Oct. 10, 1961 S. D. EILENBERGER 3,003,552

DRAPERY TRAVERSE

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FIG.1

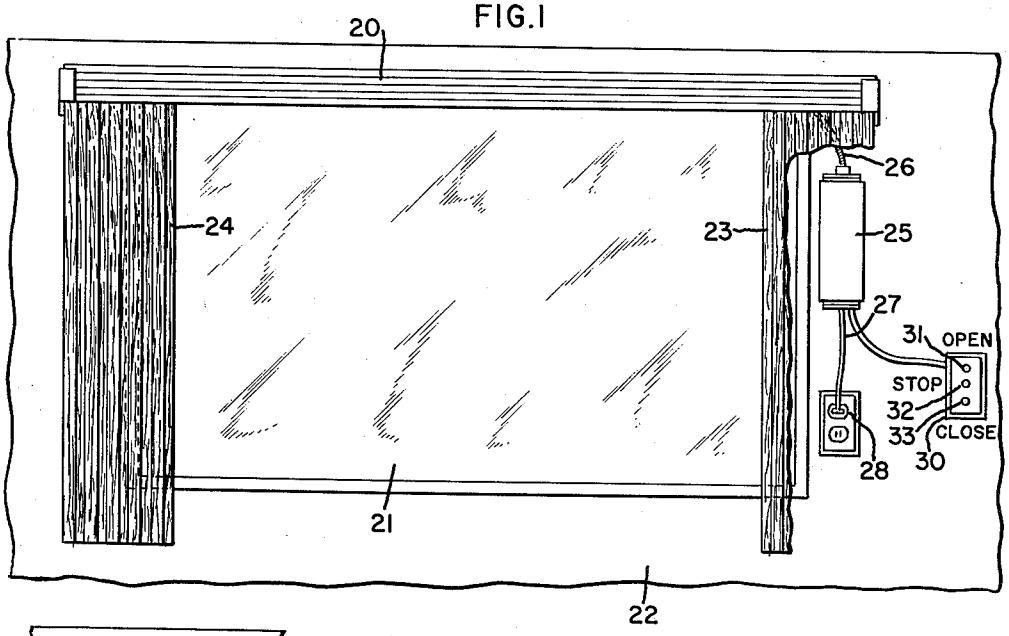
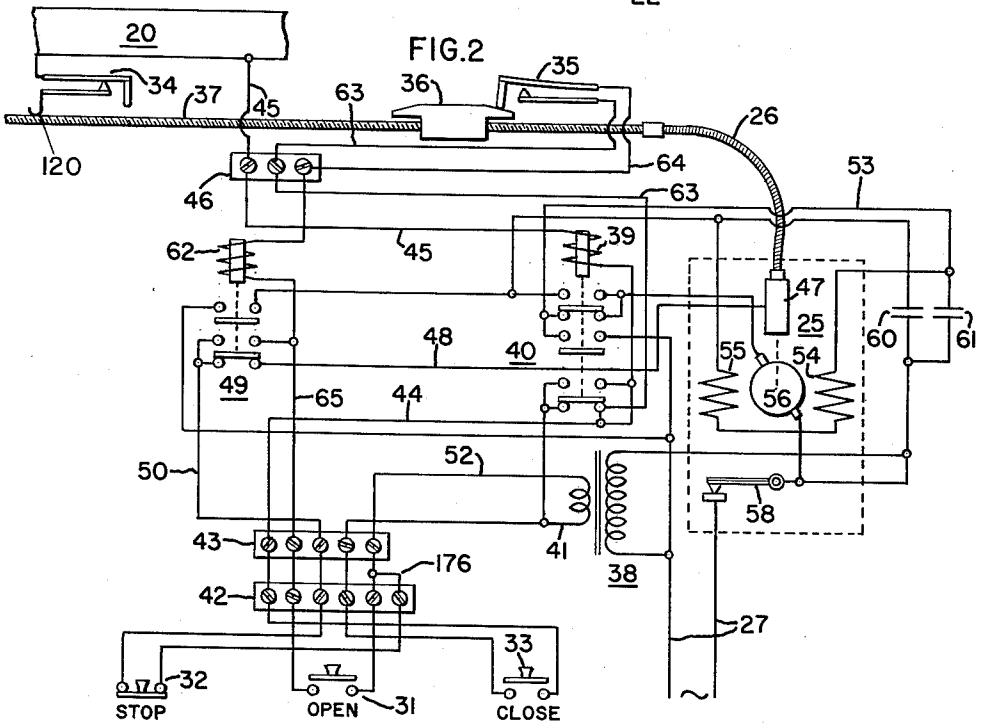


FIG.2



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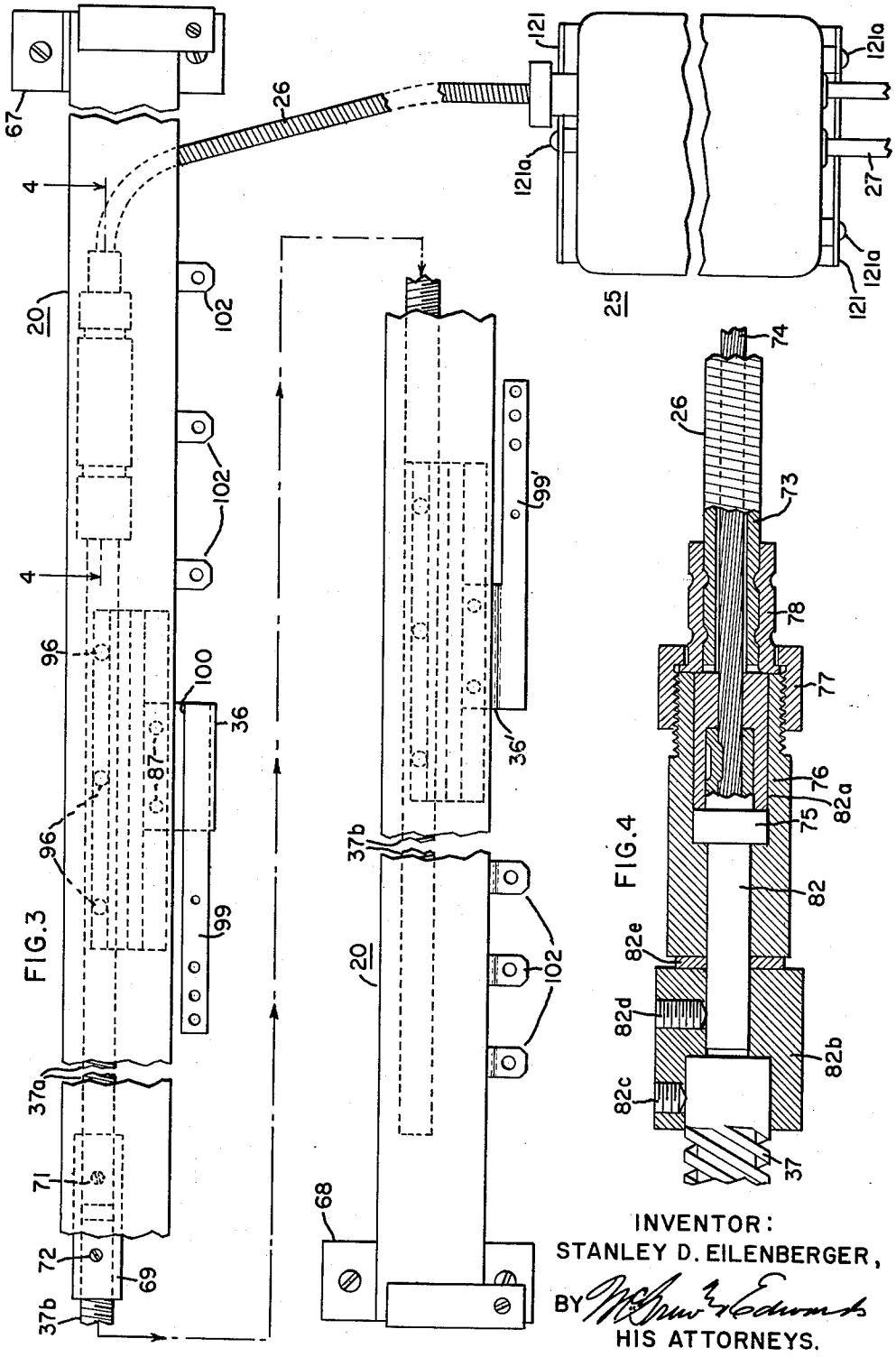

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DRAPERY TRAVERSE

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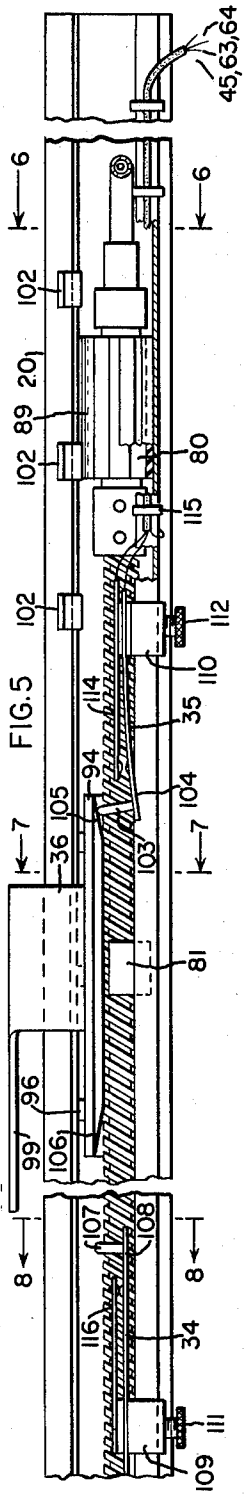

FIG. 5

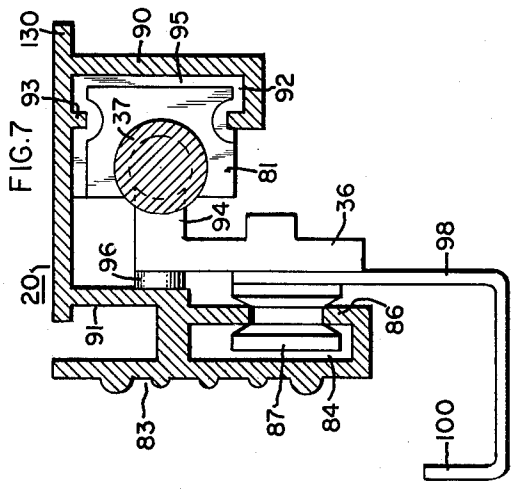

FIG. 7

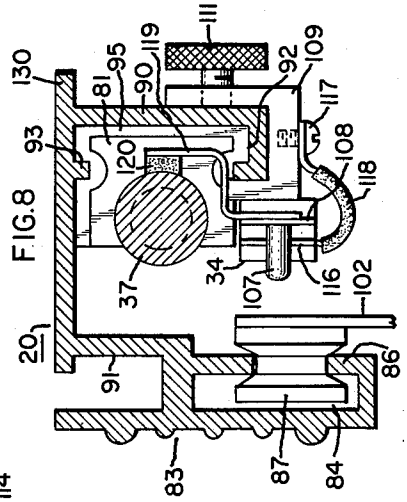

FIG. 8

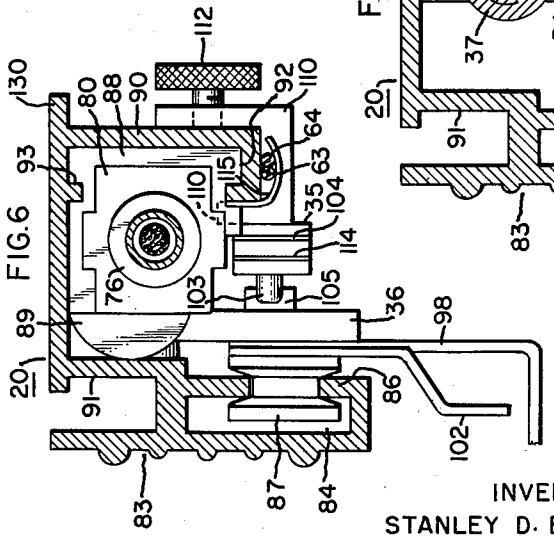

FIG. 6

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DRAPERY TRAVERSE

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FIG. 9

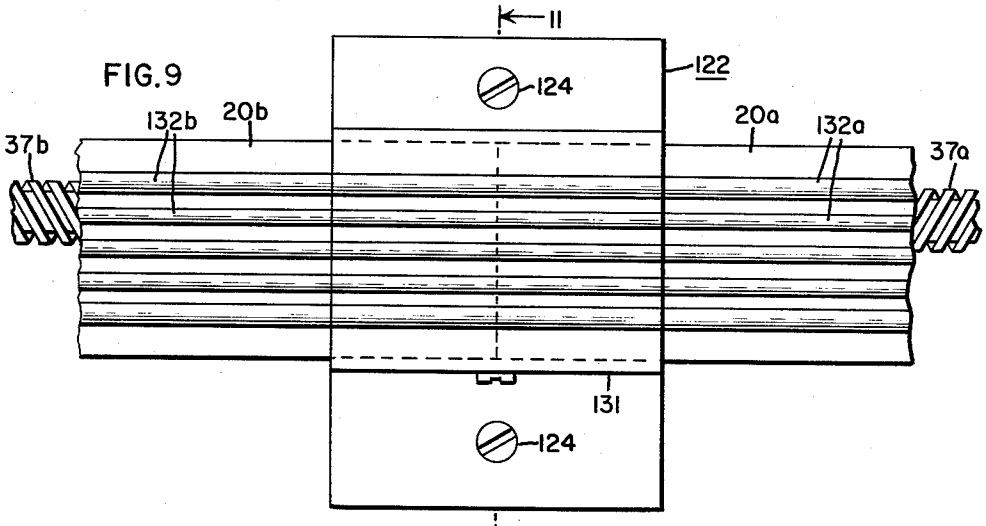


FIG. 10

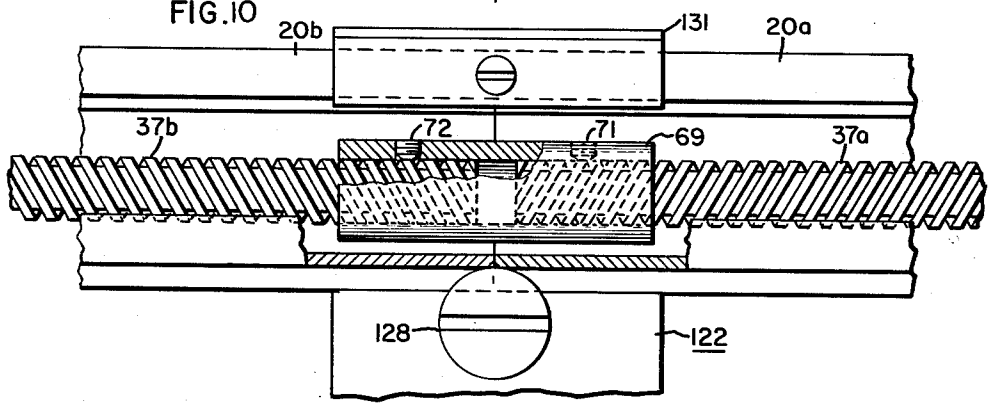
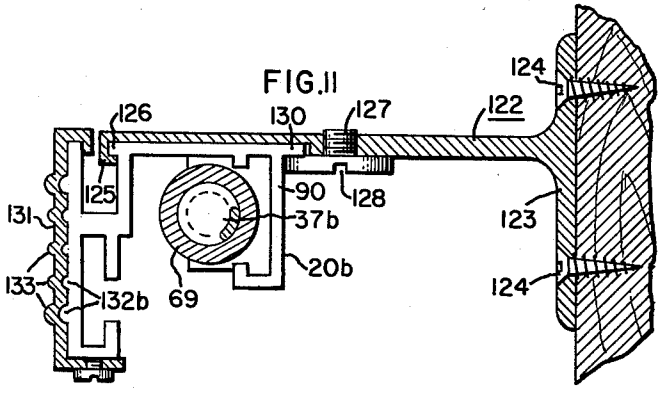


FIG. 11



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DRAPERY TRAVERSE

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FIG.12

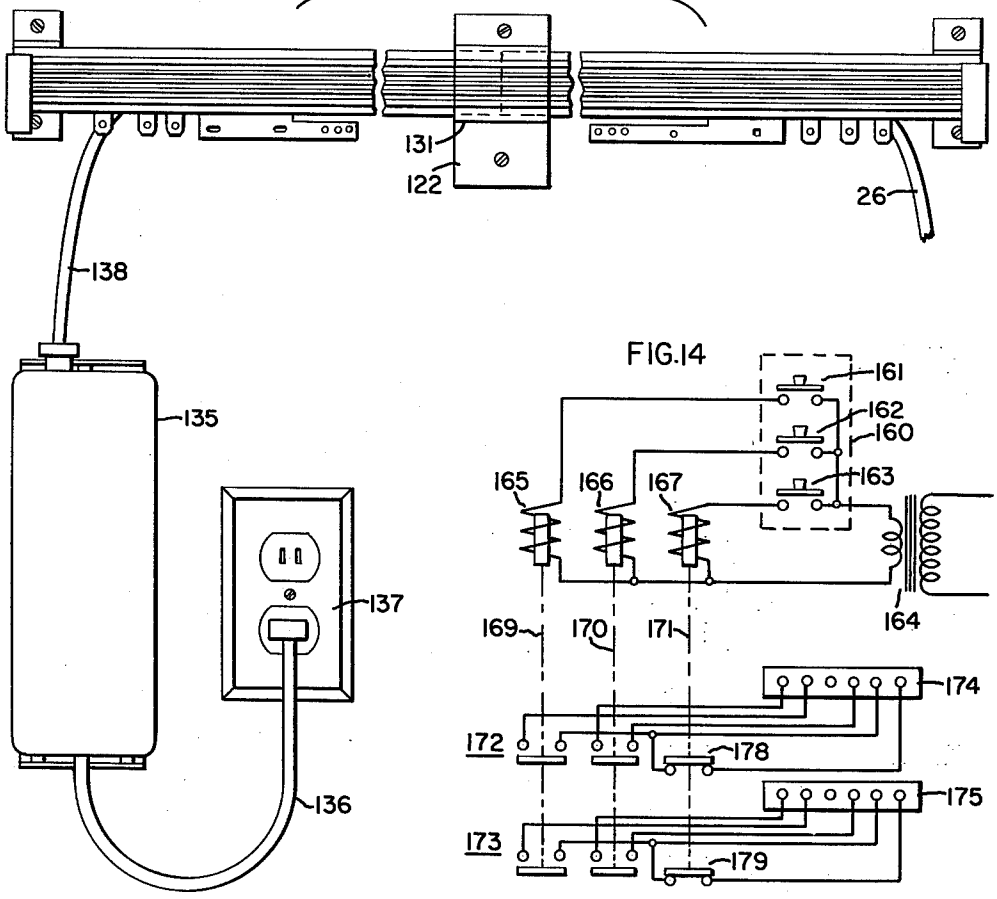
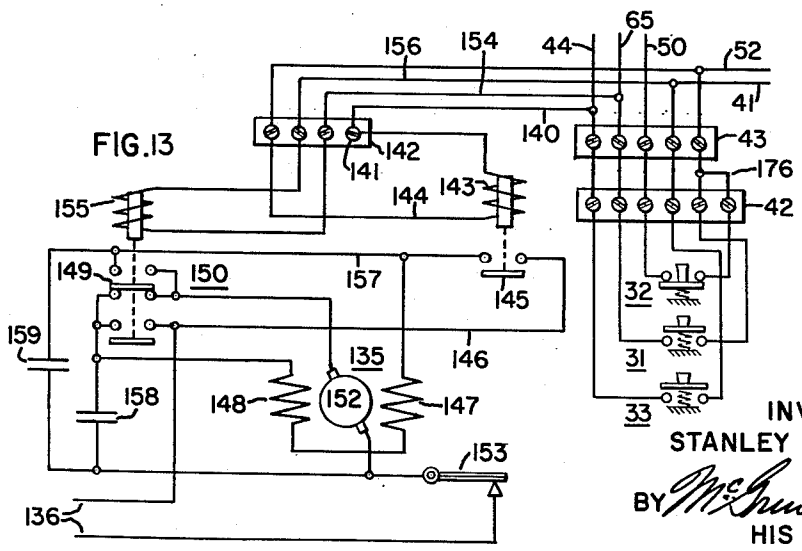


FIG.14

FIG.13



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United States Patent Office 3,003,552 Patented Oct. 10, 1961

3,003,552

DRAPERY TRAVERSE

Stanley D. Eilenberger, Cranston, R.I., assignor to Electric Traverse Rod Company, Cranston, R.I., a corporation of Rhode Island

Filed Apr. 3, 1959, Ser. No. 803,897
6 Claims. (Cl. 160—331)

This invention relates to traverse mechanisms for supporting draperies or curtains and for moving them between their open and closed positions, and particularly to an improved traverse assembly arranged for actuation by an electric motor drive.

In modern houses, particularly those with very wide windows, and in commercial establishments it is desirable to provide easily operated traverse assemblies for carrying heavy draperies or curtains. Various arrangements have been devised heretofore to utilize motors for moving the draperies between their open and closed positions; these devices have met with varying degrees of success but have not proved fully satisfactory in installations where the smooth and easy movement of heavy draperies is essential. Accordingly, it is an object of the present invention to provide a drapery traverse assembly including an improved arrangement for assuring easy and uniformly smooth operation.

It is another object of this invention to provide an improved motor-driven drapery traverse.

It is a further object of this invention to provide an improved motor-driven drapery traverse capable of supporting heavy draperies easily and of moving them with minimum operating noise.

Briefly, in carrying out the objects of this invention in one embodiment thereof, the track member of the traverse assembly is constructed from extruded metal such as aluminum which provides a guide track along the front side for movement of the master carrier and idlers which support the drapery. At the rear of the track within the extruded member there is mounted a longitudinal screw or threaded drive shaft extending parallel to the guide track which actuates the drapery by engagement with a rack mounted on the master carrier. An electric motor is mounted on a suitable support such as the wall adjacent one end of the traverse and is connected directly to the threaded shaft by a flexible shaft. The motor is reversible so that the shaft may be rotated in either direction to open and close the drapery.

In order to control the motor and stop the movement of the master carrier at the two ends of its travel, limit switches are mounted in the traverse assembly for engagement with cams on the master carrier; these limit switches open the motor circuit and stop the motor at each end of the master carrier travel. The threaded shaft is employed as a portion of the electrical circuit for the limit switch remote from the motor drive and for this purpose is mounted in insulated bearings so that it is out of electrical contact with the metal track. Thus a circuit to the remote limit switch may be completed from the drive shaft through the track and is effected by employing a carbon brush engaging a short length of the shaft near the outer end position of the carrier movement. The insulated bearing assemblies include resilient material for minimizing the transmission of vibrations from the shaft to the track and thereby minimize the sound produced upon operation of the motor.

The construction of the traverse assembly is such that it makes it easy to make up traverses of any desired length up to the maximum effective length for one unit, and furthermore two units of maximum length may be connected by suitable couplings and driven either by a single motor or by dual motors, one at each end of the complete assembly, the motor controls being coordinated

so that full operation of both sections of a double drapery is assured.

The features of novely which characterize this invention will be pointed out with particularity in the appended claims. The invention itself, however, as to both its organization and method of operation, together with further objects and advantages, may best be understood on reference to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is an elevation view of a window provided with a drapery traverse embodying the invention;

FIG. 2 is a circuit diagram of the control for the traverse of FIG. 1;

FIG. 3 is an enlarged elevation view of the traverse assembly and motor of FIG. 1;

FIG. 4 is an enlarged sectional view along the line 4—4 of FIG. 3;

FIG. 5 is an enlarged bottom plan view of a portion of the traverse;

FIG. 6 is an enlarged sectional view along the line 6—6 of FIG. 5;

FIG. 7 is an enlarged sectional view along the line 7—7 of FIG. 5;

FIG. 8 is an enlarged sectional view along the line 8—8 of FIG. 5;

FIG. 9 is a front elevation view of a modification of the invention;

FIG. 10 is a bottom view of the modification of FIG. 9;

FIG. 11 is a sectional view along the line 11—11 of FIG. 9;

FIG. 12 is a view similar to FIG. 3 illustrating another embodiment of the invention;

FIG. 13 is a circuit diagram of a portion of the circuit employed in connection with the control of FIG. 12; and

FIG. 14 is a circuit diagram of a master control for operating a plurality of traverse assemblies simultaneously.

Referring now to the drawings, the traverse assembly illustrated in FIG. 1 comprises a track or traverse rod **20** which for purposes of illustration has been shown as formed of extruded metal, preferably aluminum, and which is mounted in a horizontal position above the window **21** in a wall **22**. Draperies **23** and **24** are mounted at the right and left-hand sides of the traverse **20** and are shown in their open position, the draperies being of the type which meet and overlap slightly at the center when closed. The drapery **23** has been broken away to show an operating motor **25** connected by a flexible shaft **26** to drive the mechanism within the track **20**. The motor is connected to receive power through a cord **27** and house outlet plug **28** and is controlled by operation of a switch panel **30**. The panel **30** has three buttons **31**, **32** and **33** for controlling the opening, stopping and closing operations of the traverse.

While the traverse track has been shown as an extruded aluminum part, other materials and methods of manufacture may be employed; for example, the track may be made from rolled steel and also may be fabricated from several strips instead of being formed from a single piece of material.

As shown in the circuit diagram, FIG. 2, the motor **25** is controlled by closed and open position limit switches **34** and **35**, respectively, which are actuated by a cam provided on a master carrier **36** which moves the drapery **23**, the switch **34** being located to be actuated when the carrier **36** reaches the center or closed position of the drapery. The master carrier is driven in a manner to be described later by rotation of a screw or threaded shaft **37** connected to be driven by the flexible cable **26**.

When the draperies are in their open positions the

switch 34 is closed and the switch 35 open, as shown in FIG. 2, the master 36 being in its extreme right-hand position in this figure. If now the button 33 is pressed to close its switch, a circuit is completed from the secondary of a transformer 38 to energize a relay coil 39 and move a switch 40 to its upper position. This circuit may be traced from one lead of the secondary of the transformer indicated at 41 through the closed switch 33, the left-hand terminals on connection blocks 42 and 43, a lead 44, the coil 39, a lead 45 anchored to the left-hand terminal of a connection block 46, thence through the metallic track 20 to the switch 34, drive shaft 37 and flexible cable 26 to the motor gear case indicated at 47, and thence through a lead 48, the lower terminal of a two-pole double-throw switch 49 and thence through a lead 50 connected to the blocks 43 and 42, through normally closed stop switch 32, and to the other side of the secondary through a lead 52. The motor gear case is insulated from surrounding parts so that it may be employed as a part of the electrical circuit. Upon energization of the coil 39 the switch 40 is moved to its upper position and the lower blade thereof closes a holding circuit connecting the lead 41 directly to the coil 39 so that the switch 33 may be opened without de-energizing the coil 39.

Closing of the upper two blades of the switch 40 completes the circuit for the motor 25. This circuit may be traced from the left-hand line 27 through the middle blade of the switch 40 and a lead 53 to the field windings 54 and 55 connected in series and thence through the upper blade of the switch 40 to the motor armature indicated at 56 and back to the right-hand side of the line 27 through a thermal or temperature-limiting switch 58.

The motor 25, which is shown as of the series wound commutator type, is then started to rotate the flexible shaft 26 through the gears within the gear box 47 in a direction to move the master carrier 36 to the left and close the draperies. At the same time a similar master carrier (not shown in FIGS. 1 and 2) moves to the right so that the draperies 23 and 24 meet at the center.

Two capacitors 60 and 61 may be provided between the line and the outer terminals of the field windings 54 and 55 in order to minimize radio interference.

When the master carrier 36 reaches its extreme left-hand position, it engages and opens the switch 34 thereby interrupting the circuit of the motor 25 and stopping the motor. It will be understood that the motor may be stopped in intermediate positions by opening the switch 32 which de-energizes the coil 39 and causes the switch 40 to move to its drop-out position. Thus when the stop switch 32 is released and allowed to close, the motor remains de-energized until either the "open" or "close" switches are operated.

When the draperies are in their center position, or any position other than their closed position, and the "open" switch 31 is closed, a coil 62 of the switch 49 is energized to actuate the switch 49 and move the two blades thereof to their upper positions. The circuit for the coil 62 may be traced from the secondary lead 41 of the transformer 38 through the lower blade of the switch 40, a lead 63, and the closed switch 35, and thence through a connection 64 passing through the connection block 46 to the coil 62 and back to the line through a lead 65, the closed switch 31, across the connecting blocks 42 and 43 to the lead 52 of the transformer secondary. Upon operation of the switch 49 a holding circuit for the coil 62 is provided through the lower blade of the switch so that the switch 31 may be released without de-energizing the coil 62.

The upper blade of the switch 49 closes a circuit to the motor 25 which may be traced from the left-hand side of the line 27 through the switch 49 to the field coils 55 and 54 in series, thence to the line 53 and the upper blade of the switch 40 in its lower position to the armature 56 of the motor and back to the line 27 through the thermal switch 58. This connection provides a reverse connection for the field windings 54 and 55 with respect to the armature 56 and the motor 25 is energized to rotate the rod 37 in the opposite direction and drive the master carrier 36 to the right and open the draperies.

If during the operation of the motor 25 it is overheated for any reason, such as forced stalling of the movement of the draperies, the thermal switch 58 will be heated and will open its contacts thereby disconnecting the motor. Opening of the thermal switch 58 also de-energizes the primary of the transformer 38 so that the actuated coil, either the coil 39 or the coil 62, is de-energized and the system cannot again be started without actuating one of the switches 31 and 33.

The structural features of the traverse assembly of applicant's invention assure smooth operation of the draperies and minimum transmission of sound during operation of the motor 25. The mechanical details of the traverse assembly of FIG. 1 are shown in FIGS. 3 through 8.

The traverse track member 20 as illustrated is made from a length of extruded aluminum and secured to the walls on brackets 67 and 68. The drive shaft 37 is made in right and left-hand sections 37*a* and 37*b*, respectively, connected by a sleeve coupler 69 at the center which is secured to the right and left-hand sections by screws 71 and 72, respectively. The sections 37*a* and 37*b* are oppositely threaded so that rotation of the shaft causes opposite movement of the master carriers geared to the two sections. The drive shaft 37*a* is coupled to the flexible shaft 26 at its right end as shown in FIG. 4.

The shaft 26 comprises an outer sheath 73 and an inner flexible cable 74 which is attached to a connector 75 journaled in a sleeve 76, the sleeve 73 being detachably secured to the sleeve 76 by a threaded coupling 77 engaging a flanged attaching sleeve or boss 78 rigidly secured to the end of the sleeve 73. The sleeve 76 is securely held in a mounting block 80 held in the track 20. A plurality of bearing blocks 81, one of which is shown in FIG. 5, are provided at intervals along the shaft 37, the number depending upon the length of the shaft and being sufficient to prevent whipping or displacement of the drive shaft during rotation. The flexible shaft 74 is provided with a coupling connection 82 rigidly attached to it within a journal member 82*a* in the bearing 76, and the coupling 82 is attached to the shaft 37 by a coupling member 82*b* provided with recesses to fit the end of the shaft 37 and the coupler 82 and attached to these elements by set screws 82*c* and 82*d*. A friction thrust washer 82*e* is provided between the stationary bearing 76 and the coupling 82*b*.

As shown in FIGS. 6, 7 and 8, the track 20 is constructed to provide a decorative front panel 83, directly behind which is a passageway 84 having a slot extending along its inner edge and providing a guide section 86 for the usual pivoted slides or guide elements of the master carriers and idlers as indicated at 87; the slot is sufficiently wide that the carriers may slide freely along it while resting on the track section 86. As shown in FIG. 6, the attaching block 80 for the coupling sleeve 76 is secured within the track 20 by a resilient mounting part 88 and a pressure block 89 which retains the assembly in position within the track 20 between a rear wall 90 and a front wall 91 spaced from the decorative wall 83 at the upper portion thereof. The part 88 and block 89 are made of rubber or other suitable resilient material. The lower portion of the rear wall 90 is inturned to provide a shallow channel 92 which engages the resilient mounting 88 and cooperates with a ridge 93 at the top of the track 20 to maintain the block assembly securely in position.

The bearing assembly, as indicated in FIGS 7 and 8, comprises a bearing member indicated by the numeral 81 which engages the outer surfaces of the threads of the shaft 37 and is open along its left-hand face to afford access for the rack element of the master carrier 36

and which is indicated by the numeral 94, and which has teeth fitting the threads of the shaft 37 and of arcuate form as indicated in FIG. 7. The bearing block 81 is mounted in the track 20 in a manner similar to the block 80, it being provided with a resilient section 95 of molded rubber or other suitable material engaging the top, back and bottom walls of the traverse track and being securely held in place by the bottom wall 92 and the ridge 93 in the upper wall. The intermediate wall 91 provides a backing bearing surface for lugs or fingers 96 formed on the carrier 36 to maintain the rack 94 in engaging position with the shaft 37.

The master carrier 36, as shown in FIGS 3 and 7, is provided with a drapery attaching portion 98 comprising a channel-shaped section secured to the body portion of the master carrier and having a forwardly extending finger 99 to which the drapery may be attached and which is formed as a part of an upwardly extending flange 100 of the member 98. The master carrier is thus carried on the pivoted sliding members 87 and rides on the upturned flange 86 of the track while the rack portion 94 engages the shaft 37 so that the carrier is driven along the traverse assembly 20 by rotation of the shaft 37.

A plurality of idler carriers 102 are provided between the master carriers and the respective ends of the assembly. These idlers, as shown in FIG. 6, are each provided with a track-engaging element 87 so that they may move along the track section 86 and hold the drapery in position in the usual manner.

In FIG. 3 the left-hand master carrier is indicated by the numeral 36' and its drapery attaching foot or bar by the numeral 99'. The bars 99 and 99' are offset with respect to one another in the usual manner so that the draperies may overlap when the two master carriers are in their drapery closing positions at the center of the track assembly 20. The master carrier 36' has its drapery attaching element 99' offset to the same degree as the idler carriers 102, it being of the general cross-sectional shape of the idler shown in FIG. 6 rather than having the large channel section of the element 98 of the carrier 36. Thus the master carrier 36' holds the drapery attached to it in direct alignment with the portions of the drapery attached to the idler carriers 102, while the drapery attaching element 99 of the carrier 36 is offset sufficiently to carry the forward portion of its drapery over the outside of the drapery attached to the other carrier. The two master carriers are of identical construction except for this difference in the drapery attaching portions 99 and 99'.

As shown in FIG. 5, the switches 34 and 35 are arranged at the center or closed and right-hand or open positions of the master carrier 36, and in this view the switch 35 has been shown in its open position as illustrated in the circuit diagram, FIG. 2. The switch 35 is held in this position by an insulated actuating post 103 mounted at the outer end of the flexible movable member of the switch 35 indicated at 104 and arranged to engage a cam surface 105 at the end of the rack portion 94 of the master carrier 36. When the closing switch 33 is operated and the carrier 36 moves to the left, the switch 35 is closed by disengagement of the element 103 from the cam surface 105, and the movement continues, unless stopped by operation of the stop switch, until a cam surface 106 on the carrier engages an insulated post 107 attached to the outer end of the movable member 108 of the switch 34 thereby opening the switch 34. The switches 34 and 35 are detachably secured in their selected positions along the traverse track 20 by clamps 109 and 110, respectively, including set screws 111 and 112. The switch assemblies are secured to their respective clamps and may thus be locked in any desired position along the track to determine the extent of movement of the master carrier. It will be understood that it is necessary only to control the switches by the master carrier 36 because the master carrier 36' is operated in synchronism with the carrier 36 by virtue of its rack engagement with the shaft 37b. Thus the center switch 34 may be arranged to be opened when the master carrier 36 reaches a position of overlapping relationship with the carrier 36'.

The clamp 110 for the switch 35 is clearly shown in the sectional view, FIG. 6, where it can be seen that the clamp surrounds the lower portion of the traverse wall 92 and holds the switch 35 in position adjacent the path of movement of the carrier 36. The switch 35 as illustrated includes insulating elements within which are clamped the base of the movable member 104 and the base of the stationary element of the switch 35 indicated at 114. The connections to the switch 35 are made through the leads 63 and 64 which may be clamped along the lower side of the wall 92 by clips 115 which afford ready release and adjustment of the leads in the event the position of the switch is to be changed.

The clamping arrangement for the switch 34 is clearly shown in FIG. 8, this switch being similar to the switch 35 and comprising three blocks of insulating material clamping the movable blade 108 and the stationary blade indicated at 116 in insulated relationship. The electrical circuit connections for the switch 34 are made from the metal clamp 109 and a set screw 117 through a lead 118 which connects the stationary switch member 116 to the electrically conducting traverse track 20 through the clamp 109 and through a spring conductor 119 clamped in conducting relationship with the blade 108 and connected in electrically conducting relationship with the shaft 37 through a brush 120. It will be noted that the shaft 37 is electrically insulated from the traverse track 20 throughout its length, if being mounted in the insulated bearings 81 and being held at its driven end in the insulated clamping block 80, and further the cable 26 and gearing assembly 47 are insulated. Thus the circuit may be completed from the traverse track through the drive shaft and no wires need be carried through the assembly to the switch 34, the electrical connections to the switch 34, as pointed out in connection with the description of FIG. 2, being had through the insulated flexible cable 26 at one end and through the ground connection to the traverse track at the other. This is indicated diagrammatically by the ground symbol in FIG. 2 which has been employed instead of a diagrammatic illustration of the track 20. The brush 120 extends axially over several of the threads of the shaft 37 so that it is at all times in engagement with the shaft.

The bearings 81 are preferably made of a self-lubricating type plastic composition such as graphited nylon. The mounting of the bearings and the bearing block 80 in resilient material minimizes the transmission of mechanical vibrations from the rotating shaft and drive assembly to the traverse track and thereby minimizes noticeable noise during operation of the traverse.

It is to be noted that the traverse assembly as above described is such that the track member and the actuating shafts may be cut to any desired length, it being necessary merely to provide bearings for the shaft 37 at the desired locations. A traverse assembly embodying the invention may be made up in various standard lengths and the invention provides a flexible design affording ready adjustment to various widths of windows without the need of changing the arrangement of the flexible lead and end assembly of the traverse.

The motor 25 together with the gearing 47 is mounted within its casing on a bracket or flanged plate 121 secured in any suitable manner to the wall adjacent the drapery traverse. The motor casing is secured within the flanged plate 121 on posts of resilient rubber or other suitable sound-damping material, three such posts being employed in the illustrated embodiment. Each of the posts 121a is rigidly secured to the casing of the motor

and has its end inserted in an opening in the flanged plate 121, the post having a suitable annular groove (not shown) for accommodation of the plate so that the head of the post may be pressed through the opening in the plate and will be retained in position by the groove, the resilience of the posts and some flexibility of the flanged plate affording easy assembly of the motor in the bracket 121. The motor, except for its connection with the bracket through the posts 121*a*, is spaced from the bracket on all sides. This mounting of the motor on the posts 121*a* minimizes the transmission of motor and gear noises to the supporting structure and assures quiet operation of the motor drive assembly.

It will be obvious that the invention may be applied either to the double-draw draperies as illustrated in FIG. 1 or to a single-draw type equivalent to one-half of the drapery installation illustrated. The construction and arrangement of the traverse assembly is simplified and makes it possible to construct an assembly of any given length within the available lengths of track and drive shaft. By way of example, assuming that a single length of sixteen feet is the maximum length manufactured, an assembly comprising two such lengths may be provided to operate draperies over a thirty-two-foot span. A coupling arrangement for such assembly is illustrated in FIGS. 9, 10 and 11 wherein two lengths of track of the same construction as the track 20, and designated 20*a* and 20*b*, have been shown secured together in a clamp assembly 122. This assembly except for the clamp 122 is the same as that shown in FIG. 3 and the same numerals have been applied to corresponding parts.

The clamp assembly 122 comprises a supporting bracket 123 which may be secured to the wall by screws as indicated at 124 and which is provided with an arm extending outwardly and into engagement with the edge of the top wall of the tracks 20*a* and 20*b* as clearly shown in the sectional FIG. 11, the arm of the bracket having a hook 125 formed at its outer end which engages the edge of the top wall indicated at 126, the hook extending into the opening in the upper front portion of the traverse track. This opening provides a channel through which electrical conductors may be threaded should it be desired to provide remote connections to control switches.

The two traverse tracks are clamped within the assembly by a flat-headed screw 127 having a screw driver slot 128 accessible from the underside of the clamp. The head of the screw 127 is large and engages the underside of a rearward extension 130 of the upper wall of the tracks 20*a* and 20*b* and locks the tracks in position, the screw 127 being mounted in a rearward portion of the arm which is recessed in its forward portion to the depth of the upper wall of the track; the traverse track thus is securely held in position, the head of the screw 127 bearing against the inner vertical wall 90 of the track.

To provide a finished appearance and cover the abutting ends of the tracks 20*a* and 20*b*, a finish or face plate 131 is placed over the outer face of the tracks 20*a* and 20*b* over the abutting ends. The face plate 131 is provided with decorative longitudinal recesses corresponding to decorative ridges 132 and 132*b* on the longitudinal outer faces of the tracks 20 and has corresponding ridges 133 formed in its outer face to provide continuity of the ridge design.

When two long assemblies are employed as mentioned in connection with FIGS. 9, 10 and 11, it may be desirable, particularly when heavy drapes are used, to employ a dual motor drive so that driving torque is applied to the shaft 37 at both ends. A drive for this purpose has been shown in FIGS. 12 and 13. The drive for the right-hand end is the same as that shown in FIG. 1 and the corresponding parts have been designated by the same numerals. The drive for the left-hand end comprises a driving motor 135 having a power connection 136 connected to a supply plug 137. The motor 135 is provided with a gear box corresponding to the gear box 47 of the motor 25 and which is contained within the motor casing and drives the shaft 37*b* through a flexible cable 138 of the same construction as the cable 26, the cable 138 being coupled to the shaft section 37*b* in the same manner as the cable 26 is coupled to the shaft 37.

The motor 135 is of the same size and type as the motor 25 and is connected with the control for the motor 25 so that the motor 135 is dependent upon the motor 25 and operates therewith so that both motors apply substantially the same power to the threaded shaft 37, thereby dividing the power rather than having one motor assume full power.

The circuit connections for controlling the motors 25 and 135 in the manner indicated above are shown in the wiring diagram, FIG. 13. In this diagram the connecting blocks 42 and 43 as shown in FIG. 2 have also been illustrated, together with the three switches 31, 32 and 33 and the leads 41, 44, 50, 52 and 65 connecting the block 43 with the circuits of FIG. 2. The diagram of FIG. 3 is to be considered as connected to the circuits of FIG. 2 as indicated and as connected to the power supply lines 27 through the cable 136, the two conductors of which are indicated in FIG. 13. Assuming that the draperies are open and the switch 35 therefore open as shown in FIG. 2, the operation of the switch 33 actuates the motor 25 through the control shown in FIG. 2 in the same manner as described heretofore. In addition, as indicated by FIG. 13, the closing of the switch 33 completes a circuit from the line 41 through the switch 33, across the switch blocks 42 and 43 to a lead 140 connected to the lead 44, thence to a terminal 141 on a connecting block 142, and thence to a coil 143, and back to the line 52 through a lead 144 and the left-hand terminal of the block 142. The coil 143 is maintained energized after opening of the switch 33 by the holding circuit effected by operation of the switch 49 of FIG. 2 to move its lowermost blade to its upper position. Energization of the coil 143 closes a switch blade 145 and completes a circuit from the upper line 136 through a connection 146, the switch 145, to field windings 147 and 148 of the motor 135, thence to an upper blade 149 of a normally closed switch 150, through the armature of the motor 135 indicated at 152, and back to the lower line 136 through a thermal overload switch 153.

The motor 135 when energized in this manner rotates the shaft 37 in the same direction as the motor 25 so that power is supplied simultaneously to both ends of the traverse assembly of FIG. 12. The draperies will then move toward their closed position either until the stop switch 32 is actuated or until the master carrier 36 moves to its extreme left-hand position and opens the switch 34. Either of these operations will de-energize the coil 143 as well as the coil 39 so that both motors are stopped.

When the draperies are in any position to the left of their right-hand limit position and the switch 31 is closed, the motors 25 and 135 are reversed to move the master carriers toward their respective right- and left-hand open positions.

The control of the motor 135 is effected upon closing the switch 31 by completing a circuit from the switch 31 through a line 154, through the block 142 to a switch actuating solenoid 155 of the switch 150, thence across the block 142 and through a lead 156 to the lead 41 of the transformer secondary. The coil 155 is maintained energized by the holding circuit of the switch 49 of FIG. 2 so that the switch 150 remains in its actuated position after the open switch 31 has been released. Operation of the switch 150 completes a circuit from the upper line of the supply 136 to the field winding 148, the winding 147, a lead 157, the upper blade 149 of the switch to the armature 152 of the motor, and thence to the other side of the line through the switch 153. Thus the motor

135 is operated in the reverse direction simultaneously with the motor 25 and the master carriers 36 and 36' move outwardly toward their open positions until the stop switch 32 is operated or until the carrier 36 engages and opens the limit switch 35. As in the case of the single circuit of FIG. 2, capacitors indicated at 158 and 159 are provided to minimize radio interference.

In one installation a drapery traverse assembly constructed as described above was driven by a series wound 115-volt alternating current commutator motor having a speed of 5000 r.p.m. at full load. The gears for driving the flexible shaft were designed with a 10.5-to-1 ratio, and the threads on the driving rod were 29° Acme general purpose threads having an 8-per-inch quadruple lead equivalent to two threads per inch. The pitch diameter of the screw thread was 0.5 inch and the resultant drive provided 24.7 pounds of thrust on the master carriers and drove the carriers at a speed of six inches per second; the speed was selected to move the draperies at a desired rate to give an effect of dignity. The transformer provides a low voltage for all control circuits and may be selected as desired. In one example this secondary control operated at 24 volts, but any other suitable voltage may be used, the requirements being that the relay coils operate at the selected voltage and that the voltage is low enough for safety.

For some installations of the traverse assembly of this invention when two or more assemblies are used, for example at different windows of the same room, it is desirable to provide not only the individual control panel at each assembly but also to provide a master control at a central location which enables the operator to move all of the draperies at the same time. The circuit diagram of a master control for this purpose is shown in FIG. 14. The control of FIG. 14 is provided with a pushbutton panel 160 having "open," "close" and "stop" push buttons 161, 162 and 163, respectively. The open, close and stop buttons are arranged to close circuits from the secondary of a transformer 164 to relay coils 165, 166 and 167, respectively. Energization of these coils raises switch actuators 169, 170 and 171, respectively, and actuates corresponding open, close and stop switch switches of a plurality of master controls, two of which are indicated by way of example at 172 and 173.

Each of the master controls includes a connection strip, the two in the diagram being indicated at 174 and 175, respectively. These master connection strips are shown as having six connection terminals corresponding in order to the connection terminals of the strips of the individual controls illustrated by the connection strip 42 in FIG. 2. When a master control is to be employed, each of the controls of the individual traverse assemblies is altered by opening the jumper connection indicated at 176 between the two last terminals on the right-hand end of the connection strip 42 and the corresponding strips of each of the individual assemblies. Each of the strips 174 and 175 is connected to the individual strip corresponding to the strip 42 with the connection terminals connected to the corresponding ones of the terminals of the strip 42 and in the same order. As shown in FIG. 14, the two terminals at the left-hand end and the three at the right-hand end are employed. The third terminal from the left is not connected to the master control because the stop switches of the master control are required to be connected in series with the stop switches of the individual controls rather than in parallel.

It will be noted that the master control as shown in FIG. 14 requires an individual transformer 164 but that it does not require any switching connections for the high-voltage motor power supply. The connections between the master control and the individual traverse assembly controls are made through suitable five-wire cables connected to the respective strips represented by the strips 42 and 174 and 175. The master control is thus arranged so that, when the two right-hand contacts of each strip are connected to the corresponding individual control circuit represented by the circuit of FIG. 2, the stop switches indicated at 178 and 179 in FIG. 14 provide a connection between the two right-hand terminals taking the place of the fixed connection or jumper 176. Thus energization of the relay coil 167 upon closing of the push button 163 opens the switches 178 and 179 and interrupts the circuits of the individual stop switches 32, the switches 178 and 179 being connected in series with the switches corresponding to the switch 32 of FIG. 2 when the switches 178 and 179 are open.

Actuation of the push button 162 to energize the relay coil 165 closes the two left-hand or open control switches of the master controls 172 and 173 and provides a shunt around the open switches corresponding to the switch 31 of all of the individual assemblies and energizes the motors to move the draperies toward their open positions. In a similar manner, when the middle or "close' push button 162 is operated to energize the coil 166, the actuator 170 is raised to close the center switches of the master controls 172 and 173 and thereby shunts the "close" switches corresponding to the switch 33 of each of the individual assemblies.

It will thus be apparent that operation of the push buttons 161, 162 and 163 is arranged to effect simultaneous operation of all of the individual controls which are connected to the master control of FIG. 14 and that the control panel 160 thus provides a central control making it possible to control each of the assemblies either from the central control or independently at the individual assembly.

While the invention has been illustrated in connection with a specific traverse assembly, various modifications and other applications will occur to those skilled in the art. Therefore it is not desired that the invention be limited to the details of construction illustrated and described and it is intended by the appended claims to cover all modifications which fall within the spirit and scope of the invention.

I claim:

1. A motor-driven traverse assembly for draperies and the like comprising, an electrically conductive elongated threaded shaft rotatable about its longitudinal axis, an electrically conductive track mounted parallel to said shaft, a carrier slidably mounted on said track and having a threaded portion engaging a segment of said shaft, electrically insulating bearings each having a semi-circular recess for receiving and supporting said shaft in insulation from said track, driving means including an electric motor for rotating said shaft, and a control circuit for said motor including said shaft and said track and a limit switch positioned along said track engageable with said master carrier for connecting said shaft and track in electrical series as part of said circuit, whereby said circuit is responsive to the position of said master carrier for controlling the operation of said motor.

2. A motor-driven traverse assembly for draperies and the like comprising, an electrically conductive elongated threaded shaft rotatable about its longitudinal axis, a track comprising conductive material mounted parallel to said shaft, a carrier mounted on said track for motion therealong having a threaded portion engaging said shaft, electrically insulating bearings for receiving and supporting said shaft in insulation from said track, driving means including an electric motor for rotating said shaft, and a control circuit for said motor including said shaft and said track and a limit switch positioned along said track engageable with said master carrier for connecting said shaft and track in electric series as part of said circuit, said switch having a brush contacting said shaft, whereby said circuit is responsive to the position of said master carrier for controlling the operation of said motor.

3. The traverse assembly defined by claim 2, wherein the limit switch is detachably mounted for adjustable positioning along said track.

4. A motor-driven traverse assembly for draperies and the like comprising, an electrically conductive elongated threaded shaft rotatable about its longitudinal axis, a track comprising conductive material mounted parallel to said shaft, a carrier mounted on said track for motion therealong having a threaded portion engaging a segment of said shaft, electrically insulating bearings each having a semi-circular recess aligned with said segment for receiving and supporting said shaft in insulation from said track, driving means including an electric motor for rotating said shaft, and a control circuit for said motor including said shaft and said track and a limit switch adjustably positioned along said track engageable with said master carrier for connecting said shaft and track in electrical series as part of said circuit, said switch having a brush contacting said shaft, whereby said circuit is responsive to the position of said master carrier for controlling the operation of said motor.

5. A motor-driven traverse assembly for draperies and the like comprising, an elongated horizontally extending panel formed with a horizontal track extending along the back side of said panel, a long thin threaded drive shaft behind said panel extending parallel to said track, whereby said track and shaft are concealed by said panel, means mounting said shaft securely in position adjacent said track including a plurality of bearing members carried by said track in closely spaced relation to prevent whipping of said drive shaft during rotation thereof, said bearing members having arcuate stationary bearing surfaces engaging said shaft over more than 180° and having aligned openings permitting free access to the threads of said shaft, drapery attaching and carrying means including a master carrier mounted on said track for movement therealong with substantially all of the weight of said carrier being borne by said track, said master carrier including a member extending into operable engagement with said threads for movement of said member along said track and through said bearing openings upon rotation of said shaft to drive said master carrier, and driving means for rotating said shaft.

6. A motor-driven traverse assembly for draperies and the like comprising, an elongated horizontally extending panel, a horizontal track behind said panel, a long thin threaded drive shaft behind said panel extending parallel to said track, whereby said track and shaft are concealed by said panel, means mounting said shaft securely in position adjacent said track including a plurality of bearing members carried by said track in closely spaced relation to prevent whipping of said drive shaft during rotation thereof, said bearing members having arcuate stationary bearing surfaces engaging said shaft over more than 180° and having aligned openings permitting free access to the threads of said shaft, drapery attaching and carrying means including a master carrier mounted on said track for movement therealong with substantially all of the weight of said carrier being borne by said track, said master carrier including a member extending into operable engagement with said threads for movement of said member along said track and through said bearing openings upon rotation of said shaft to drive said master carrier, an elongated bearing surface engaging said member opposite said bearing openings holding said member in operable engagement with said shaft, and driving means for rotating said shaft.

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