Aug. 18, 1931. R. C. GRAY 1,818,977

FRICTION CASEMENT ADJUSTER

Filed Jan. 25, 1929

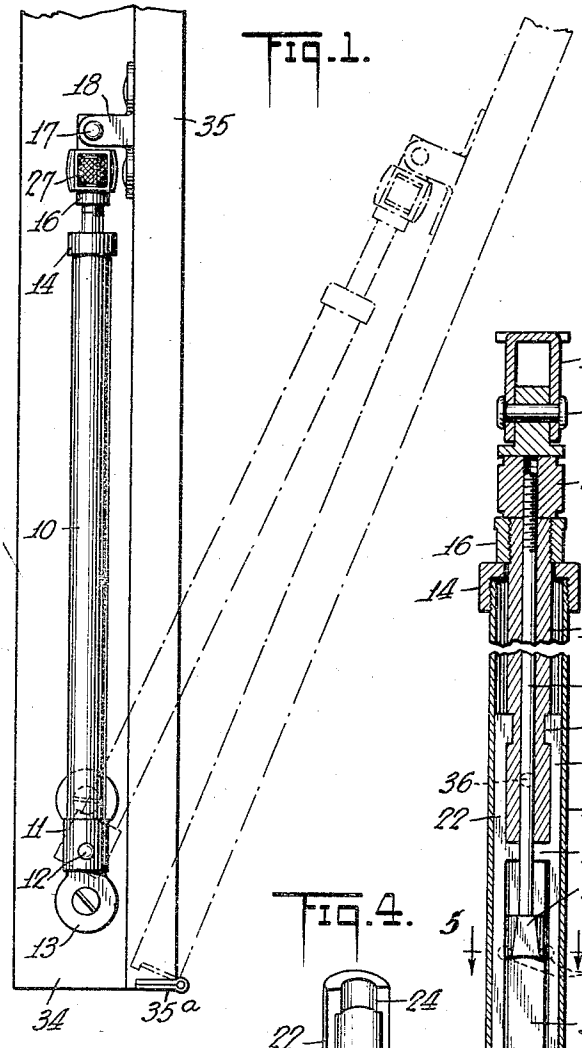

Fig. 1.

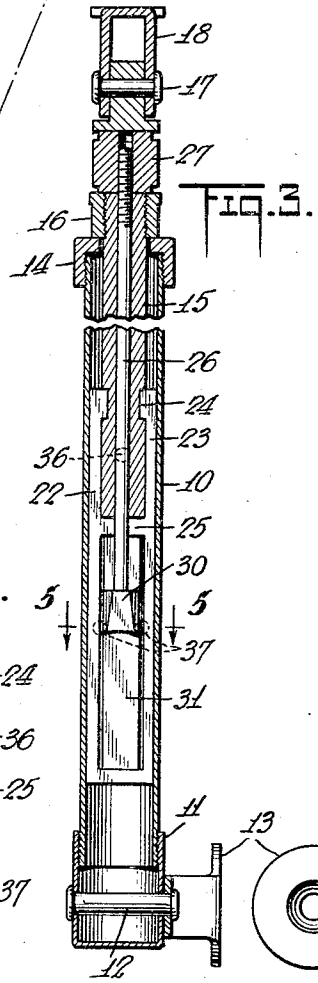

Fig. 3.

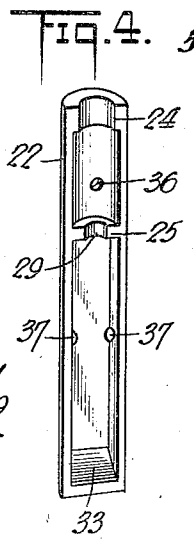

Fig. 4.

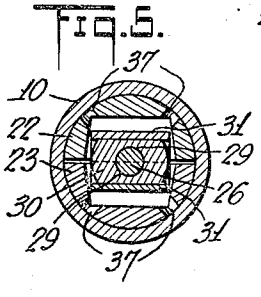

Fig. 5.

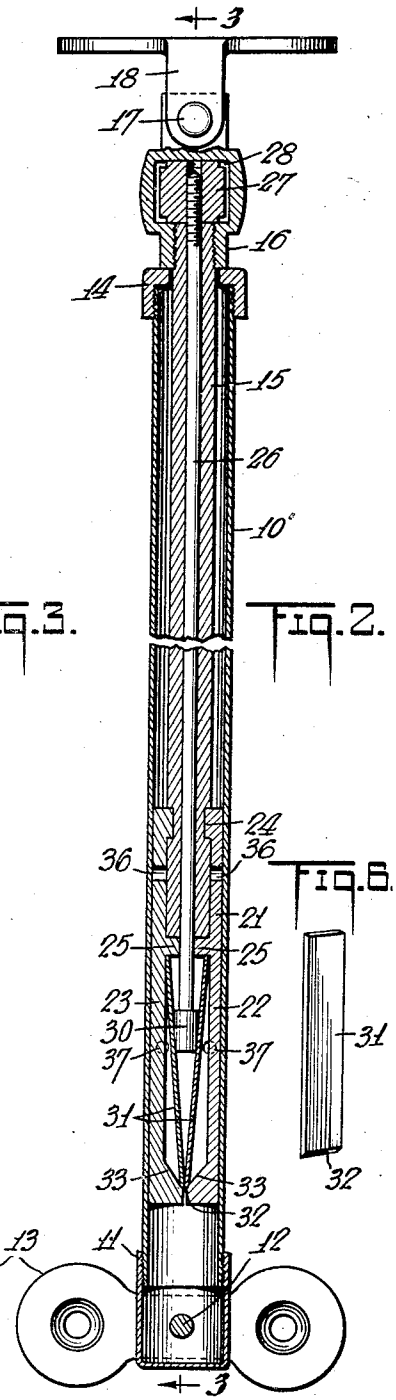

Fig. 2.

Fig. 6.

INVENTOR
Robert C. Gray
BY Russell Bond
ATTORNEY

Patented Aug. 18, 1931 1,818,977

UNITED STATES PATENT OFFICE

ROBERT C. GRAY, OF WARREN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

FRICTION CASEMENT ADJUSTER

Application filed January 25, 1929. Serial No. 334,965.

My invention relates to improvements in friction casement adjusters of the type adapted for use on casements, transoms and similar hinged devices for holding the same at any desired position.

My invention more particularly relates to casement adjusters provided with means for regulating the resistance offered by the adjuster to movement of the window or other device to which it is attached.

I am aware that adjusters have been produced and are in commercial use in which tractive friction may be regulated after the adjuster has been attached to the casement. In such adjusters a barrel and plunger are used, the barrel being connected to the frame of the window and the stem of the plunger to the casement, so that as the casement is swung open the plunger will be drawn along the barrel. The plunger is made of two sections which are relatively expansible so as to vary frictional engagement with the barrel. The plunger stem has a wedge thereon which fits between the plunger sections and said sections engage a nut threaded on the stem, so that by turning the plunger in one direction or the other with respect to the stem there will be a relative movement between the wedge and the plunger sections, causing the latter to expand or contract, depending upon the direction of turning. Since the plunger is inaccessible the barrel is so mounted that it may be rotated and thus, by reason of frictional engagement between the barrel and the plunger, the latter will also be rotated. It will be observed that in this construction reliance is placed on initial friction between the plunger and the barrel, else the plunger cannot be turned, but in adjusting the device a careless or unexperienced person might turn the barrel sufficiently to lose friction between the barrel and the plunger. When this happens, the only way of adjusting the device is to take it apart and turn the plunger on the stem until it has expanded sufficiently to produce the requisite friction.

It is an object of my invention to overcome this difficulty by providing a construction such that expansion of the plunger will not depend upon frictional engagement between the plunger and barrel.

Another object is to provide means for adjusting a wedge in an expansible plunger from a point outside the barrel of the adjuster.

Another object of my invention is to provide an adjuster in which the plunger is automatically lubricated, thereby insuring a smooth operation at all times. With the constructions as heretofore produced it has been undesirable to provide lubrication for the plunger for the reason that the friction between the plunger and the barrel has been depended upon to furnish the means for adjusting the expansion of the plunger. By reason of the positive expansion of the plunger provided by my invention, this difficulty no longer exists and consequently, I am able to provide means which will automatically keep the contacting surfaces of the plunger and barrel lubricated. Another advantage of lubricating the plunger, lies in the fact that once the device has been adjusted for a certain tractive resistance the adjustment will be maintained with a high degree of permanency, whereas in previous constructions the dry contacting surfaces were apt to wear and vary the tractive resistance, thus requiring constant adjustment.

With these objects in view and other objects which will appear hereinafter, I shall now describe a preferred embodiment of my invention and shall thereafter point out the novelty and scope of the invention in the claims.

In the accompanying drawings:

Figure 1 is a side elevation of my improved friction casement adjuster showing the device as adapted to a casement window;

Fig. 2 is a view of the adjusted in longitudinal section and on a larger scale;

Fig. 3 is a view in section taken on the line 3—3 of Fig. 2;

Fig. 4 is a view in perspective of one of the plunger sections;

Fig. 5 is a view in transverse section taken on the line 5—5 of Fig. 3; and

Fig. 6 is a view in perspective of one of the plates used in the plunger.

My improved adjuster comprises a barrel or cylindrical casing 10 provided with a cap 11 on one end thereof. The cap is pivotally secured by means of a rivet 12 to a bracket 13. The opposite end of the barrel is provided with a cap 14 which is centrally apertured to pass a plunger stem 15. The plunger stem 15 is screwed or otherwise secured in one end of a fitting 16 which at its opposite end is pivotally connected by means of a rivet 17 to a bracket 18.

Within the barrel 10 is an expansible plunger 21 which is longitudinally slit to form two like sections 22 and 23. Each section is in the form of a semi-cylindrical shell provided with an inwardly extending flange 24 at its upper end. The stem 15 is formed with an annular recess to receive the flanges 24, thereby attaching the plunger to the stem so that the plunger may be drawn into or out of the barrel 10 and at the same time will be free to expand. Each of the plunger sections is further provided with a diaphragm wall 25 which fits against the inner end of the stem 15.

The plunger 15 is longitudinally bored to receive a rod 26 extending therethrough. This rod is provided at its upper end with a screw thread adapted to engage a nut 27. This nut is fitted into a slot 28 which extends transversely through the fitting 16. The outer surface of the nut is knurled so that it may readily be turned between thumb and finger to feed the rod 26 longitudinally with respect to the stem 15. The rod 26 projects from the inner end of the stem 15, passing through an aperture 29 formed between the diaphragm walls 25, and secured to the lower end of the rod there is a wedge 30. This wedge preferably consists of a cylindrical plug with opposite sides thereof cut away at an angle to reduce the thickness of the plug toward its lower end.

The plug is adapted to bear against a pair of plates 31 which are mounted in the plunger 21. These plates, as indicated in Fig. 6, are of spring steel and are mounted at an angle corresponding substantially to the angle of the wedge as clearly shown in Fig. 2. In other words, the plates at one end are seated against the shell of the plunger sections at the base of the diaphragm walls 25 and meet at the junction line of the sections near the lower end of the plunger. The lower ends of the plates 31 are preferably beveled as indicated at 32 (Fig. 6) so as to fit against inclined surfaces 33 formed in the plunger sections. The plates are free to flex because they are supported only at their ends and being formed of spring metal, they provide for a resilient expansion of the plunger.

In use, the device may be mounted as shown in Fig. 1, or if desired it may be inverted. In either case one of the brackets will be secured to the window frame 34 and the bracket to the casement 35. Because the pivotal connection to the bracket secured to the frame 34 is not axially alined with the hinge 35ª connecting the casement to the frame, when the window is swung open, as indicated by broken lines in Fig. 1, the plunger stem 15 will be drawn out of the barrel 10, sliding the plunger 21 in the barrel. This movement will be resisted by friction between the plunger and the barrel. The friction is regulated by turning the nut 27 so as to feed the wedge 30 in or out of the plunger, and it will be evident that as the wedge is fed inward the plunger sections 22 and 23 will be moved apart, expanding the plunger and increasing the friction between the plunger and the barrel.

In order to lubricate the plunger each plunger section is formed with an aperture 36 therethrough in that portion of the section in which the end of the stem is seated, and also with a pair of apertures 37 in the lower portion of the plunger under the plates 31. A certain amount of graphite or other lubricant is introduced into the openings 36 and 37 and also a store of lubricant may be provided in the spaces under the plates 31. This lubricant will serve to keep the outer surface of the plunger well lubricated so that a smooth action will always be provided between the plunger and the barrel, and there will be no danger of wearing the surfaces, as would happen if dry friction surfaces were used.

It will be observed that in regulating this adjuster, the wedge 30 is positively fed into or out of the plunger by turning the nut 27. In other words, there is a positive means for regulating the tractive friction of the adjuster from a point outside of the barrel, so that no matter how loose the plunger may be in the barrel it can always be expanded to the desired extent. At first thought it may be considered that the rod 26 should be held while the nut 27 is turned thereon, but the rod 26 will not turn with the nut 27 because of its engagement with the plates 31 and even though the plunger were contracted to such an extent as to provide no frictional contact between the barrel 10 and the plunger, there is sufficient frictional engagement between the flanges 24 and the recess 25 in the stem 15 to insure holding of the rod 26 against turning when the nut 27 is adjusted.

While I have described and illustrated a preferred embodiment of my invention, I wish it to be understood that this is merely illustrative and not limitative of my invention and that I consider myself at liberty to make such variations and changes in construction and arrangements of parts as fall within the spirit and scope of the following claims.

I claim:

1. In a device of the character described, a barrel, a plunger slidable therein, a hollow stem connected to the plunger and projecting from the barrel, the plunger having a pair of laterally separable sections, a wedge adapted to force the sections apart and thereby diametrically expand the plunger, a rod secured to the wedge and extending through the stem, and means for adjusting the rod longitudinally to control the expansion of the plunger.

2. In a device of the character described, a barrel, a plunger slidable therein, a hollow stem connected to the plunger and projecting from the barrel, the plunger comprising a pair of laterally separable sections, a bearing plate in each section, a wedge operable between the bearing plates to force the sections apart, and means exterior to the barrel for operating the wedge.

3. In a device of the character described, a barrel, a plunger slidable therein, a hollow stem connected to the plunger and projecting from the barrel, the plunger comprising a pair of laterally expansible sections, a resilient bearing plate in each section, a wedge operable between the plates to force the sections apart, a rod secured at its inner end to the wedge and projecting through the stem, the outer end of the rod being threaded, a nut upon said threaded rod, and means for limiting axial movement of the nut with respect to the stem whereby on rotation of the nut the wedge will be adjusted to determine the diametric expansion or contraction of the plunger.

4. In a device of the character described, a barrel, a plunger slidable therein, a hollow stem connected to the plunger and projecting from the barrel, the plunger comprising a pair of laterally expansible sections, a resilient bearing plate in each section, a wedge operable between the plates to force the sections apart, a rod secured at its inner end to the wedge and projecting through the stem, the outer end of the rod being threaded, a nut upon said threaded rod, a fitting secured to the outer end of the stem and having a transverse slot therein to receive the nut, and a pair of brackets pivotally secured to the barrel and the fitting respectively.

5. In a device of the character described, a barrel, a plunger slidable therein and comprising a pair of laterally separable sections, a resilient bearing plate in each section, a wedge movable between the plates to force the sections apart, and means exterior to the barrel for moving the wedge, each plunger section being formed with a pocket for lubricant closed by one of the bearing plates and with an opening leading therefrom to the exterior of the plunger section whereby as the plate is flexed lubricant will be forced out of the pocket through the opening.

6. In a device of the character described, a barrel member, a plunger member movable therein, means for attaching one of said members to a window casing and the other to a window, means for expanding the plunger member to cause friction between the latter member and the casing member, and means exterior to the casing member and operable while said members are attached for positively controlling the expanding means to maintain any desired degree of friction.

7. In a device of the character described, a barrel member, an automatically expansible plunger member, means for expanding the plunger member to cause friction between the latter member and the casing member, and means exterior to the casing member and operable while said members are attached for positively controlling the expanding means to maintain any desired degree of friction.

8. In a device of the character described, a barrel member, an automaticaly expansible plunger member, means for resiliently expanding the plunger member to cause friction between the latter member and the casing member, and means exterior to the casing member and operable while said members are attached for positively controlling the expanding means to maintain any desired degree of friction.

9. In a device of the character described, a barrel, an automatically expansible plunger slidable therein, means within the plunger for resiliently expanding the same, means exterior to the barrel for actuating the expanding means, and means actuated by the expanding means for lubricating the plunger.

10. In a device of the character described, a barrel, a plunger slidable therein and comprising a pair of lateraly separable sections, a wedge slidable between the sections, and means exterior to the barrel for effecting a positive nonrotary sliding movement of the wedge with respect to the sections to force the sections apart and hold the same at any desired degree of spacing.

In testimony whereof, I have signed this specification.

ROBERT C. GRAY.