June 18, 1957 G. W. SMITH 2,796,072

AWNING

Filed June 4, 1956 3 Sheets-Sheet 1

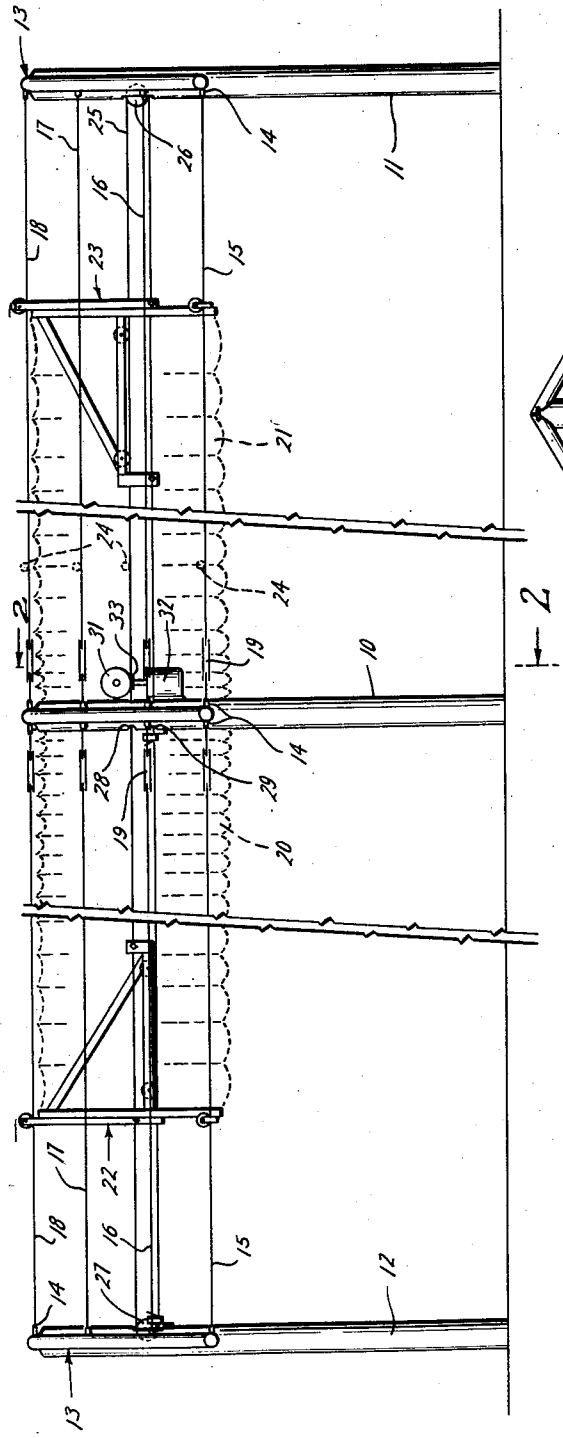


Fig. 1

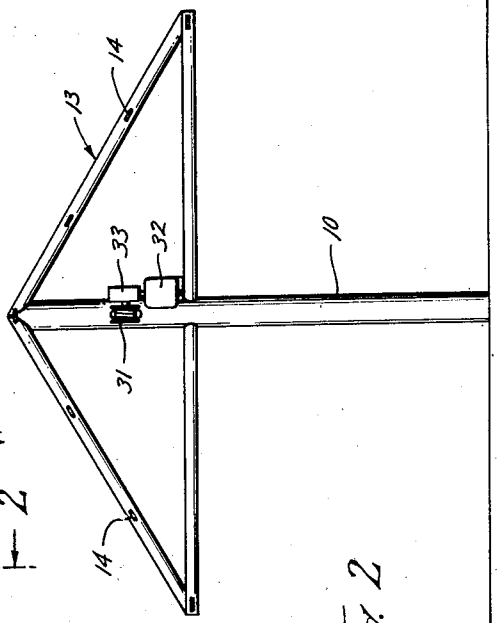


Fig. 2

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AWNING

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Fig. 3

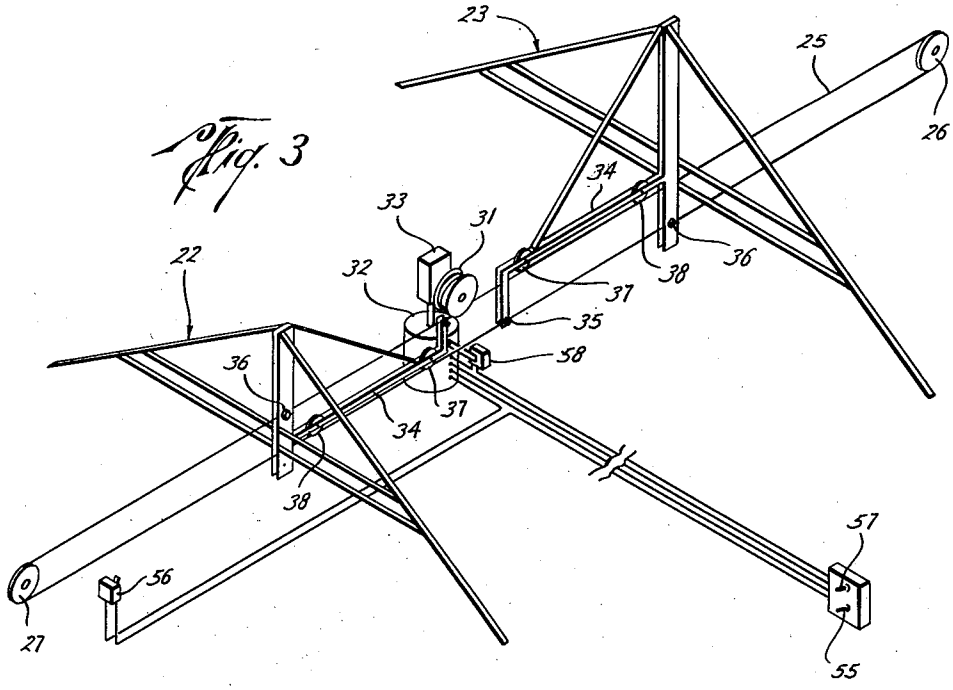
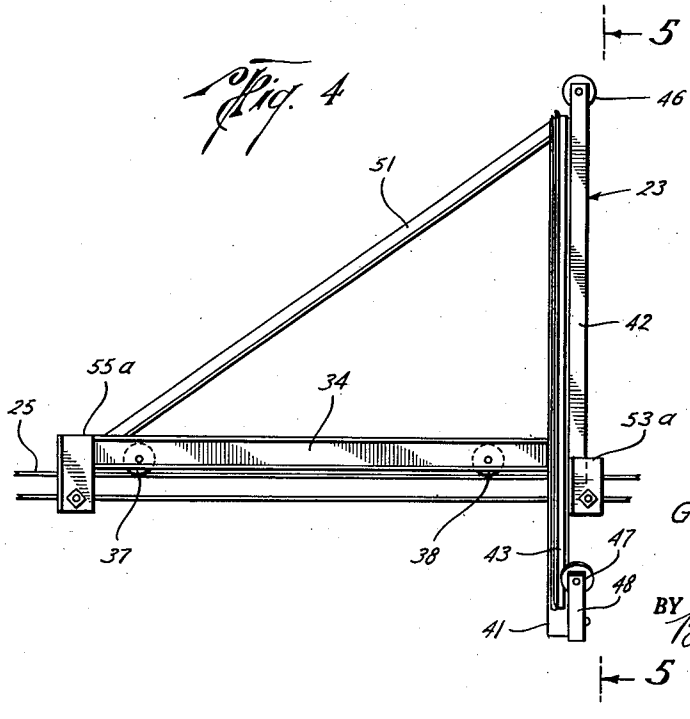


Fig. 4



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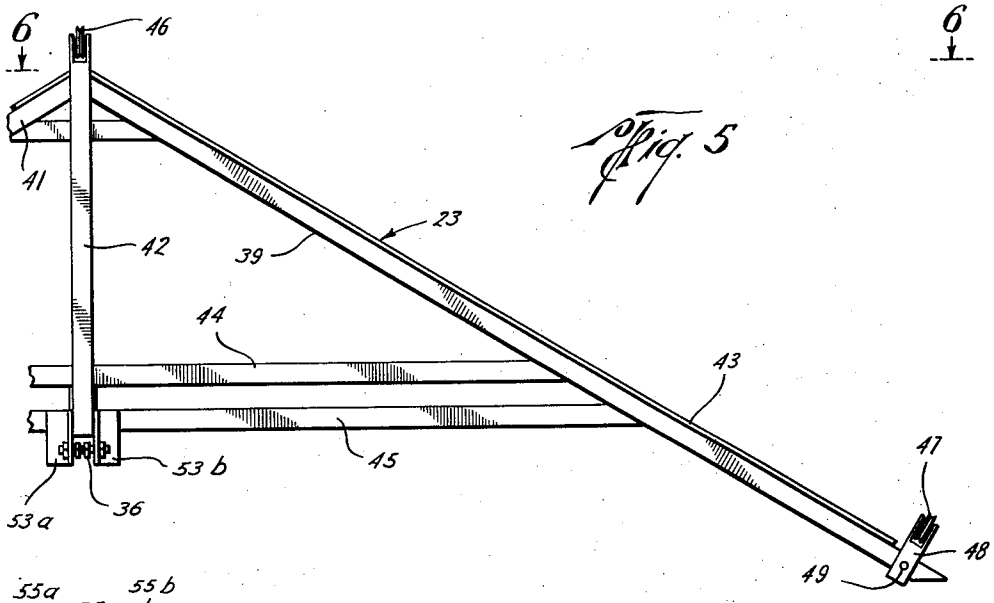


Fig. 5

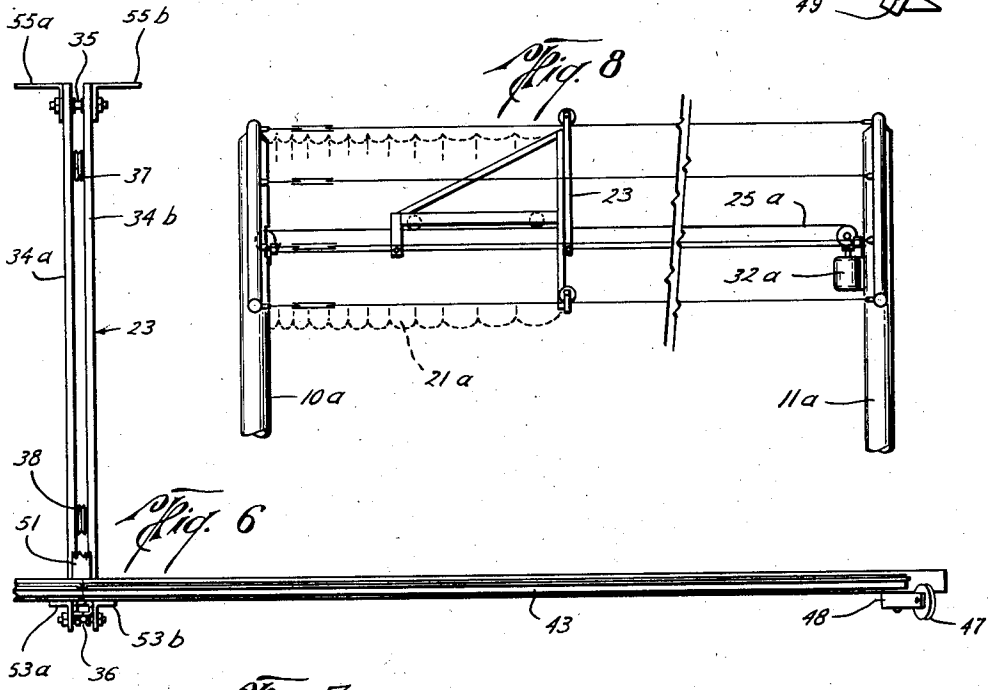


Fig. 6

Fig. 8

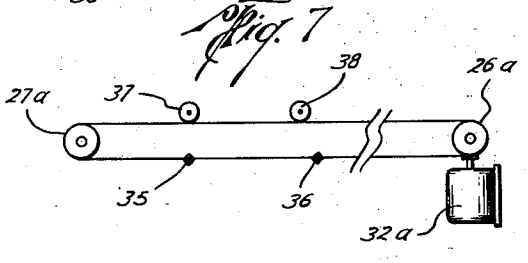


Fig. 7

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AWNING

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Application June 4, 1956, Serial No. 589,060

6 Claims. (Cl. 135—5)

This invention relates to awnings and more particularly to awnings whose covers are spread and collapsed along wires strung between spaced supports.

Drive-in eating establishments frequently provide covered stalls for their customers' automobiles. The covered stall both protects the customer's automobile from the rays of the sun during the day and from rain during the day or night. An awning provided by an awning cover suspended from spaced wires stretched between supports is one popular way of providing a covered stall. As the awning is needed only during rainy or hot sun shiny weather, and the cover is susceptible to damage, particularly by high winds, hail, etc., is is customary to construct the awning so that the awning cover may be expanded between supports when needed and collapsed adjacent one of the support when adverse weather conditions, such as high winds, hail, or the like, occur. In the past, a number of ropes have been secured to the free end or ends of the awning cover and one or more persons have collapsed or extended the cover by pulling on these ropes. Manual control of the awning has proved unsatisfactory, particularly, where the area under the awning is occupied by automobiles and high velocity wind conditions suddenly develop. Manual control of this type of awning requires a porter or other masculine help to be on hand at all times to collapse the awning cover in the event of sudden need.

It is an object of this invention to provide an awning of the type referred to above with a cover which may be quickly and easily spread or collapsed by mechanical means without the use of pull ropes.

Another object is to provide an awning of the type referred to above with a cover which may be spread or collapsed using motor power controlled from a remote location.

Another object is to provide an awning of the type referred to above in which the awning cover may be spread or collapsed by energizing a motor which is automatically cut off upon the cover reaching fully spread or collapsed position.

Another object is to provide an awning as in the preceding objects in which a single mechanism spreads and collapses the awning cover in both directions from a central support toward and away from two end supports.

Another object is to provide a bridle for an awning of the type referred to above which is supported on the awning cover support wires and which will not cock and bind while the awning cover is being opened or closed due to winds, or the like.

Another object is to provide a bridle for an awning of the type referred to above which runs smoothly and easily on a simple system of supporting and pulling wires.

Other objects, features and advantages of this invention will be apparent from the drawings, the specification and the claims.

In the drawings wherein there is shown illustrative embodiments of this invention and wherein like reference numerals indicate like parts:

Fig. 1 is a side elevational view of an awning constructed in accordance with this invention with the awning cover shown in phantom;

Fig. 2 is a view taken along the lines 2—2 of Fig. 1 in the direction of the arrows showing the center support and drive means for spreading and collapsing the awning cover;

Fig. 3 is a perspective schematic view of the bridles, endless wire, drive and control means for spreading and collapsing the awning cover;

Fig. 4 is a view in side elevation of a bridle used in spreading and collapsing the awning cover;

Fig. 5 is a fragmentary view along the lines 5—5 of Fig. 4 in the direction of the arrows;

Fig. 6 is a fragmentary view along the lines 6—6 of Fig. 5 in the direction of the arrows with parts broken away for purposes of illustration;

Fig. 7 is a schematic view of an endless cable and the rollers and securing means of a bridle, all for use on a two-support awning; and

Fig. 8 is a view in side elevation of a two-support awning with the awning cover shown in phantom constructed in accordance with this invention.

The awning shown in Fig. 1 has a cover which spreads in opposite directions from the center support **10**. Supports for the awning cover are provided by center post **10** and the two ends posts **11** and **12**. These posts are sunk in the ground. They are preferably embedded in the ground in a manner to maintain them in upright position such as by embedding them in a large block of concrete, or the like. Each post is provided with a gable **13** at its upper end. Spaced eyes **14** are provided on the sloping members of gable **13** on one side of each end post and on both sides of the center post **10**.

A plurality of spaced awning cover support wires **15, 16, 17,** and **18** extend between the eyes **14** of each post. Turn buckles **19** are provided in each wire so that they may be maintained taut.

An expansible and collapsible awning cover is suspended from the several cables **15** through **18**. Where the three-pole form of stall is used, the awning cover is preferably in two sections **20** and **21** as shown in phantom. Each awning cover section **20** and **21** has one end secured to post **10** and is secured at its other end the bridles indicated generally at **22** and **23** respectively. The awning cover may be suspended from the several wires **15** through **18** in the conventional manner by a plurality of eyes carried by the awning cover and slidable on the several wires **15** through **18**. These eyes are indicated in phantom at **24** on Fig. 1 at one section of awning **21**. These eyes are normally secured to the upper surface of the awning cover at spaced intervals along the length of the awning cover with one eye for each cable at each interval. Eyes **24** are spaced at rather close intervals so that when the awning cover is collapsed, it will fold in accordion folds as shown in phantom adjacent the center pole **10** and will be adequately supported when the awning cover is fully extended.

The bridles **22** and **23** and hence the free ends of the awning cover are reciprocated toward and away from the end posts **11** and **12** by an endless wire **25** strung over pulleys **26** and **27**. Pulleys **26** and **27** are mounted on end posts **11** and **12** respectively for rotation about horizontal axes. The bridles **22** and **23** are supported upon and secured to the endless cable in a manner to be explained hereinafter. The cable **25** is continuous between the two end posts and travels through passageways **28** and **39** in central post **10**.

The endless cable is driven by being wrapped around a drive drum **31** which is rotated by reversing motor **32** through a suitable angle gear **33**.

Referring now to Fig. 3, it will be noted that each of the bridles is in generally gable form to conform to the gables of the supports 10, 11 and 12. A stabilizing arm 34 is carried by the bridle and extends in the direction of the endless wire 25. Arm 34 underlies the awning cover when the awning is collapsed so as not to interfere with the full extension of the awning cover to the end posts 11 and 12.

In order to pull and support the bridles 22 and 23, the bridles and stabilizing arms are provided with spaced means 35 and 36 for securing the bridles to the endless wire on one side of the pulleys and a pair of spaced rollers 37 and 38 which run on the endless wire on the other side of the pulleys. In this manner, each bridle is actually supported by both the upper and lower section of the endless wire 25. This will minimize the effect of sag in the wire and will provide for smooth movement of the bridle between the center and end posts. Any vertical tilting moment imposed on the bridle by a resistance of the awning cover to spreading or collapsing will be exerted on both sections of the endless wire 25 due to the feature of connecting the bridle to the endless wire at spaced points on one side of the pulley and having spaced rollers on the bridle run on the wire on the other side of the pulley. The arm 34 has substantial length, and due to this length and the resistance to the tilting movement by both the upper and lower section of the endless wire 25, this tilting moment will be slight and have only a negligible effect on operation of the unit. Note that if the bridle is permitted to tilt, the bridle will tend to bind on the awning cover support wires.

It will be noted that the arm 34 is identical for the two bridles but is inverted on one of the bridles so that the rollers 37 and 38 of bridle 23 run on the upper section of wire 25 and the rollers 37 and 38 of bridle 22 run on the lower section of endless wire 25. The securing means 36 of the two bridles are accordingly at different positions on the two bridles to be in line with the securing means 35 of arm 34. This inverted relationship permits spreading and collapsing of two sections of awning with a single drive and control mechanism and therefore, considerably reduces the cost of the unit.

The construction of bridle 23 is best shown in Figs. 4, 5 and 6. The bridle shown corresponds to bridle 23 of Figs. 1 and 3, but it will be understood that bridle 22 will be identical with that shown in Figs. 4 through 6 except that arm 34 will be inverted and the securing means 36 will be at a different position as shown in Fig. 3.

The desired gable shape is provided by a pair of downwardly slanting frame members 39 and 41. These frame members extend downwardly from the peak of the bridle and are secured at the peak to a central vertically extending frame member 42. Frame members 39 and 41 may be provided with any desired means for securing the bridle to one end of the awning cover such as the latch 43. Cross bars 44 and 45 extend between frame members 39 and 41 at points spaced from the peak of the bridle to strengthen the bridle.

The bridle is suspended from the central awning cover support wire 18 and from the two outside support wires, one of which is shown at 15, by rollers at the peak and end extremities of the bridle. Preferably, the roller 46 which engages the central wire 18 is carried at the upper end of central frame member 42. The two rollers 47 which are carried at the extremities of the bridle to engage the outside awning cover support wires are preferably carried in a yoke member 48 which is hinged to the bridle by a pin 49. Hinging movement is provided about an axis parallel to the awning cover support wires so that rollers 47 will remain in engagement with the wires while permitting slight rotation of the bridle about a horizontal axis. A tendency for the bridle to rotate about a horizontal axis will be present in windy conditions as the awning cover support wires will not be completely rigid.

The bridle is held against cocking and binding on the awning cover support wires by the stabilizing arm 34 and its attachment to the endless wire 25. Arm 34 is preferably provided by a pair of channel members 34*a* and 34*b* with their channels facing away from each other. The rollers 37 and 38 are journaled for rotation between the two channel members. Preferably, the stabilizing arm 34 and the central frame member 42 are arranged at right angles to each other. A diagonal brace 51 extends between members 34 and 42 to strengthen the structure. As noted above and as best shown in Fig. 4, rollers 37 and 38 support the bridle on the endless wire 25.

The bridle is secured to the endless wire 25 at spaced points on the bridle. One securing means 36 is provided between spaced angle irons 53*a* and 53*b* carried by the central support 42. The other securing means 35 is carried by angle iron members 55*a* and 55*b* which depend from the end of stabilizer arm 34 at a point spaced from securing means 52.

In explaining the operation of the awning, reference is made to Fig. 3 which shows the bridles in their position to collapse the awning cover. Motor 32 is energized by throwing switch 55 to the "on" position which causes clockwise rotation of drive drum 31. This rotation causes movement of endless wire 25 in a counter clockwise direction and spreading apart of the two bridles 22 and 23. As the bridles reach their fully extended position, bridle 22 contacts limit switch 56 which is wired in series with switch 55 and motor 32. Such contact opens the limit switch and interrupts current flow to the motor with the awning cover in fully extended position. When it is desired to close or collapse the awning cover, the switch 57 is energized which causes motor 32 to operate in reverse direction to cause counter clockwise movement of drive drum 31 and clockwise movement of the endless wire 25. As soon as the bridle moves out of contact with limit switch 56, it automatically resets and closes the circuit between motor 32 and switch 55. However, switch 55 is of the type which automatically opens upon stoppage of current flow therethrough and no current will pass to the motor through this circuit until switch 55 is again energized. As the bridles move into retracted position, bridle 22 will strike limit switch 58 which interrupts flow of current to motor 32 when the awning cover is fully collapsed. When the awning is again extended, the limit switch 58 will close as explained in the case of limit switch 56.

Referring now to Figs. 7 and 8, this invention is shown in conjunction with a two-support awning. This two post form of the invention is identical with the right hand section of the awning of Fig. 1 except that the motor 32 is shown to be mounted on post 11*a* instead of post 10*a* to permit it to drive the endless wire through pulley 26*a*. The bridle 23 is supported on and attached to the endless wire 25*a* in the manner heretofore explained by securing means 35 and 36 and rollers 37 and 38. The endless cable 25*a* runs between pulleys 27*a* and 26*a*. Pulley 26*a* also functions as the driving drum for the endless wire. This form of the invention may be used where a short section of awning is desired.

From the above, it will be seen that all the objects of this invention have been attained. There has been provided a means for automatically extending and collapsing an awning cover which may be handled with power from a remote location. Operation of a simple switch is all that is necessary to control the awning. The bridle arrangement is such that the bridle will not cock and bind even in high wind conditions and the awning cover may be extended or retracted while being buffeted by a high wind. A model of the illustrated structure has been tested and works satisfactorily when subjected to a wind velocity of 70 miles per hour. The bridles, though

supported by a plurality of flexible wires will have little tendency to cock or tilt as they are secured to and supported by the upper and lower portions of the endless wire which causes movement of the bridle.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. A collapsible awning comprising, spaced supports, a plurality of spaced wires extending between the supports, an awning cover supported on the wires and means for spreading and collapsing the cover along the wires comprising, confronting pulleys carried by the supports at points spaced from the wires, an endless wire extending over the pulleys, means for driving the endless wire over the pulleys in both directions, and a bridle having a portion extending transversely of the spaced wires and secured to one end of the cover, said bridle suspended from said spaced wires and secured to the endless wire at a first point to prevent rotation of the bridle about a horizontal axis and to provide for movement of the bridle with the endless wire to extend and collapse the cover, said bridle including an arm extending in the direction of and engaging the endless wire at a second point spaced along the arm from the first point and preventing cocking and binding of the bridle.

2. A collapsible awning comprising, spaced supports, a plurality of spaced wires extending between the supports, an awning cover supported by the wires, and means for spreading and collapsing the cover along the wires comprising, confronting pulleys carried by the supports at points spaced from the wires, an endless wire extending over the pulleys, means for driving the endless wire over the pulleys in both directions, a bridle having a portion extending transversely of the spaced wires and secured to one end of the cover, said bridle suspended from said spaced wires and secured to the endless wire on one side of the pulleys at a first point to prevent rotation of the bridle about a horizontal axis and to provide for movement of the bridle with the endless wire to extend and collapse the cover, said bridle including an arm extending in the direction of the endless wire and connected thereto at a point spaced from said first point on said one side of the pulleys to prevent cocking and binding of the bridle, and spaced rollers carried by the arm and resting on the endless wire on the other side of said pulleys to support the bridle thereon.

3. A collapsible awning comprising, spaced supports, a plurality of spaced wires extending between the supports, an awning cover supported by the wires, and means for spreading and collapsing the cover along the wires comprising, confronting pulleys carried by the supports at points spaced from the wires, an endless wire extending over the pulleys, motor means for driving the endless wire over the pulleys in both directions, a bridle having a portion extending transversely of the spaced wires and secured to one end of the cover, said bridle suspended from said spaced wires and secured to the endless wire on one side of the pulleys at a first point to prevent rotation of the bridle about a horizontal axis and to provide for movement of the bridle with the endless wire to extend and collapse the cover, said bridle including an arm extending in the direction of the endless wire and connected thereto

at a point spaced from said first point on said one side of the pulleys to prevent cocking and binding of the bridle, spaced rollers carried by the arm and resting on the endless wire on the other side of said pulleys to support the bridle thereon, and means for automatically stopping the motor means when the cover is fully extended or collapsed.

4. A collapsible awning comprising, spaced supports, a plurality of spaced wires extending between the supports, an awning cover supported by the wires, and means for spreading and collapsing the cover along the wires comprising, confronting pulleys carried by the supports at points spaced from the wires, an endless wire extending over the pulleys, electric motor means for driving the endless wire over the pulleys in both directions, a bridle having a portion extending transversely of the spaced wires and secured to one end of the cover, said bridle suspended from said spaced wires and secured to the endless wire on one side of the pulleys at a first point to prevent rotation of the bridle about a horizontal axis and to provide for movement of the bridle with the endless wire to extend and collapse the cover, said bridle including an arm extending in the direction of the endless wire and connected thereto at a point spaced from said first point on said one side of the pulleys to prevent cocking and binding of the bridle, spaced rollers carried by the arm and resting on the endless wire on the other side of said pulleys to support the bridle thereon, and limit switches carried by said support and connected in the control circuit for the motor, one of said switches engaged by the bridle when the awning cover is fully extended to shut off current to the motor and the other of said switches engaged by the bridle when the awning cover is fully collapsed to shut off current to the motor.

5. A collapsible awning comprising, three in-line spaced supports, a plurality of spaced wires extending between said supports, an elongate awning cover supported on the wires, means for spreading the cover from the center support toward each end support along the wires and for collapsing the cover adjacent the center support comprising, confronting pulleys mounted on the end supports for rotation about horizontal axes at points spaced from the wires, an endless wire extending over the pulleys and having an upper and a lower portion, electric motor means for driving the endless wire over the pulleys in both directions, a pair of bridles having portions extending transversely of the spaced wires and secured to opposite ends of the cover, one of said bridles suspended from the spaced wires between the center support and each end support, each bridle including an arm extending in the direction of the endless wire, one of said bridles secured to the upper portion of the endless wire at spaced points and having spaced rollers resting on the lower portion of the endless wire to support said one bridle thereon, said other bridle secured to the lower portion of the endless wire at spaced points and having spaced rollers resting on the upper portion of the endless wire to support said other bridle thereon, whereby the bridles will be simultaneously moved toward and away from the center support with movement of the endless wire and the bridles will be held against cocking and binding, and limit switches carried by the center support and one end support and connected in the control circuit for the motor, one of said switches engaged by a bridle when the cover is fully extended to shut off current to the motor and the other of said switches engaged by a bridle when the cover is fully collapsed to shut off current to the motor.

6. As a subcombination, a bridle adapted to be secured to one end of an awning cover and pulled along awning cover support wires to spread and collapse an awning cover comprising, a central frame member having a roller at one end by which it can be suspended from a central awning cover support wire, an arm extending from the central frame member, spaced clamping means carried by the other end of the frame member and by said

arm, spaced rollers carried by said arm, said clamping means adapted to secure the bridle to a two-pulley endless wire on one side of the pulleys and said rollers adapted to support the bridle on the endless wire on the other side of the pulleys, frame members extending laterally from the central frame member in a plane perpendicular to

said arm and having means for securing the bridle to one end of an awning cover, and hinged pulleys on the ends of said last-mentioned frame members for suspending the bridle from awning cover support wires.

No references cited.