Nov. 1, 1932. R. A. NORQUIST ET AL 1,885,756

WINDOW SCREEN

Filed Aug. 28, 1929

Fig. 1.

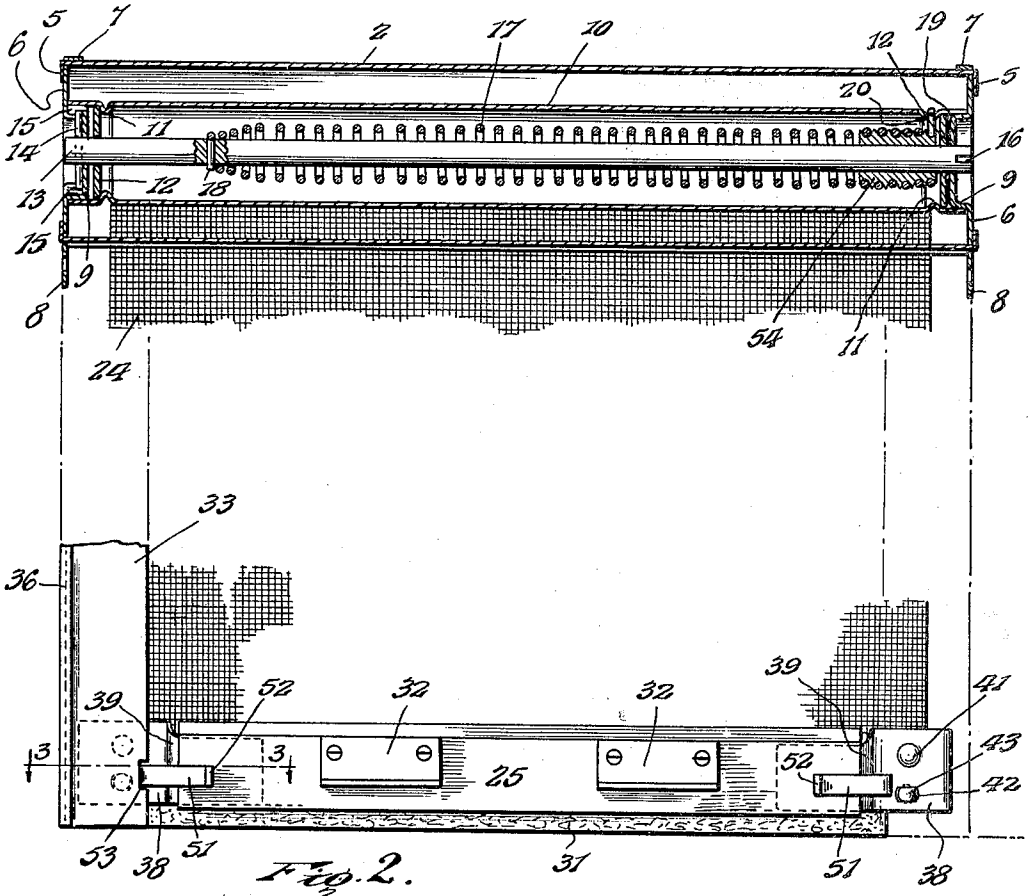


Fig. 2.

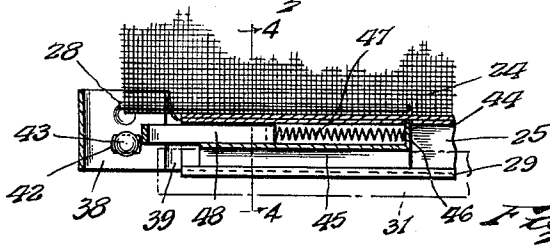


Fig. 4.

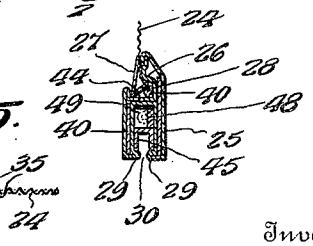


Fig. 5.

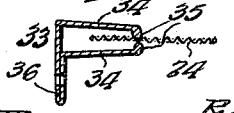
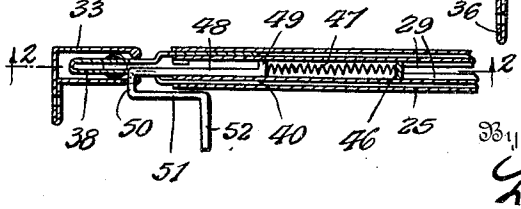


Fig. 3.



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# UNITED STATES PATENT OFFICE

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## WINDOW SCREEN

Application filed August 28, 1929. Serial No. 389,029.

This invention relates to window screens of the rolling type and has for its object the provision of an improved guide and improved means for engaging the guide and maintaining the engagement of the edges of the screen with the guides. It is also an object of the invention to provide a novel latch mechanism whereby the screen may be retained in its lowered position and which mechanism may be very cheaply and expeditiously produced. The invention is illustrated in the accompanying drawing and consists in certain novel features which will be hereinafter first fully described and then more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a vertical section taken along the axis of the winding drum,

Fig. 2 is an enlarged sectional view through the latch mechanism,

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1, the line 2—2 in Fig. 3 indicating the plane of the section shown in Fig. 2,

Fig. 4 is a detail section on the line 4—4 of Fig. 2,

Fig. 5 is a section through the guide.

The invention is applicable to any window frame. In applying the invention, there is provided a box or case 2 of rectangular cross section whereby it may fit closely against the lintel of the window frame and against the front bead on said frame. The case is preferably formed of sheet metal, and has a slot in its bottom through which the screen may pass to be wound and unwound. The ends of the longitudinal walls of the casing are formed with tongues, as shown at 5 in Fig. 1, which are inserted through slots provided therefor in the end walls or plates 6 and bent down so as to be clinched against said end plates. The end plates are provided along three edges with flanges 7 whereby they will center the case, the flanges being omitted at the lower corners of the plates and the plates being extended downwardly to provide tongues 8 through which fastening devices may be inserted into the sides of the window frame to secure the box or case in place. If the window should be very wide so that the case will be long enough to show a tendency to sag between its ends, the ordinary right angle brackets may be provided and secured through one leg to the case and through the other leg to the top or lintel of the window frame. The described connection between the casing and the end plates avoids the use of rivets or other extraneous fastening devices and permits the parts to be very easily assembled without impairing the efficiency of the connection so that the case may be easily fitted into position within the window frame and will not come apart as long as the window frame remains intact.

The central portion of each end plate is pressed laterally to form a boss 9 which, when the parts are assembled, extends inwardly and constitutes a bearing for the winding drum shown at 10. The drum is provided adjacent each end with projections or teats 11 pressed inwardly and constituting stops to resist endwise movement of the drum. Against the outer side of each set of teats 11, a washer 12 is fitted to the drum so as to be disposed between the teats and the respective bosses 9 and thereby maintain the relation of the parts. The washers and the bosses are provided with axially alined openings to receive the winding rod 13 which is fitted rotatably and slidably therein. At one end, the left hand end in Fig. 1, a pin 14 is inserted through the end of the rod and the coacting boss 9 is provided with diametrically opposite lugs or notches 15 within which the ends of the pin seat to prevent relative rotation of the rod, while at the opposite end the rod is formed with a diametrical notch 16 adapted to be engaged by a screw driver or similar turning tool. The winding spring 17 is coiled around the winding rod and at its inner end is extended through the rod, as shown at 18, whereby it is secured to the rod. The opposite end of the spring is carried outwardly through a slot or notch 19 in the adjacent end of the drum 10 and is then bent over against the outer surface of the drum, as shown at 20, whereby it is fixed thereto.

The screen, indicated at 24, is preferably of woven wire mesh material and has one

transverse edge held snugly within the drum so that it cannot be easily released from the drum.

The lower edge of the screen is fitted to a rail 25 which is constructed of sheet metal and includes a socket member, indicated at 26, and a clinching member 27 which is sprung into the socket after the edge of the screen has been fitted therein so that the screen is firmly locked in place. The lower edge of the screen is preferably rolled around a stout wire or light rod, as shown at 28, one of these rods being provided at each lower corner of the screen so that the corners will be held against curling and will move easily through the side guides.

The rail 25 extends downwardly below the lower end of the screen and the material of the rail is so bent as to present coacting jaws 29 forming a slot 30 in which may be engaged the upper edge of a strip 31 of felt or other cushioning material whereby the screen may be brought into close engagement with the sill of the window and at the same time avoid marring of highly finished sills. One objection to metal window screens heretofore, especially of the rolling type, has been the difficulty of maintaining a close joint between the lower end of the lowered screen and the window sill so that the joint would be proof against the entrance of flies or other insects. The present arrangement very effectually overcomes this objection. To facilitate the raising and lowering of the screen, handles 32 of any convenient form are secured upon the rail 25, as shown.

The rail 25, as has been said, is constructed of sheet metal and is preferably rolled or bent or stamped from a single blank. In the completed rail, the front and rear walls thereof are doubled, spaces being provided to receive the branches of a slide which is adapted to ride in the guides or rails 33 secured to the sides of the window frame. The guides are also constructed of sheet metal and present mating side plates or jaws 34, as shown clearly in Fig. 5, the inner edges of the jaws being somewhat enlarged to provide beads 35, between which the screen passes, and present convex surfaces to the screen so that wear of the same will be minimized. The guides are formed with lateral flanges 36 through which securing devices are inserted into the window frame. The slides which have been mentioned are also formed of sheet metal and present a body portion 38 formed by bending a blank transversely at its middle whereby the slide will be given the form of two leaves joined together at their outer ends and adapted to pass through the slot or opening between the jaws of the guide and travel along the same. The leaves or branches of the slide are expanded laterally somewhat between their ends, as shown at 39, and are also reduced in height so that they may be inserted between the inner and outer walls of the rail 25, as shown clearly at 40 in Fig. 3. The resiliency of the branches or leaves of the slide will cause it to frictionally engage the walls of the rail with sufficient force to be positively retained in the rail. Each slide is provided in the branches of its body portion with protuberances or blisters 41 struck therefrom near their upper edges and in their lower portions they are provided with slots 42 in which are seated balls 43 of such relative diameters that they project through the slots in the opposite sides of the slide but are prevented by the width of the slots from escaping therethrough. When the slide is properly engaged within the guide, the protuberances 41 will engage the side walls of the guide sufficiently to avoid twisting of the screen or of the rail while the balls will bear against the walls of the guide with sufficient friction to maintain the screen in the position to which it may be lowered, and to enhance this frictional engagement the guide may have one wall spring tempered so that it will tend to bind upon the ball when the screen is not in motion but will yield sufficiently to permit a smooth easy movement when the screen is being raised or lowered.

It is obvious that when the screen is lowered the winding spring will be wound and the tension thereof increased so that it will tend to at once rewind and raise the screen.

The formation of the rail 25 provides a cross web 44 and within the space defined by this cross web and the inner side walls of the rail we mount latch mechanism whereby the screen will be held in its fully lowered position positively and against the action of the winding spring. This latch mechanism comprises a base 45 in the form of a channel member resting at its side edges upon the inwardly projecting beads formed upon the walls of the rail at 29, this arrangement being shown most clearly in Fig. 4. The inner end of this channeled base member is formed with an upstanding tongue 46 which provides an abutment for an expansion spring 47, said spring being disposed within the space below the cross web 44 and the top of the channeled base 45. Slidably mounted upon the base member at the outer end of the same is a latch consisting of a light bar bent to provide a portion 48 which extends longitudinally of the base member 45 between the walls of the rail and has its rear end bent laterally to provide an abutment 49 against which the front end of the spring 47 bears. The outer portion of the bar is bent to provide a transverse shoulder 50 at the outer end of the portion 48 and then extends inwardly or laterally, as at 51, parallel with the portion 48 and terminates in a thumb piece 52. The shoulder 50 passes through an opening provided therefor in the slide 38, as shown in Fig. 3, and is adapted to fit within a notch 53 formed in the

edge of the front member or wall of the guide 33, as shown in Figs. 1 and 3, so that the premature raising of the screen will be positively prevented. It, of course, will involve no departure from the invention to provide additional notches at various points in the guide so that, if desired, the screen may be held partly lowered but such arrangement will not ordinarily be employed inasmuch as the primary purpose of the screen is to prevent the entrance of insects into a room. It is, however, sometimes desired to have a screen partly raised temporarily for various reasons and we may sometimes provide a plurality of notches to accommodate users desiring the same.

Upon referring to Fig. 1 it will be noted that a bushing or sleeve 54 is provided upon one end of the winding rod 13 within the coils of the winding spring. This bushing serves to properly center the spring with respect to the winding rod and the coils of the spring engage the bushing so closely as to prevent the coils expanding in such a manner as to release the end of the spring from the winding drum.

When the screen is to be applied to a window, the tension of the winding spring may be easily adjusted by engaging a screw driver in the notch 16 and then exerting sufficient pressure to move the winding rod endwise so that the locking pin 14 will be beyond the range of the lugs or notches 15. The rod may then be easily rotated so that the spring may be set at the desired tension and when the proper tension has been attained the spring is permitted to return the rod to the position shown in Fig. 1.

It will be understood, of course, that, in order to permit raising of the screen, the thumb pieces 52 of the latches are pressed inwardly, and the handles 32 are arranged adjacent the latches so that they may be easily grasped at the same time that the latches are released by exerting pressure upon the thumb pieces. The balls ride easily within the guides but the edges of the guides are pressed toward each other, as clearly shown in Figs. 3 and 4, so that they will positively prevent the balls passing through the sides of the guides and, consequently, the screen will be held within the guides at all times and the edges of the same will be guarded against breakage. The resiliency of the guides will cause them to closely embrace the edges of the screen and prevent the same rattling in high winds.

Having thus described the invention, we claim:

1. In a rolling window screen, the combination with a screen, of guides engaging the side edges of the same and including mating jaws between the edges of which the screen passes, slides carried by the lower corners of the screen and extending into the guides, and rolling balls mounted within said slides to travel between the jaws of the guides and having diameters greater than the distance between the edges of the jaws to span the space between the jaws.

2. In a rolling screen, guides including mating jaws embracing the screen, a hollow walled rail secured to the lower end of the screen, and a slide consisting of a body having parallel branches frictionally engaged in the walls of the rail at the end thereof with the outer portion of the slide fitting in the adjacent guide, and a ball fitted between and projecting through the branches of the slide within the guide.

3. In a rolling screen, guides for the side edges of the same, a rail secured to the lower end of the screen and having a hollow body, slides frictionally engaged in the ends of said rail and projecting therefrom to fit within the respective guides, and latches mounted within the ends of the rail between the sides of the slides and having portions projecting through the slides to engage notches in the guides, the notch-engaging portions of the latches constituting transverse shoulders and the terminal portions of the latches extending from the shoulders at the front of the rail and provided with thumb pieces.

In testimony whereof we affix our signatures.

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