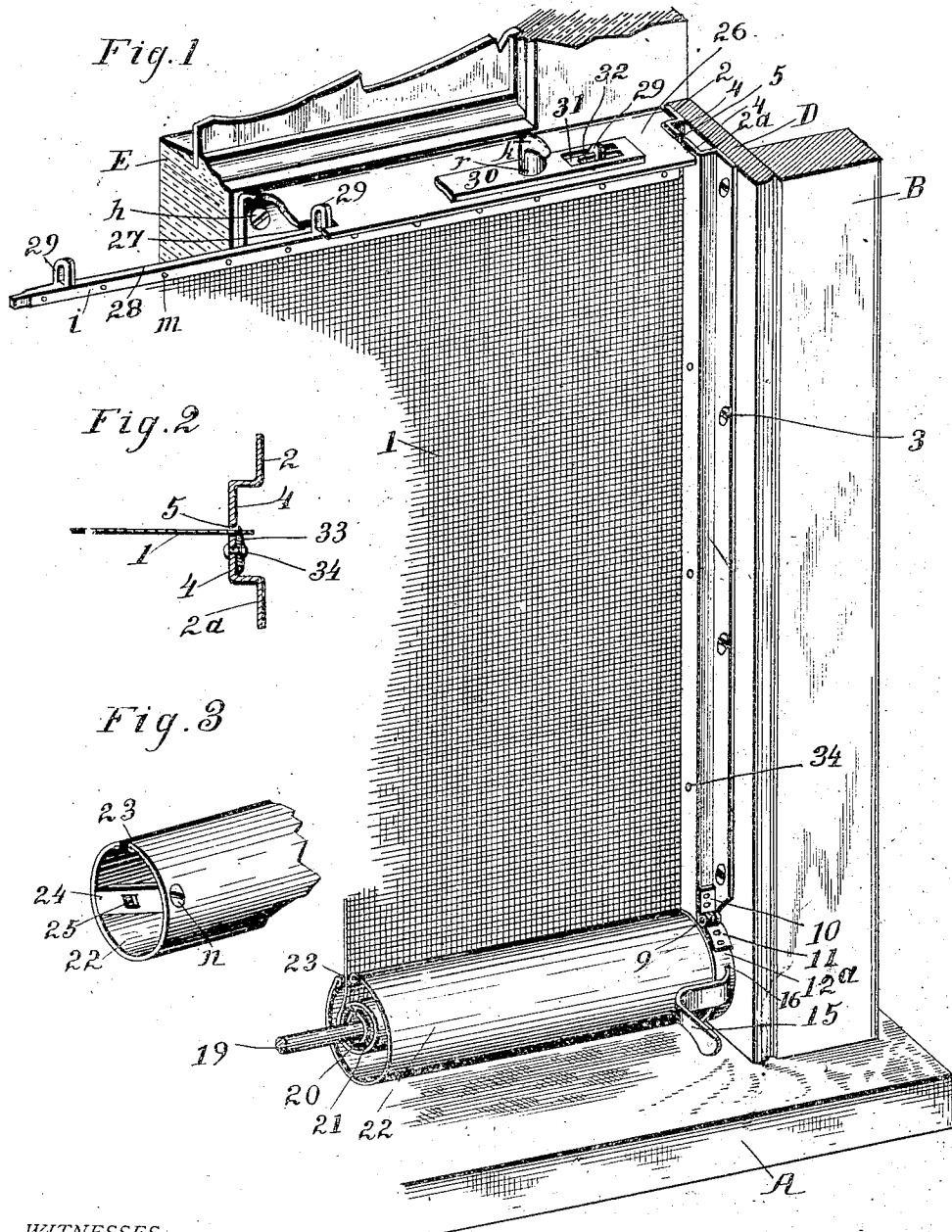


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 ROLLER WINDOW SCREEN.  
 APPLICATION FILED DEC. 29, 1911.

1,042,805.

Patented Oct. 29, 1912.

2 SHEETS-SHEET 1.



WITNESSES  
 Linus Barnes  
 Willis Barnes

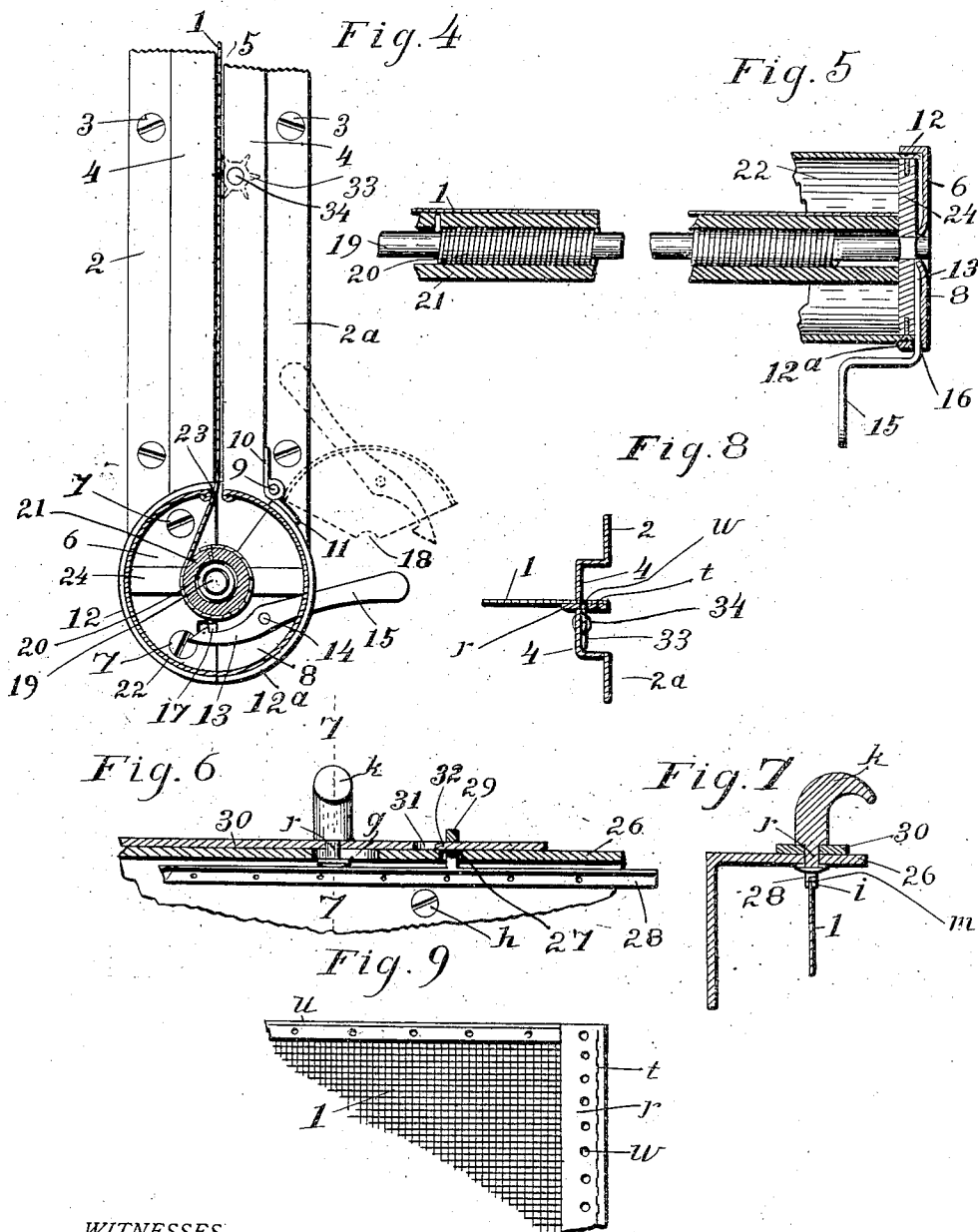
INVENTOR  
 Albert K. Lovell  
 By George L. Barnes Attorney

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# UNITED STATES PATENT OFFICE.

ALBERT K. LOVELL, OF NEW HAVEN, CONNECTICUT.

## ROLLER WINDOW-SCREEN.

1,042,805.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed December 29, 1911. Serial No. 663,564.

*To all whom it may concern:*

Be it known that I, ALBERT KINGMAN LOVELL, a citizen of the United States of America, and resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Roller Window-Screens, of which the following is a specification.

My invention relates to window screens, and it has for its object to provide a roller window screen which shall automatically co-operate with the window sash to screen the opening in proportion as the sash is raised, leaving the glass at all times unobstructed, and which shall be adapted for instantaneous removal from the sash and frame by simple liberating movement of the engaging devices by which it is held to said parts.

To this end the invention consists in the novel combination, arrangement and construction of parts as hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a perspective view of my improved roller screen, shown in its application to a window frame and the lower window sash, which is represented in the raised position and with the flexible screen unwound. Fig. 2 is a horizontal cross section through the edge of the screen and the guide ways on the plane of one of the screen retaining pinions journaled within the guide ways. Fig. 3 is a perspective view of an end of the stationary housing inclosing the screen rolling apparatus, showing the means for holding the spring supporting core against rotation. Fig. 4 is a vertical cross section through the screen, its housing and screen rolling apparatus, showing the guide ways in elevation, in the direction of the axis of the screen rolling apparatus. Fig. 5 is a vertical longitudinal section through the screen rolling apparatus on the axial line and plane of the screen. Fig. 6 is a vertical longitudinal section in the plane of the screen through the screen holding and fastening devices for securing the non rolling end of the screen to the window sash. Fig. 7 is a vertical cross section through the same on the line 7, 7, of Fig. 6. Fig. 8 is a horizontal cross section similar to Fig. 2 of a modification of the screen, and

Fig. 9 is a front elevation of the edge part of a screen embodying such modification. 55

Referring to the drawings my improved roller screen is shown as applied to the lower sash of an ordinary window and adapted for screening the lower half of the opening. But it will be readily understood 60 that it may with equal facility be used in the inverted position and attached to the upper sash to screen the upper half of the opening, and that the construction in the two cases will differ only in inversion, either 65 being susceptible of employment alone, or used together, as desired. Only a single edge of the screen is shown, which will suffice to illustrate the construction, as both edges are operated alike. Similarly, only 70 a single side of the window is shown, namely, the right hand side viewed from the interior of the room in which it is placed. The view embodies the right hand end of the cap stool A, or lower horizontal part of 75 the window trimming, the vertical right hand casing B, and the vertical stop D secured in a plane at a right angle to the casing and forming one side of the usual groove in which the lower sash E is adapted to 80 travel. These parts of the window architecture are common and well known and need not be further shown or described.

The invention contemplates the use of a flexible screen 1 attached at its respective 85 ends to the window sash and to a roller mounted on the casing with each side edge of the screen received and adapted to travel in a guideway attached to the vertical stop D. Said guideway comprises a pair of vertical 90 guide strips 2, 2<sup>a</sup>, each formed with a flange by which it is separately attached to the stop by the screws 3, and a part 4 parallel therewith but offset from it a certain distance. The offset parts of the re- 95 spective guide strips forming a pair are projected toward each other and set at the proper distance apart to provide a slot 5 between their edges, which slot forms the guideway for the reception and movement 100 of the edge of the screen, as fully shown in Figs. 2 and 4. The two strips forming a guide way may be adjusted when placed upon the casing to fit various thickness of screen as required. 105

Secured to the window stop at the lower

end or underneath the guide strip 2, or that nearest the window sash, and as near the cap stool A as possible, is a half bearing 6 for the reception and support of the screen rolling apparatus, to be hereinafter described. Said half bearing in the form shown comprises a semidisk secured by the screws 7 passing through it, with its straight or diametral edge coincident with the plane of the slot 5 between the guide strips, and its curved edge presented toward the sash and provided with a semi-circular rim or flange 12 around it, as shown in Fig. 4. The lower end of the guide strip abuts against said half bearing to form a neat joint between the parts, and the flange of the bearing is preferably proportioned to project from the stop the same distance as the part 4 of the guide strip is raised therefrom, or flush with the face of the guideway.

Correspondingly situated with reference to the guide strip 2<sup>a</sup> is a substantially similar half bearing 8, hinged to the guide strip by the pivot 9 and hinge parts 10 and 11, secured respectively to the guide strip and flange 12<sup>a</sup> of the half bearing. The hinged bearing is provided with a latch 13 pivoted thereto by the pin 14 and having a lever handle 15 projecting out through a slot 16 in its rim in the direction away from the opposite bearing. The latch is adapted to engage a projection or catch 17 on the face of the opposite half bearing to normally lock the two half bearings together, the latch in the present instance being automatically operated to hook upon the catch by the weight of the handle or lever, preponderating on the opposite side of its fulcrum. The two half bearings when thus locked together comprise a cylindrical socket the purpose of which is to hold and support the end of the screen rolling apparatus. Each of the half bearings is formed with a semicircular bearing 18 at its center which together form a circular seat at the center of the socket for the purpose of supporting the rod or core 19 of the roller spring and screen winding drum. The screen rolling apparatus comprises the said rod 19 supported in the central circular seat 18 of the socket, 12, 12<sup>a</sup>, a helical spring 20 coiled around the rod with one end fastened thereto, as shown in Fig. 5, a tube or drum 21 mounted upon the rod and its spring coil with the opposite end of the spring fastened to it as shown in said Fig. 5 and also having the lower end of the screen fastened upon it, for the purpose of winding the screen upon the drum in the direction contrary to that in which the coiled spring is wound. These parts are inclosed by a cylindrical housing 22 having its ends received and held in the socket aforesaid, and formed with a longitudinal slot 23 extending the entire length of its upper side

and registering with the guide slot 5 between the guide strips, through which the screen is led to the support by which its upper end is secured to the sash, as hereinafter described. At each end of the housing is a cross bar or bridge 24 secured by the screws *n* and having a perforation 25 of rectangular or other non circular form through which the rod 19 is fitted, shaped at that point to correspond to its bearing in the bridge and thus held stationary and non-rotatable in the housing. The edges of the slot 25 are preferably made rounding by bending the edge of the metal under as shown, to provide a blunt or rounded edge for contact with the screen, and facilitating its passage.

The devices for removably attaching the end of the screen to the window sash comprise a horizontal bracket plate or shelf, 26, secured to the inner face of the lower part of the sash frame E by the screws *h* and having a series of perforations 27 in the plane of the screen; a bar 28 riveted to the end of the screen and provided with the vertical eyelets 29 for engaging and projecting through said perforations of the bracket plate and a locking strip 30 mounted on the bracket plate and provided with slots 31 and longitudinal key tongues 32 in the slots for engaging the eyelets 29 by longitudinal movement of the locking strip upon the bracket plate. To retain the locking strip in position upon the bracket plate, a pair of longitudinal slots *g* are provided in the plate, through which extend the rivets *r* headed over on the lower side of the plate, and permitting lengthwise motion only of the strip. The rivets are preferably formed with the raised hooked head *h* which are adapted for use as lifts in raising the window sash. The bar 28 to which the upper end of the screen is riveted, is in the present instance, an angle strip having one of its limbs on the side of the screen and other extending over the edge of the screen with the eyelets 29 arising from it. A plain strip *i* is riveted to the vertical limb of the angle plate on the outer side of the screen, with the rivet *m* passing through the screen, as shown in Fig. 1. The ends of the bar 28 are fitted to engage and slide in the guide way 5 the same as the edges of the screen. A series of toothed pinions 33 are arranged on the inner face of one of the guide strips, journaled upon suitable pivots 34 upon which they are adapted to revolve. The pinions are so positioned that their teeth engage the edges of the screen, passing through the meshes thereof, and their purpose is to hold the screen distended laterally and prevent its edges from withdrawing from the guide slot as it travels therein. Figs. 8 and 9 show a modification in which a

flexible band *r* is sewed to the edge of the screen by the thread *t*, and the band is provided with a series of perforations *w* for engaging the teeth of the pinions. In such modifications the bar *u* at the upper end of the screen will differ from the bar 28 only in stopping at the inner edge of the band, as shown in said figures.

In the operation of my improved roller screen, it will be understood that with the guide strips and sockets of the rolling apparatus secured to the window casing, and the sockets opened as shown by the dotted lines in Fig. 4; it will be necessary, in assembling the other parts of the screen rolling apparatus, to first wind the screen on the drum 21 by hand, without disturbing the spring 20, that is, leaving it in its normal state of repose, and without tension. The drum with the screen so wound entirely upon it may then be inserted in the housing 22, after the removal of one of the cross bridges 24 therein, the end of the screen adjacent the bar 28 at the same time being slid along the slot 23 of the housing, with the bar on the outside of the housing. When the drum and screen are entirely inserted to place in the housing all said parts may be seated in the half bearings 6 and the other half bearings 8 may then be closed upon the parts and locked in such position by the engagement of the latches 13 with the catches 17 on the respective half bearings. In such position the small bearings at the centers of the half disks will form whole bearings which receive and support the projecting ends of the rod 19, and the flange of the sockets will retain the housing in place. Thus either of these features will alone support the screen rolling apparatus, but both may contribute in such function. The flanges however are required for the purpose of covering the ends of the housing and providing tight joints at those places.

With the parts of the screen rolling apparatus in place, and the bar 28 lying over and along the longitudinal slot 23 of the housing, if the window sash be moved to its lowest position or seat, the eyelets 29 of the bar will enter and project through the perforations 27 of the bracket plate, 26, and also the slot 31 of the locking strip 30, provided the strip is placed at the proper end of its throw, to bring the clearance space of the slots at the ends of the key tongues 32 provided for that purpose in alignment with the eyelets. A slight longitudinal motion of the locking strip will then engage the key tongues with the eyelets and the screen will then be fastened to the window sash in readiness for use. Then as the sash in operation is raised the screen will be unrolled from the drum and follow it upward, to screen the opening in the window, and the

spring will be correspondingly coiled into tension upon its supporting rod. With the spring in a state of tension it will conversely revolve the drum and automatically wind the screen upon it as the window sash is lowered, thus always maintaining the screen straight and distended over the varying width of the window opening. In this movement the edge of the screen will ride upon and in engagement with the teeth of the pinions 33, thus preventing the flapping of the screen at its edges and their disengagement from the guide way of the guide strips. The window light always remains unobstructed by the screen, and when it is desired to open the window without the opening being covered by the screen, it is only necessary to disengage the key tongues of the locking strip from the eyelets of the screen by the reverse movement of the strip from that used in locking the parts, when the sash is at its lowest position and the screen is withdrawn into the housing.

I claim as my invention:

1. In roller window screens, the combination of a flexible screen, having one end secured to the window sash, guideways upon the casing for receiving and guiding the edges of the screen, and rotatable toothed pinions mounted upon the guideways and intermeshing with the edges of the screen to retain them in place in the guideways in the movement of the screen along the ways.

2. In roller window screens the combination of a spring actuated drum mounted on the window casing, a screen fastened at one end to the drum and at the other to the window sash, guide ways upon the casings for retaining and guiding the edges of the screen in its movement along the guideways, and rotatable toothed pinions pivotally mounted upon the guide ways intermeshing with the edges of the screen in its movement along the guide ways.

3. In roller window screens, the combination of a flexible screen, having one end secured to the window sash, winding mechanism carrying the other end of the screen, guideways each comprising a pair of separate strips mounted upon the window casing and forming an intervening slot for the reception of the edge of the screen, and rotatable toothed pinions pivotally mounted within the guideway intermeshing with the edges of the screen to hold them in the guideways as the screen is raised or lowered.

4. In roller screen apparatus the combination of a drum, a screen attached to the drum, a spring for revolving the drum in the direction for winding the screen upon it, a housing secured to the window casing for supporting the drum, means for locking the screen to the window sash, guide ways connected with the casings for engaging and

guiding the edges of the screen, and rotatable toothed pinions placed along and pivotally mounted upon the guide ways for intermeshing with the edges of the screen in its movement along the guide ways.

5 In roller screen apparatus the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets comprising a stationary half secured to the window casings and a movable half hinged to the stationary part, and guide ways each comprising a pair of separate strips, connected with the casings for engaging and guiding the edges of the screen.

6. In roller screen apparatus the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets comprising a stationary half secured to the window casings and a movable half hinged to the stationary part, guide ways each comprising a pair of separate strips, connected with the casings for engaging and guiding the edges of the screen, means for locking the screen to the window sash, comprising a bracket plate secured to the sash having a series of perforations, eyelets carried upon the screen adapted to engage the perforations, and a locking strip movable upon the bracket plate, and provided with locking tongues engageable with the eyelets by movement of the locking strip along the plate.

7. In roller screen apparatus the combination of a drum, a screen attached to the drum, a spring for revolving the drum in the direction for winding the screen upon it, a housing secured to the window casing for supporting the drum, means for locking the screen to the window sash, comprising a bracket plate secured to the sash having a series of perforations, eyelets carried upon the screen adapted to engage the perforations, and a locking strip movable upon the bracket plate, and provided with locking tongues engageable with the eyelets by movement of the locking strip along the plate, and guideways connected with the casings for engaging and guiding the edges of the screen.

8. In roller screen apparatus the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets comprising a stationary half secured to the window casings and a movable half hinged to the stationary part, guide ways each com-

prising a pair of separate strips, connected with the casings for engaging and guiding the edges of the screen, and rotatable toothed pinions journaled along the guide ways to intermesh with the screen in the guide ways and guide its edges in their movement.

9. In roller screen apparatus the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets comprising a stationary half secured to the window casings and a movable half hinged to the stationary part, guide ways each comprising a pair of separate strips, connected with the casings for engaging and guiding the edges of the screen, means for locking the screen to the window sash, comprising a bracket plate secured to the sash having a series of perforations, eyelets carried upon the screen adapted to engage the perforations, and a locking strip movable upon the bracket plate, and provided with locking tongues engageable with the eyelets by movement of the locking strip along the plate.

10. In roller screen apparatus the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets comprising a stationary half secured to the window casings and a movable half hinged to the stationary part, guide ways each comprising a pair of separate strips, connected with the casings for engaging and guiding the edges of the screen, means for locking the screen to the window sash, comprising a bracket plate secured to the sash having a series of perforations, eyelets carried upon the screen adapted to engage the perforations, and a locking strip movable upon the bracket plate, and provided with locking tongues engageable with the eyelets by movement of the locking strips along the plate, toothed pinions journaled in the guide strips for engaging the screen and bands secured to the edges of the screen provided with perforations for the engagement of the teeth of the pinions, substantially as and for the purpose specified.

11. In roller screen apparatus, the combination of a drum, a screen attached to the drum and to the window sash, a spring for revolving the drum in the direction for winding the screen upon it, a housing incasing the drum, compression sockets each comprising a stationary half secured to the window and a movable half hinged to the stationary part, and latches for locking the movable parts of the sockets to the stationary parts to hold the housing in place.

12. In roller screen apparatus, the combi-

nation of a screen, winding apparatus  
mounted upon the casing for coiling the  
screen in the form of a roll, guides for re-  
ceiving and guiding the edges of the screen,  
5 and means for locking the screen to the win-  
dow sash comprising a bracket plate secured  
to the sash having a series of perforations,  
eyelets carried upon the screen adapted to  
engage the perforations, and a locking strip  
10 movable upon the bracket plate and pro-

vided with locking tongues engageable with  
the eyelets by movement of the locking strip  
along the plate.

Signed by me at New Haven, Connecticut,  
this 27th day of December, 1911.

ALBERT K. LOVELL.

Witnesses:

GEORGE L. BARNES,

ALBERT McC. MATHEWSON.