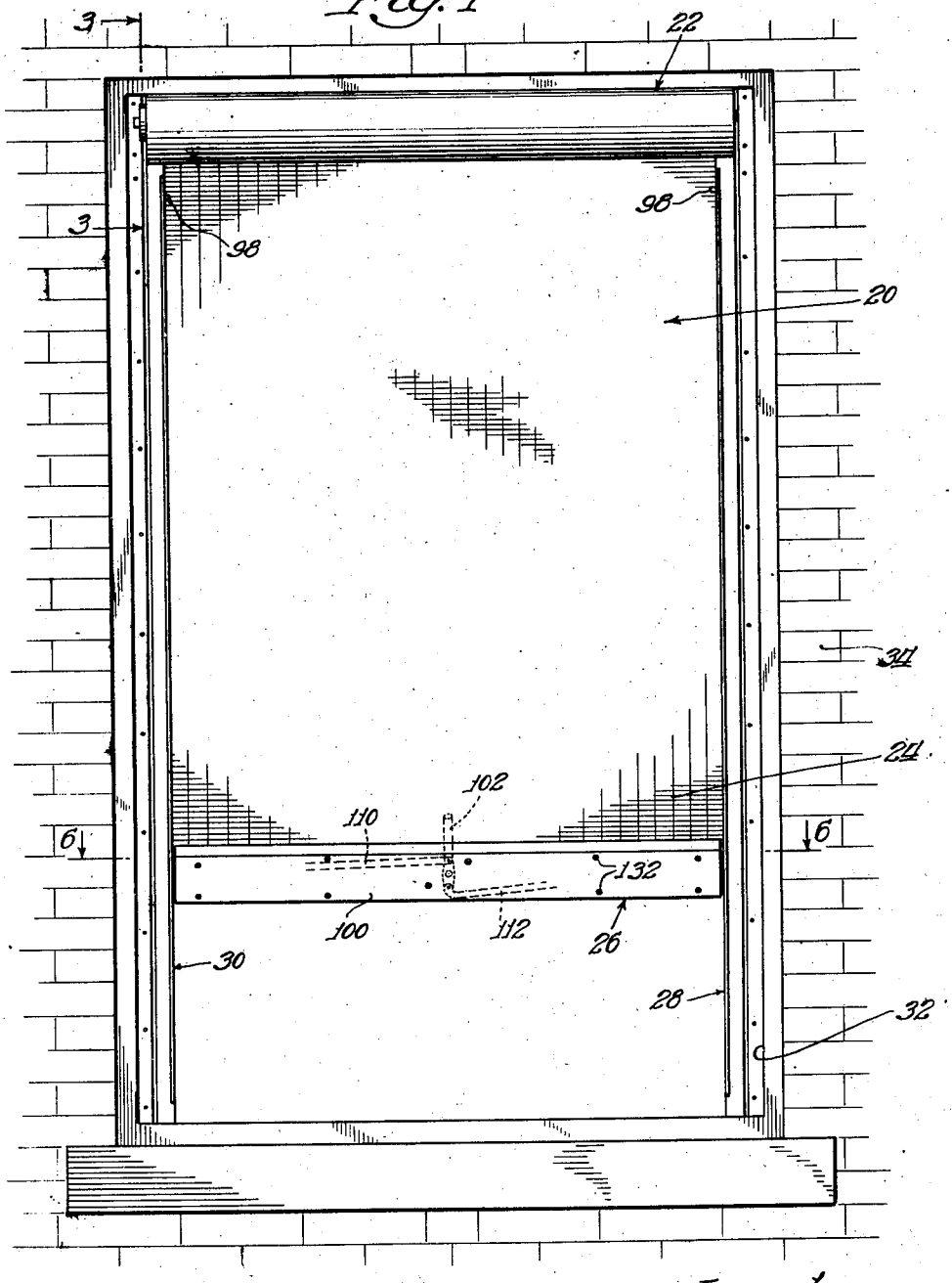
Aug. 20, 1946. H. E. VAN VOORHEES 2,406,272

ROLL SCREEN ASSEMBLY

Filed Dec. 5, 1942 6 Sheets-Sheet 1

Fig. 1



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ROLL SCREEN ASSEMBLY

Filed Dec. 5, 1942 6 Sheets-Sheet 2

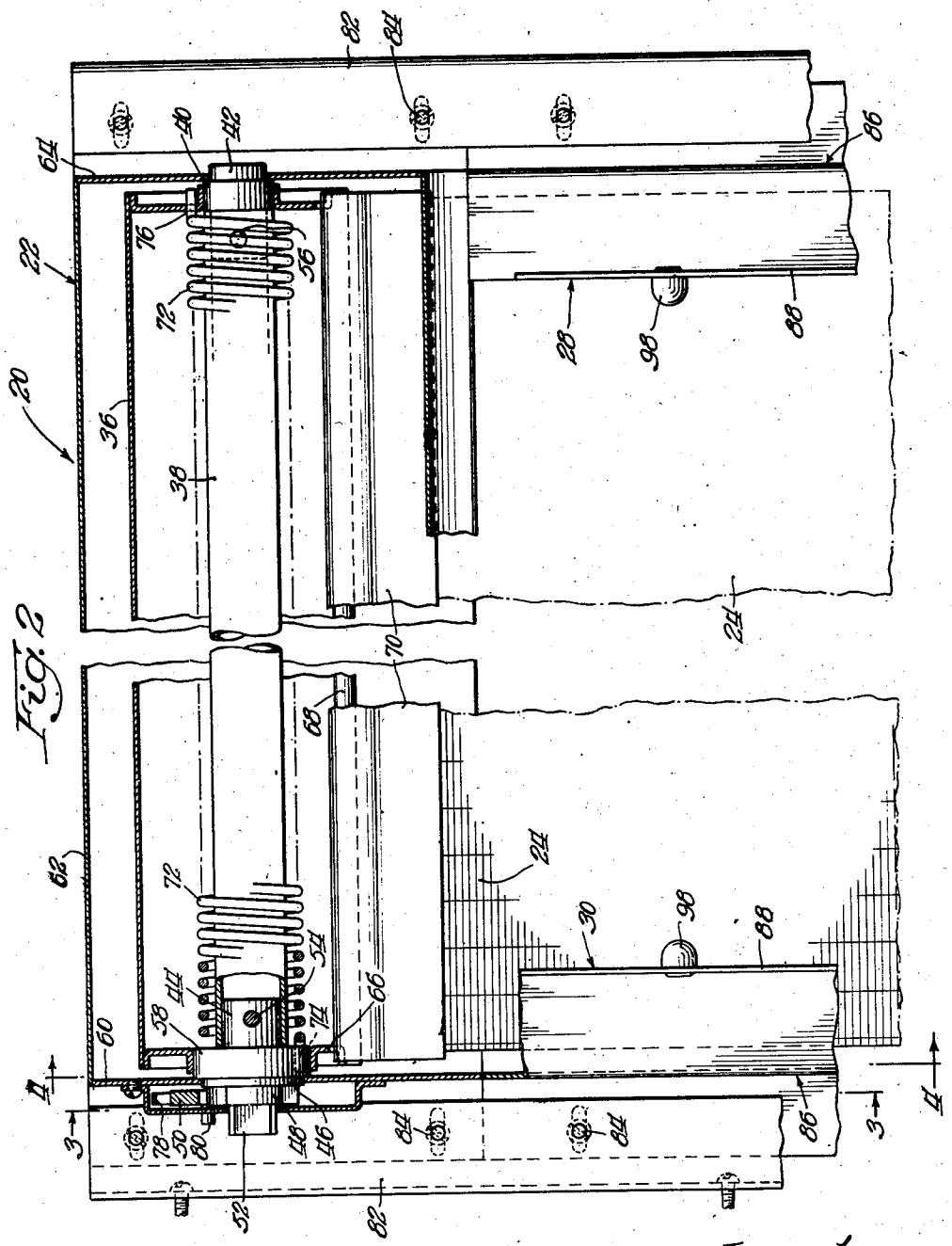


Fig. 2

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ROLL SCREEN ASSEMBLY

Filed Dec. 5, 1942 6 Sheets-Sheet 3

Fig. 5

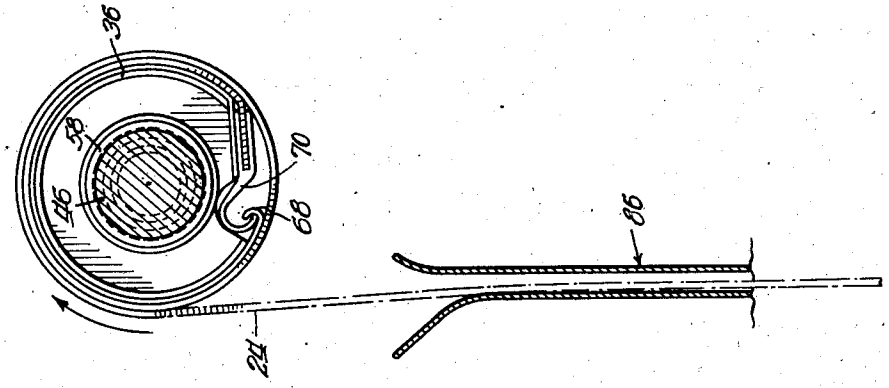


Fig. 4

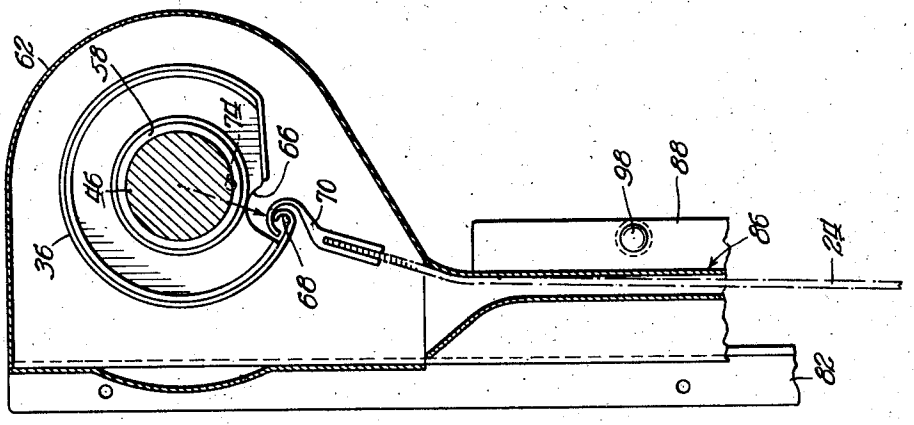
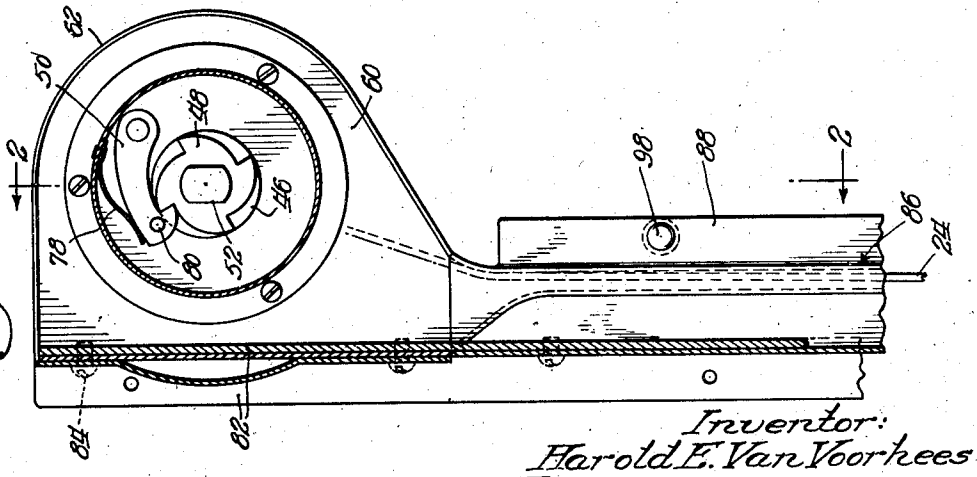


Fig. 3



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ROLL SCREEN ASSEMBLY

Filed Dec. 5, 1942 6 Sheets-Sheet 4

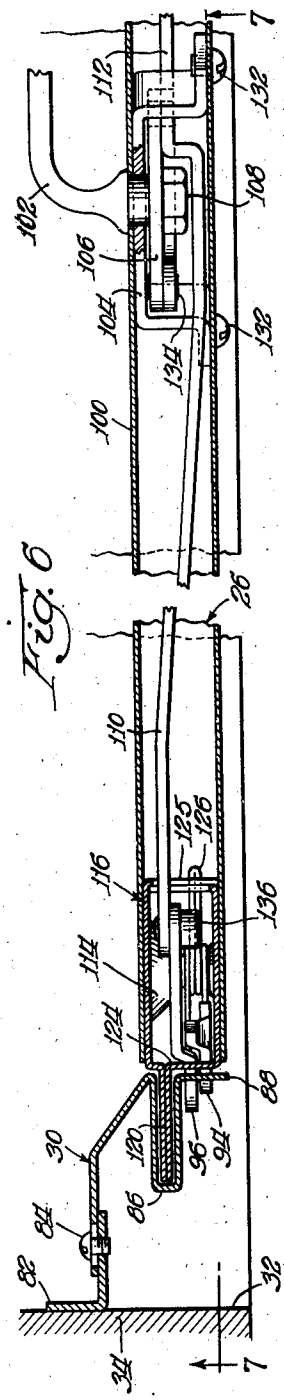


Fig. 6

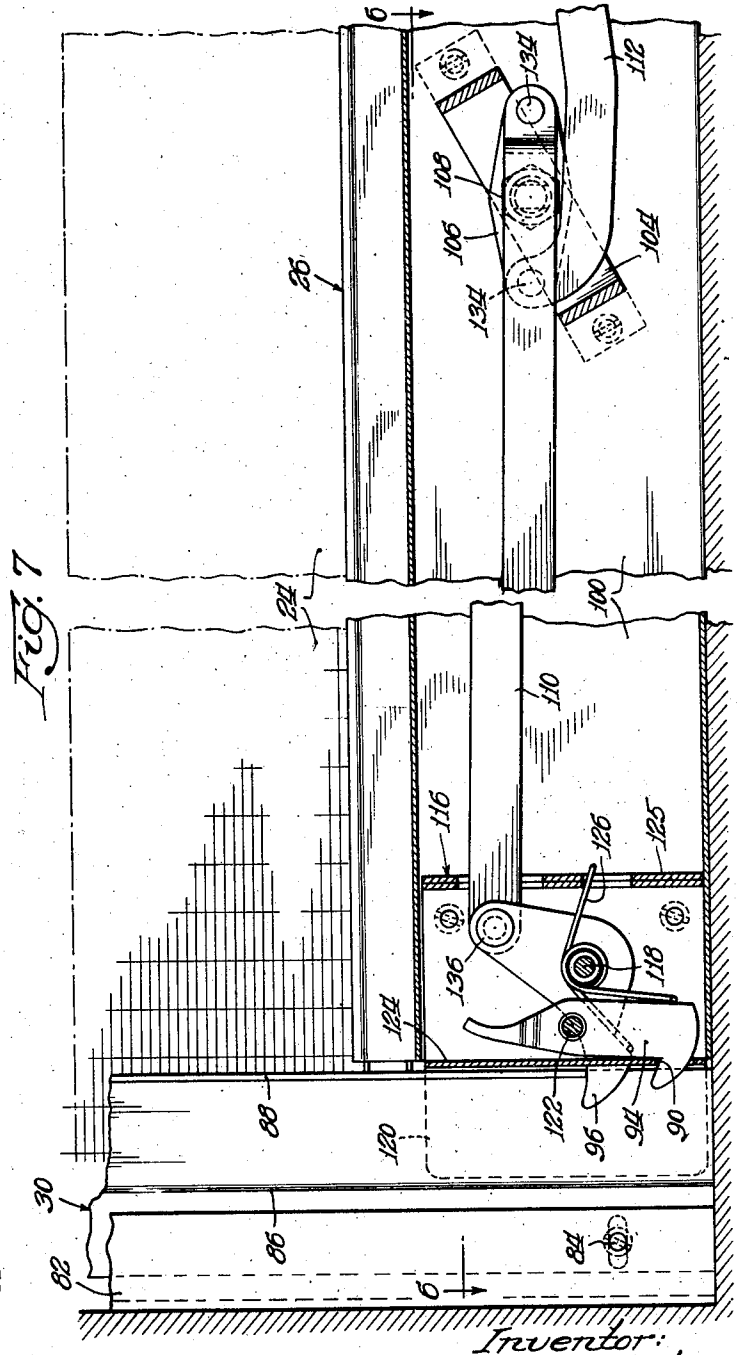


Fig. 7

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ROLL SCREEN ASSEMBLY

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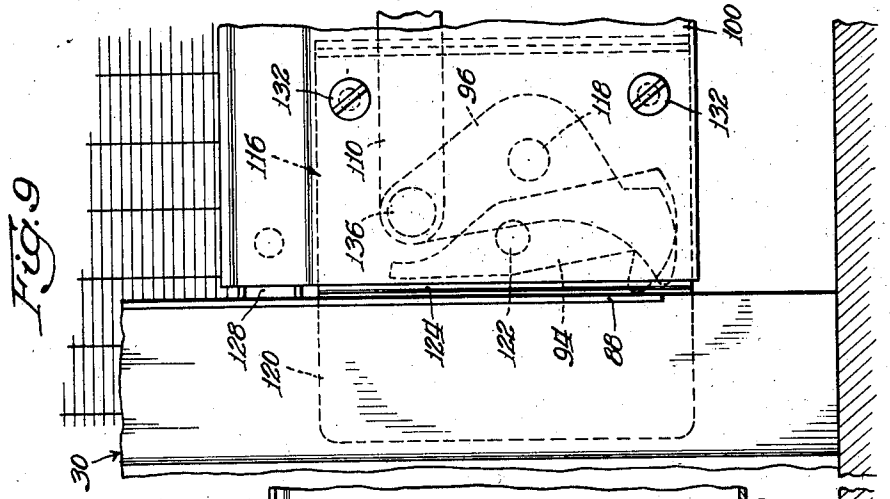


Fig. 9

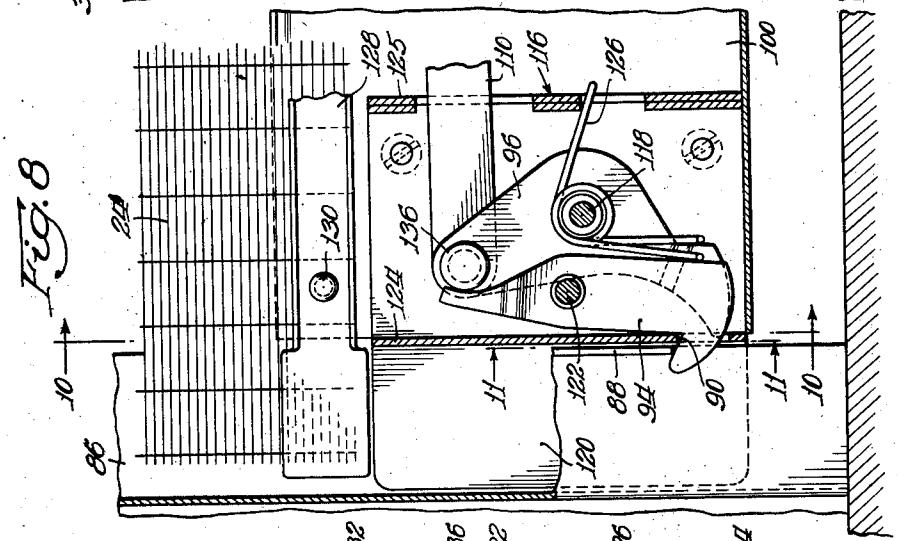


Fig. 8

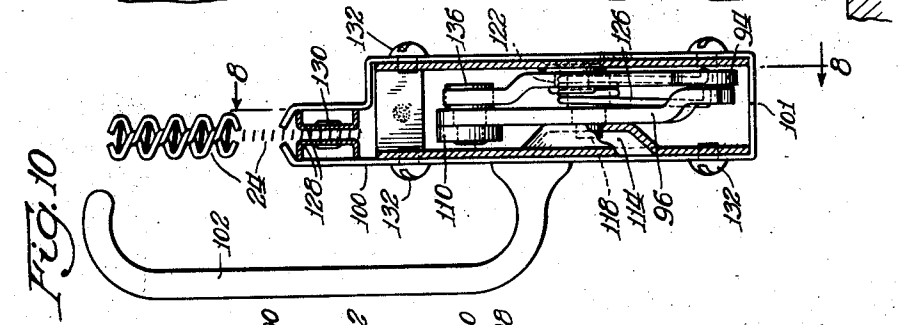


Fig. 10

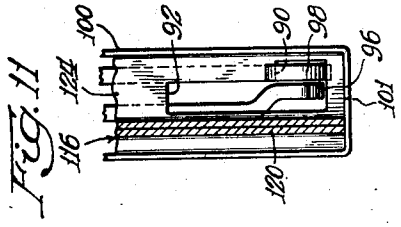


Fig. 11

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ROLL SCREEN ASSEMBLY

Filed Dec. 5, 1942 6 Sheets-Sheet 6

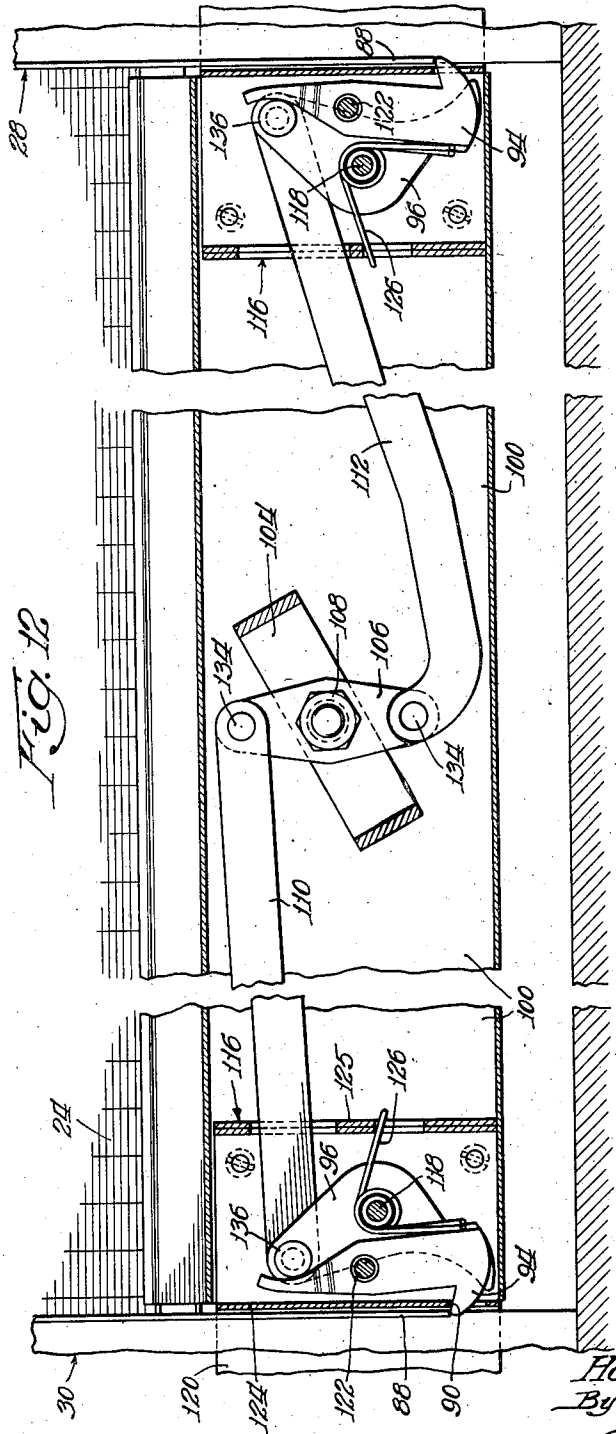


Fig. 12

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Patented Aug. 20, 1946

2,406,272

UNITED STATES PATENT OFFICE

2,406,272

ROLL SCREEN ASSEMBLY

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Application December 5, 1942, Serial No. 467,923

19 Claims. (Cl. 160—281)

1

This invention relates primarily to improvements in roller type screens or the like. The principal object of the invention is to provide an improved means for adjusting, latching and tensioning such devices.

In devices heretofore on the market, for adjusting, latching and tensioning screens, such as those which are longitudinally resilient, having ribbon-like transverse elements and longitudinally extending resilient connecting means requiring a predetermined stretch or tensioning for proper optical effect and desired result, such for example, as those disclosed in United States Patents No. 2,078,940 of May 4, 1937, issued to J. J. Grebe and No. 2,194,222 of Mar. 19, 1940, issued to W. B. Ewing, there have developed serious objections to the adjusting, latching and tensioning means which have shown up in practical applications of the screen.

In the first place, it has generally been a practice to provide a tensioning means which at all times exerted considerable strain on the screen cloth, generally a strain sufficient to rapidly roll up the screen cloth when the latching means was released. The average user would release the latch, and turn the device loose letting it roll itself up. This would result in a sudden checking action when the lower rail of the screen reached the top, tending to distort the screen cloth and pull it loose from the lower rail. As a result, the average life of a screen was comparatively short.

Screen cloth having the construction disclosed in the above mentioned Grebe and Ewing patents is inherently stretchable lengthwise, that is, it will elongate from end to end and if tension is placed thereon, such stretching within the elastic limits of the material exists only while tension is placed on the screen. In order to secure the proper optical and solar effect it is desirable, in fact almost necessary, that the screen be tensioned—that is, that the screen cloth itself be stretched—while the screen is in normal position over a fenestra.

The elastic limit of such screen cloth is ordinarily critical and improper tensioning or stretching which is not uniform or which is to a greater than desired amount causes damage to the screen by altering the angularity of the ribbon-like weft members and the size or shape of the loops of the warp strands, thereby destroying the uniformity and alignment of the spacing of the weft members.

Further, with the constructions heretofore on the market, the person lowering the screen to its

2

extended length would normally grasp one side of the bottom rail of the screen and hook it first, thus distorting the screen cloth on that side. As a result, the screen cloth became torn and permanently distorted, which would tend to destroy the proper fit in the guide channels and spoil the desired and proper optical effect of the screen cloth by reason of the distortion. Also such distortion would let in insects and spoil the light-reflecting and absorbing qualities of the screen cloth.

A further objection was the fact that in previous constructions it was difficult to make the screens properly fit the guide channels and still be able to stop the screen at any position and have it remain at that position. As a result usually excessive friction was required in the guide channels, or it was preferable to have such screens either extended full length or entirely rolled up. Most persons after using such a screen a short while would extend it to its full length and leave it there. This restricted the utility of the screen and consequently its desirability and salability.

It is an object of this invention to overcome all of the above mentioned defects.

It is a further object of this invention to provide a construction in which a single handle positioned for even pull on the screen cloth is provided for raising and lowering the screen, and which handle is operable to tension the screen by elongating the warp strands and likewise to release the catches.

It is an object to provide a catch means which automatically engages a catch receiving means when the screen is extended to its normal length, and thereby latches the screen in extended position and indicates to the operator the position at which the tensioning means shall be manually operated. In this connection, the catch means provided is novel, and its application and arrangement are novel.

One object of this invention is to provide a cam tensioning means which is lever operated. In this connection it is an object to provide a tensioning means which will uniformly distribute the tension.

Further, it is an object to provide a device in which substantially all of the tension is absorbed directly by an arbor or roller diametrically across its axle, and in which the arbor spring means is sufficient only to counterbalance the weight of the screen. This accomplishes the object of eliminating the necessity for expensive, strong springs, with consequent saving in material and

costs and with some reduction in the size of the arbor necessary to house such a spring.

It is another object of the invention to provide a device which will be rugged and have a comparatively long life, and a device which will allow movement of the screen by overcoming merely inertia and friction.

Likewise it is an object to provide a device which is readily manufactured by available machinery, and is comparatively inexpensive.

These and other objects and features of this invention will become apparent from the following specification when taken together with the accompanying drawings in which:

Fig. 1 is a front elevational view disclosing an installation of a roll-screen to which the improvements herein disclosed are applicable, the control handle being indicated by dotted lines;

Fig. 2 is a fragmentary elevational view showing the details of the roller construction, the view being taken on the lines 2—2 of Fig. 3, looking in the direction of the arrows and a portion of the device being shown in cross-section;

Fig. 3 is a fragmentary side elevational view partly in cross-section, and taken on the lines 3—3 of Figs. 1 and 2, looking in the direction of the arrows;

Fig. 4 is a view similar to that of Fig. 3, but taken on the lines 4—4 of Fig. 2, looking in the direction of the arrows;

Fig. 5 is a fragmentary side elevational view, showing the arbor and screen arrangement of Fig. 4, but with the position of the screen on the arbor being changed by rolling a portion of the screen onto the arbor;

Fig. 6 is a fragmentary plan view in cross-section, taken on the lines 6—6 of Figs. 1 and 7, looking in the direction of the arrows;

Fig. 7 is a fragmentary, front elevational view in cross-section, showing the tensioning and latching means, taken on the lines 7—7 of Fig. 6, looking in the direction of the arrows;

Fig. 8 is a fragmentary, front elevational view taken on the lines 8—8 of Fig. 10, looking in the direction of the arrows, and showing the details of the latch, and cam tensioning mechanism, of the lower rail assembly, the latch appearing in engaged position;

Fig. 9 is a fragmentary elevational view generally similar to that of Fig. 8, the latch and cam assembly being shown in dotted lines, and the latch being in disengaged or released position as compared to the position of the latch of Fig. 8.

Fig. 10 is a side elevational view taken on the lines 10—10 of Fig. 8 looking in the direction of the arrows, the view being enlarged in part to show details of construction on the screen cloth;

Fig. 11 is a fragmentary, elevational view taken on the lines 11—11 of Fig. 8 looking in the direction of the arrows; and

Fig. 12 is a fragmentary, front elevational view, showing in detail the arrangement of the lower rail assembly.

Referring more in detail to the construction shown in the various drawings, and referring first to Fig. 1, there is provided what may be termed a roll screen assembly installation 20. This comprises an arbor housing assembly 22, containing an arbor or roller assembly, hereinafter described in detail; a screen cloth 24; a lower rail assembly 26; guide rails 28 and 30. The construction is shown as installed in a conventional window opening 32 of a wall 34.

Referring next to the construction of Figs. 2, 3, 4 and 5, and first to Fig. 2, there is provided

the arbor housing assembly 22, having the arbor 36 around which the screen cloth 24 is adapted to roll in raising the roll screen assembly. This arbor 36 has the axle 38 on which it is mounted for rotation. In this connection, the arbor 36 is provided with the bearing 40 which is attached to the arbor 36 and mounted for rotation on the axle extension 42.

At the other end of the axle 38, there is provided a second axle extension 44, diametrically enlarged at 46, and having a pawl engaging ratchet means 48, adapted to engage a pawl 50 (see Fig. 3 in particular). On its outer end, the axle extension 44 is preferably flattened on at least two sides or otherwise shaped so that it may be easily gripped by a wrench or the like for the purpose of rotating the axle 38 with respect to the arbor 36, for the purposes later apparent. This flattened end portion 52 is a part of the axle 38, the axle extension 44, of which the flattened end portion 52 is a part, being attached to the axle 38 by means of a pin or the like 54.

The axle extension 42 is attached to the axle 38 by the pin 56.

The arbor 36 on the pawl end of said axle 38, is provided with the enlarged bearing 58, to which it is integrally attached. This enlarged bearing 58 seats on the axle enlargement 46, and preferably rests against the end wall 60 of the arbor housing 62 (see Fig. 2), and the bearing 40 preferably abuts against the end wall 64 of the arbor housing 62, the bearings at each end clearing the end walls 60 and 64 only sufficiently to allow easy movement of the arbor in rotating, while preventing the arbor from moving longitudinally any material amount.

The arbor 36 is preferably longitudinally channeled as shown at 66 in Fig. 4, and is provided with hook engaging means 68, as shown in Figs. 4 and 5. This hook engaging means 68 is adapted to engage a hook-shaped member 70 forming the upper molding or edge of the roll screen 24, and in the position of Fig. 4 the tensioning pull on the screen is diametrically across the arbor, and does not affect the spring 72, hereinafter described, materially. Other convenient attaching means might be used but the one disclosed seems preferable. In this connection, it is noted that the roll screen may be readily attached to or detached from the arbor as desired.

The axle 38 has mounted thereon a coil spring 72. One end of the spring 72 is attached to the axle, preferably to the enlarged axle extension 46, as shown at 74 in Fig. 2, and the other end of the spring 72 is attached to the arbor, preferably to the end of the arbor 36 as shown at 76. It is readily understood that the movement of the arbor 36 with respect to the axle 38 is generally dependent upon the tensioning of the spring 72. It is one of the important features of this invention that the spring 72 should be of such strength and so adjusted as to regulate the arbor to where the load of the screen cloth 24, molding 70, and lower rail assembly 26, together with any other weight on the screen, is almost exactly counterbalanced. This is to permit the positioning of the screen at any position desired from full extension to completely rolled position, and (when it is so positioned) to retain the screen in that position in the absence of external force exerted thereon. It is also for the purpose of facilitating the raising and lowering of even a heavy screen by making such operation a mere matter of overcoming inertia and friction, and therefore a very easy matter in the ordinary installa-

tion. Thus the spring acts as a counterbalance for the screen cloth and mechanism, and extraneous forces are used to move the screen.

The proper construction to secure the necessary counterbalancing is not difficult to determine. The weight of the lower rail assembly **26** and the extended screen cloth **24** is determined when the screen cloth is in the extended or unrolled position. When in this position, the radius of the arbor **36** is determined, and the combined weight of the extended screen cloth and lower rail assembly is multiplied by the radius of the arbor **36**, which gives the torque in inch-pounds when the screen cloth is unrolled.

Next, the weight of the lower rail assembly and any extended portion of the screen cloth is determined when the screen cloth is wound onto the arbor **36**, and the radius of the arbor **36** with the screen cloth wound thereon is determined. These two sums are then multiplied together and the product is the torque when the device is in the rolled position.

The next step is to determine the number of revolutions necessary to change the screen cloth from the unrolled position (of the first step) to the rolled positon of the second step. By determining the difference in torque between the two positions and by dividing the torque difference, that is, the increase in torque, by the number of revolutions from the rolled to the unrolled position, the amount of torque per revolution is determined. A spring with the proper characteristics may then be selected by calculation or by using an engineers' handbook or charts furnished by the spring manufacturers. It is not difficult to check the accuracy of the above calculations by using the formula:

$$Ma=\frac{Ed^4}{11.25DN}$$

where

Ma=moment per turn in inch lbs.
E=Young's modulus for steel 30,000,000
d=wire size in inches
D=mean diameter of spring
N=number of coils

This formula would indicate the rate of deflection in inch-pounds per turn of the spring. To calculate the number of turns necessary in adjusting the arbor for the rolled up position, the torque as above derived in that position divided by the number of inch-pounds per turn would indicate the number of revolutions necessary. It is then a simple matter to turn the axle extension **52** that many turns, and allow the pawl **50** to lock the axle **36** in that position so that the spring will be under the proper tension. As the screen unrolls the deflection of the spring is increased by the necessary amount to counterbalance the load.

It is understood that the axle **36** is normally held against rotation by the pawl **50** engaging the teeth of the ratchet **48**, except for the purpose of winding the spring, in which case the turning of the member **52** to the right lifts the pawl over the teeth of the ratchet **48**. The pawl is preferably spring-pressed by means of the spring **78**, so that it will not be accidentally disengaged allowing the spring to unroll. However, the pawl **50** may be released from the ratchet **48** by lifting the pawl knob **80** provided for that purpose.

The arrangement of the guide rails **28** and **30** will be most clearly apparent from an examination of Figs. 3, 6 and 7. These guide rails **28** and **30** preferably comprise a light gauge angle

iron **82** which is fastened to the window molding by any convenient means (not shown). Attached to each angle iron **82** by bolts **84** or the like, is the channel member **86**. The channel member **86** is channelled to receive one edge extension **120** of the lower rail assembly and one edge of the screen cloth, and to guide the screen in its longitudinal movements. As will be clearly apparent from Figs. 3 and 4, the channel **86** preferably flares at the top to form a smooth juncture with the bottom opening in the arbor housing **62**.

As will be clearly apparent from Figs. 6 and 7, the channel member **86** is provided with a lateral projecting strip **88** which is preferably integral with the member **86**, and which ends a short distance above the window ledge (Fig. 7) in a position to be engaged by a cam **96** and latch **94** for latching and tensioning the screen.

Preferably the stops **98** are provided on either side as a part of the projecting strip **88**, and near the top thereof, for the purpose of engaging the lower rail and preventing it from jamming against the arbor housing **62**, and possibly injuring the hands of the operator or damaging the screen mechanism.

As will be apparent from examination of the enlarged portion of Fig. 10 (and from consulting the above mentioned Ewing and Grebe patents), the type of screen to which this is primarily directed should be tensioned longitudinally to give the proper optical characteristics. It should not normally have greater stress placed on one side of the screen than on the other, but should be uniformly tensioned across the whole. The tensioning of the type of screen disclosed in the Grebe and Ewing patents above mentioned includes elongating the screen cloth by a stretching action within the elastic limits of the warp strands of the woven screen. Thus the proper optical and solar characteristics necessitate this stretching action when the screen is over the window opening. Such tension other than merely retaining the screen taut would be of no particular value in the ordinary type of screen cloth not using a ribbon-like weft member. Should the tensioning be excessive in the screen cloth using the ribbon-like weft member, the weft member may be pulled out of proper angular position. This tensioning is secured in an improved manner as hereinafter more fully disclosed.

Referring to the construction shown in Figs. 6 to 12 inclusive, in which the lower rail assembly **26** is illustrated in detail, this lower rail assembly 26 comprises a housing or case **100**, which preferably consists of two sheets together forming the sides and bottom of the housing **100**, the metal being shaped as is clearly apparent from Fig. 10 in particular, and extending longitudinally, substantially the width of the space between the rails **28** and **30**. Preferably these side plates are turned under and meet at **101** as indicated in Fig. 10, thus forming the bottom of the housing **100** when the device is assembled.

Mounted on one side of the housing on case **100**, and usually on the side which would be nearest the operator such as the room side of a window, is the handle **102**. (See Figs. 1 and 6.) It is desirable that this handle **102** be spaced about an equal distance from the ends of the housing **100**, and journalled for rotation in the side wall **100** and in a reinforcing bracket **104**. This handle **102** extends into the housing **100**, and has mounted for rotation therewith on its inner end, a lever or rocker arm **106**. This lever

arm 106 may be keyed to said handle or may be otherwise attached thereto in order that the two become integral and rotate together. The lever arm 106 is preferably retained in place by means of the nut 108, which likewise holds the handle 102 in position.

At its outer end, the lever arm 106 has journalled thereto by means of the pins 134, the links or levers 110 and 112. These levers are journalled to the lever arm 106 for rotation with respect to said lever arm, whereby the rotation of the handle 102 with consequent turning of the lever arm 106 moves the levers 110 and 112 longitudinally in the case 100.

Journalled to the outer end of the levers 110 and 112 are the tensioning cams 96. Referring particularly to Figs. 6, 7 and 10, it will be noted that the cam 96 is located in a box 116, which box 116 is, in turn, located in one end of the housing 100. A similar box 116 is also located in the other end of the housing 100. The cam 96 is mounted for rotation about an axis formed by a bolt or the like 118 carried by the bracket 114. The bracket 114 is formed by being stamped or struck out of the material forming the side of the box 116, or it may be a separate strap properly shaped and spot-welded or otherwise attached to the side of the box 116. This box 116 has the vertical edge extensions 120 adapted to fit into the channel 86 and to move longitudinally of said channel. The cam 96 may be extended outwardly past the outer end wall 124 of the box 116 through a slot or opening 92 provided in said end wall for that purpose (see Fig. 11 in particular, and also Figs. 6, 7 and 8). This slot or opening permits the cam to move inwardly and outwardly with respect to the end 124 of said box 116, and to engage the side rail projecting strip 88 for the purpose hereinafter noted. The catch 94 is also mounted in said box 116, and it is journalled on the axle means 122, and rotates thereon within the limits permitted by the box. The toe or hook portion of said catch 94 normally extends out past the outer end 124 of the box, through a catch slot or opening 90, so as to engage under pressure of the spring 126, the projecting strip 88, as hereinafter described.

The cam 96 and the catch 94 are normally urged into the engaged or latching position by means of a spring member 126, one end of which engages the catch 94 and the other end of which engages the cam 96, the spring being wound on or carried by the axle bolt 118, and doubled upon itself so that its doubled section extends to a position of engagement with and is held by the inner end wall 125 of the box 116, thus holding the spring 126 tensioned. This construction will be clearly apparent from examination of Figs. 6, 7 and 10.

The screen cloth 24 preferably is provided with reinforcing channel members 128 at its lower edge portion (see Fig. 10), which channel members 128 may be attached to the screen cloth by means of the brads 130 or any convenient means. The screen cloth may be attached to the end rail by means of the clamping action exerted by the upper portion of the housing 100 (see Fig. 10) when the sides of said housing are held firmly clamped in place as by means of the bolt 132 or the like.

There are several obvious methods of assembling the unit for operation, and to describe such methods in detail would serve no useful purpose here and would unnecessarily lengthen this disclosure.

After assembly, assuming for the purpose of description that the screen is in the "rolled-up" position, the screen assembly may be lowered by grasping the handle 102 and pulling downward as far as desired. The assembly will remain counterbalanced in such an operation, until it reaches the position where the screen cloth is fully extended as in Fig. 4 but not with tension thereon. In this movement downward, the catch 94 rides against the third rail projecting strip 88. This would normally be the position shown in dotted lines in Fig. 9.

When the screen has reached its downward limit of movement before tensioning, the catch 94 will "click" into the position below the strip 88 indicated in Fig. 8. In all of the movement so far described the handle 102 is pointing upward.

The catches 94 normally click into position on both ends at the same time because the screen is pulled down in the center and will come down straight. As soon as these catches 94 click into place, the handle 102 may be turned to the position shown in Fig. 6, and the cam 96 will engage the lower edge of the projecting strip 88, and will exert a downward force moving the screen to the exactly tensioned position desired, as shown in Fig. 7. This will not "over stretch" the screen, or twist or warp it. Where reliance is not placed on the catches to indicate the position for beginning the camming action, the cams might be forced outwardly against the projecting strip 88, and due to the considerable leverage secured, the projecting strip 88 or some other part would have to "give." This might damage the screen installation, so that it is desirable to have the catches engaged by "clicking" into position.

It is here noted that the very important object of tensioning the screen without exerting any tensioning pull on the spring 72 is accomplished in this method. When the tensioning action takes place, the arbor is in the position shown in Fig. 4, and the tensioning pull is diametrically across said arbor as indicated by the arrow in said figure. This does not exert any additional pull on the spring, and the spring is merely exerted a sufficient amount to counterbalance the normal untensioned weight of the screen and lower rail assembly. This is an extremely important feature as was pointed out in connection with the objects.

When it is desired to release the cam and catches so that the screen assembly may be moved up into the rolled position, the handle 102 is turned so that it is in the position shown in Fig. 1 in dotted lines, and is then turned a slight bit further to the operator's right (in a clockwise direction with respect to the operator) so that the cam and lever joining pin 136, which projects sufficiently to contact the catch 94 at the top as is indicated in Fig. 10, will press against catch 94 as in Fig. 12 and will disengage said catch from the projecting strip 88, freeing the screen and allowing it to be moved upwardly.

It is understood that the handle mechanism above described does not necessarily have to work in the exact manner disclosed. The parts could be reversed so that the handle would rotate in the opposite direction, that is, anticlockwise, but the principle would be the same, and for the purposes of disclosure there would be no difference.

As soon as the catch 94 has cleared the bottom of the strip 88, the handle may be moved into an upright position for further positioning of the screen, in which position the cams and catches assume the positions indicated by dotted lines in Fig. 9.

While I have described my invention in connection with certain specific embodiments thereof, it is to be understood that this is by way of illustration rather than limitation and that the invention is to be defined by the appended claims which should be given a scope as broad as commensurate with the prior art.

I claim:

1. A roller type screen assembly comprising an open mesh woven screen cloth having warp and weft stands; a roller automatically rotatable in a winding direction and to which one end of said screen cloth is detachably secured; means for arresting unwinding movement of said screen cloth when a predetermined length thereof is withdrawn from said roller; a rail secured to the other end of said screen cloth; and control means carried by said rail, said control means including means operable to latch said rail in position when said predetermined length of screen has been unwound from said roller to thereby retain said unwound length of screen cloth in extended position, said control means also including means operable to effect a lengthwise tensioning of the screen cloth between said rail and arresting means by moving the rail beyond said latched position, whereby to stretch the warp strands of the screen cloth.

2. A roller type screen assembly as defined in claim 1, wherein the means for effecting lengthwise tensioning of the screen cloth comprises cam means on said rail.

3. A roller type screen assembly comprising an open mesh woven screen cloth having warp and weft strands; a roller automatically rotatable in a winding direction and to which one end of said screen cloth is detachably secured; means for arresting unwinding movement of said screen cloth when a predetermined length thereof is withdrawn from said roller; a rail secured to the other end of said screen cloth; guide means for receiving the margins of said screen cloth and the ends of said rail; and control means carried by said rail, said control means operable to latch said rail to said guide means when said predetermined length of screen has been unwound from said roller to retain said unwound length of screen cloth in extended position, said control means also including cam means on said rail operable to engage said guide means for effecting a tensioning of the unwound length of screen cloth by moving the rail beyond said latch position, whereby to stretch the warp strands of the screen cloth.

4. A roller type screen assembly as defined in claim 3, wherein the cam means on said rail are adapted to be operated by a single manually operable control means comprising a handle.

5. In a roller type screen assembly for installation in a fenestral opening having a spring loaded adjustable roller automatically rotatable in a screen winding direction, an open mesh woven screen cloth detachably secured at one end to said roller, said screen cloth having ribbon-like weft strands and warp strands adapted to be elastically elongated; a rail secured to the other end of said screen cloth; means for arresting unwinding movement of said screen cloth when a predetermined length thereof is withdrawn from said roller; and guide means for receiving the margins of said screen cloth and the ends of said rail, those improvements comprising: automatically projected latching means carried by said rail and adapted to engage said guide means at a predetermined extended position of said screen cloth for releasably retaining said rail and screen cloth at said position; separate cam means carried by said rail operable to engage said guide means after the latching of the screen and rail has been effected and adapted to tension said screen cloth between said rail and arresting means by moving the said rail beyond said latched position to effect said elastic elongation of the warp strands to hold the screen cloth taut; and means comprising a handle operatively connected to said cam means for engaging and disengaging said cam means from said guide means, said handle actuated cam means being operable to also disengage said latch means upon a continuation of the movement releasing said cam means, whereby said screen cloth may be rewound upon said roller.

6. In combination with screen cloth wound upon an automatic winding roller and having ribbon-like weft strands and having warp strands which are inherently elastic to permit longitudinal elongation for tensioning an unwound length of the cloth, means maintaining one end region of said screen cloth against longitudinal movement in an unwinding direction when a predetermined length is withdrawn, and means at the other end of said screen cloth operable to stretch the withdrawn length of screen cloth thereby tensioning the latter.

7. In combination with screen cloth wound upon an automatic winding roller and having ribbon-like weft strands and having warp strands which are inherently elastic to permit longitudinal elongation for tensioning the cloth, means maintaining one end of said screen cloth against longitudinal movement when in unrolled position, and means at the other end of said screen cloth operable to stretch the unrolled screen cloth thereby tensioning the latter, said last means including an end rail attached to said other end of said screen cloth and means intermediate the ends of said end rail for operating said tensioning means.

8. In combination with a wound length of screen cloth adapted to be extended by longitudinal elongation while tensioning the cloth, means maintaining one end of said screen cloth against longitudinal movement when in unwound position, and means at the other end of said unwound length of screen cloth operable to stretch the screen cloth for effecting a tensioning thereof, said last mentioned means including an end rail with cam elements located adjacent the respective ends thereof and a central manually operable control means for operating said cam elements.

9. In combination with screen cloth adapted to be extended by longitudinal elongation while tensioning the cloth, means maintaining one end of said screen cloth against longitudinal movement, and means at the other end of said screen cloth operable to hold and stretch the screen cloth thereby tensioning the latter, said means including an end rail carried by said screen cloth, latching means thereon holding said screen cloth in unstretched condition and separate cam devices on said rail for effecting the aforesaid stretching and tensioning of said screen cloth.

10. In a screen assembly of the class described, a roller; means on said roller for receiving and

releasably retaining a longitudinally extensible tensionable screen adapted to be rolled thereon, said means comprising coacting hook portions on the periphery of said roller and the adjacent portion of said screen; catch means latching said screen in extended position; cam means operable to apply tension to the latched screen; and means operable to release said cam means and then to release said catch means, permitting winding of the screen on said roller, the arrangement being such that said cam means is operable to extend said screen for the tensioning operation, after said screen is latched, by exerting a force on said screen diametrically of the roller.

11. A screen as defined in claim 10, wherein the cam means and the latch means are actuated to release the screen by a common means.

12. In a roller type screen assembly for a window, comprising a roller mounted in an end portion of the window and having automatic rewinding action; a reticulate screen adapted to be wound on and unwound from said roller, said screen having warp strands characterized by elasticity to permit elongation thereof for tensioning the screen, said screen having an end edge free of said roller; means defining fixed cam and latch engaging elements at the regions of the window which are remote to said roller; and a rail attached to said free edge of the screen and adapted for movement in a direction toward said elements to withdraw at least a portion of said screen from said roller; those improvements which comprise, yieldable latches at the ends of said rail adapted when registered with said elements to be automatically projected thereinto to latch said rail and maintain the screen against the rewinding action of said roller; means for restraining the unwinding movement of said screen when said rail is latched; cam means adjacent the ends of said rail; and manually operable means intermediate the ends of said rail adapted to move said cam means for cam action with respect to said elements thereby to force said rail beyond said latched position and effect said elongation of said warp strands and the tensioning of the screen between said rail and said restraining means.

13. A roller type screen as defined in claim 12, wherein the cam and latch means are separate and the manually operable means moving said cam means are adapted to release said latch means by continuing the movement of said cam means in a releasing direction and engaging the latch means by the cam means and urging the latch means in a retracting direction.

14. A roller type screen assembly as defined in claim 12, wherein the means defining said cam and latch engaging elements comprise guides for the opposite longitudinal margins of said screen, having cam and latch engaging recesses in the portions thereof which are remote to said roller.

15. In combination with a screen cloth having ribbon-like weft strands and having warp strands adapted for longitudinal elongation for tensioning the cloth, a roller for winding and unwinding said screen cloth; means at one end of said screen cloth for arresting movement thereof longitudinally of said warp strands when said screen cloth is in unwound position, and means defining latches and cams at the other end of said screen cloth, said latches being operative to effect the latching of the screen cloth when extended to its arrested untensioned position and said cams being then operative to effect said elongation of the warp strands to tension the cloth.

16. In a roller type screen assembly for a fenestral opening or the like, comprising a reticulated screen cloth having warp strands with elastic characteristics, a roller automatically rotatable in a winding direction, means securing one end region of said screen cloth to said roller; guide means for said screen cloth, means arresting unwinding movement of said screen cloth from said roller when a predetermined length is withdrawn from said roller, latch means at the free end of the screen cloth, said latch means being adapted to latch the screen in its arrested and untensioned position and means carried at the free end of said screen cloth adapted to extend said screen cloth longitudinally of the weft strands for uniform tensioning of said screen cloth.

17. In a roller type screen assembly for a window, comprising a reticulate screen having warp strands characterized by elasticity to permit elongation thereof for tensioning the screen; a roller mounted in the top portion of the window and having automatic rewinding action, said screen being initially wound on said roller and having a free end edge; and a rail attached to said free edge of the screen and adapted for movement in a direction away from said roller to withdraw at least a portion of said screen from said roller; those improvements which comprise, guides along the upright portions of said window, said guides having fixed recesses adjacent the sill of the window, said rail and screen being guided by said guides; spring urged latches pivoted at the rail ends adapted when registered with said recesses to be projected thereinto to latch said rail and to maintain the screen against said rewinding action of the roller; means effective on the screen when said rail is latched to restrain further unwinding movement of said screen; cam means fulcrumed at the rail ends adjacent said latches; and common means carried by said rail for operating said cams, said common means comprising a manually operable rocker arm and links operatively connecting the ends of said arm to said cams, movement of said rocker arm in one direction being adapted to move said cams in said recesses thereby to force said rail downwardly beyond its latched position and effect said elongation of the warp strands thereby to tension said screen between said rail and said screen restraining means, and movement of said rocker arm in a reverse direction being adapted to release and withdraw said cams, and a continuation of said reverse movement causing said cams to engage said latch means and withdraw the latch means from said recesses.

18. A window screen assembly comprising: a roller; automatic means normally urging said roller in a winding direction, said roller having a peripheral opening extending longitudinally thereof, one longitudinal edge of said opening having a hook element extending therealong; a piece of screen cloth of a given width and length to cover a given size window opening; a hook element secured to the upper end of said screen cloth and interengageable with the hook element on said roller for detachably securing said screen cloth to said roller and for exerting a pull in a direction diametrically of said roller when said screen cloth is fully unwound from said roller; latch engaging means at the lower part of said window opening; and means carried by the lower end of said screen cloth cooperable with said latch engaging means for latching said screen cloth in extended, substantially untensioned position when said screen cloth is fully unwound

from said roller and for stretching said screen cloth beyond said fully extended position to longitudinally tension the same.

19. A window screen assembly comprising: a roller; automatic means normally urging said roller in a winding direction; a piece of screen cloth of a given width and length to cover a given size window opening having the upper end thereof secured to said roller; latch engaging means at the lower part of said window opening; and

means carried by the lower end of said screen cloth cooperable with said latch engaging means for latching said screen cloth in extended, substantially untensioned position when said screen cloth has been fully unwound from said roller and for stretching said screen cloth beyond said extended position to longitudinally tension the same.

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