Sept. 29, 1959 D. MACY 2,906,323

COMBINED AWNING AND SHUTTER CONSTRUCTION

Filed Feb. 23, 1956 2 Sheets-Sheet 1

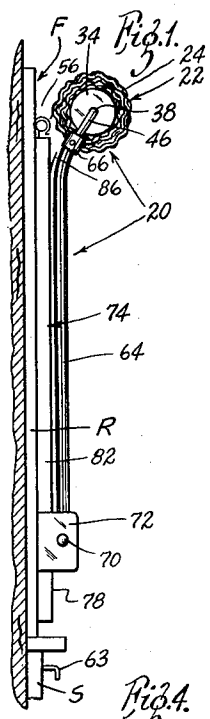


Fig. 1.

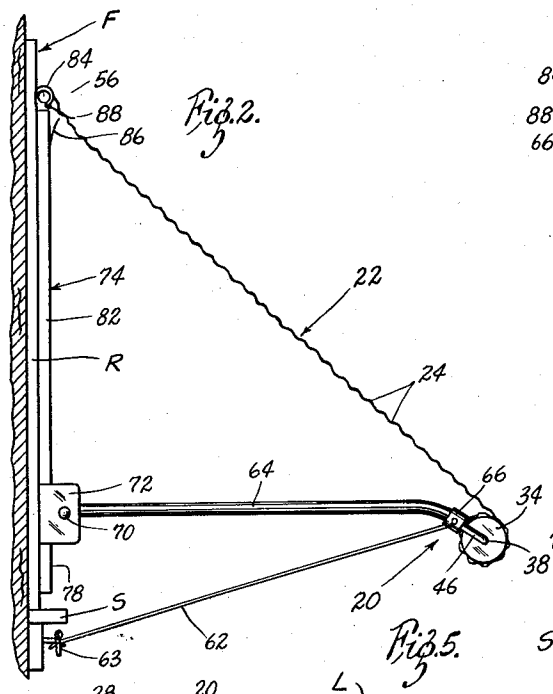


Fig. 2.

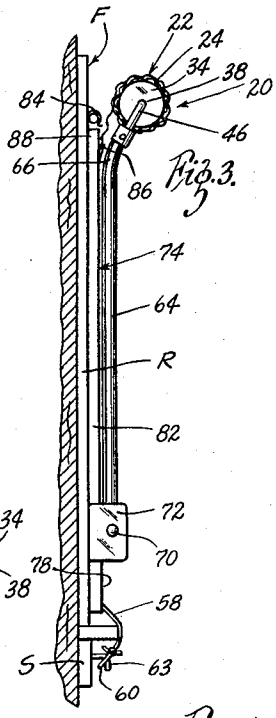


Fig. 3.

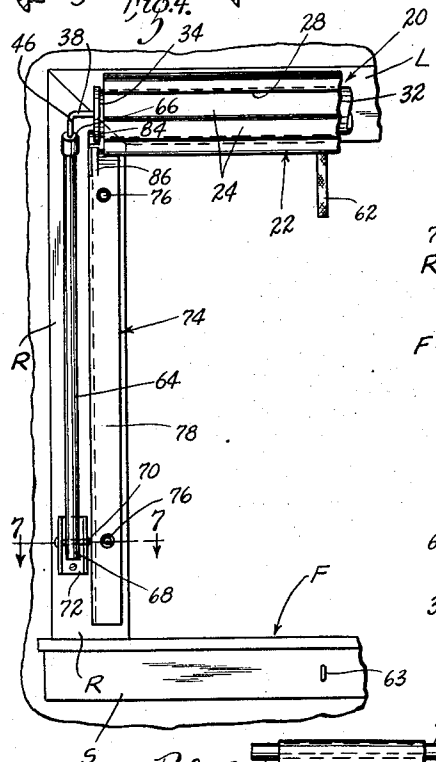


Fig. 4.

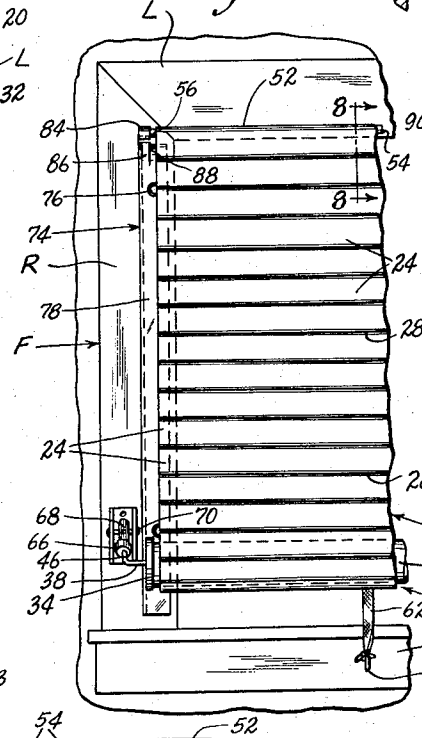


Fig. 5.

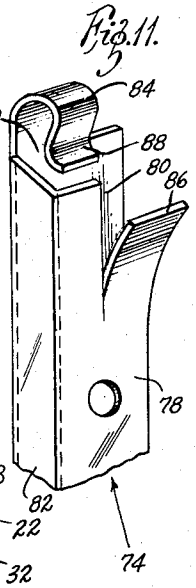


Fig. 11.

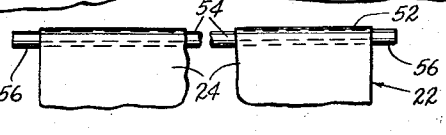


Fig. 15.

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Fig. 6.

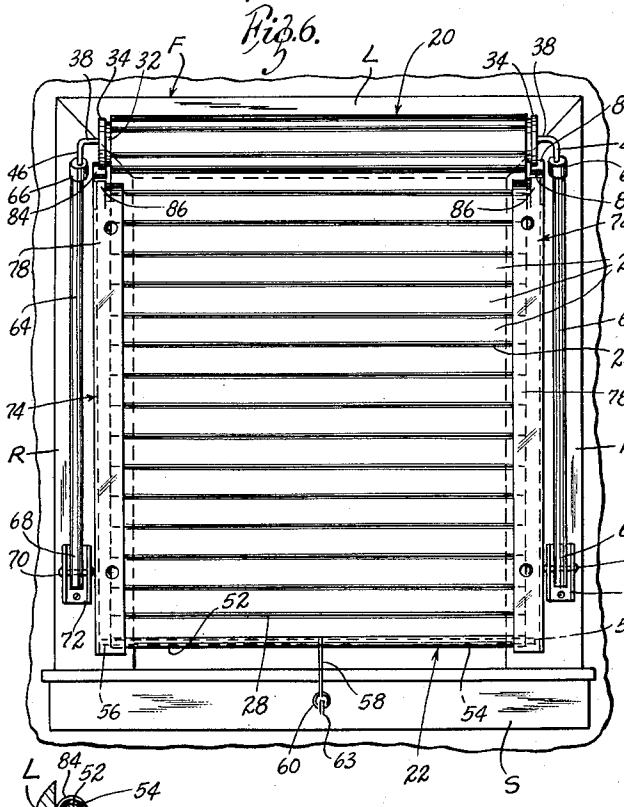


Fig. 7.

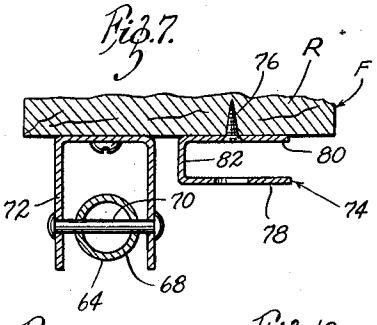


Fig. 9.

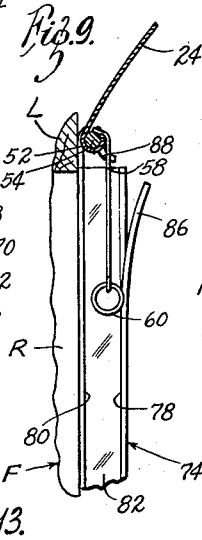


Fig. 10.

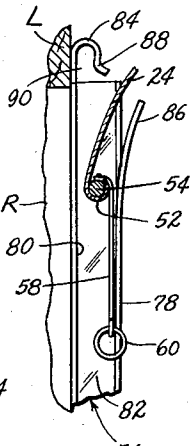


Fig. 8.

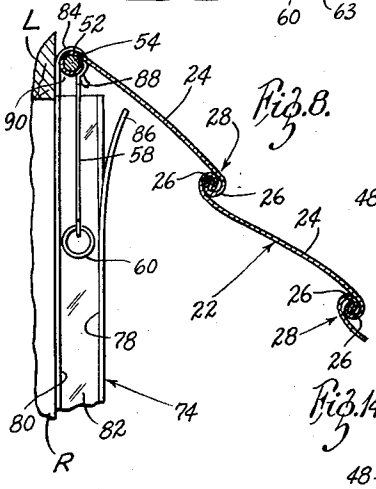


Fig. 13.

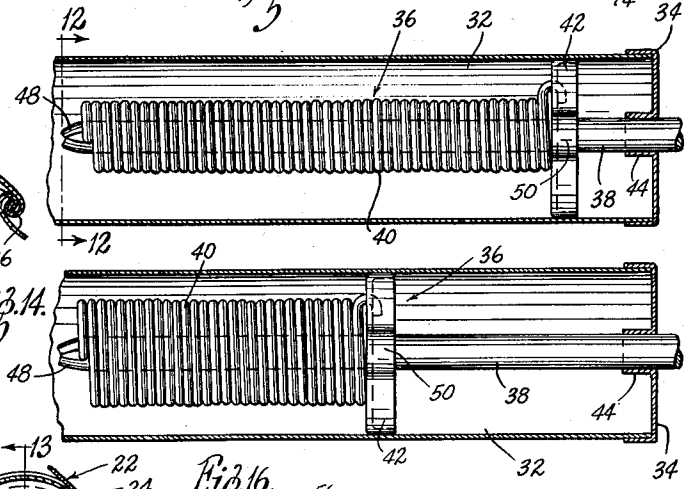


Fig. 14.

Fig. 12.

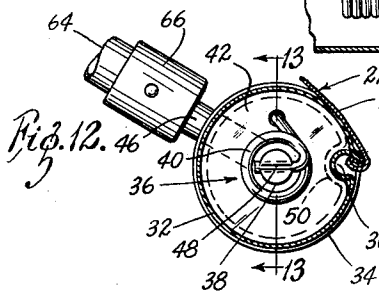


Fig. 16.

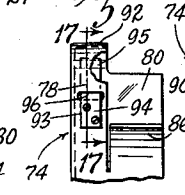
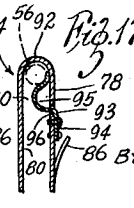


Fig. 17.



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United States Patent Office 2,906,323 Patented Sept. 29, 1959

2,906,323

COMBINED AWNING AND SHUTTER CONSTRUCTION

Donald Macy, Richmond Heights, Mo., assignor to Artcraft Venetian Blind Manufacturing Company, St. Louis, Mo., a corporation of Missouri

Application February 23, 1956, Serial No. 567,201

10 Claims. (Cl. 160—62)

Generally, the present invention relates to protective devices of the type that may be installed on the window and door frames of buildings, dwellings, and the like.

More particularly, the present invention relates to a novel construction including a roll-up or flexible metallic curtain that may selectively be employed in either an awning or in a shutter capacity.

Curtains of this type are usually constructed of a plurality of narrow panel members or slats that have rockable, or what may be termed flexible interlocking connections along their adjacent edges. The uppermost slat of the curtain is usually permanently secured above a window or door opening. The lowermost slat is secured to a roller or cylinder that is rotatably supported by a pair of arms hingedly mounted on a lower portion of the frame surrounding the opening. In consequence of this arrangement, when the free ends of the arms move away from the frame, the curtain will unfold outwardly and downwardly as is well understood.

The present invention is designed to incorporate a roll-up awning of the wind-up type, preferably that disclosed in the copending application of Harry Nelson, filed January 27, 1956, Serial Number 561,900, assigned to the assignee of the instant application. The Nelson disclosure includes a pair of winding devices that are disposed in the end portions of the cylinder to which the lowermost slat of the articulated curtain is attached. These winding devices include coil spring arrangements adapted to normally maintain the curtain in rolled-up status.

The primary object of this invention is to provide a novel arrangement whereby an automatic roll-up awning such as that referred to may be readily utilized also to serve as a shutter when desired. To this end, the uppermost panel of the curtain is releasably retained, rather than permanently secured, above a building opening.

Stated more explicitly, it is the principal object of the invention to provide means effective to maintain the upper end thereof stationary when the curtain is to function in an awning capacity, and to enable said upper end to be lowered when the curtain is to function in a shutter capacity.

Another object of the invention is to provide novel guide means for the curtain to facilitate its "change-over" from awning to shutter disposition.

A further object is to provide means adapted to minimize lateral displacements of the slats when the curtain is in the process of being lowered, said means also being effective to shield said curtain ends from wind blasts after it has been lowered into shutter disposition.

Other objects of the invention are to provide a combined awning and shutter construction that may be installed and operated with ease, and has a pleasing appearance both when in use as well as when not in use.

Inasmuch as the awning-shutter herein contemplated may be employed to protect building openings of various sizes, it is also an object of this invention to provide a

construction that may be fabricated in any desired length without departing from the structural concepts to be set forth in greater detail hereinafter.

It is a feature of the invention that, when not disposed in either an awning or a shutter capacity, the device may be disposed entirely out of the way so as not to obstruct the window or other opening in any manner whatsoever. That is to say, the rolled-up curtain would be supported by means of the arms so as to lie adjacent the window frame or building wall above the opening.

Other novel features and advantages of the invention not specifically noted hereinbefore will be apparent or mentioned in the detailed description to follow with reference to two sheets of drawings wherein:

Figure 1 is an end elevational view of a combined awning and shutter assembly installation constructed in accordance with the teachings of the present invention, the assembly being shown in normal or not-in-use status;

Figure 2 is a similar view demonstrating the assembly disposed in an awning status;

Figure 3 is a similar view demonstrating the assembly disposed in a shutter status;

Figure 4 is an outside-the-building or front elevational view of the left hand half of the installation as disposed in Figure 1;

Figure 5 is a similar view of the left hand half of the installation as disposed in Figure 2;

Figure 6 is a similar view of the entire installation as disposed in Figure 3;

Figure 7 is a fragmentary transverse section, on an enlarged scale, taken along the line 7—7 of Figure 4;

Figure 8 is a fragmentary vertical section, on an enlarged scale, taken along the line 8—8 of Figure 5;

Figures 9 and 10 are views similar to Figure 8 with certain parts occupying moved positions;

Figure 11 is a perspective view of the upper end portion of one of a pair of generally channel-shaped members included in the assembly;

Figure 12 is an enlarged transverse sectional view through the right hand end of the winding cylinder, the view being indicated by the line 12—12 in Figure 13;

Figure 13 is a longitudinal sectional view taken as indicated by the line 13—13 in Figure 12;

Figure 14 is a view similar to Figure 13 with certain elements disposed in a moved position;

Figure 15 is a fragmentary detail view of the uppermost curtain slat and the transverse bar rigid therewith;

Figure 16 is a front elevational view of the upper end portion of a slightly modified generally channel-shaped member; and

Figure 17 is a vertical sectional view taken on the line 17—17 of Figure 16.

Numeral 20 designates generally the combined awning and shutter assembly of the present invention. For descriptive purposes herein, the assembly 20 is shown mounted exteriorly of a dwelling on a window frame F that may include a lintel L, a sill S, and left and right side rails R.

The assembly 20 includes a flexible curtain 22 that is composed of a plurality of relatively narrow slats 24, each of said slats, except the uppermost, having similar though reversely rolled formations or hollow bead sections 26 along its marginal edges as shown. Adjacent ones intermediate the uppermost and lowermost slats are rockably interlocked as shown particularly at 28 in Figure 8, so as to permit free articulation of them. The illustrated interlocking connections 28 form no part of the present invention. The lowermost slat 24 has its bottom marginal edge formation 26 crimped into a longitudinal recess 30 provided therefor in the periphery of a cylinder 32, as shown in Figure 12. The recess or

groove 30 is coextensive with the cylinder 32, and said lowermost slat is retained in position against lateral movements thereof by caps 34 that are pressfitted onto the opposite ends of said cylinder.

At this point it is to be noted that the wind-up mechanism 36 appearing in Figures 12 through 14 has been illustrated solely for the purpose of clarifying the operation of the present invention. That is to say, whereas this invention incorporates said mechanism, no claim thereto per se is made herein, inasmuch as it constitutes subject matter disclosed in the copending application aforesaid of Harry Nelson.

As the Nelson disclosure teaches, identical wind-up mechanisms 36 are provided in both ends of the cylinder 32. Briefly, each of the mechanisms 36 includes a torsion rod 38, a coil spring 40, and a peripherally flanged disc 42. The rod 38 extends into the cylinder through a bearing 44 in the end cap, whereby the two rods rotatably support the cylinder at each end thereof. Outside the cylinder, each torsion rod is bent right-angularly to form an extension 46, as shown particularly in Figures 4 through 6. The innermost end of said rod is slotted and deformed as at 48 whereby to anchor the inner convolution of the spring 40, the outer convolution being anchored in the disc 42 as shown. Said disc is slidable longitudinally of the cylinder, but restricted against rotary motion by the provision of an arcuate indent 50 that partially embraces the cylinder recess 30, as shown in Figure 12.

In accordance with the concepts of the present invention, the top marginal edge of the uppermost slat 24 is formed to provide a coextensive semicircular segment 52, as best seen in Figures 8 through 10. Numeral 54 designates a round metallic bar that is welded or otherwise positively secured into the segment 52. The bar 54 is of greater length than the slats 24, so that the end portions 56 thereof project therebeyond, as particularly demonstrated in Figure 15.

Rigidly attached in any suitable manner centrally of the bar 54 is a tape or drawstring 58 that preferably has a ring 60 secured to its depending extremity. Further, as disclosed in said copending application, a draw cord 62 is anchored at one end to the cylinder 32, and when the curtain is in awning status, the free end of said cord is tied to a cleat or hook 63 projecting from the window sill S, as shown in Figure 5. When the curtain is in shutter status, the ring 60 on the extremity of the drawstring 58 is looped over said hook, as best seen in Figures 3 and 6.

Each of the torsion rod extensions 46 is secured to the free end portion 66 of one of a pair of tubular arms 64. The opposite end portion 68 of each of said arms has a pivotal connection 70 with one of a pair of brackets 72 that are preferably mounted on the side rails R in a plane above that of the sill S. It is noted that the brackets 72 may, in some installations, be mounted on the building adjacent the rails, or if desirable, on the guide tracks to be described.

The most important feature of the invention resides in the novel means provided for supporting the bar 54 in the rolled-up and awning dispositions of the curtain; for facilitating the lowering and subsequent raising operations of the curtain from and to the rolled-up disposition thereof; and for protecting the lowered curtain against wind hazards.

The means referred to are incorporated in a pair of guide tracks generally designated 74 that are mounted by means of screws 76 on the side rails R of the window frame F. As best seen in Figure 6, these guide tracks extend from the lintel portion L of the frame to a plane preferably a short distance above the sill S. With particular reference also to Figures 7 and 11, it is noted that the tracks are channel-shaped, and include spaced leg sections 78 and 80 connected by a web section 82. The sections 78 and 80 are spaced apart a distance slightly greater than the diameter of the slat interlocking connections 28, so that as will appear, free but automatically controlled vertical movements of the curtain may be had. As clearly shown in Figure 6, the tracks are positioned with their channels opening toward one another, and are so mounted that they will overlap the side edge portions of the curtain when the latter is lowered.

At the top, each track terminates in a resilient clip or loop segment 84 that is illustrated as being integral with section 80, and an arcuate segment 86 that is illustrated as being integral with section 78. It is to be understood of course that, whereas the guide tracks 74 and the clip and arcuate segments thereof are illustrated as being of integral construction, the clips 84 and the segments 86 may obviously be formed separately and then integrated with the tracks by welding or otherwise.

The resilient loop segments 84 are diametered to snugly embrace the projecting ends 56 of the bar 54, and as most clearly demonstrated in Figure 11, terminate in reversely curved extremities 88 to form relatively narrow entrance openings 90 leading into the loop segment.

As particularly demonstrated in Figure 11, the spaces obtaining between the uppermost edges of the leg sections 78 and the thereabove terminal edges of the reversely curved extremities 88 are of less extent than the diameter of the bar 56, for a reason to appear.

A modified arrangement for the upper ends of the tracks 74 appears in Figures 16 and 17. In accordance with the concept there illustrated, a semicircular web segment 92 connects the leg segments 78 and 80 at the top, and the resilient clip for engaging one of the projecting ends 56 of the bar 54 comprises a leaf spring 93. The lower end portion 94 of said spring is secured, by screws or the like, to the outer face of the leg segment 78. The free upper end portion 95 of the spring is of arcuate configuration and projects through an elongated slot 96 provided therefor in said leg segment to form an entrance opening 90 as shown.

Operation

Although it is believed that the procedure necessary to operate the invention should be evident from the foregoing description and an inspection of the drawings, a brief explanation will be given.

The combined shutter and awning assembly 20 would be installed with the parts disposed as in Figures 1 and 4. Thus, the arms 64 would be perpendicular or approximately so, depending on the length of curtain wound about the cylinder 32. The projecting ends 56 of the rod 54 would each be lodged in one of the loop segments 84. At this time the windup mechanisms 36 would be disposed as illustrated in Figure 14. Inasmuch as these wind-up mechanisms constantly tend to rotate the cylinder 32 in a clockwise direction (as viewed in Figure 1), the rod ends 56 cannot be displaced from engagement with the loops 84.

Assuming now that it were desired to employ the invention in awning capacity, the draw cord 62 would be pulled downwardly causing the cylinder 32 to rotate counterclockwise. Consequently the curtain 22 would be unwound, as the arms 64 swing outwardly from the frame F. When the desired length of curtain has been unwound, the cord 62 would be fastened to the hook 63, thus maintaining the curtain taut, as demonstrated in Figures 2 and 5. It is to be observed that during this entire operation, the rod 54 is positively retained in place by the loop segments 84, because the "pull" of the curtain is always away from the clip opening 90. In other words, during the movement of the curtain 22 and arms 64 to extended awning position, the rod ends 56 would simply move clockwise in the loop segments 84, but displacement thereof would be prevented by the reversely curved formations of the segments 88. At this time, the windup mechanisms 36 would be disposed as illustrated in Figures 12 and 13.

Assuming now that it were desired to return the as-

sembly to the normal Figure 1 disposition, it would only be necessary to unfasten the cord **62**, whereupon the cylinder **32** would be free to rotate clockwise again, thus automatically winding up the curtain together with the draw cord. It is to be observed that during this entire return operation, the rod ends **56** simply move in a counterclockwise direction, but displacement of them is prevented by the reversely curved formations of the segments **88**.

In Figures 3 and 6, the assembly **20** is illustrated as it would appear when serving as a shutter. With attention directed also to Figures 9 and 10, the simple procedure required to dispose the assembly in shutter status will be explained. The disposition of parts appearing in Figure 9 corresponds to the Figure 1 disposition of them, so that the rod **54** has its projecting ends **56** firmly gripped in the resilient loop segments **84**, as hereinbefore explained. A direct downward pull on the drawstring **58**, however, would effect escape of the rod **54** via the openings **90**, inasmuch as the reversely curved extremities **88** are distensible.

Assuming that the rod **54** had been thus released, the curtain would begin to unwind from the cylinder in response to continued downward movement of the drawstring, as suggested in Figure 10. When the curtain had been lowered to cover the window, the ring **62** would be slipped over the hook **63** thus maintaining the curtain in shutter status.

During the downward movements of the curtain, the projecting rod ends **56** and the marginal side portions of the curtain **22** would ride in the guide tracks **74**, the segments **78** and **80** serving as rails for the slat interlocking connections **28**.

Obviously, as the curtain continues its descent, the diameter of the rolled-up slats on the cylinder continues to decrease, so that during the final stages, the curtain enters the tracks at an angle, as suggested in Figure 3. Such entry is facilitated by the provision of the arcuate segments **86**. Because the cylinder **32** is constantly biased to rotate in a clockwise direction, any slack in the curtain will be taken up automatically. In the shutter status of the assembly, the windup mechanisms **36** would also be disposed approximately as shown in Figures 12 and 13.

Assuming now that it were desired to return the curtain to its Figure 1 or normal disposition, it would only be necessary to remove the ring **60** from engagement with the hook **63**. Thereupon the curtain would automatically rise with sufficient momentum to cause the rod ends **56** to re-enter the loop segments **84** via the openings **90**, the reversely curved segments **88** being again momentarily distended. As the rod ends **56** approach the segments **88** near the end of the upward movement of the curtain, they are riding along the inner faces of the track segments **78**, as should be apparent. It is noted, however, as previously mentioned, that the spaces between the upper edges of said track segments and the terminal edges of said reversely curved segments **88** are too small to permit the escape of said rod ends.

With respect to the modified construction appearing in Figures 16 and 17, it is not deemed necessary to repeat the mode of operation. Were the arrangement disclosed in these two views incorporated therein, the invention would be operable in the identical fashion described.

In view of the foregoing description augmented by an inspection of the drawings, it should be manifest that the present invention provides a novel construction that may be readily installed, and thereafter operated with ease.

Whereas the preferred embodiment and one modification have been illustrated and described, the invention may admit of other structural changes without departing from its scope as set forth in the claims.

What is claimed is:

1. In an articulated curtain of an automatic roll-up type awning, said curtain being constructed of a plurality of narrow slats having flexible interlocking connections with adjacent slats along their longitudinal marginal edges: means for releasably supporting the upper end of said curtain in a plane above an opening in a dwelling or the like, said means comprising a round bar rigid with the top longitudinal marginal edge of the uppermost of said slats and having its opposite ends projecting beyond the side marginal edges of all of the slats; and a pair of spaced resilient clip or loop elements adjacent the upper end of said opening each adapted to positively retain one of the projecting ends of said bar against fortuitous displacement.

2. In an articulated curtain of an automatic roll-up type awning, said curtain being constructed of a plurality of narrow slats having flexible interlocking connections with adjacent slats along their longitudinal marginal edges: means for releasably supporting the upper end of said curtain in a plane above an opening in a dwelling or the like, said means comprising a round bar rigid with the top longitudinal marginal edge of the uppermost of said slats and having its opposite ends projecting beyond the side marginal edges of all of the slats; and a pair of spaced resilient clip or loop elements adjacent the upper end of said opening each adapted to positively retain one of the projecting ends of said bar against fortuitous displacement, said loop elements constituting the upper extremities of a pair of guide tracks each perpendicularly mounted along the structure defining the sides of said opening.

3. In an articulated curtain of an automatic roll-up type awning, said curtain being constructed of a plurality of narrow slats having flexible interlocking connections with adjacent slats along their longitudinal marginal edges; the construction set forth in claim 2, and a drawstring or the like fixed at one end of said bar centrally thereof whereby the projecting ends of the bar may be withdrawn from said resilient loop elements in response to a directly downward pull applied to the free end of the drawstring.

4. In a combined awning and shutter construction of the character described: a pair of guide tracks each attached to one of the side rails of a window frame and extending from the lintel portion to a selected plane above the sill portion of said frame, each track being of channel configuration to include spaced first and second leg sections connected by a web section, a resilient clip or loop segment terminating in a reversely curved extremity formed on the upper end of the first leg section, and an arcuate segment formed on the upper end of the second leg section.

5. In a combined awning and shutter construction of the character described: a pair of guide tracks each attached to one of the side rails of a window frame and extending from the lintel portion to a selected plane above the sill portion of said frame, each track being of channel configuration to include spaced first and second leg sections connected by a web section, a semicircular section joining said first and second leg sections at the top, and an elongated slot formed in the second leg section; a leaf spring having its lower end portion secured to said second leg section with its free upper end portion projecting through said slot, said upper end portion of the spring having an arcuate configuration; and an arcuate segment formed on the upper end of the second leg section.

6. In combination: an articulated curtain of the automatic roll-up type supported from the free ends of a pair of arms pivotally connected to brackets mounted on the side rails of a window frame or the like; a semicircular segment coextensive therewith provided along the top marginal edge of the uppermost slat of said curtain; a round bar rigidly secured into said semicircular segment and having its ends projecting therebeyond; a pair of guide tracks each mounted on one of said side rails and extending from the lintel portion to a plane a short dis-

tance above the sill portion of said frame; a pair of resilient loop segments each integral with one of said tracks at the top, said loop segments being diametered to snugly embrace the projecting ends of said bar when the curtain is in rolled-up and when the curtain is in awning status; a reversely curved extremity on each loop forming a relatively narrow entrance opening leading thereinto; a drawstring secured centrally of said bar and adapted responsive to a directly downward pull thereon to effect the distention of said loops whereby to release said projecting ends and cause the curtain to descend with the side marginal edges thereof riding in the guide tracks; arcuate guide segments rigid with the tracks at the top to facilitate entry of the curtain thereinto; and means for releasably securing the drawstring to the sill aforesaid to maintain the curtain in the shutter status thus attained.

7. In combination: an articulated curtain of the automatic roll-up type having its lowermost slat secured to a wind-up cylinder rotatably supported from the free ends of a pair of arms pivotally connected to brackets mounted on the side rails of a window frame; a semicircular segment coextensive therewith provided along the top marginal edge of the uppermost slat of said curtain; a round bar rigidly secured into said semicircular segment and having its ends projecting therebeyond; a pair of guide tracks each mounted on one of said side rails and extending from the lintel portion to an appropriate plane above the sill portion of said frame; a pair of resilient loop segments each integral with one of said tracks at the top, said loop segments being diametered to clasp the projecting ends of said bar both when the curtain is in rolled-up or in awning status; a reversely curved extremity on each loop forming a relatively narrow entrance opening leading thereinto; a drawstring secured centrally of said bar and adapted responsive to a directly downward pull thereon to effect the distention of said loops whereby to release said projecting ends via said entrance openings and cause the curtain to descend with the side marginal edges thereof riding in the guide tracks; arcuate guide segments rigid with the tracks at the top to facilitate entry of the curtain thereinto as the diameter of the rolled up portion thereof is decreased; means to secure the drawstring to a fastening device on the sill aforesaid for maintaining the curtain in the shutter status thus attained; and means incorporated in the wind-up cylinder aforesaid adapted to automatically return the curtain to rolled-up status following release of the drawstring from said fastening device.

8. A combined awning and shutter for use with a window or like frame around an opening, comprising: a roller and a curtain attached at one end to the roller so it may be rolled thereon and unrolled therefrom; arm means adapted to have rockable attachment at the end to the frame so as to enable the free end to be swung to and out from the frame, the roller being mounted upon the free end of the arm means; releasable means to secure the free end of the curtain with respect to the frame, so that when the arm means has its free end swung out, carrying the roller, with the free end of the curtain secured, the curtain will be extended as an awning; the releasable means including a holding device engaging over the outer end of the curtain to secure the end of the curtain against being pulled away from the wall when the arms are swung outward, said holding device having a release passage on its lower side to release the curtain when a downward force, parallel to the frame is applied thereto, and engageable means to withdraw the end of the curtain from the releasable means while the arm means are adjacent to the frame, and extend the curtain over the opening in the manner of a shutter.

9. The device of claim 8, with track means to be disposed vertically on the frame, beside the opening, and means on the sides of the curtain, interengageable with the track means, to confine the curtain when positioned as a shutter.

10. The device of claim 8, wherein the curtain comprises an assembly of slats of relatively stiff material, articulated together to make the curtain flexible for rolling onto the roller, but relatively stiff against bending transversely of the slats.

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