

May 2, 1944.

E. H. SCHANE

2,347,845

ELECTRICALLY OPERATED AWNING

Filed Dec. 8, 1941

4 Sheets-Sheet 1

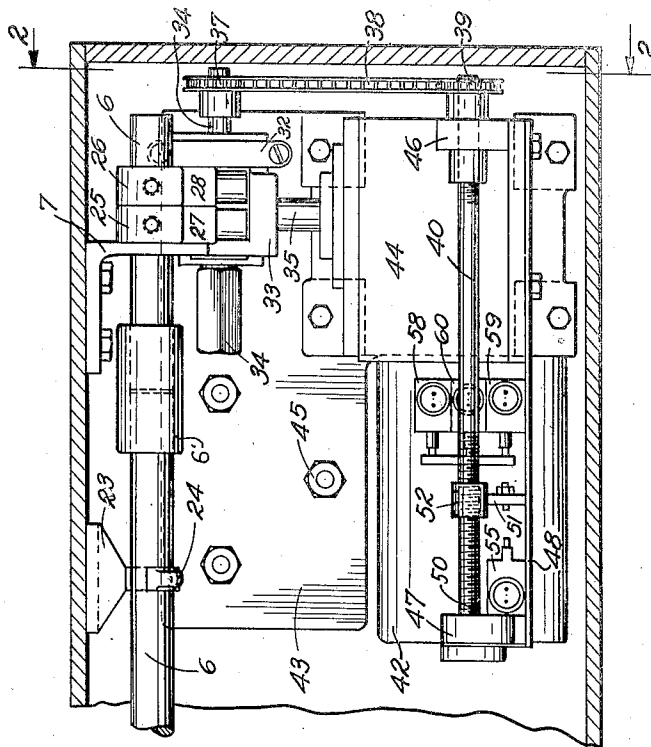
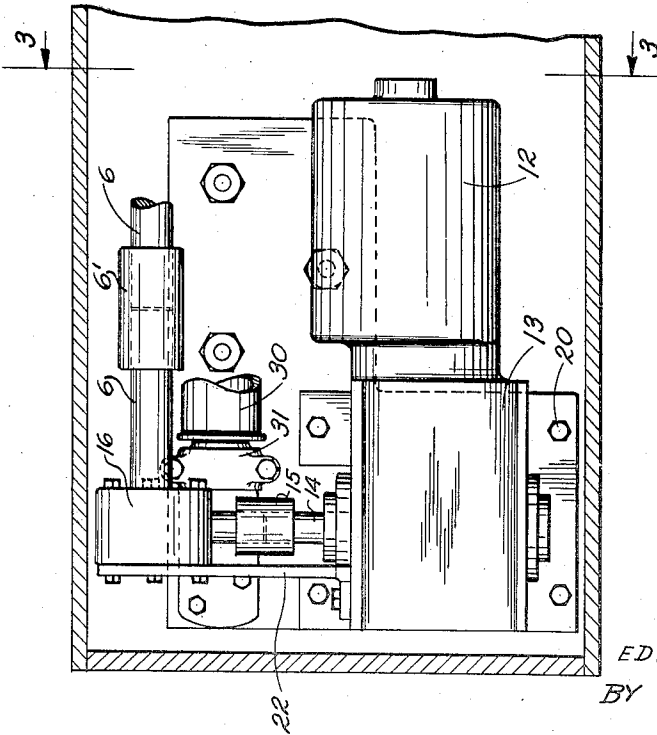


Fig. 1



INVENTOR.
EDWARD H. SCHANE
BY *Rich & Watt*
ATTORNEYS

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4 Sheets-Sheet 2

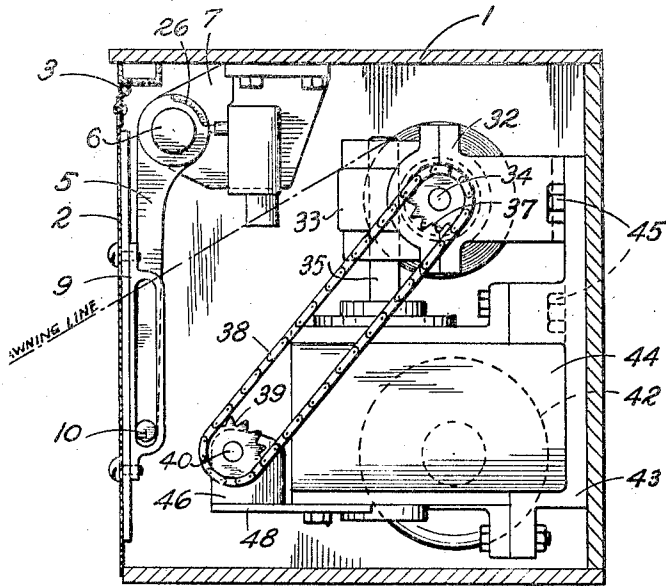


Fig. 2

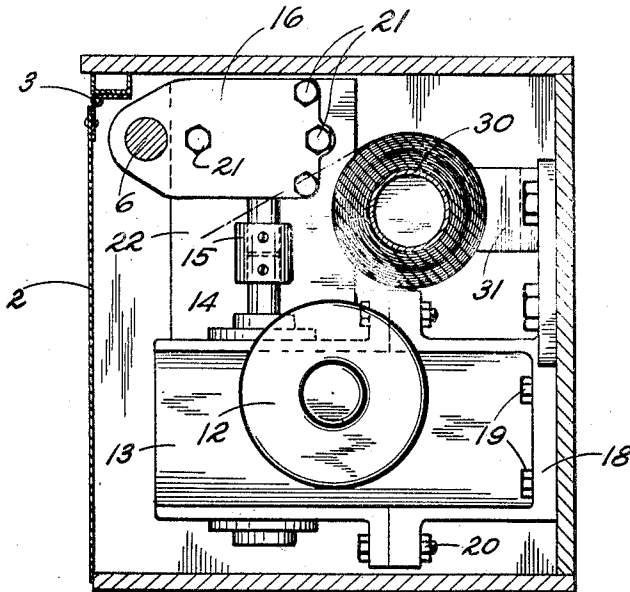


Fig. 3

INVENTOR.
EDWARD H. SCHANE

BY

Rickey & Watts
ATTORNEYS

May 2, 1944.

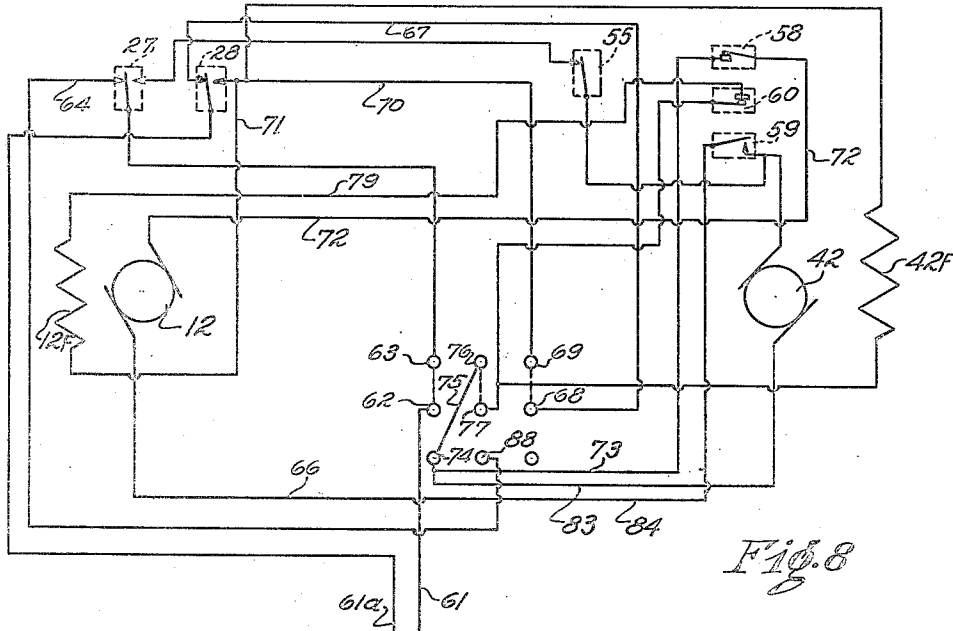
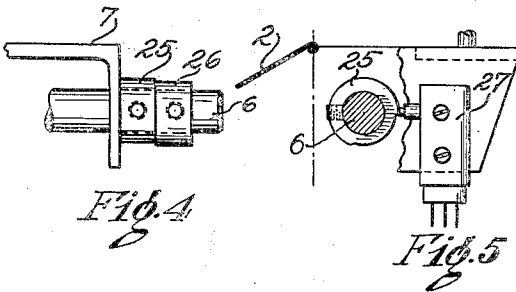
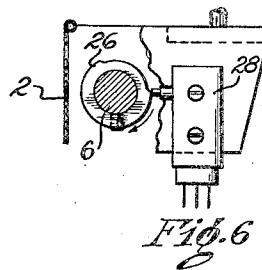
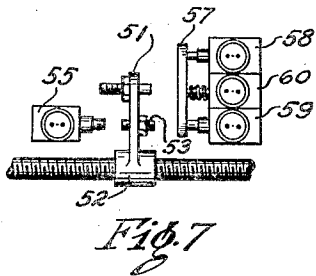
E. H. SCHANE

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4 Sheets-Sheet 3



INVENTOR.
EDWARD H. SCHANE
BY
Rickey & Watts
ATTORNEYS

May 2, 1944.

E. H. SCHANE

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4 Sheets-Sheet 4

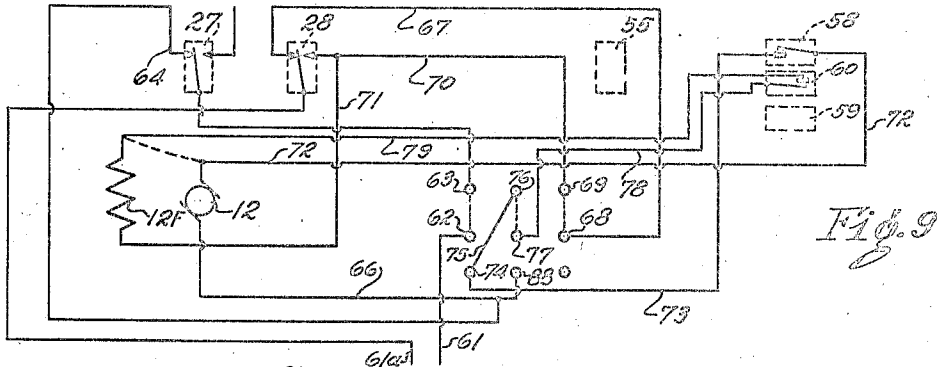


Fig. 9

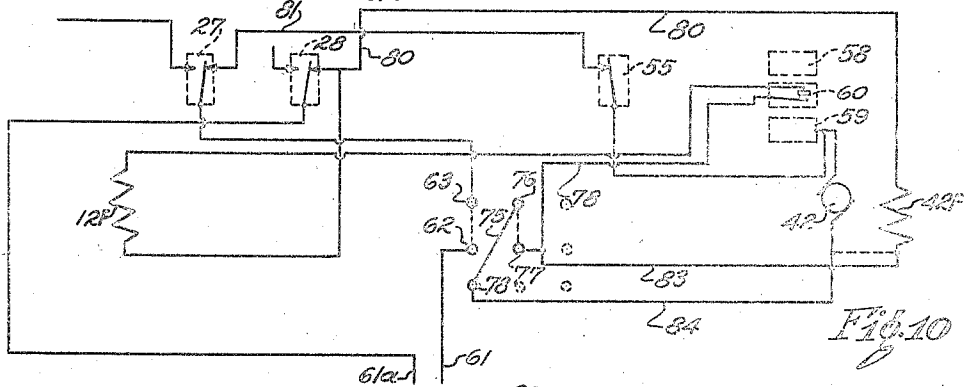
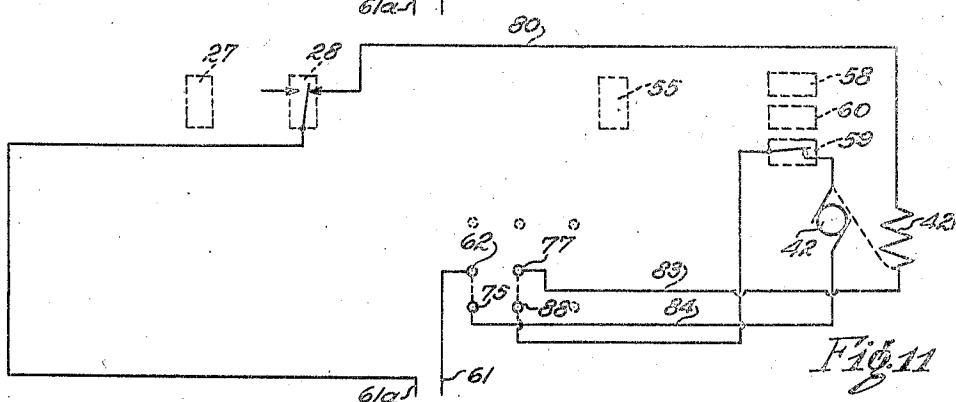


Fig. 10



UNITED STATES PATENT OFFICE

2,347,845

ELECTRICALLY OPERATED AWNING

Edward H. Schane, Lakewood, Ohio, assignor to
The Fanner Manufacturing Company, Cleve-
land, Ohio, a corporation of Ohio

Application December 8, 1941, Serial No. 422,069

8 Claims. (Cl. 160—22)

This invention relates to improvements in awning mechanisms and more particularly to an improved automatic awning raising and lowering mechanism.

It has become common practice, in connection with awnings for store fronts or the like, to provide a recess in the front of the store in which the awning is disposed. The recess is provided with a closure in the form of a lid which when closed substantially conceals the awning. Not only is this type of awning installation desirable from the appearance standpoint, but it also is desirable to protect the awning and its associated mechanisms from the effect of rain, snow, ice, and the like.

Heretofore in letting down the awning, it was necessary to first use a winding crank to raise the lid, then transfer the winding crank to the awning lowering mechanism to lower the awning. This also made it necessary to have at least one of the controls extending from the face of the building; furthermore, it was also necessary to shift the winding crank from one control to the other and this operation sometimes resulted in striking the window and breaking the same. Furthermore, these winding operations necessitated the operator going outside the store, thus subjecting the operator to the inclemencies of the weather. These operations were also relatively slow and laborious.

By my present invention the awning may be quickly unrolled and rolled up. The operator need not go outside the building to roll or unroll the same since the controls may be, and usually are, disposed inside. The awning automatically rolls up or down without further attention other than closing the proper switch. With the automatic control the entire closure may be closed and there is no need for any unsightly controls to extend from the front of the building.

It is therefore an object of my invention to provide an automatic awning control for raising and lowering awnings.

Another object of my invention is to provide means for raising and lowering awnings that may be operated from inside the building.

Another object of my invention is to provide an awning wherein no controls are visible exteriorly of the building and wherein all parts are completely enclosed within the awning recess.

Another object of my invention is to provide an improved circuit controlling mechanism for raising and lowering an awning.

Still other objects of the invention and the invention itself will become more apparent from

the following description of an embodiment thereof which description is illustrated by the accompanying drawings and forms a part of this specification.

In the drawings:

Fig. 1 is a broken front elevational view looking into an awning recess and showing on the left in elevation the mechanism for raising the awning recess lid or closure and on the right in elevation the mechanism for rolling and unrolling the awning, certain parts being omitted in the interests of clarity of description;

Fig. 2 is an end elevational view of the awning roller control mechanism taken on the line 2—2 of Fig. 1;

Fig. 3 is an end elevational view of the lid raising mechanism taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary elevational view of the lid lifting shaft and limit switch cams;

Figs. 5 and 6 are fragmentary side elevational views of the cams of Fig. 4 and the limit switches showing the different positions taken thereby when the lid is in the open and closed positions respectively;

Fig. 7 is a fragmentary elevational view of the controller and limit switch mechanisms operated in conjunction with the roller;

Fig. 8 is a complete circuit diagram showing diagrammatically the motors and switches used in conjunction with my invention;

Figs. 9, 10, 11 and 12 are circuit diagrams showing the various parts of the circuit for four different phases during the operation cycle of the circuit of Fig. 1 the wiring in each phase that is not in actual use at some time during the cycle being eliminated.

Briefly, the invention contemplates the provision of an awning such as is used for store fronts which is disposed in an awning recess in the front of the building presumably above the windows and doors of the ground floor. Obviously it is not limited as to location and would be applicable to awnings or drop curtains in other places. The front of the recess is closed by a door when the awning is retracted and the awning is disposed in the recess on a roller. The door is adapted to be opened and the awning unrolled out of the recess, being supported during its outward travel and in its extended position by folded awning arms which are well known in the art. The invention constitutes automatic means for opening the door to a predetermined angle after which the awning starts to unroll and unrolls to a predetermined extended position where it remains in extended position.

When it is desired to return the awning, the awning is rolled up into the recess and when rolled up the awning rolling mechanism stops and the lid controlling mechanism starts and is maintained in an energized condition until the lid is closed.

More specifically, the awning recess is designated at 1, it being understood that the recess may be in an integral part of the building. A recess lid 2 is provided for closing the front of the recess, being hingedly secured at 3 to the top wall of the recess. The lid may be swung outwardly as indicated diagrammatically in Fig. 5 by means including arms 5 which are supported by and keyed to a shaft 6 which shaft is in turn supported at one end by a bracket 7 secured to the top of the recess and at the other end a gear box 16. A slidable connection for the arm 5 with the lid is provided in the form of slotted members 9 secured to the inside of the lid by rivets or screws and in which pins 10 carried by the arms 5 are adapted to reciprocate. Rotation of the shaft 6 causes the arms 5 to swing outward which moves the lid 2 by means of the pins 10, which slide in the bracket 9.

A shaft rotating unit is provided in the left end of the recess as viewed in Fig. 1 and comprises a reversible motor 12 which is connected to the shaft through a reduction gearing 13, a shaft 14, coupling 15 and the gear box 16. The gear box 16 houses a worm and pinion which provides additional reduction drive to the shaft 6. The shaft 6 is divided for convenience in assembly, the parts being connected to each other by the coupling 6'. A bracket 10, Fig. 3, is secured to the rear wall of the awning recess by studs 19, and the motor unit is mounted upon this bracket by means of bolts 20 which extend through flanges on the gear box and bracket. The gear box 16 is secured to an upstanding bracket 22 extending parallel to the end wall and carried by reduction gear housing 13.

The shaft 6 extends completely across the recess to the other end as shown at the right in Fig. 1. The left end of the shaft 6 is supported by the gear box 16, while the right end is supported by the bracket 7. Sagging of the shaft is prevented by providing additional intermediate brackets 23 which have supporting hooks 24 engaging the shaft at selected intervals throughout the length of the shaft, the brackets being secured to the top wall of the awning recess in the manner of the bracket 7.

Although the lid 2 has been illustrated throughout as being hinged at 3 to the top of the recess, it is quite within the purview of my invention to have it mounted directly on the shaft 6.

Control of the motor 12 is effected through cams 25 and 26 carried by the shaft and arranged to operate switches. The cams are disposed on the end of the shaft 6 which extends beyond the bracket 7 at the right end of the recess (Figs. 1 and 4 to 6).

The cam 25 cooperates with the switch 27 to open the circuit to the lid raising motor after the lid has opened a predetermined distance and the cam 26 cooperates with the switch 28 to de-energize the circuit when the lid is closed. The cams 25 and 26 and the switches 27 and 28 operated thereby provide limit switches for controlling the opening and closing of the lid as will hereinafter be more fully described.

Means for controlling the distance the awning will be unrolled and to also limit the rolling

up of the awning, is provided in the form of a switch mechanism which is controlled by the shaft 40, the shaft 40 being operated by the chains and sprockets hereinafter described, from the shaft 34. The shaft 35 is driven by a motor 42 through a gearing disposed in the housing 44, and it in turn drives a stub shaft 34 through gears in the housing 33 to rotate the awning roller 30 in the proper direction to raise or lower the awning. The end of the shaft 34 extends outboard toward the end of the recess and carries the sprocket 37 which is connected by the chain 38 to the sprocket 39 on the shaft 40. The shaft 40 is journaled in bearing brackets 46 and 47 supported by a base 48 which is in turn supported by the base 43 that supports the motor 12. The shaft 40 is provided with a thread at 50 to provide a lead screw for a traveler 51 which has a nut 52 engaged with the lead screw and carries a plurality of pins for engagement with the operating pins of the control switches, as best shown in Figs. 1 and 7. The pin 53, which is adjustable in the traveler, is adapted to engage the limit switch 55 at one end of travel of the traveler. The pin 56 which is likewise adjustable is adapted to engage the operating yoke 57 at the other end of its travel to operate the switches 58, 59 and 60.

Before going into the circuit a brief description of the operation will assist in the understanding of, not only the mechanism, but the circuit therefor.

It being assumed that the lid to the awning recess is closed and the awning is rolled up on the roller as shown in Figs. 2 and 6, a control switch is thrown to the "awning down" position which causes the lid raising motor 12 to be energized to start raising the lid, which lid is opened up substantially to the position shown in Fig. 5 which position is controlled by the adjustment of the cam 25. At this time the cam 25 operates the limit switch 27 which opens the lid motor circuit, de-energizing the lid motor and closing the roller motor circuit to start the roller motor 42 to unroll the awning. The awning unrolls, being supported in its outward travel by suitable awning arms. When the roller moves, the shaft 40 revolves, the traveler 51 traveling to the left as viewed in Fig. 1 until it contacts the switch 55 which de-energizes the motor 42.

When in this position the awning is fully extended to a predetermined distance and the various circuits are conditioned for re-rolling the awning and closing the lid when the main switch is thrown to the "awning up" position.

When the main switch is thrown to the "awning up" position, the motor 42 rotates in the opposite direction, the awning is rolled up on the roller into the recess, the traveler 51 moving to the right as shown in Fig. 1 until the pin 53 engages the switch bar 57 (Fig. 7) to operate the switches 58, 59 and 60. At this time the motor 42 is de-energized, stopping the awning rolling, and the lid closing motor 12 energized to start the closing of the lid. When the lid is closed the cam 26 opens the switch 28 to de-energize the lid closing motor and condition the circuit for another complete cycle of operation.

The circuit for accomplishing the foregoing, together with the mechanism, is best shown in Figs. 8 to 12 inclusive.

Fig. 8 shows the complete circuit diagram of all of the wiring in the circuit including the main switch, motors and limit switches.

Fig. 9 shows the portions of the circuit in use during the lid opening phase.

Fig. 10 shows the portions of the circuit in use during the lid opening and awning unrolling phase.

Fig. 11 shows the circuit on the awning re-rolling phase.

Fig. 12 shows the circuit during the lid closing phase.

Referring more particularly to Fig. 9, where the main switch constitutes triple-pole double-throw switch hereinafter referred to as a TPDT or main switch which is thrown to the "awning down" position, as indicated by the dotted lines from the center poles in Fig. 9. Current from right side of line 61 goes to contact 62 of the TPDT switch where it is connected to terminal 63. From terminal 63 it is connected to the SPDT single pole double throw switch 27 which, when the lid is closed, transfers the current to line 64 which connects to the terminal 88. This line also connects directly to the lower brush of the motor through line 66.

The other side 61a of the line goes directly to the SPDT switch 23 which, when the lid is closed, connects the line 67 through the left contact to center pole 68 of the main switch. From here it is conducted through terminal 69 of the switch to the line 70 which is connected to 28 on the right side. Line 71 then feeds the current to the lower side of the motor field 42F of the lid operating motor 42. At the start of the lid motor the switch 28 is connected as mentioned, immediately after starting the cam 26 (Fig. 6) on the lid shaft shifts the switch (the plunger riding on the low spot of the cam) and causes the switch blade to be moved to its normal position so that contact from the line 61A is made directly with the right hand contact and line 71 to the motor field 42F, cutting out the connection through the main switch. This, as will be shown later, allows the same cam and switch to operate as a limit switch for the lid motor when the main switch is changed to the "up" position and the lid is closing.

The lower terminals of the lid motor are thus fed with current while the upper field and brush terminals are connected to each other as indicated by the dotted line in Fig. 9, the motor being a series motor.

The connection between the upper end of the field and brush as indicated by the dotted lines in Fig. 9, is effected by the line 72 which leads to the SPST switch 58 which is operated in conjunction with switches 59 and 60 by the awning roller control switch unit. The switch 58 is normally open, but when the awning is rolled up it is closed by the rider 51. The circuit is therefore through the switch 58 and line 73 down to the lower left terminal 74 of the main switch across the jumper 75 to upper center terminal 76 through the switch blade to the center pole 77 and thence through line 78 to switch 60. From switch 60 the connection is by the line 79 to the upper field terminal.

The lid, continues to open, the lid shaft being revolved by the lid motor until the cam 25 moves to the position shown in Fig. 5 whereupon the high portion of the cam moves the plunger of the SPDT switch 27 opening the left side of the circuit in switch 27 breaking the connection to the lid motor and switching the current to the right terminal of the switch 27 from which it is conducted to the switch 55 by the line 81. In

this position the awning roller mechanism is energized to unroll the awning from the recess.

The circuit is now conditioned as shown in Fig. 10. Current is taken from the left side 61a of the main line directly to switch 28; from there it is conducted through the right terminal of the switch through the line 80 directly to the upper motor field 42F of the roller motor 42. Current is also conducted through the switch 28B through the field of the lid motor to switch 60 and thence to the main switch through line 78 to the switch blade to terminal 76 thence by jumper to terminal 74 and then to the lower brush terminal of the roller motor. This condition only exists for a very short period, however, since as soon as the roller starts the switch 60 which is in the line from the lid motor field to the main switch is opened by the rider 51, disconnecting the field. The resistance of the lid motor field prevents the field from drawing too much current and thus preventing operation of the roller motor.

Current to the upper brush of the roller motor is received from the right side 61 of the main line through the center pole 62 of the main switch by way of the blade to terminal 63, thence to the switch 27 out the right hand terminal through line 81 over to the SPST limit switch 55 which is normally closed, and thence to the upper brush of motor 42.

The lower brush and field terminals of the roller motor are connected together, as indicated by the dotted line, through lines 83 and 84 and terminals 77, 76, jumper 75 and terminal 74 of the main switch. The awning is unrolled by the motor, which unrolling is accomplished by rotating the awning roller. The shaft 34 of the awning roller is connected to the roller limit switch mechanism through chain 38 to cause the rider 51 to travel from the switches 58, 60 and 59 toward the limit switch 55. When the awning is fully extended, the rider 51 opens the limit switch 55 which is in the line 81 to the roller motor upper brush, opening the circuit and stopping the motor. The awning is now unrolled and extended.

When it is desired to roll up the awning and close the lid the operator merely changes the main TPDT switch to "awning up." The circuit under this condition in Fig. 11, connects the center poles of the main switch to the lower poles. When this is done, current is applied to the lower brush terminal and upper field terminal of the motor 42 and the other upper brush terminal and the lower field terminal are connected together. This causes the motor to reverse its direction from that previously described. Previously, when the roller started to unroll the awning, the rider 51 of the roller switch mechanism moved away from switches 58, 59 and 60. This caused 59 to be closed and the other two opened.

Current is fed from the left side of the main line 61A directly to switch 28 and from the right terminal thereof through line 80 directly to the upper field terminal of the roller motor field 42F. Current from the other or right side 61 of the main line is fed to the center pole 62 of the main switch through the blade to terminal 76 and from 76 through line 84 directly to the lower brush terminal of motor 42. The lower terminal of field 42F is connected directly to center pole 77 by line 83, through the blade to terminal 88

and thence to and through the limit switch 59 to the upper brush terminal of motor 42.

The motor being energized in the reverse direction, the awning is rolled up, the rider 51 of the roller switch unit moves to the right until the point where the awning is completely rolled up, the rider then strikes and operates switch 58, 59 and 60. Switch 59 being in the motor circuit and normally closed, is now opened and the circuit de-energized and the awning roller motor stops.

Simultaneously with the opening of switch 59, switches 58 and 60 close. The circuit connections during this stage are illustrated in Fig. 12. Power from left side 61a of the main line is led directly to switch 28 through the right hand contact to the line 71 to the bottom of the lid motor field 12F. Power from the other or right side 61 of the line as viewed in the figure is fed to center pole 62 through the switch blade to contact 75, thence it is conducted by wire 73 to switch 58 and then from switch 58 by line 72 to the upper brush of lid motor 12. The other upper lid motor field terminal and the lower lid motor brush are connected together, this connection being from the lower lid motor brush through line 66 to terminal 88 of the main switch through the switch blade to center pole 77 from the center pole 77 through line 78 to the now closed switch 60 through line 79 over to the upper lid motor field terminal.

The motor operates in reverse to the previous operation and the lid is closed. When the lid reaches the closed position, the SPDT switch 28 is thrown to the left terminal which opens the line and circuit to the motor. The circuit components are now in position to lower the awning which may be brought about as previously described.

It will thus be seen that I have provided a mechanism wherein the operator only needs to throw the control switch and the awning is completely raised or lowered without further attention.

Having thus described my invention I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope thereof.

I claim:

1. In combination with a closure for an awning recess and an awning disposed on a roller in said recess and adapted to be unrolled and rolled up in said recess on said roller, means for rotating said roller including a reversible motor, a motor circuit connecting said motor to a source of current, means for raising and lowering said closure and control means operated by the closure including a circuit breaker in said roller motor circuit to hold the motor circuit open until the closure is moved to a predetermined position.

2. In combination with a closure for an awning recess and an awning disposed on a roller in said recess and adapted to be unrolled and rolled up in said recess on said roller, means for rotating said roller comprising a reversible motor, a motor circuit connecting said motor to a source of current, means for raising and lowering said closure and control means operated by the closure including a circuit breaker in said motor circuit to hold the motor circuit open until the closure is moved to a predetermined position, circuit breaker means operated by said roller to open said motor circuit at two positions of said awning and thereby limit the rolling and unrolling of said awning from said roller.

3. In combination with a closure for an awning recess and an awning disposed on a roller in said recess and adapted to be unrolled and rolled up in said recess on said roller, means for rotating said roller comprising a reversible motor, a motor circuit connecting said motor to a source of current, means for raising and lowering said closure and control means operated by the closure including a circuit breaker in said motor circuit to hold the motor circuit open until the closure is moved to a predetermined position, and circuit breaker means operated by said roller to open said motor circuit at two positions of said awning and thereby limit the rolling and unrolling of said awning from said roller, said circuit breaker means including a lead screw connected in driven relation to said roller, and manually operated control means cooperating with said circuit to initiate the unrolling or rolling up of the awning and a rider for said lead screw and movable thereby, switches disposed in the path of the rider on opposite sides thereof and interposed in said circuit and operable to open and close and reverse the circuit to the motor to control the movement of the awning roller.

4. An awning control mechanism for operating a lid of an opening of an awning recess and for moving of the awning from and into the recess comprising a reversible motor for opening and closing the lid of the recess, a second reversible motor for unrolling and rolling up the awning, means carried by said lid to control the stopping and starting and reversal of the said first motor and to cause the starting of the second motor and means controlled by the unrolling of the awning to cause the stopping and facilitate starting of the second motor and to facilitate the first motor and a main switch member interposed in both of said circuits to control said motors.

5. In combination with a closure for an awning recess and an awning roller having an awning roller thereon disposed in said recess and adapted to be unrolled from and rolled up on said roller into the recess, a reversible motor for opening and closing said closure, a second reversible motor for rolling up and unrolling said awning, circuit means for controlling the movements of said motors and including a main switch connected to a source of current, said main switch being connected to said first motor to cause said motor to be energized to open said closure, adjustable cam means carried by the closure, and switch means operable by said cam means and interposed in the circuit to open the circuit to the first motor upon the closure reaching a predetermined position, said switch means upon opening the circuit to the first motor closing a circuit to said second motor to connect said second motor to said main switch means to energize said second motor and unroll the awning from said roller; an adjustable controller connected to said awning roller and having a plurality of switch means operable thereby, one of said switch means operable after the start of the roller to open a circuit to the first motor, a switch means interposed in the circuit to the second motor and operable by said controller upon the awning being unrolled a predetermined distance to open the circuit to said second motor, said main switch when moved to an alternate position adapted to cause the second motor to be energized in a reverse direction, and said adjustable controller, upon the awning being rolled up opening

the circuit to the second motor and positioning the circuit for subsequent energization in the lowering direction and positioning said circuits to said first motor to subsequently energize said first motor in the reverse direction to close said closure, said adjustable cam means adapted to open said circuit upon the closure reaching a closed position and condition the circuit for operation in a reverse direction.

6. In combination with an awning mechanism mounted in an awning recess and an awning roller disposed in said recess and adapted to raise and lower an awning by rolling and unrolling the awning upon and from said roller and motor drive means for operating the roller, a circuit controller therefor including a lead screw, a rider on said lead screw and movable thereby, drive means connecting said lead screw to said roller, and switches adjustably disposed at opposite ends of said lead screw and operable by said rider to control circuits to said motors.

7. An awning control circuit for an awning disposed on a roller in a recess in a building and having a lid operated by an oscillatory shaft for closing the recess, and motor drive means for opening and closing said lid and unrolling and rolling up said awning, said circuit including a main manually controlled switch for starting the awning unrolling or rolling operation and operable to connect said lid motor into the circuit prior to unrolling the awning, a pair of cams on said lid operating shaft, and switches operated by said cams, one of said switches being operable at the start of said lid opening to condition said circuit for limiting the lid closing when the lid is later closed, the other of said switches being connected in the lid circuit to maintain a closed circuit to the lid operating motor until the lid is opened a predetermined distance and then being operated by said cam on said lid shaft to interrupt said circuit to said lid motor and complete the circuit to the roller motor to start the roller motor to unrolling the awning, switch means for said roller including adjustable switch

operating members driven by said roller and operable upon the start of said roller motor to condition said circuit for rolling up said awning when said main switch is moved to awning roll up position, and a limit switch operated by said operating member to interrupt the roller motor and stop the unrolling of the awning when the roller is unrolled a predetermined distance and to permit said awning to remain in an unrolled or open position until said main switch is moved to said awning rolling up position and said switch means operable by said operating member when said awning is rolled up to interrupt said roller motor circuit to stop the roller motor from rolling the awning and to close the circuit to the lid motor to start the lid motor in the reverse direction to close the lid and to condition the roller motor circuit for unrolling the awning when the main switch is moved to an awning unrolling position and said lid switch operated as a limit switch under control of said cam when said lid is closed and to condition said circuit for reopening said lid when said main switch is moved.

8. In combination with an awning roller having an awning adapted to be rolled upon and unrolled therefrom comprising a reversible motor connected to said roller, a controller for controlling said motor connected to and driven by said roller, said controller including a lead screw rotatable with said roller, a traveler movable longitudinally on said lead screw, and switches disposed in the path of said traveler and adapted to be operated thereby upon predetermined movement of the traveler, a circuit for providing operating current for said motor including a main switch selectively movable to complete said circuit to cause the motor to be energized and to roll or unroll the awning, said switches operated by said traveler also being in the circuit with the main switch and operable to open the circuit after predetermined movement of the roller in either direction.

EDWARD H. SCHANE.

CERTIFICATE OF CORRECTION.

Patent No. 2,347,845.

May 2, 1944.

EDWARD H. SCHANE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 16, strike out the words "at one end" and insert the same after "supported" in line 14; and second column, line 17, for the reference numeral "12" read --42--; line 27, after "travel" insert --of traveler 51--; page 4, second column, line 44, claim 5, for "roller" read --rolled--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of July, A. D. 1944.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.