Sept. 6, 1932. M. J. SASGEN 1,876,173

ADJUSTABLE DOORSTOP

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Fig. 1.

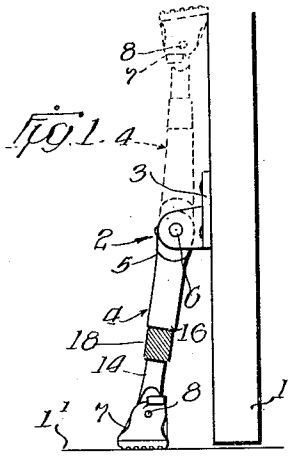

Fig. 3.

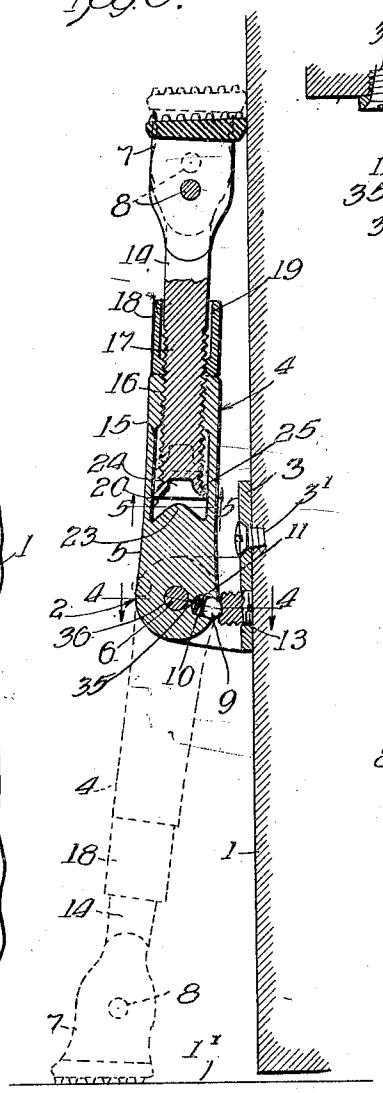

Fig. 4.

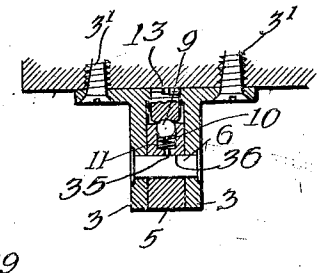

Fig. 2.

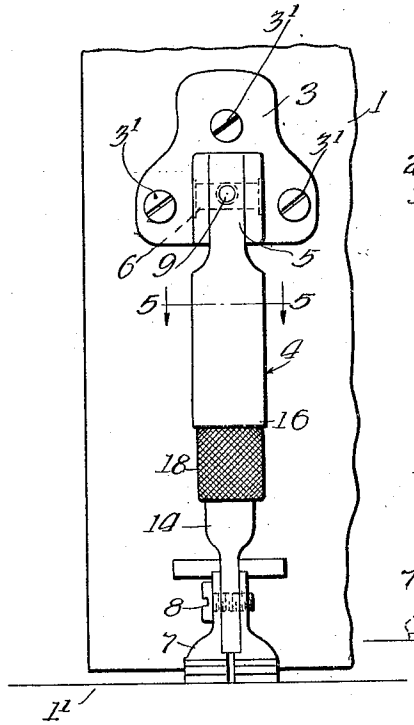

Fig. 5.

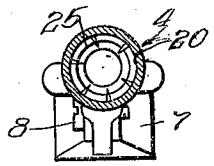

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Fig. 6.

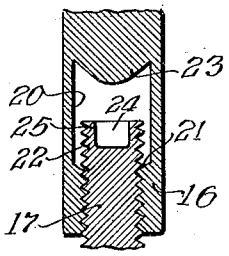


Fig. 7.

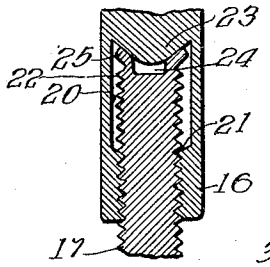


Fig. 10.

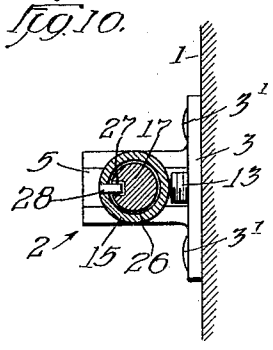


Fig. 9.

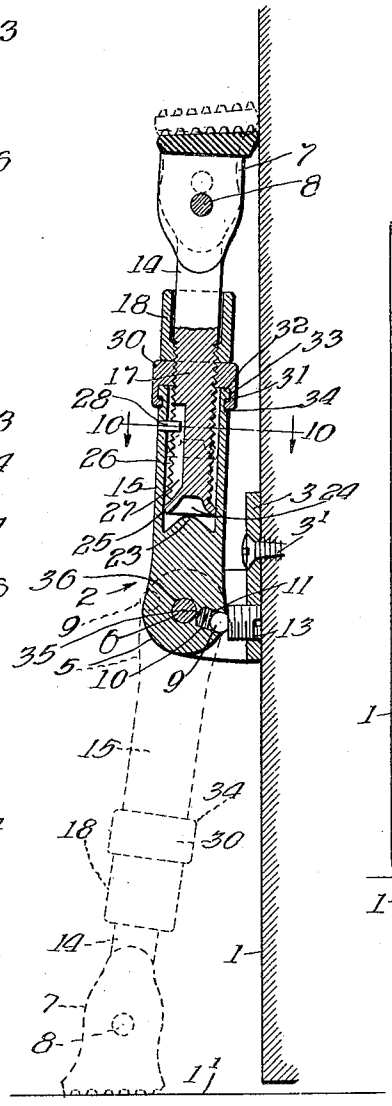
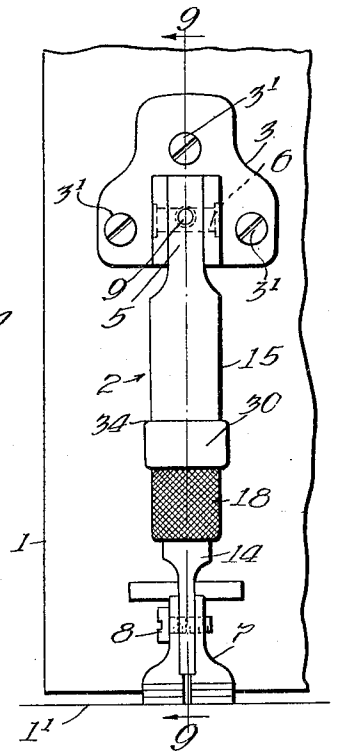


Fig. 8.



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UNITED STATES PATENT OFFICE

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ADJUSTABLE DOORSTOP

Application filed July 22, 1930. Serial No. 469,819.

This invention relates to improvements in door stops and has special reference to devices adapted to be attached to the lower ends of doors to prevent the free swinging of the doors.

This present invention relates especially to the swinging lever type and has to do with improved means for making the stop lever adjustable as to length and to spring means for yieldingly retaining the lever in raised or inoperative position.

An important feature relates to simple means for preventing the removal or disengagement of the adjustable end of the lever thereby preventing mischievous removal of this part of the device.

Other useful functions and features of importance will appear from the following description and claims taken in conjunction with the accompanying drawings forming part of the specification and in which:—

Fig. 1 is a side elevation of a door stop embodying the invention in one form and shown attached to a door;

Fig. 2 is an enlarged front elevation of the stop shown in Fig. 1, the lever being shown in operative position;

Fig. 3 is a vertical central section of the stop, the lever being shown in inoperative position;

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3;

Fig. 5 is a horizontal section on the line 5—5 of Fig. 3;

Figs. 6 and 7 are fragmentary longitudinal sections similar to Fig. 3, particularly disclosing the means and method used in locking the adjustable part of the lever against removal;

Fig. 8 is a view similar to Fig. 2, showing a slightly modified form of the invention, the lever being shown in operative position;

Fig. 9 is a vertical central section on the line 9—9 of Fig. 8, the lever shown in full lines in inoperative position; and

Fig. 10 is a horizontal section on the line 10—10 of Fig. 9.

In said drawings, 1 represents an ordinary swinging door and the door stop 2 is adapted to be secured upon one face of the door near its bottom and is designed to hold the door against swinging in one direction.

The stop 2 is of the lever type and consists of a base bracket 3 and an operative lever 4. The lever 4 is pivotally mounted at one end 5, on a pivot 6 carried by the bracket 3, to swing up and down. When the lever is swung up, as shown in dotted lines, Fig. 1, and full lines Fig. 3, it is in inoperative position and simple yielding means are provided for yieldingly retaining it in such position. When the lever is freed from the holding means, it drops down by gravity and its lower end is adapted to engage the floor 1′ and brace the door against swinging, in an obvious manner.

The lever has a foot piece 7 secured by a screw 8 and the foot piece has an envelope of semi-hard rubber to assist it in engaging the floor to hold the door against being swung in one direction.

For yieldingly holding the lever in raised, inoperative position, I provide a spring pressed ball 9 mounted in a hole 10 in the periphery of the lever base 5. The ball is yieldingly held pressed outwardly by a coiled spring 11 in the hole 10 beneath the ball. The ball is held against escape by pressing in the edges of the mouth of the hole to form a ball retaining shoulder, in the usual manner. In use, the ball is adapted to engage with a cupped projection 13 rigid with the base 3. This projection 13 may comprise a screw mounted in a threaded opening in the base and adapted to be adjusted in said opening to provide the proper engagement with the spring pressed ball 9.

As the lever is swung up to inoperative position, the rubber envelope 7 on the free end of the lever is adapted to contact with the door and limit the swinging of the lever and, as the lever reaches this point, the ball 9 is forced past the edge of the cup in the free end of the projection 13 and enters the cup and this engagement retains the lever yieldingly in its raised position so that the door can swing freely.

The device is fixed in relation to the door and the floor by the base 3 which is adapted to be secured permanently to the door by

screws 3′ and once it has been secured, it is not advisable to change it. But the relation between the door and the floor is not always permanent and unless the lever 4, when in operative position, inclines at a proper angle, it will not operate satisfactorily as a stop. For this reason and also so that in affixing the stop to the door it need not be accurately placed vertically, the lever itself is made adjustable as to length.

In the form shown in Fig. 3, the lever is made in two main parts, the base part 5 and the free end part 14. The base part has an elongated hollow extension 15 which is internally threaded at its free end 16, and the free end part 14 has a stem 17 which is externally threaded to fit in the extension 15. It will be readily understood that the lever can be adjusted as to length by rotating the free end portion to obtain the length for proper bracing.

For clamping the free end portion in its adjusted position, a clamping or jamb nut 18 is provided which is mounted on the stem 17 and has a counter-bored nozzle 19 to cover up the threaded portion of the stem. As shown, the nut 18 is cylindrical to give it a neat appearance and its surface is knurled so that it can be readily turned to clamp the parts of the lever together.

To prevent the mischievous removal of the free end part of the lever, I provide means for permanently securing the two parts against separation but which allows of the adjustment described.

To secure the parts against separation, I provide an enlarged counter-bored chamber 20 in the extension 15 beyond the threaded portion 16 and the free end of the stem 17 projects into this chamber. The threaded portion 16 forms an internal shoulder 21 in the extension 15 at the outer end of the chamber 20 and I provide means for expanding the free end 22 of the stem 17 so that the stem 17 cannot be removed from the threaded opening 16. This means comprises the provision of a conical bottom 23 in the chamber 20 and the free end 22 of the stem 17 is bored out, as shown at 24, to provide a relatively thin, circumferential wall 25 at the end of the stem. It will now be clear that by screwing the stem 17 in far enough to cause the thin wall 25 to engage the conical bottom 23, the wall can be readily forced or flared outwardly, as shown in Fig. 7. As the outer diameter of the wall 25 is the same as the threaded stem, it is obvious that once the wall 25 has been flared out, as shown in Fig. 7, it would be difficult or impossible to separate the two parts of the lever. It should be understood that before the two parts are thus secured against separation, the jamb nut 18 is threaded onto the stem in advance of the extension 15.

In the form of adjustment described, it is necessary, in adjusting the length of the lever, to rotate it full turns only as the floor engaging face of the free end of the lever is arranged at a slight angle to the longitudinal axis of the lever for proper engagement with the floor. This necessitates the accurate setting of the free end part of the lever rotationally by the one making the adjustment.

To avoid the necessity of such rotational adjustment, the form of the invention shown in Figs. 8 to 10 is used. In this form the extension 15 of the base end of the lever has a free axial opening 26 through which the threaded stem 17 of the free end part of the lever freely slides. The threaded stem 17 is provided with a longitudinal key-way 27 and an inwardly projecting pin 28 is secured in the wall of the extension 15.

The inner end of the pin 28 projects into the key-way 27 and prevents the rotation of the free end part of the lever 14. In this form, as in the other, the inner or free end of the stem 17 is adapted to be expanded to retain the two main parts of the lever against separation.

To hold the free part and cause its adjustment longitudinally, I provide a rotatable nut 30 fitting the threaded stem 17 and having a nozzle 31 adapted to overlap the free end 32 of the extension 15. The outer surface of the extension 15 is provided with a circumferential groove 33 near its free end and the edge portion 34 of the nozzle 31 of the nut 30 is formed inwardly to engage in said groove. This engagement retains the nut 30 against longitudinal movement but allows it to be freely rotated. It is now obvious that when the parts are assembled as shown in Fig. 9, and the nut 30 is rotated, the free end portion of the lever will be adjusted longitudinally but will be held against rotation. The rotational relation of the two parts of the lever is fixed by the pin 28 and key-way or groove 27.

For the purpose of locking the two parts of the lever in their adjusted relation, a jamb nut 18 is provided as in the first form.

In this form the free removal of the free end portion 14 of the lever is prevented from being separated from the base portion 5 by the pin 28 which projects in far enough to serve as a shoulder to engage the flared out end wall 25 on the stem 17.

The pocket 10 in which the ball 9 and spring 11 are held is connected at its inner end by an oil hole 35 with the central opening 36 which receives the pivot 6. This is for the purpose of making use of the pocket as an oil hole for the pivot, the ball serving to prevent the escape of the oil. It is very convenient to apply the oil when the lever is swung up to horizontal position with the oil hole on top. The ball can readily be depressed by pressing the nozzle of an oil can against same at the time the oil is applied.

As many modifications of the invention

will readily suggest themselves to one skilled in the art, I do not limit or confine the invention to the specific details of construction or combinations of parts herein shown and described.

I claim:

1. In a door stop of the kind described, a pivoted lever, the lever made of a plurality of relatively longitudinally movable parts for adjusting the lever, means for retaining the parts rigidly in their adjusted positions and means for permanently securing the parts against complete separation.

2. In a door stop of the kind described, a swinging lever, the lever made of a plurality of parts having longitudinal threaded engagement for adjustment of the length of the lever, and means for permanently securing the parts against complete separation.

3. In a door stop of the kind described, a lever, a base upon which the lever is pivotally mounted at one end to swing up and down, the lever adapted to be swung up to substantially vertical inoperative position, means for yieldingly retaining the lever in such position comprising a co-operating projection and a depression on the pivoted end of the lever and base, means for yieldingly retaining the projection in engagement with the depression, the depression being provided in a part adjustable from and toward the co-operating projection.

4. In a door stop of the kind described, a lever, a base upon which the lever is pivotally mounted at one end to swing up and down, the lever adapted to be swung up to substantially vertical inoperative position, means for yieldingly retaining the lever in such position comprising a co-operating projection and a depression on the pivoted end of the lever and base, means for yieldingly retaining the projection in engagement with the depression, the yieldingly-held projection being mounted in a pocket in the pivoted end of the lever, an oil hole connecting said pocket with the hole in the lever which receives the pivot, and the yieldingly-held projection serving as an oil hole cover.

In witness that I claim the foregoing as my invention, I affix my signature this 18th day of July, 1930.

MICHAEL J. SASGEN.