

July 18, 1967

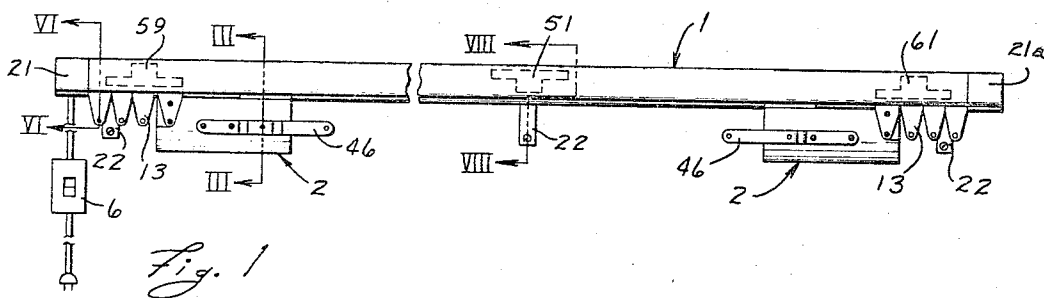
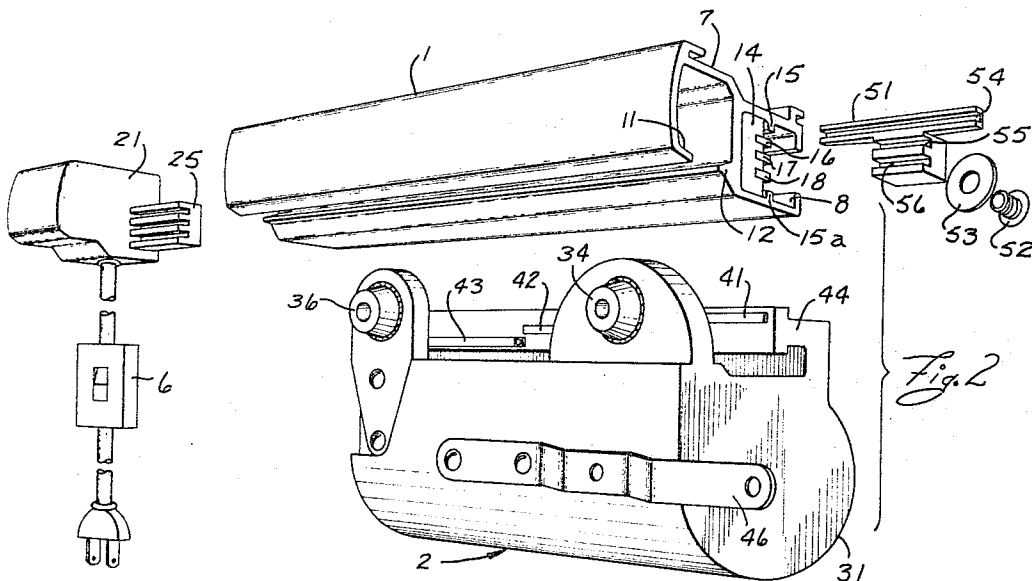
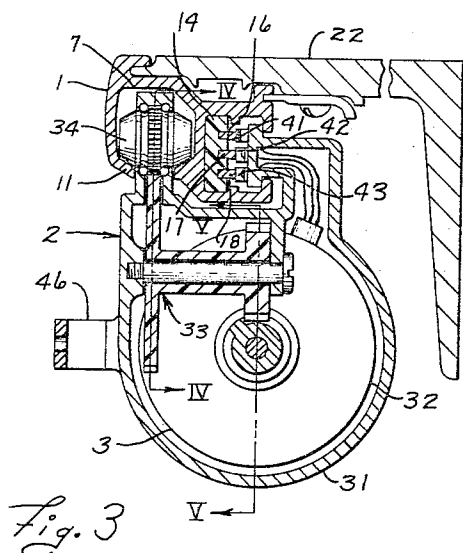
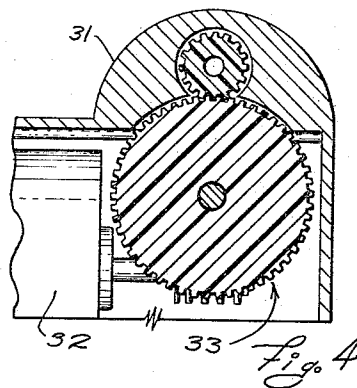
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3,331,428

STRUCTURAL DEVICE

Filed June 11, 1964

2 Sheets-Sheet 1



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Fig. 6

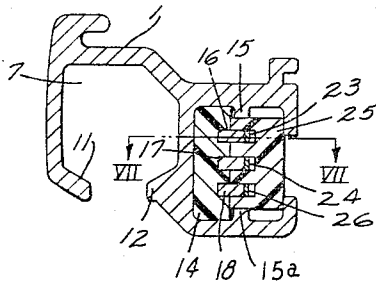
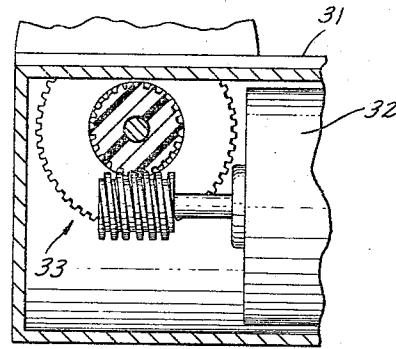


Fig. 5

Fig. 7

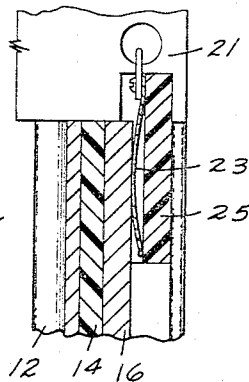
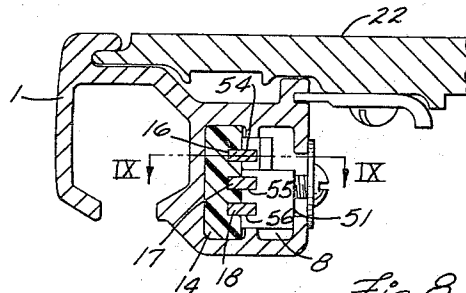


Fig. 8

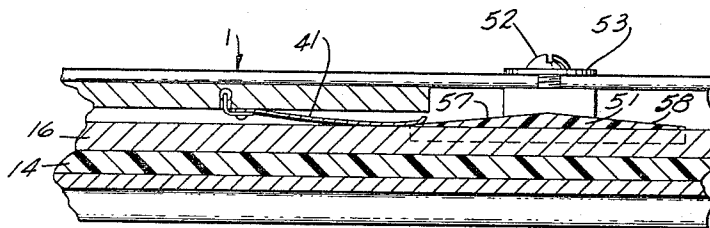


Fig. 9

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3,331,428

STRUCTURAL DEVICE

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11 Claims. (Cl. 160—331)

This invention relates to a panel-supporting traverse rod and particularly to a type thereof in which the master carriers are actuated by power energizable means contained within the rod itself.

Inasmuch as the invention was developed primarily for the traversing support of draperies and other similar panels, the following description will proceed in terms of such application. However, it will be recognized that in its broader aspects, the invention is applicable to the traversing support of other types of panels, such as doors or screens of general applicability.

Turning now for illustrative purposes to the specific subject of traverse rods for use with draperies and similar decorative and/or light-excluding panels, the convenience of providing power-operated means, such as electric means, for actuating same has long been well recognized. Particularly, where very heavy draperies having long traverses are involved, such as in many institutional uses, or where, as is sometimes the case, the drapery is located in a position not readily accessible for manual operation, the use of power-operated means is desirable and is widely used. Further, it is frequently desired to open and close draperies automatically in response to ambient light intensity for which purpose light-responsive photoelectric cells are used to cause operation of traversing motors. However, in the systems adaptable to these purposes, with which I am acquainted, the power-operated means merely serve to move the conventional draw cords in essentially the same manner as when they are manually operated. In other words, the traverse rod and its operating draw cords are essentially the same for either manual or power operation and the power means serve merely to move the draw cords in one direction or the other.

This is reasonably satisfactory insofar as its operation is concerned but it causes serious maintenance problems in that the driving means has heavy frictional engagement with the draw cords so that severe wear problems are encountered. Replacement of the draw cord in a traverse rod is always a time-consuming matter and when there is also a driving motor involved, the replacement of such a cord is further complicated. Also, the motor must be relatively large to overcome the considerable frictional forces created by the draw cords passing over the end pulleys and tension pulleys in conventional traverse rods. In addition, the draw cords in a traverse rod will sometimes get out of place and bind on a pulley or become caught on a hanger or other parts of the apparatus. When this happens in a manually operated device, the operator manually senses the existence of a malfunction and can stop the operation. When the same thing occurs in a motor-driven unit, the apparatus is likely to become badly jammed or otherwise damaged before the malfunction is detected. While various types of safety devices, such as slip-type drives, can be provided, such are complex and expensive and, hence, are undesirable. Further, many people consider draw cords of any kind to be unsightly and, therefore, undesirable.

Accordingly, it is among the objects of the invention:

(1) To provide a power-operable traversing device adaptable to the support and traversing of household or institutional draperies or the like, which will be of maximum effectiveness and reliability while being of minimum original cost and requiring a minimum of maintenance.

(2) To provide a traversing device, as aforesaid, which

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will eliminate the draw cords customarily provided for presently known traverse rods of this general type.

(3) To provide a traversing device, as aforesaid, in which the motor may be mounted on and be an integral part of the master slide of the traversing assembly.

(4) To provide a traversing device, as aforesaid, in which the power conductors for supplying current to the motor are contained within the traverse rod itself and the motor cooperates therewith to derive energy therefrom.

(5) To provide a traversing device, as aforesaid, whose structural features will render it capable of meeting the requirements and operating conditions encountered in commercial and institutional installations.

(6) To provide an integral motor and master slide adaptable for use in place of the conventional master slide of a drapery traverse unit and which will be sufficiently small and inconspicuous that its use will not be objectionable from a decorative point of view.

Other objects and purposes of the invention will be apparent to persons acquainted with apparatus of this general type upon reading the following specification and inspecting the accompanying drawings.

In the drawings:

FIGURE 1 is a broken, front elevational view of a traverse unit embodying the invention, and showing in broken lines the positions of the stopping blocks.

FIGURE 2 is an exploded, perspective view of portions of the unit shown in FIGURE 1.

FIGURE 3 is a sectional view taken on the line III—III of FIGURE 1.

FIGURE 4 is a sectional view taken on the line IV—IV of FIGURE 3.

FIGURE 5 is a sectional view taken on the line V—V of FIGURE 3.

FIGURE 6 is a sectional view taken on the line VI—VI of FIGURE 1.

FIGURE 7 is a sectional view taken on the line VII—VII of FIGURE 6.

FIGURE 8 is a sectional view taken on the line VIII—VIII of FIGURE 1.

FIGURE 9 is a sectional view taken on the line IX—IX of FIGURE 8 and showing one master carrier approaching the center stopping block.

Referring to the drawings, there is shown a track 1 for supporting and guiding a pair of master carriers 2. While a pair of master carriers are shown for a two-way draw operation, it will be apparent that a single master carrier can be used for a one-way draw operation. Also, more than two master carriers can be provided at spaced points along the track. A reversible motor unit 3 is mounted on each of the master carriers and is adapted to drive the carrier back-and-forth along the track 1 as desired. Any suitable control device, such as a three-position switch 6, may be provided for controlling each said motor unit. The switch 6, for example, may have a first position in which the carrier is moved toward the right, a second position in which the carrier is moved toward the left and a third position in which the carrier is stopped.

While the track structure 1 may take any of many specific shapes, the one set forth in the drawings will be sufficient to illustrate the invention and reference is accordingly made thereto. The track 1 in this embodiment is provided with dual channels 7 and 8, one thereof being adapted for supporting the panel-supporting carriers and the other thereof being adapted for supporting the structure for energizing the motor units 3. The channel 7, here adapted for supporting the carriers, is generally shaped as an inverted U and it has flanges 11 and 12 defining a slot which opens downwardly for the reception of drapery support carriers 13, such as nylon slides of conventional form, as well as the master carriers 2. Alternatively, the slider-carrying channel may face side-

wardly as shown in my patent application Ser. No. 159,851, now Patent Number 3,151,666 assigned to the same assignee as the present application.

The channel 8, here adapted for carrying the energizing structure for the motor unit 3, has a block 14 of insulating material mounted therein and retained in place by lips 15 and 15a. A plurality, normally three, of conductors 16, 17 and 18 are embedded in the block 14 in vertically spaced-apart relation and are insulated from each other. The conductors 16, 17 and 18 are insulated from the metal of the traverse rod 1 by the block 14. If the traverse rod is itself formed of a non-conductive material, such as an extruded plastic, then the block 14 can be an integral part of the track. The block 14 and the conductors 16, 17 and 18 can be assembled together outside the track and then the block can be slid into place. Alternatively, a layer of plastic material can be poured into the track so that it is molded in situ. While the plastic is still flowable, the conductors can be embedded in the plastic so that they are held firmly into position when the plastic is solidified.

End caps 21 and 21a are provided for closing the ends of the track and bracket members 22 may conveniently be affixed to said track for supporting same on a suitable supporting structure, such as a wall. The brackets 22 can be of any conventional type and, desirably, are the same as those shown in patent application Ser. No. 169,794, now abandoned.

The end cap 21 is provided with any suitable structure for contacting the conductors 16, 17, and 18, which structure may be resilient conductive strips 23, 24 and 26 which are mounted in grooves in a plug 25 which closely slideably interfits with the block 14. The strips 23, 24 and 26 are connected to suitable source of current through wires which are connected through the switch 6 to a suitable source of electrical potential. One of the strips, here strip 24, is a common ground and the other two strips are energized in positive polarity and such energization may be either D.C. or A.C. End cap 21a in the embodiment shown has no electrical connections and merely closes the end of the rod.

The two motorized master carrier units 2 are in the embodiment shown wound in opposite polarities so that one switch 6 can serve to control movement of both drapery halves. However, this specific arrangement merely suggests some of the many control possibilities which the present invention affords and others will suggest themselves to workers in this art.

The motor unit 3 may take any of many forms wherein a motor of sufficiently small size is provided for propelling itself along said track and supporting and carrying a master carrier 2 which in turn supports a panel for traversing movement. In this embodiment the motor unit 3 comprises a carriage structure 31 supporting a reversible, rotatable motor 32 whose shaft is connected through suitable gearing 33 to a drive wheel 34. The drive wheel 34 may preferably be faced with some high friction material, such as rubber, for improving its traction with respect to the track flanges 11 and 12. The carriage 31 is also provided with a further supporting wheel 36 which may or may not be driven as desired.

Shoes 41, 42 and 43 are arranged in vertically offset longitudinally staggered relation on a projecting arm 44 of the carriage 31 for engagement with the conductors 16, 17 and 18, respectively, for energization thereby. The shoes 41, 42 and 43 are staggered to prevent short circuiting.

The shoes 41, 42 and 43 are suitably connected to the motor 32 so that energization of the conductor 16 will rotate the motor in one direction whereas energization of the conductor 18 in the same polarity will drive the motor in the opposite direction.

A panel support arm 46 extends from the carriage 31 for connection to the panel in any conventional manner. If desired, said master carrier 31 may receive supplemen-

tal support from the arm 44 which extends through the slot of channel 8 in a manner set forth in more detail in application Ser. No. 159,851.

Referring again to the two-way draw structure illustrated in the drawings, in order automatically to stop supply of current to the motor units 3 when the draperies are closed, there is provided structure for automatically disengaging one of shoes 41, 42 and 43 of each unit 3, here the shoe 41, from its associated conductor, here conductor 16. In the disclosed embodiment, this is carried out by a block 51 of insulating material disposed in the channel 8 at the location where the master carriers are adjacent each other. The block 51 is releasably fixed in place therein by screw 52 and lock washer 53. The block 51 is T-shaped in plan view and has three grooves 54, 55 and 56 in one surface into which fit the conductors 16, 17 and 18, the upper groove 54 being formed in the cross-bar of the T. The surface of the cross-bar of the T opposite the groove 54 is shaped to form oppositely inclined cams 57 and 58 so that when the shoes 41 engage same they are moved out of contact with the conductor 16. It is assumed in this discussion that when conductor 16 is energized, the master carriers are moved toward each other so that movement of the master carriers ceases when shoes 41 are disengaged from conductor 16. It will be noted that when such occurs, shoes 42 and 43 will still be contacting the conductors 17 and 18 so that when conductor 18 is energized, the master carriers 2 will be moved apart.

It will also be desirable to disengage shoes 43 from conductor 18 when the panels reach their open position. For this purpose additional blocks 59 and 61 can be mounted in the tracks near the opposite ends thereof. These blocks correspond in all respects to the block 51 except that they are inverted so that their cross-bars are lowermost whereby they can serve to disengage the shoes 43 from conductor 18.

It is to be noted that the blocks 59 and 61 can be adjusted along the track 1 to compensate for variations in draperies, particularly the desired, "pack-back." Likewise, block 51 can be adjusted lengthwise as needed, for example, if panels of different lengths are connected to the respective master carriers. It will be apparent that the same techniques, with appropriate modifications can be used for one-way operation, or when more than two master carriers are used, either for one-way or two-way draw operation.

It will also be understood that the blocks 51, 59 and 61 can be eliminated where the switch 6 is a three-position switch so that the user can de-energize all of the conductors 16, 17 and 18 by operating the switch. This is less desirable for many situations because it does not provide for an automatic stopping of the motors, but it may be desirable in order to make it possible to position the panels in positions between the fully open and fully closed positions. If the switch 6 is a two-position switch, then the panels will necessarily run to said blocks 51, 59 and 61 before stopping.

In use, assuming that the panels are in an open condition with the master carriers 2 in the position shown in FIGURE 1, when it is desired to move the panels to a closed position the switch 6 is actuated to energize the conductor 16. This in turn supplies current to the motors 32 to cause rotation of the drive wheels 34 so that the master carriers 2 move toward each other. When the shoes 41 engage the cams 57 and 58, and are moved out of contact with the conductor 16, the motors are de-energized and movement of the master carriers stops.

When it is desired to move the master carriers 2 to the FIGURE 1 position, the switch 6 is actuated to cause energization of the strip 18 which energizes the motors to cause movement of the master carriers away from each other. Such continues until the shoes 43 engage the cams on the blocks 59 and 61 and are moved thereby out of

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contact with the strip 18, whereupon movement of the master carriers ceases.

While in the embodiment shown, the two motor units are operable simultaneously from a single switch, it will be evident from the disclosure already given that a simple modification in the control system can render each of the two motor units independently operable from independent switches.

While the motor 32 provided for the motor unit 3 herein shown is a rotative motor, it will be understood that other kinds of motor devices may be utilized, such as any of the many straight-line solenoid type of motors available and commonly utilized for doors.

Although particular preferred embodiments of the invention have been disclosed above in detail for illustrative purposes, it will be recognized that variations or modification of such disclosure, which lie within the scope of the appended claims are fully contemplated.

What is claimed is:

1. A traverse rod construction for supporting movable panel means, the combination comprising:

a driving unit;

elongated track means for supporting said panel means and said driving unit, said track means having a first channel having a lengthwise extending slot opening outwardly therefrom;

electrical conductors mounted on and extending lengthwise of said track means outside of said first channel; means on said driving unit responsive to energization thereof from said conductors for moving said driving unit along said track means;

said driving unit having a plurality of rollers positioned in said first channel supported thereon for movement therealong, said rollers being connected to said driving unit by means extending through said slot, said driving unit further including driving means for driving at least one of said rollers so that said driving unit can be moved lengthwise along said track means in response to the electrical energization of said conductors;

said track means having a second channel positioned in side-by-side relation to said first channel, said conductors being located in said second channel, said driving unit including a further support extending into said second channel and slidably supported thereon and having elements extending through said further support into said second channel, said elements being in sliding contact with said conductors.

2. A traverse rod construction according to claim 1 including switch means for controlling the supply of electrical potential to said conductors.

3. A traverse rod construction according to claim 1, including means for disconnecting said driving unit from said conductors at selected points along said track means.

4. A traverse rod construction according to claim 1, in which said driving unit includes an electric motor for moving said unit along said track means.

5. A traverse rod construction according to claim 1, in which said driving unit includes elements in sliding

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contact with said conductors and winding means in said driving unit and connected to said elements for creating an electrical field for causing movement of said driving unit along said track means.

6. A traverse rod construction according to claim 1, including end fixtures mounted on the ends of said track means, at least one of the fixtures having further conductors therein slideably interfitted with said first-named conductors in said track means.

7. A traverse rod construction according to claim 1, in which said electrical conductors are elongated strips mounted on the interior walls of the second channel of said track means and said electrically responsive means are connected to said strips by sliding shoes mounted on said driving unit.

8. A traverse rod construction according to claim 7, in which said track means is divided by a wall into two compartments, said strips being mounted in one compartment and said slot communicating with the other compartment, a portion of the driving unit including the shoes being mounted in said one compartment and another portion of the driving unit being mounted in the other compartment for sliding movement therealong.

9. A traverse rod construction according to claim 7, including insulating means mounted at selected points inside of the second channel of said track means, said insulating means having cam surfaces for engaging said shoes and moving them out of engagement with said strips.

10. A traverse rod construction according to claim 1 including panel engaging means mounted rigidly onto said driving unit for operatively associating said driving unit with said panel means whereby movement of said driving unit along said track means will effect corresponding movement of said panel means.

11. The traverse rod construction according to claim 10 wherein the panel engaging means is mounted at the side of said driving unit and at least partially overlapping same whereby the said driving unit is at least partially concealed by the panel and said panel is supported and driven thereby.

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