Oct. 28, 1952 T. C. RADFORD 2,615,513

ROLL-AWAY SCREEN

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Fig. 1

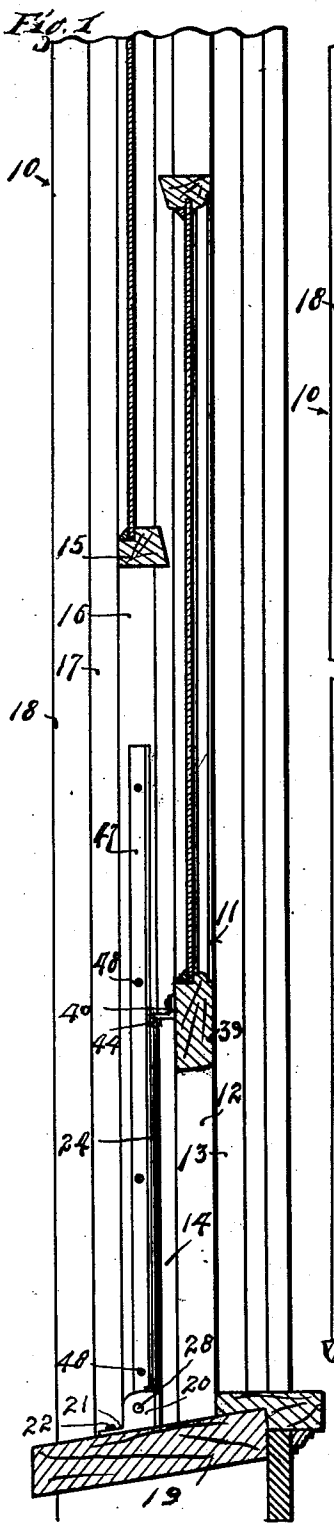
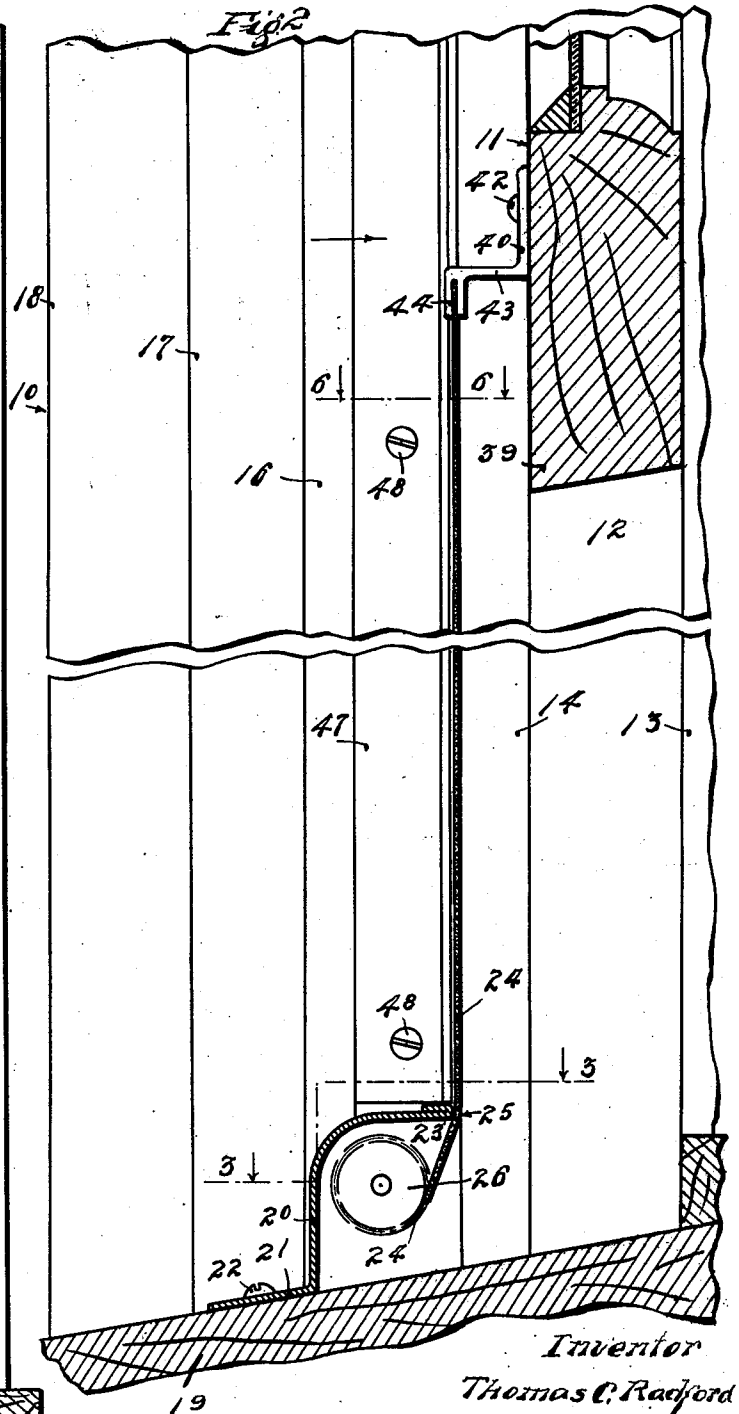


Fig. 2



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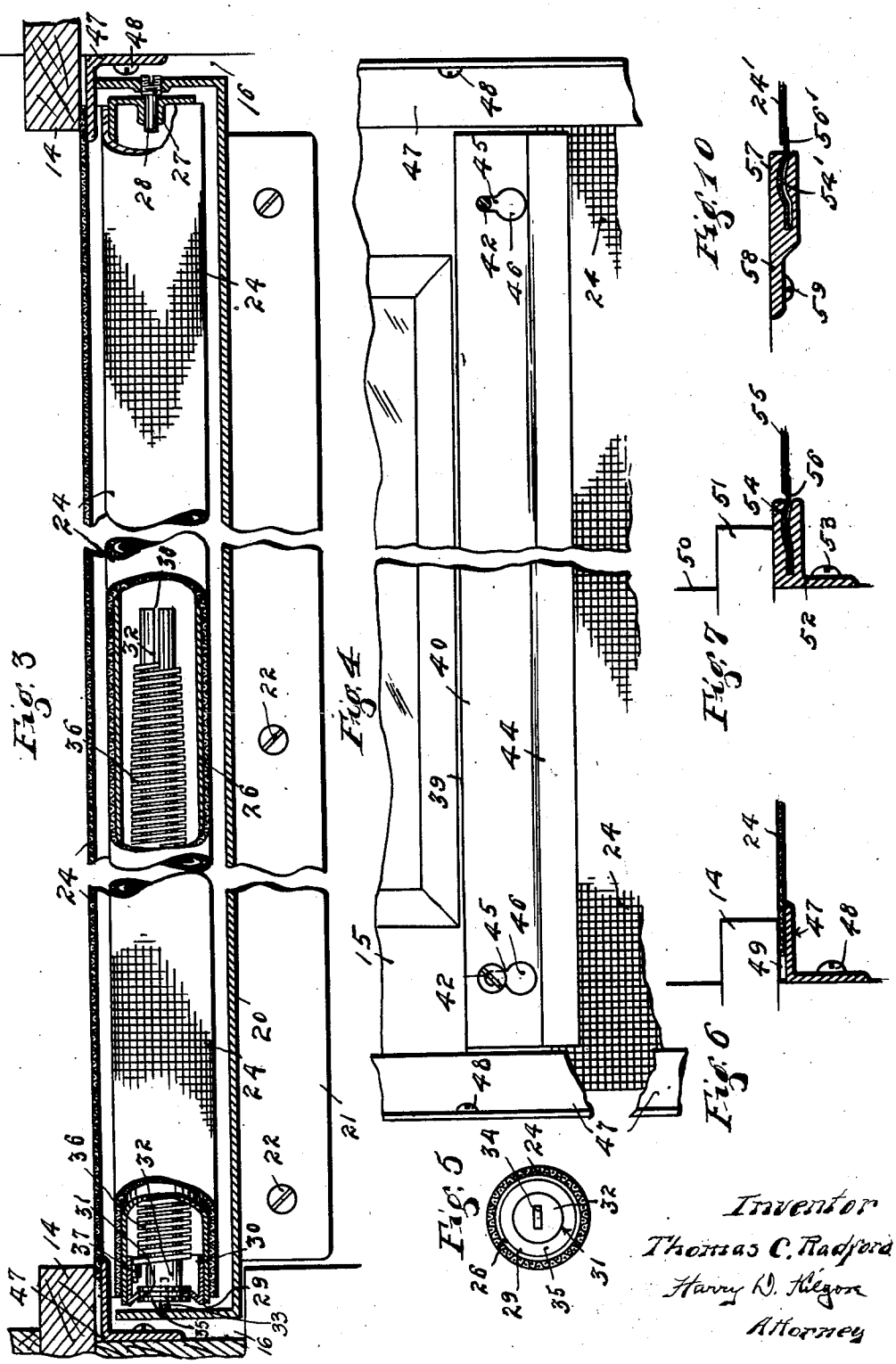


Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 10

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Fig. 8

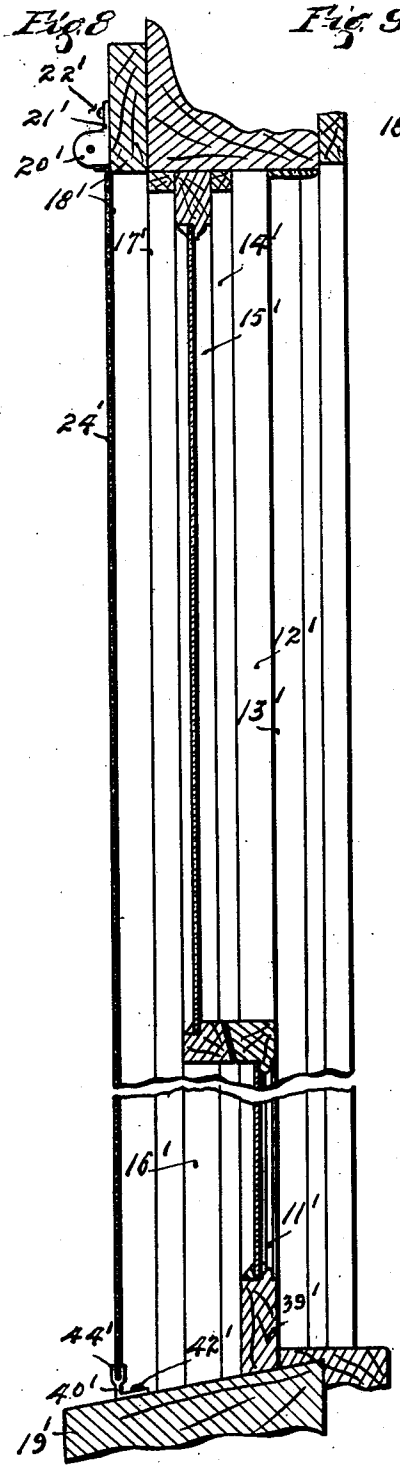
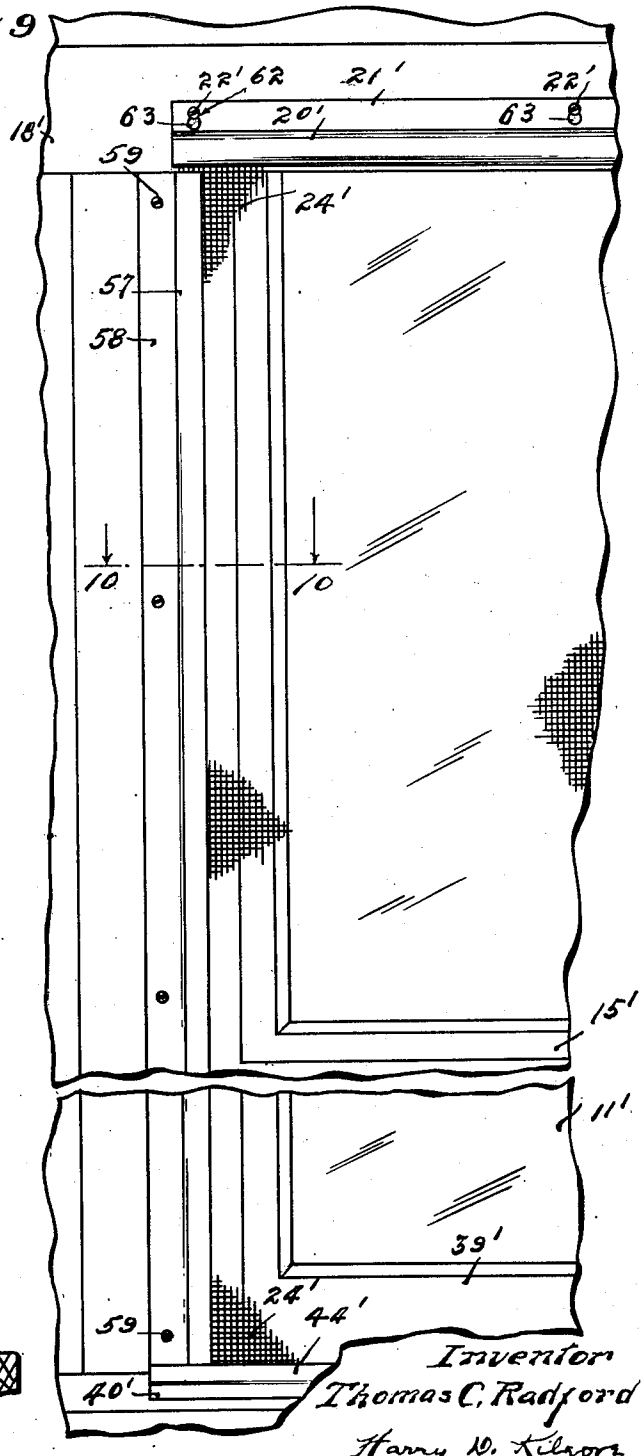


Fig. 9



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ROLL-AWAY SCREEN

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3 Claims. (Cl. 160—28)

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My invention relates to improvements in screens and, more particularly, to one that will roll away.

While the invention is intended for general use, it is especially well adapted for use in all openings for windows, doors, automobile windows and the like.

The object of this invention is to provide a screen that is very compact, easy to install and, when installed, is permanent, requires no seasonal removal and replacement, is self-storing, does not interfere with storm window installation, and is self-adjusting as to length.

To the above end, generally stated, the invention consists of the novel devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a fragmentary view principally in vertical section taken centrally through a double-hung window in which the invention is installed;

Fig. 2 is a view corresponding to Fig. 1, but is considerably more fragmentary, further sectioned, broken and on an enlarged scale;

Fig. 3 is a broken detail view partly in plan and partly in horizontal section taken on the irregular line 3—3 of Fig. 2;

Fig. 4 is a fragmentary broken elevational view looking at certain parts in Fig. 2 in the direction of the arrow marked thereon;

Fig. 5 is a left-hand end view of roller and screen, as shown in Fig. 3, removed from the housing;

Fig. 6 is a detail view partly in diagram and partly in section taken on the line 6—6 of Fig. 2, and rotated 90° counterclockwise;

Fig. 7 is a view corresponding to Fig. 6, but showing a modification thereof;

Fig. 8 is a broken view corresponding to Fig. 1, but showing a different installation of the invention;

Fig. 9 is a fragmentary outside elevational view of the parts shown in Fig. 8;

Fig. 10 is a detail view in section taken on the line 10—10 of Fig. 9, on an enlarged scale.

For the purpose of showing one installation of the invention, there is fragmentarily illustrated in Figs. 1 to 4, inclusive, a double-hung window in which the invention is installed. Of the parts of the window shown, it is important to note the frame 10, the lower sash 11 mounted in runways 12 formed by outer stops 13 and intermediate

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stops 14, the upper sash 15 mounted in runways 16 formed by the intermediate stops 14 and the outer stops 17, outside casing 18 and the sill 19.

Referring now in detail to the invention shown in Figs. 1 to 6, inclusive, the numeral 20 indicates a long housing having an open front and bottom. The end portions of the housing 20 extend into the runways 16. Integral with the back of the housing 20, at the bottom thereof, is an outturned flange 21 which rests on the sill 19 and is detachably secured thereto by screws 22. This flange 21 extends the full distance between the stops 17. The top of the housing 20, at the front thereof, is folded backwardly upon itself to afford a smooth directional guide 23 for a plastic mesh screen 24. This guide 23 is spaced outwardly from the intermediate stops 14 to leave narrow passageways 25 therebetween and closely positions the screen 24 to the outer faces of said stops.

Within the housing 20 is a long tubular roller 26, the right-hand end of which, as shown in Fig. 3, is closed and has at its axis a hub 27 that projects into the roller 26. A trunnion 28 has screw-threaded engagement with the right-hand end of the housing 20 on which the hub 27 is turnably mounted and supports the respective end of the roller 26 therefrom. The purpose of attaching the trunnion 28 to the housing 20, by means of screw-threads for axial adjustment, is to facilitate the mounting of the roller 26 thereon.

A cap 29 closes the left-hand end of the roller 26 and has an annular flange 30 telescoped into said roller and rigidly secured thereto. The central portion of the cap 29 is inset and has an axial hole 31. A round rod 32 extends into the roller 26 through the axial hole 31. This cap 29 and hence the roller 26 is turnably mounted on the rod 32. A flat stud 33, rigidly secured to the inner side of the left-hand end of the housing 20, extends into an oblong hole 34 in the outer end of the rod 32 and thereby holds said rod from turning. A pair of opposing washers 35 is rigidly secured to the rod 32 and the cap 29 extends therebetween. These washers 35 hold the rod 32 against axial movement relative to the roller 26.

Encircling the rod 32 is a coiled spring 36, one end portion of which extends through a loop 37 cut and pressed from the flange 30 on the cap 29. The other end of the spring 36 extends transversely through a slit 38 in the inner end of the rod 32 and anchors the spring 36 thereto. The screen 24 is attached to the roller 26 and is arranged to be wound thereon. This screen

extends out of the housing 20 through the passageways 25.

The screen 24, at its upper edge portion, is secured to the lower rail 39 of the lower sash 11 by a connector plate 40. This connector plate 40 is secured to the rail 39 of the lower sash 11 by screws 42. Integral with the lower longitudinal edge of the connector plate 40 is an outturned flange 43 which extends transversely between the intermediate stops 14. On the longitudinal edge of the flange 43 is a pair of downturned jaws 44 between which the upper edge portion of the screen 24 extends and is rigidly secured. The screws 42 extend through vertical slots 45 in the connector plate 40 and also formed in said connector plate, at the lower ends of the slots 45, are round holes 46 slightly larger in diameter than the heads of the screws 42. To remove the connector plate 40 from the sash 11, or in other words, detach the screen 24 from said sash, it is only necessary to lift the connector plate 40 to align holes 46 with the screws 42 and then move the connector plate 40 outwardly from the sash rail 39 to withdraw the connector plate 40 from the screws 42. The flange 43 which extends transversely between the stops 14 forms a closure between the sash rail 39 and the screen 24. The jaws 44 hold the screen 24 parallel to the stops 14.

Vertical guides 47 are provided for the longitudinal edge portions of the screen 24. These guides 24 are formed of angle bars having one of their flanges in the runways 16 and secured to the window frame 10 by screws 48. The other flanges of the guides 47 extend parallel to the intermediate stops 14 and are spaced outwardly thereof to form narrow channels 49 into which the longitudinal edge portions of the screen 24 extend.

From the above description, it is evident that the roller 26 is at all times under strain to wind the screen 24 thereon and hold the same taut so that the same is smooth. When raising the lower sash 11, the operation thereof will unwind the screen 24 from the roller 26 so that the same is self-adjusing for the size of the opening between the sash 11 and the sill 19. Pull on the screen 24, by the raising of the lower sash 11, will rotate the roller 26 and thus progressively increase the tension of the spring 36.

When lowering the lower sash 11, the tensioned roller 26 will wind the screen 24 thereon so that the same is self-adjusting for the window opening between said sash and the sill 19. The guides 47 keep the overlapped longitudinal edge portions of the screen 24 close to the stops 14. The housing 20 and the connector plate 40 form closures between the screen 24 and the window. The plastic screen 24, due to the nature thereof, will wind on the roller 26 in very compact form so that the same occupies comparatively little space and does not interfere with the raising or lowering of either of the sash 11—15 or the installation of a storm window. When the lower sash 11 is closed, the jaws 44 substantially engage the top of the housing 20 so that the screen 24 is encased and out of the weather.

Referring now to the modification of the guide 47 shown in Fig. 7, wherein the window frame and intermediate stop are diametrically shown and designated by the numerals 50 and 51: The modified guide 52 is also in the form of an angle bar having one of its flanges secured to the window frame 50 by screws 53. The other flange of the guide 52, which extends parallel to and

contacts the outer side of the stop 51, has formed therein a narrow, deep groove 54 that is concavo-convex in cross-section and extends the full length of the guide 52. The plastic screen 55, at its longitudinal edge portions, is attached to thin spring tapes 56, only one of which is shown. The tape 56 shown slides endwise in the groove 54 and will wind, with the screen 55, on a roller. The tape 56 is concavo-convex in cross-section and is thus interlocked with the guide 52 and prevents edgewise removal of the tape 56 from the guide 52. One of the main reasons for interlocking the screen 55 with the fixed guides 52 is to prevent a child from pushing the screen out and falling out of the window.

In the installation of the screen shown in Figs. 9 and 10, all parts that correspond to like parts in Figs. 1 to 6, inclusive, are given the same reference numerals followed by a prime (′). In this installation, the housing 20′ is attached to the head member of the outside casing 18′ and the connector plate 40′ is attached by screws 42′ to the sill 19′. A guide 57, identical with the guide 52 except that it is in the form of flat bars in place of an angle bar, has a rearwardly projecting extension 58, of reduced thickness, secured by screws 59 to one of the stiles of the casing 18′. The tape 56′ in the groove 54′ is attached to the screen 24′.

To put a storm window, not shown, in the window frame 10′, the connector plate 40′ is removed from the sill 19′ and the screen 24′ is wound and stored in the housing 20′. If desired, the housing 20′ may be removed from the casing 18′ without removing the screws 22′. To permit this removal of the housing 20′, the flange 21′ is provided with notches 62 and holes 63 for the screws 22′.

From what has been said, it will be understood that the invention described is capable of modifications as to details of construction and arrangement within the scope of the invention herein disclosed.

What I claim is:

1. In a device of the class described, a housing, a tubular roller in the housing, an axially movable trunnion on the housing on which the roller at one end is removably mounted, a cap closing the other end of the roller and having an axial hole, a rod extending into the roller through the axial hole in the cap, said rod having an out-of-round axial hole in the outer end thereof, said cap being rotatably mounted on the rod, an out-of-round stud on the housing and extending into said axial hole in the outer end of the rod, and removably supporting the rod, a coiled spring encircling the rod and having one of its ends secured to the roller and having its other end attached to the rod, a screen windable on the roller, said screen having means on its other end for attaching the same to a support, and means for holding the roller and rod against relative axial movement.

2. In a device of the class described, a housing, a tubular roller in the housing, an axially movable trunnion on the housing on which the roller at one end is removably mounted, a cap closing the other end of the roller and having an axial hole, a rod extending into the roller through the axial hole in the cap, said rod having an out-of-round axial hole in the outer end thereof, said cap being rotatably mounted on the rod, an out-of-round stud on the housing and extending into said axial hole in the outer end of the rod, and removably supporting the rod, a coiled spring

encircling the rod and having one of its ends secured to the roller and having its other end attached to the rod, a screen windable on the roller, said screen having means on its other end for attaching the same to a support, and a pair of opposing washers rigidly secured to the rod between which the cap extends and thereby holds the roller and the rod against relative axial movement.

3. In a device of the class described, an elongated housing having an open side and closed ends, a tubular roller in the housing, a cap closing one end of the roller and having an axial hole, a rod extending axially into the roller through the hole in the cap, means holding the rod and the roller against relative axial movement, a fixed stud on one of the closed ends of the housing, said rod being mounted at its outer end on the stud for endwise removal, said rod and stud having out-of-round interlocking engagement that holds the rod from turning, a trunnion having screw-threaded engagement with the other closed end of the housing and on which the roller at its other end is turnably mounted, said trunnion being operable to release the roller and permit the same to be removed from the stud and from the housing through its open side, a coiled spring encircling the rod and having one of its ends secured relative to the roller and its other end attached to the rod, and a screen windable on the roller and having means on its outer end for attaching the same to a support.

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