, and for releasing said latching means.

11. In a door stop mechanism adapted to cooperate with an enlarged head of a bumper post that is relatively movable toward and away from said mechanism: a casing having an aperture adapted to be aligned with said head in the path of relative movement of said head and said mechanism; a plate guided for movement within said casing in a direction transverse to the direction of relative movement of said post and said mechanism; a cushion secured to said plate and movable therewith, said cushion being alignable with said casing aperture to provide an abutment limiting relative advancement of said head and said mechanism; resilient spring means secured to said plate and said casing urging said plate to move in one direction to position said cushion in alignment with said casing aperture for cooperation with said head; said plate having an edge alignable with said casing aperture in another position of said plate for permitting free passage of said head, said edge forming a latching surface movable into engagement with said head for preventing relative retraction of said head from said mechanism; and manually operable means attached to said plate for facilitating movement of said plate in said other direction against the action of said spring means.

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