W. H. LEAVER.

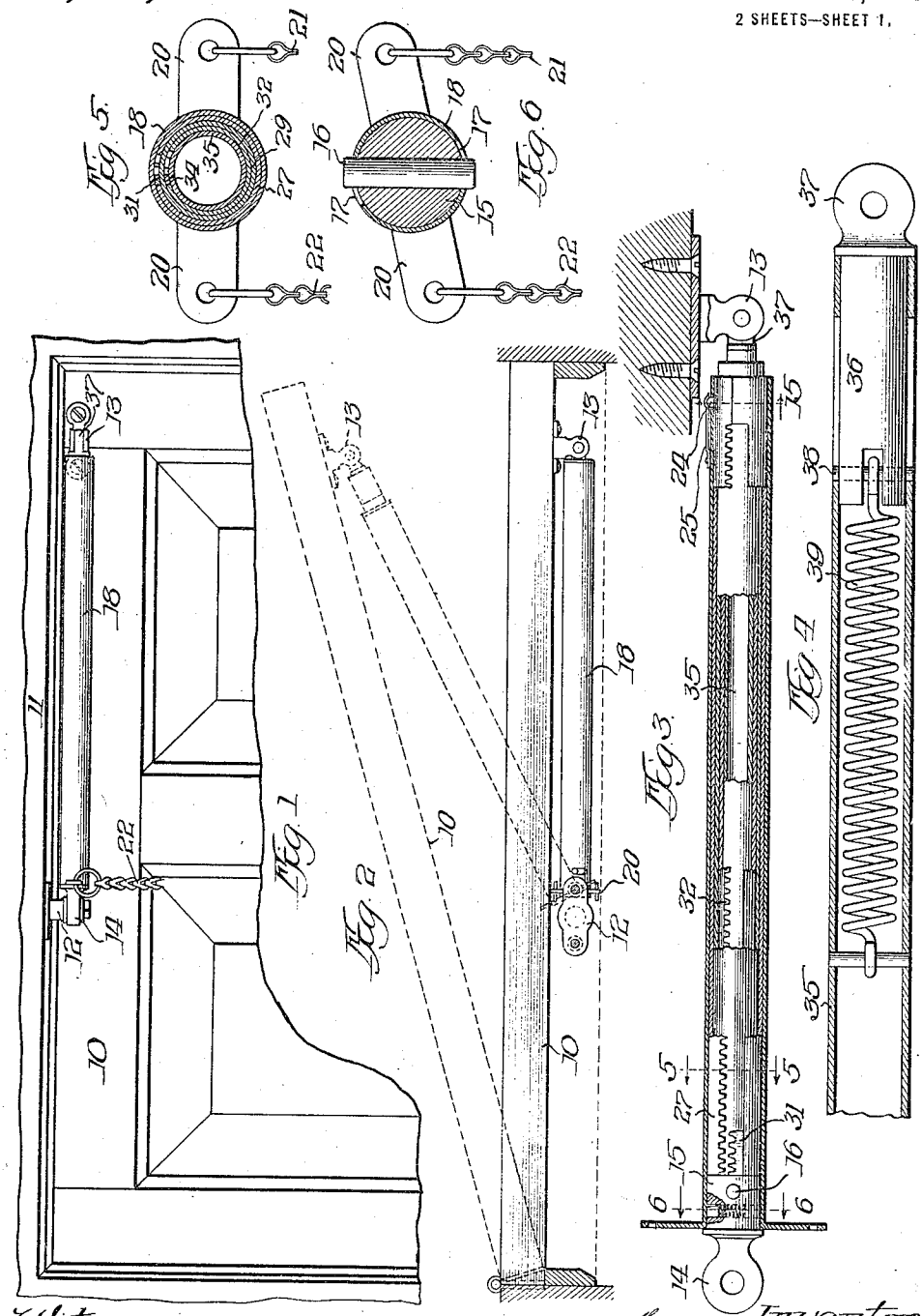
DOOR STOP.

APPLICATION FILED DEC. 19, 1917.

1,282,884.

Patented Oct. 29, 1918.

2 SHEETS—SHEET 1.



Witness
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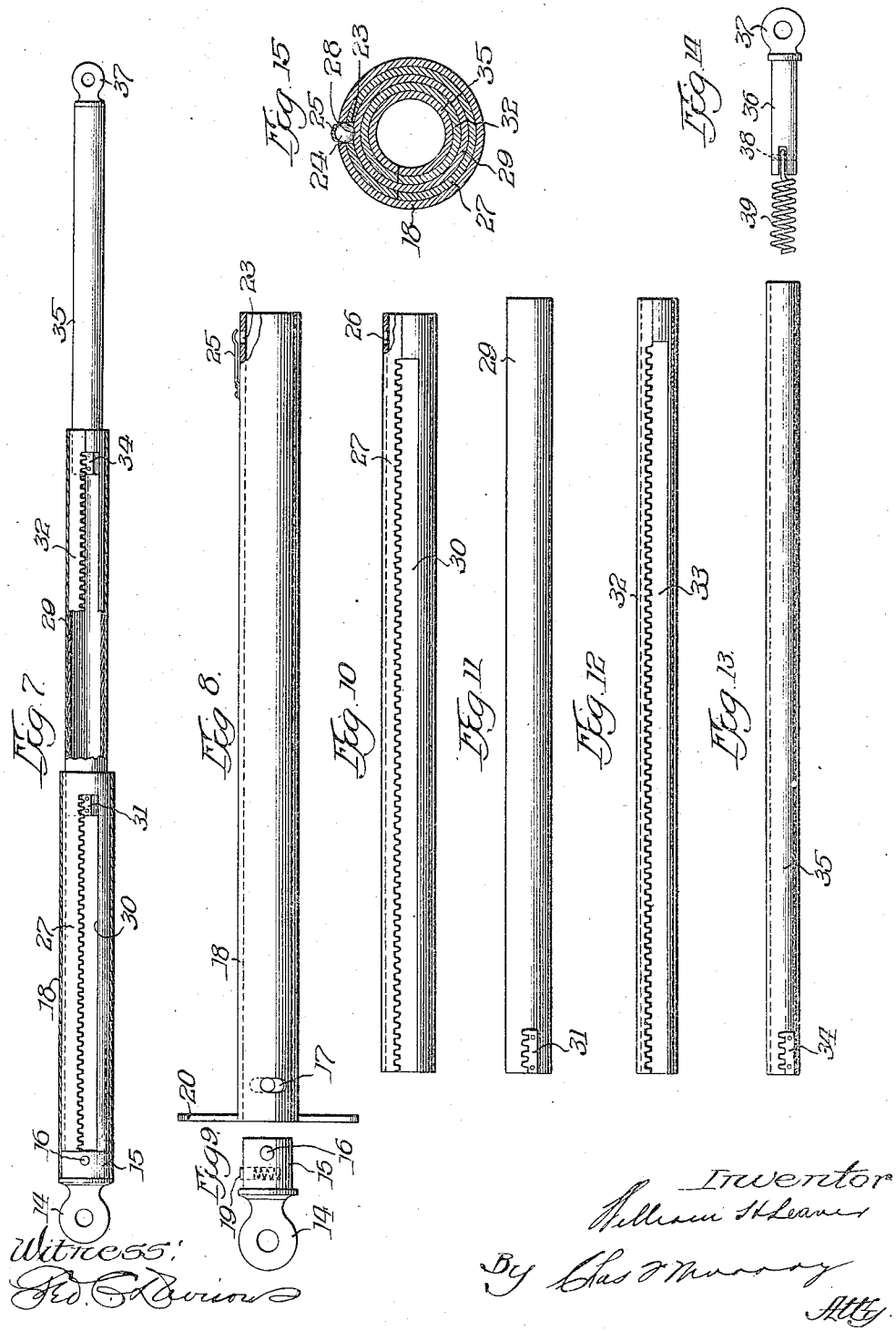
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. LEAVER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO MELVIN H. FORCE, OF CHICAGO, ILLINOIS.

DOOR-STOP.

1,282,884. Specification of Letters Patent. Patented Oct. 29, 1918.

Application filed December 19, 1917. Serial No. 207,936.

To all whom it may concern:

Be it known that I, WILLIAM H. LEAVER, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Door-Stops, of which the following is a specification.

My invention relates to door controlling devices and particularly to a novel door stop.

An object of the present invention is to provide a door stop which shall be in the form of a telescoping rod adapted to be secured to the door and casing at the upper end of the door together with novel means for locking the telescoping parts at any point in the opening movement of the door. The device is so constructed as to act not only as a stop but as a lock for maintaining the door in any desired partially opened position. The result is secured by providing rigid telescoping members adapted for relative angular movement, said parts having coöperating means for interlocking.

A further object is to provide in a device of this character means for absorbing excessive shocks at the extreme open position of the door. This provision is of advantage in all doors whether or not they are equipped with spring actuated door checks, and particularly if not equipped with such devices. In the latter case the breakage of door glass or of the door itself by uncontrolled opening movement is avoided.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a fragmentary elevation of a door and casing showing my improvement applied thereto;

Fig. 2 is a sectional plan view of the same showing the door in dotted lines in partially opened position;

Fig. 3 is an enlarged longitudinal, sectional view of the device with parts broken away;

Fig. 4 is an enlarged sectional view of the shock absorbing means employed;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view on the line 6—6 of Fig. 3;

Fig. 7 is a longitudinal, sectional view showing the device in extended position;

Fig. 8 is an elevation of the outer barrel;

Fig. 9 is a view of the end plug for the barrel;

Fig. 10 is a view of the shell which is secured to the barrel 8;

Fig. 11 is a view of the intermediate barrel;

Fig. 12 is a view of the rack member which is secured to the intermediate barrel 11;

Fig. 13 is a view of the outer end member;

Fig. 14 is a view of the plug for the opposite end, and,

Fig. 15 is a sectional view on the line 15—15 of Fig. 3.

In the drawings the door to be controlled is indicated at 10, the same being mounted in a casing 11. A lug 12, which acts as a pivot is secured to the casing while a bracket having pivoted ears 13, is fixed to the door. An apertured ear 14, formed integrally with the plug 15, (best shown in Figs. 3 and 9) serves as the connection between the stop and the pivoted lug 12. A transverse pin 16, which projects from the plug and operates in the slots 17, in the casing or barrel 18, serves as the means for preventing longitudinal separation of the two parts but permits limited angular movement of the casing 18, with relation to plug 15. As a means for restricting such relative movement I provide the spring-advanced plunger 19, which may advantageously be formed of leather or similar material.

The casing or barrel 18, is provided at one end with the oppositely extending apertured arms 20, (best shown in Figs. 5, 6, 8) to which chains 21, 22, may be attached, for a purpose hereinafter described. On the opposite end the casing is provided with a small aperture 23, adapted to accommodate a ball 24, resiliently held in place by the flat spring 25. The ball projects through an opening 26, in the rack member 27, (shown in Fig. 10) and engages a slight depression 28 formed in the intermediate sliding member 29 (shown in Fig. 11). The ball serves the purpose of resiliently retaining the intermediate member in place.

The rack member 27, is rigidly fixed to the barrel 18, and is provided with a longitudinal slot 30, within which the toothed lug, secured to the barrel 29, is adapted to travel. The lug is of less width than the slot 30, thereby providing for limited freedom of

movement to engage and disengage the teeth of the lug and the teeth of the rack member 27.

The second rack member 32, (shown in Fig. 12) is substantially a duplicate of the member shown in Fig. 10 except that it is of smaller diameter to enable its being secured to the inside of the intermediate member 29. It is also provided with the slot 33, within which the toothed lug 34, on the extreme outer member 35, may operate. The member 35, (as best shown in Fig. 4) has a plug 36, fitted in its open end, the plug terminating in an apertured ear 37, for engagement with the bracket member 13. A pin and slot connection 38, and a tension spring 39, serve as a means for absorbing excessive shocks due to the extreme opening of the door. The pin 38, however, serves to prevent relative rotation between the apertured ear 37 and the outer member 35. It will be noted that the rack member 27, is rigid with the casing 18, and that the rack member 32, is rigid with the intermediate member 29. Also that the extreme outer member 35, is non-rotatable. It will, however, be noted that the members 18 and 29, with their attached racks, are rotatable relative to the support 14, and the outer member 35. Therefore, rotation imparted to these members by a pull on the chains 21 or 22, will result in engaging or disengaging the toothed lugs 31, 34, with the rack members 27, 32, and this is true at all points of extension. In other words, the door which is controlled by this device may be securely and rigidly locked at any point in its opening movement.

One advantage in the use of a device of this sort which is mounted at the upper end of the door is that practically all door checks are mounted at this point and as the spring of the check tends to exert a constant closing force, this force is exerted at substantially the point of application of the force instead of at the lower, outer corner of the door, as in the case of the foot operated stops. The use of this stop is objectionable, not only for the reason stated, but for various other reasons. They serve to mar polished floors; they do not securely hold on such floors and if rugs are employed the holding action is still less secure. The advantage in the device herein described is that it is a positive lock instead of a frictional one.

It is desirable when the door begins its opening movement that the first or outer member 35, be advanced first, and it is for this reason that I employ the spring pressed ball 25. The resistance afforded by the ball will prevent the movement of the intermediate member 29, until the outer member is fully extended. The operation of locking and interlocking will probably be apparent but it may be stated that the first motion following a pull exerted on the chain 22, serves to rotate the casing 18, and its rigid rack bar into engagement with the lug 31, on the part 29. Continued rotation sets up a similar movement of the part 29, and its contained rack bar 32, until engagement with the lug 34, is effected. The interlocking action is the reverse of that described.

The device has been shown with three telescoping parts but it will be understood that it may be used with equal facility if only two of such parts are employed. The invention is not limited therefore to the precise construction shown and described.

I claim:

1. In a device of the class described, the combination of a tubular member fixed to a support, a tubular member fixed to a door, an intermediate tubular member, all of said members being in telescoping engagement, one of the tubular members being fixed against rotation, the other of said tubular members being mounted for limited rotation, and rack bars and teeth carried on the telescoping members, said bars and teeth being adapted for engagement to lock the telescoping members at different points in their extension, substantially as described.

2. In a device of the class described, the combination of a tubular member fixed to a support with capacity for limited rotation said member carrying a rack, a second tubular member fixed to a door with capacity for limited spring-resisted longitudinal movement, teeth carried by said last named tubular member, and means operative through the agency of said rack and teeth for locking the tubular members against longitudinal movement, said locking action being caused by the rotation of said first named member, substantially as described.

3. In a door stop, the combination of a tubular member, means for connecting the same to a support with capacity for limited rotation, friction means for resisting said limited rotation, a second tubular member adapted to be connected to a door, a rack and rack teeth on the tubular members, and means operative through the agency of said rack and rack teeth for locking the tubular members in different positions of longitudinal separation, substantially as described.

4. In a door stop, the combination of a tubular member having a rack affixed to the inner surface thereof, a second tubular member fitted within the first member and provided also with a rack affixed to the exterior surface thereof, the teeth of said racks being oppositely disposed, and means permitting relative rotation of the two tubular members to cause engagement of said racks, the parts being so arranged that neither of said racks is visible in any position of the parts, substantially as described.

5. In combination, a tube provided with an internal, longitudinal groove, one edge of which is toothed in the form of a rack, a second tube having a short rack fixed to the exterior thereof near one end, said rack being of such width as to fit within said groove with freedom for limited angular movement to engage with and disengage from said first mentioned rack, and means for effecting relative angular movement between said tubes, the exterior of said first tube and the exposed portion of the exterior of the second tube when in extended position being circumferentially complete, substantially as described.

6. In combination, a tube having a rack tube permanently secured therein, said rack tube having a longitudinal groove, one edge of which is toothed, a telescoping tube adapted to reciprocate within said rack tube and provided with a toothed lug occupying, but of less width than, said groove, an attaching lug connected to the end of said first tube and means permitting limited angular movement of the first tube relative to said lug, substantially as described.

7. In combination, a tube, a plate bent into cylindrical form and permanently fixed in said tube, one edge of said plate being notched in the form of a rack, a second tube reciprocable within said cylinder and provided with a toothed lug near one end thereof, said lug being adapted to engage said rack upon relative angular movement of the two tubes, and means for connecting the extremities of said tubes to a door and casing respectively, substantially as described.

8. In a door stop, the combination of a tubular member having a rack affixed to the inner surface thereof, a second tubular member fitted within the first member and provided also with a rack affixed to the exterior surface thereof the teeth of said racks being oppositely disposed, means at the extremities of said tubes for connecting the same to a door and casing respectively, and shock-absorbing means in one of said connections, substantially as described.

WILLIAM H. LEAVER.

Witness:
T. D. BUTLER.

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