

March 4, 1930.

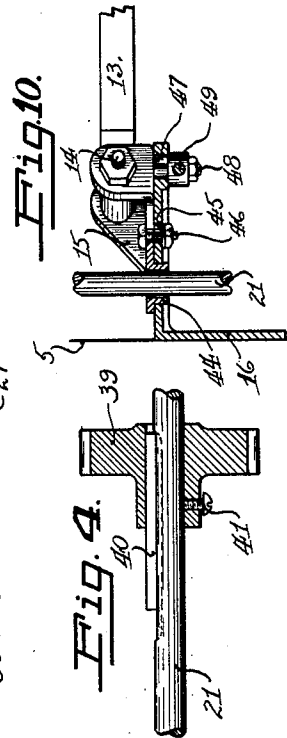
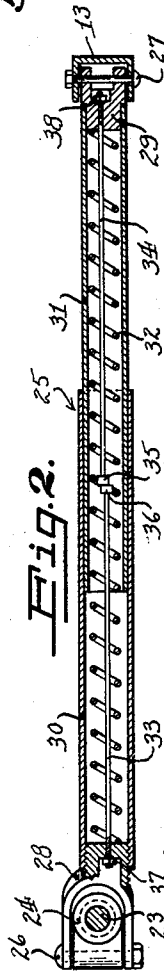
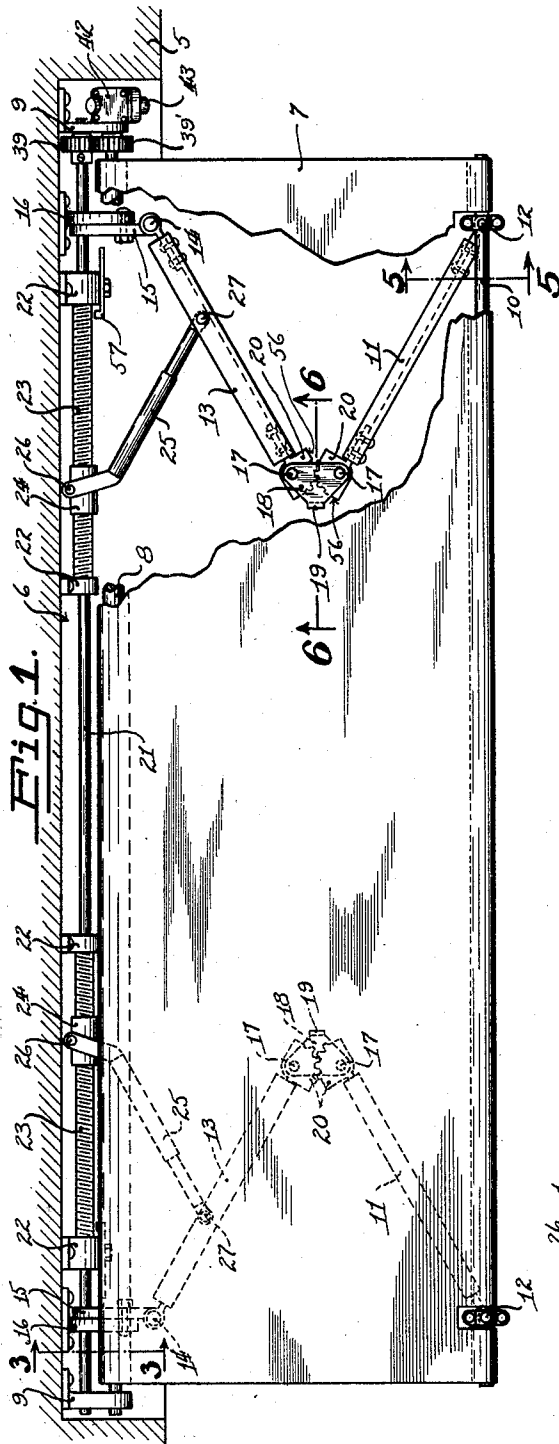
J. L. STUART

1,749,197

AWNING

Filed Jan. 26, 1929

2 Sheets-Sheet 1



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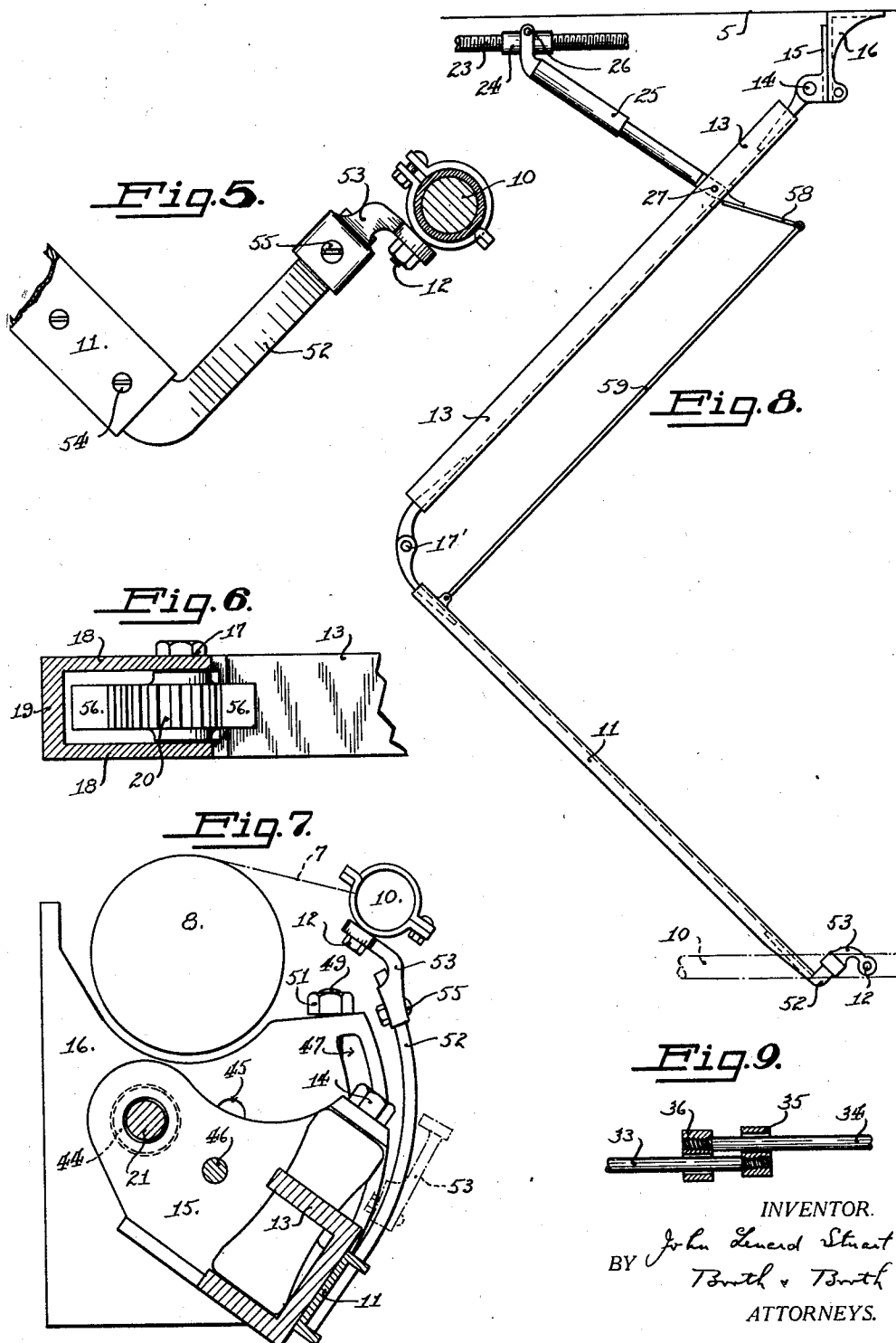
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AWNING

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

JOHN LENARD STUART, OF OAKLAND, CALIFORNIA

AWNING

Application filed January 26, 1929. Serial No. 335,291.

My invention relates to awnings of the disappearing type, and constitutes an improvement upon the awning for which United States Letters Patent No. 1,594,643 were issued to me August 3rd, 1926.

The general objects of my present invention are similar to those set forth in my said patent, viz:—to provide means for positively moving the awning, both to extend and to retract it, so that it can be positioned at any angle without reference to the effect of gravity; to provide an awning which, when retracted, will occupy no more space than that provided in the usual recess formed in the building wall; to provide means for supporting and operating the awning which may be wholly housed within such recess, so that there need be no rods or other parts extending into the interior of the building or down the front thereof; and to provide an adjustable mounting whereby the slope or inclination of the awning may be varied.

More specifically, the objects of my present invention are to provide improved means for extending and retracting the awning, to the end that friction may be reduced to a minimum; to provide improved means for compensating for the increasing effective diameter of the roller as the awning cover is wound thereupon, so that said cover is taut at all times; and to simplify the entire mechanism, so that its cost of manufacture is reduced and its efficiency and durability are increased.

For purposes of illustration, I have herein described and illustrated, as a typical embodiment of my invention, an awning capable of extension from a building wall at a slight inclination from the horizontal. It will be obvious, however, that the awning, when suitably mounted, may be extended in any direction, and that it may be made to occupy any of a great variety of positions, without material change in its construction. It is to be understood, moreover, that the form and construction herein shown and described may be varied, within the limits of the claims hereto appended, without departing from the spirit of the invention as expressed in said claims.

With this in view a typical embodiment of my invention will now be fully described with reference to the accompanying drawings, wherein:—

Fig. 1 is a broken plan view of my awning as mounted in a building wall, showing it in partly extended position.

Fig. 2 is a longitudinal section, enlarged, of one of the spring cushioned operating links.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1 showing means for adjusting the slope of the awning.

Fig. 4 is a sectional detail showing the means for attaching the driving gear to the operating rod.

Fig. 5 is a sectional detail taken on the line 5—5 of Fig. 1 and enlarged.

Fig. 6 is a sectional detail taken on the line 6—6 of Fig. 1 and enlarged.

Fig. 7 is a transverse detail, partly diagrammatic and partly in section, illustrating the relative positions of the adjustable supporting bracket, the front bar, and the roller of the awning when said awning is retracted.

Fig. 8 is a plan view showing a modified form of toggle arm connection for operating the front bar of the awning.

Fig. 9 is an enlarged detail of the stop lugs 35 and 36 shown in Fig. 2.

Fig. 10 is a horizontal section taken on the line 10—10 of Fig. 3.

In the drawings, the reference numeral 5 designates a building wall, and 6 is the usual recess formed therein for the reception of the awning when retracted. The canvas or flexible cover 7 of the awning is wound upon a roller 8, which is rotatably mounted in brackets 9 secured within the recess 6.

The forward edge of the cover 7 is secured to a bar 10. A pair of toggle arms 11 are pivotally connected at 12 with said bar 10. A second pair of toggle arms 13 have their outer ends pivotally connected with the inner ends of the arms 11 by joints to be described later, the length of the arms 13 being the same as that of the arms 11. The inner ends of the arms 13 are pivotally mounted at 14 on brackets 15 adjustably

secured to fixed brackets 16, which are fastened to the wall 5.

The connection between the adjacent ends of the toggle arms 11 and 13 may be a simple pivot, but I prefer to employ the connection shown in Figs. 1 and 6, in which said arms are pivoted, at 17, to a connecting member 18, which comprises two spaced plates rigidly joined by a neck 19, one of said plates lying above and the other below the ends of the arms 11 and 13. The ends of said arms are further provided with intermeshing gear segments 20, so that the angular relation between the arms 11 and the connecting members 18 is always the same as that between the arms 13 and said members.

The mechanism for swinging the toggle arms 11 and 13 to move the bar 10 toward or away from the wall 5, and thereby to retract or extend the awning, comprises a rotatable horizontal shaft 21, mounted in suitable bearings 22 and also journaled in the brackets 9, and provided with oppositely threaded screw portions 23. Nuts 24 engage said screws and are connected with the inner toggle arms 13 by links 25, whose ends are respectively pivoted, at 26 and 27, to said nuts and said arms 13.

The links 25 are spring cushioned, as shown in Fig. 2. Each comprises end members 28 and 29 which carry the pivots 26 and 27, and a pair of tubular telescoping body members 30 and 31. A compression spring 32 is housed within said body members, bearing against the end members 28 and 29. An adjustable stop is provided for limiting the extension of the link, said stop comprising a pair of rods 33 and 34 whose inner ends are provided with heads or stop lugs 35 and 36 Fig. 9, adapted to abut against each other. The lug 35 is secured to the end of the rod 33 and rides upon the rod 4 and the lug 36 is secured to the rod 34 and rides upon the rod 33, when the spring is compressed. The outer ends of the rods are extended through the end members 28 and 29 and are provided with nuts 37 and 38, Fig. 2, by which the effective length of said rods, and therefore the maximum extension of the link, may be adjusted.

It will readily be seen that when the shaft 21, Fig. 1, is rotated in one direction, the nuts 24 are moved apart, and the links 25 force the toggle arms 11 and 13 outwardly, thereby moving the bar outwardly, without endwise movement and in parallel relation to the roller 8, and extending the awning; and when said shaft is rotated in the other direction, the reverse movement of said nuts, links, and toggle arms, retracts said awning. Although I have shown the operating mechanism as positioned below the cover 7, it is obvious that it may be above if desired. In either case, the entire awning, including the cover 7, and bar 10, and all the operating mecha-

nism, is housed when retracted within the recess 6.

The screw shaft 21 and the roller 8 are connected together, for simultaneous rotation, by any suitable means, such as a pair of spur gears 39 and 39'. For a purpose to be explained later, I prefer to secure the gear 39 upon the shaft 21 by the means shown in Fig. 4, comprising a relatively long key 40 and a set screw 41 which prevents endwise movement of the gear upon its shaft. Any convenient mechanism may be employed for rotating the interconnected shaft and roller. As an example of such mechanism, I have indicated at 42 in Fig. 1 a well known form of awning worm-gear box mounted upon the end of the roller shaft. It is understood that the operating shaft 43 of said gear box is turned by the usual removable long handled crank or wrench, not shown.

It will be seen that both the screw shaft 21 and the roller 8 are positively driven in extending and retracting the awning. The various parts are so proportioned that the cover 7 is wound on or off the roller 8 at approximately the same speed as the simultaneous movement of the bar 10. The springs 32 in the links 25 keep approximately the same tension on the cover 7 at all times, and compensate for the slight speed differential between the movements of the roller 8 and the bar 10, such as is caused by the varying effective diameter of said roller as the cover is wound on or off, and also for expansion and contraction of the cover due to climatic changes.

In order to insure that the total travel of the bar 10 shall be equal to the total travel of the cover 7 as wound on or off the roller 8, and also to provide the proper tension upon said cover, the following adjustment is made. The set screw 41 is loosened and the gear 39 is moved endwise along the shaft 21 out of mesh with the gear 39', the key way in said gear being loose enough to permit such movement. The roller 8 is then turned, by its operating means 42 and 43, to wind up the cover 7, the shaft 21 remaining stationary because the gears 39 and 39' are out of mesh. When the desired tension upon the cover 7 is obtained, the gears 39 and 39' are again meshed and the former is locked in position by its set screw 41.

In order to provide adjustment of the slope, inclination or elevation of the awning when extended, the brackets 15, by which the toggle arms 13 are supported, are angularly adjustable in the fixed brackets 16, about the axis of the shaft 21 as a center. An annular flange 44, Figs. 3, 7 and 10, projects from the adjustable bracket 15 and has a bearing in the fixed bracket 16, said flange freely surrounding the shaft 21. An arcuate slot 45 is provided in the bracket 16, through which a clamp bolt 46 extends to lock the two brackets together. A second arcuate slot 47 is formed

in said fixed bracket, through which extends a stud 48 secured to the adjustable bracket. The head of an adjusting screw 49 is mounted upon said stud, said screw extending upwardly through a flange 50 on the fixed bracket and having a nut 51 above said flange. Thus by screwing up or down on said nut, when the clamp bolt 46 is loose, the bracket 15 is moved in a vertical plane angularly about the axis of the shaft 21 to vary the slope of the awning.

When the awning is set up with considerable slope, as shown in Fig. 7, it is desirable that the front bar 10 be elevated above the ends of the arms 11, so that when the awning is fully retracted, said bar will occupy a position as close to the roller 8 as possible. I therefor provide brackets as shown in Figs. 5 and 7 for connecting the bar 10 to the arms 11. Each of said brackets consists of two parts 52 and 53, the former secured to the end of the arm 11 at 54 and rising on an inward curve therefrom, as shown in side elevation in Fig. 7. The part 53 fits over and is bolted at 55 to the curved portion of the part 52, and is offset to provide the pivotal connection 12 with the bar 10, as shown in Fig. 5. When the awning is installed and the slope set at the desired angle, the part 53 is secured to the curved part 52 in such a position that the bar 10, when retracted, will come as close to the roller 8 as possible. If the slope is steep, the part 53 will be secured near the upper end of the part 52, as shown in full lines, but if the slope approaches the horizontal, the part 53 will be secured farther down upon the part 52, as shown in dotted lines in Fig. 7, and the projecting end of the latter may then be cut off.

It is preferable that the movements of the toggle arms 11 and 13 be limited positively at both extremes. For this purpose, I provide the gear segments 20 with abutting faces 56 at both ends of their gear teeth, as shown in Figs. 1 and 6. The outward movement of said arms may also be limited by adjustable stops 57 secured to the bearings 22 and adapted for engagement by the nuts 24. The stops are so positioned that the pivots 12, 14, and 17 of the arms 11 and 13 lie in a straight line when said arms are fully extended, so that said arms rigidly resist any force acting upon the bar 10 to move it inwardly, such as is caused by wind pressure against the cover 7.

A modified arrangement of toggle arms or levers for moving the bar 10 in and out in parallel relation to the cover carrying roller is illustrated in Fig. 8. The arms 11 and 13, instead of having the gear segments 20 shown in Fig. 1, are pivoted together at 17'. The spring cushioned link 25 has an extension 58, which is pivotally connected with the arm 11 by a link 59 parallel with the arm 13. By this arrangement the arms 11 and 13 are posi-

tively folded by the movement of the nut 24 upon the screw 23.

It should be noted that, on account of the arrangement of the described operating mechanism, the front member or bar 10 of the awning may be moved in or out, positively and smoothly, and that such movement may take place equally well in any direction, irrespective of the effects of gravity. Thus the awning may be extended horizontally, or inclined upwardly or downwardly, or may be extended vertically upward or sideways, or may even be mounted upon an incline laterally to conform to a sloping street, if the supporting brackets 16 be properly positioned. It should also be noted that the simultaneous operation of the frame extending means and the cover carrying roller prevent any sagging or bunching of the cover, and that the resilient construction of the links 25 automatically takes care of any differential movement, keeps the cover taut at all times, and can be adjusted easily to provide the proper tension on said cover. The operating mechanism as shown and described provides a convenient, positive, and easily operated device for extending and retracting the awning and for maintaining the front member or bar 10 in parallel relation to the roller 8.

This form of operating mechanism also lends itself very well to the ready adjustment of the slope or inclination of the awning, such adjustment being effected without interfering in any way with said operation mechanism. Finally attention is directed to the fact that the entire awning and frame, when retracted, is completely housed within the recess 6, there being no rods or other members extending either into the building or upon the face of its wall.

I claim:—

1. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a link separate from the second arm and pivotally connected with the first mentioned arm; and means for moving said link to extend and retract the frame.

2. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a resilient link pivotally connected with the first mentioned arm; and means for moving said link to extend and retract said frame.

3. In an awning structure having a fixed

support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a link having two relatively movable portions, one of which is pivotally connected with the first mentioned arm; a spring connecting said link portions; and means for moving the other link portion to extend and retract said frame.

4. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a link having two relatively movable portions, one of which is pivotally connected with the first mentioned arm; a spring connecting said link portions; means for limiting the relative movement of said portions; and means for moving the other link portion to extend and retract said frame.

5. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a link comprising telescoping end portions, one of which is pivotally connected with the first mentioned arm; a helical spring within and guided by said end portions for relatively moving them; a rod secured to each end portion, said rods lying within said spring; inter-engaging lugs carried by said rods for limiting their relative movement; and means for moving the other link portion to extend and retract said frame.

6. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm having its inner end pivotally connected with the outer end of the first arm and its outer end pivotally connected with said bar; a link separate from the second arm and having its outer end pivotally connected with the first mentioned arm; a screw rotatably carried by said support; a nut engaging said screw and connected with the inner end of said link; and means for rotating said screw to extend and retract said frame.

7. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising a bracket

fixed to said support; a movable bracket adjustably secured to said fixed bracket for vertical swinging movement; a pair of toggle arms having their adjacent ends pivotally connected together and their other ends pivotally connected with said bar and said movable bracket respectively; a link pivotally connected with one of said arms and separate from the other; and means for moving said link to extend and retract said frame.

8. An awning comprising a fixed support; a roller mounted thereupon; a flexible cover wound upon said roller; a bar to which the outer edge of said cover is secured; means for rotating said roller; and means connected with said roller and operable in timed relation thereto for moving said bar toward and away from said support, the last mentioned means including a resilient connection adapted to keep said cover taut.

9. An awning comprising a fixed support; a roller mounted thereupon; a flexible cover wound upon said roller; a bar to which the outer edge of said cover is secured; a system of levers for moving said bar toward and away from said support, said system including a resilient connection; and means interconnecting said roller and said levers for movement in timed relation.

10. An awning comprising a fixed support; a roller mounted thereupon; a flexible cover wound upon said roller; a bar to which the outer edge of said cover is secured; pivotal arms movably connecting said bar and said support; a rotatable shaft having a screw thread thereon; a nut engaging said thread; a resilient link connecting said nut and said arms; and means for rotating said roller and said shaft in timed relation.

11. An awning comprising a fixed support; a roller mounted thereupon; a flexible cover wound upon said roller; a bar to which the outer edge of said cover is secured; pivotal arms movably connecting said bar and said support; a rotatable shaft having a screw thread thereon; a nut engaging said thread; a resilient link connecting said nut and said arms; means for rotating said roller and said shaft simultaneously; and means for rotating said roller and said shaft independently.

12. An awning comprising a fixed support; a roller mounted thereon; a flexible cover wound upon said roller; a bar to which the outer edge of said cover is secured; a system of horizontally movable levers for moving said bar toward and away from said support, said system including a resilient connection; an adjustable mounting upon said support to which said system of levers is connected adapting them for angular vertical movement; and means for rotating said roller and moving said levers in timed relation.

13. In an awning structure comprising a fixed support, a movable bar, and a flexible

cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm pivotally connected with said bar; intermeshing gear segments secured to the adjacent ends of said arms; and a member pivotally connected with said arms at the axes of said segments.

14. In an awning structure comprising a fixed support, a movable bar, and a flexible cover extending between them, an extensible frame for moving said bar comprising an arm pivotally mounted upon said support; a second arm pivotally connected with said bar; intermeshing gear segments secured to the adjacent ends of said arms; a pair of spaced plates pivotally connected with said arms at the axes of said segments, one plate lying on each side of said segments; and a rigid connection between said plates.

15. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them; a system of levers for moving said bar toward and away from said support; an upwardly extending member pivotally connecting one of said levers with said bar; and means for varying the effective length of said member.

16. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them; a system of levers for moving said bar toward and away from said support; a bracket fixed to said support; a movable bracket secured to said fixed bracket for angular adjustment in a vertical plane, said system of levers being carried by said movable bracket; and a screw having one end connected with said movable bracket and the other with said fixed bracket and adapted to adjust the angular relation between said brackets.

17. In an awning structure having a fixed support, a movable bar, and a flexible cover extending between them; a system of levers for moving said bar toward and away from said support; a shaft rotatably mounted upon said support for operating said levers; a bracket fixed to said support and provided with an aperture through which said shaft freely extends; a movable bracket adjacent said fixed bracket and provided with an annular flange journaled within said aperture and surrounding said shaft, said system of levers being carried by said movable bracket; and means for adjusting the angular relation between said brackets.

In testimony whereof I have signed my name to this specification.

JOHN LENARD STUART.