Jan. 2, 1968 R. H. GOBLE 3,361,191

TRAVERSE ASSEMBLY

Filed Oct. 22, 1965 2 Sheets-Sheet 1

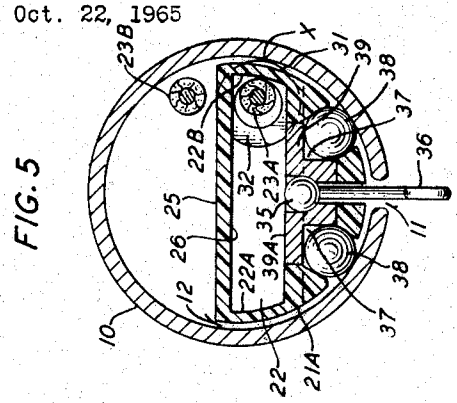


FIG. 5

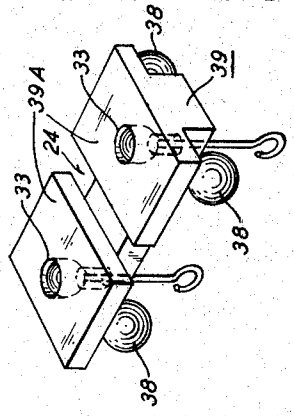


FIG. 6

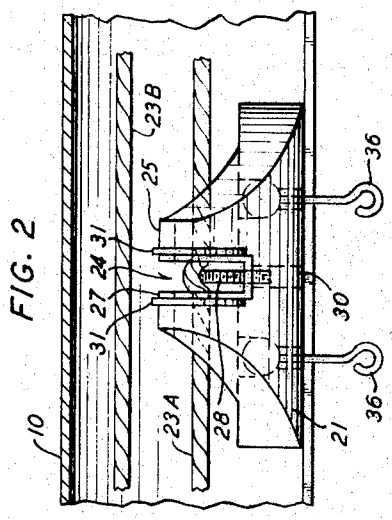


FIG. 2

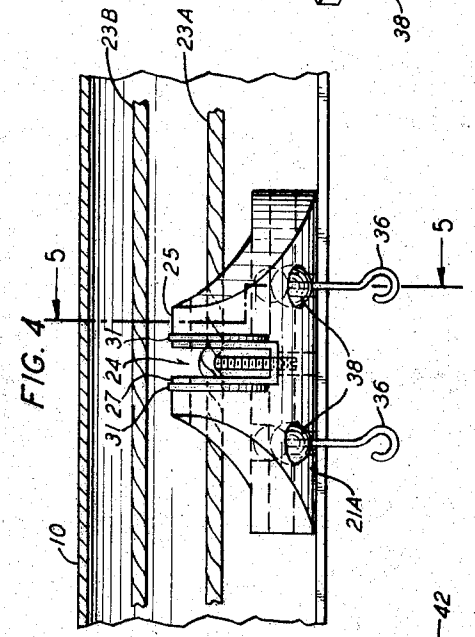


FIG. 4

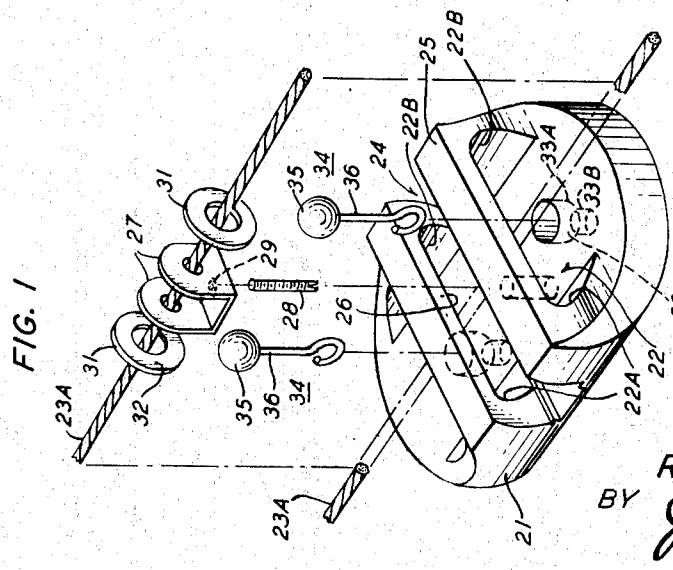


FIG. 1

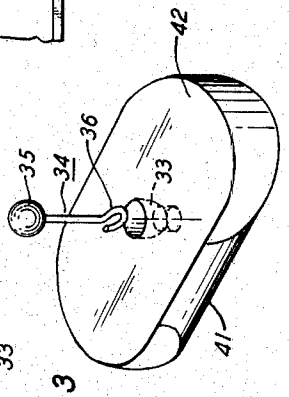


FIG. 3

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FIG. 8A

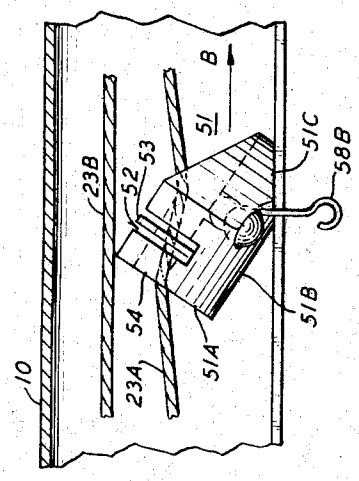


FIG. 8

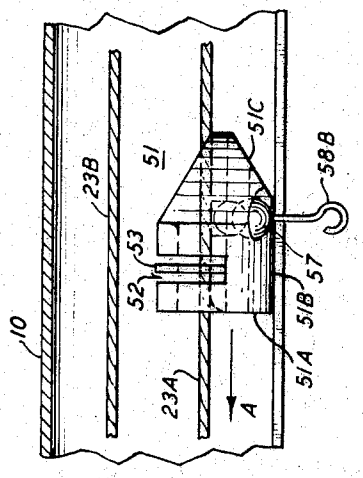


FIG. 7

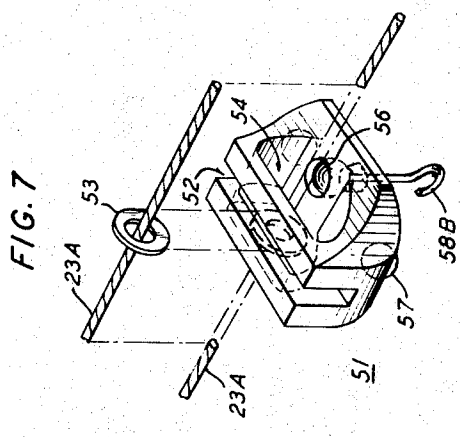


FIG. 11

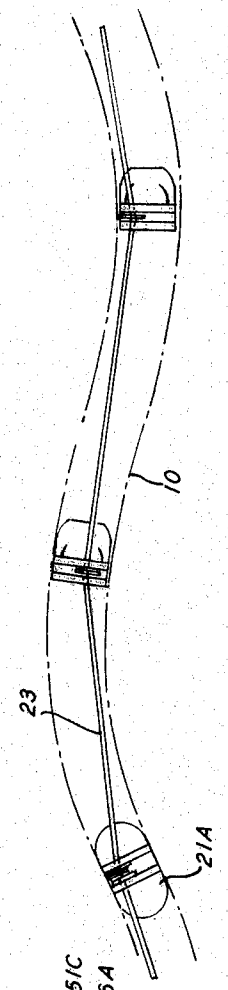


FIG. 9

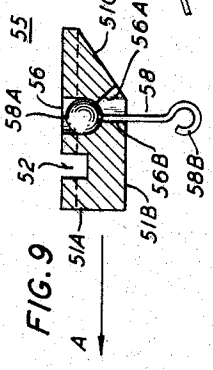
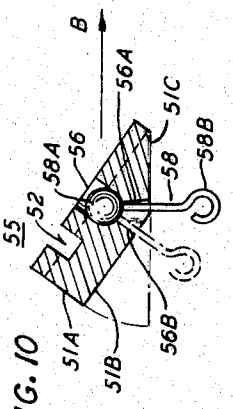


FIG. 10



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3,361,191

TRAVERSE ASSEMBLY

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Filed Oct. 22, 1965, Ser. No. 501,909
20 Claims. (Cl. 160—345)

This invention relates to a traverse assembly for supporting flexible curtains, draperies, panels and the like. Particularly, the invention relates to an improved curtain traverse assembly which is capable of operating on a curved track. In its more particular aspects, the invention relates to a rear fold curtain traverse apparatus designed to operate on a curved track.

Inasmuch as the present invention has arisen out of activity in the drapery traverse field, the invention will be described and illustrated in terms of an improved traverse assembly construction which is particularly useful in the support and sidewise movement of curtains or draperies. However, it will be recognized that the invention, in its broadest aspects, will be well adapted for use in other fields, and accordingly the illustrative use of drapery traverse assemblies is not to be considered as limiting.

Conventional drapery traverse assemblies have generally comprised master and intermediate carriers which either slide or roll on a relatively straight track member. The master carrier is activated by an operating cord and either pulls the intermediate carriers when the drapery is closed, or pushes against them when the drapery is opened. Because most of the known traverse assemblies are designed solely for straight path operation, certain difficulties experienced with curved or irregular path operation are not usually experienced. These difficulties include excessive binding and jamming of the carriers as they travel around the curved portions of the track, entanglement of the operating cable, etc. Attempts at solving the problems inherent in curved track operation have either been unsuccessful or have involved fairly complicated and expensive assemblies.

The present invention is concerned with a relatively simple and inexpensive curtain traverse assembly which is uniquely adapted for smooth curved track operation without the difficulties associated with prior arrangements. The traverse assembly of the present invention is particularly useful for opening and closing stage curtains in theatres and the like, such as over a proscenium arch, or where space is at a premium, or where a particular staging effect is desired. It will, however, be generally useful wherever a curved or irregular curtain path is desired to achieve either a complete or partial enclosure of a particular area with a drapery, curtain, panel or the like, such as in hospitals, homes, offices, etc. By means of the invention, the path of the drapery, etc. can be directed along curves of much sharper radii than hitherto attainable.

The apparatus of the invention overcomes the difficulties associated with conventional traverse assemblies by utilizing a hollow track member, preferably in the form of a tube or pipe which can be readily bent into the desired configuration at the installation site. The track member is provided with a longitudinal slot in its underside, and supports a plurality of carriers which slide longitudinally within the track and have depending hangers extending through the slot for pivotal attachment to the curtain or drapery. The cross-sectional shape of the carriers is generally similar to a lower portion of the cross-section of the track member, so as to provide a minimum of play between the carriers and the track member. A unique feature of the invention resides in the total enclosure of an operating cable within the track member, which cable

provides the means for effecting longitudinal movement of the master carriers.

In one embodiment of the invention, the master carriers are provided with a horizontal and longitudinal aperture through which one run of the operating cable passes. In another embodiment of the invention, both the master and intermediate carriers are so provided. In both embodiments, a second run of the operating cable passes freely over the tops of all the carriers. The nature of these apertures in terms of their shape and position constitutes a unique and essential feature which is responsible for the feasibility of curved track operation in accordance with the invention. In particular the apertures in the carriers are positioned near the center axis of the track member and extend horizontally substantially across the diameter of the track so as to provide for substantially unrestricted movement of that portion of the operating cable passing through each aperture when the cable is placed under tension as the curtain is opened or closed. The operating cable is thus able to immediately assume its most natural position within the track member without disturbing the position or stability of the carriers, and consequently without causing binding of the curtain hangers at the slot.

It will be readily appreciated that curved track operation differs from straight track operation in that the operating cable in the latter is not subject to substantial horizontal movement, whereas in the former the operating cable shifts horizontally from one side of the track to the other whenever the track path changes direction as in a curve. Further, in curved track operation, the operating cable will tend to assume a position of least resistance, by "riding up" if necessary to about the center of the track. It will be observed, therefore, that without the aforedescribed provision for substantially unrestricted movement of the cable when placed under tension, the carriers responsive to movement of the cable will be carried with it into a jamming or binding position, thereby rendering the traverse assembly inoperative. The difficulties experienced with similar traverse assemblies, when used in curved track operation, have generally derived from their failure to provide appropriate means for permitting the operating cable to assume a natural unhindered position regardless of the direction of the path of the track. As a result, the carriers of prior assemblies are subject to excessive binding and possible "jumping" off the track.

In addition to the provision of the aforementioned apertures, the master carriers of the present invention, while responsive to longitudinal movement of the operating cable, are not attached directly thereto, so that the cable is permitted relatively independent horizontal movement. This is accomplished by provision of a collar member attached to the cable which bears against the master carrier and pushes the latter when the cable moves longitudinally, without, however, hindering its horizontal movement. This feature will be hereinafter described in greater detail.

In another embodiment of the invention, wherein all carriers, master and intermediate, are provided with the aforementioned apertures, the hangers associatd with the intermediate carriers are adapted to be pivotally retained thereby, and the intermediate carriers are, in turn, adapted to rotate over the hangers into gripping contact with the operating cable by the weight of the curtain when the cable is moved in one longitudinal direction, so as to provide "rear fold" action.

Other embodiments and refinements of the invention will become apparent in the following description in light of the attached drawings wherein:

FIGURE 1 is a partially exploded perspective view of

a master carrier and a section of one run of the operating cable, said carrier intended for use with a relatively lightweight drapery;

FIGURE 2 is a side elevation of the master carrier of FIGURE 1, together with sections of both runs of the operating cable, and the track member shown in partial cross section;

FIGURE 3 is a partially exploded perspective view of an intermediate carrier intended for use with the master carrier of FIGURE 1;

FIGURE 4 is a side elevation of a master carrier intended for use with a relatively heavy drapery, together with sections of both runs of the operating cable and the track member shown in partial cross section;

FIGURE 5 is a vertical cross section taken along the line 5—5 of FIGURE 4, looking in the direction of the arrows;

FIGURE 6 is a perspective view of the metal T designated 39 in FIGURE 5;

FIGURE 7 is a partially exploded perspective view of an intermediate carrier intended for use with the master carrier of FIGURE 4, together with a section of one run of the operating cable;

FIGURE 8 is a side elevation of the intermediate carrier of FIGURE 7 showing its position when moved in the direction of the arrow, together with sections of both runs of the operating cable and the track member shown in partial cross section;

FIGURE 8A shows the position of the intermediate carrier of FIGURE 8 when moved in the direction of the arrow and illustrates the cable gripping action of the carrier in the rear fold embodiment of the invention;

FIGURE 9 is a vertical cross section along the center line of the metal T member of the intermediate carrier of FIGURES 8 and 8A when the latter is moved in the direction of the arrow;

FIGURE 10 shows the position of the metal T member of FIGURE 9 when the carrier is moved in the direction of the arrow, and also illustrates the pivoting of the curtain hanger associated therewith; and

FIGURE 11 is a plan view of a reversely curved track schematically showing a master carrier and two intermediate carriers at different sections of the track, and illustrating the lateral shifting of the operating cable with change in direction of the track path.

Referring now to the drawings in detail, wherein like reference characters indicate like parts throughout the several figures, FIGURES 1 and 4 show master carriers 21 and 21A, intended for use with a relatively lightweight and heavyweight drapery, respectively. FIGURES 2 and 5 show these same master carriers in different views. In general all the carriers of the invention, whether master or intermediate are constructed of a material having a low coefficient of friction in order to facilitate their longitudinal movement along the metal track. The carriers are generally semi-cylindrical in shape, so that their lower convex surfaces are generally complementary to the lower concave inner surface of track member 10 so as to provide a minimum of play therebetween and to ensure stable operation. The track member 10, as shown in FIGURE 5, is generally tubular in shape and has a longitudinal slot 11 in its underside, through which depending curtain hangers 34 extend for pivotal attachment to the curtain or drapery. The tubular track member 10 generally has a circular cross section within which the various carriers fit rather snugly as they travel longitudinally within the track member. The clearance 12 between the carriers and the track member is preferably less than the diameter of the operating cable 23 in order to avoid slippage of run 23B of the latter between the two and consequent cable fouling. The track member, being constructed of conventional tubing or piping can be readily bent into the desired configuration path at the installation site without the need for prefabrication. This feature is of particular significance for special staging effects, etc. where the particular desired curved path cannot be readily predicted beforehand.

As indicated in FIGURES 1 and 5, the master carriers 21 and 21A are provided with a horizontal and longitudinal aperture 22, through which one run 23A of an operating cable 23 passes freely. Apertures 22 are longitudinally bisected by recessed slots 24 in the top surface 25 of the carrier. The function of slots 24 will be hereinafter described in further detail. As shown in FIGURES 2, 4, and 5, a second run 23B of operating cable 23 rides freely over the relatively flat upper surface 25 of the carriers generally parallel to the first run 23A. The shape and position of the apertures 22 in the master carriers 21 or 21A comprise an essential and critical feature of the invention responsible for the feasibility of curved track drapery operation. As will be clearly observed in FIGURE 5, the apertures 22 are positioned relatively symmetrically about the central longitudinal axis of the track member 10 and extend laterally along a relatively horizontal plane substantially across the diameter of the circular cross section of the track member 10. It will be immediately observed therefore, that, regardless of the instantaneous lateral position of run 23A of operating cable 23 within aperture 22, the operating cable will have substantially unrestricted freedom of movement as it travels through the apertures.

The relative freedom of movement of the operating cable 23 is of such importance in the present invention, that a brief elucidation is desirable. Referring again to FIGURE 5, it will be observed that the two runs 23A and 23B of operating cable 23 lie very close to one another in about the same vertical plane and to an extreme side of the track member. This will represent a typical situation encountered in curved track operation, as opposed to straight track operation wherein the two runs of the cable would be positioned at about the center axis of the track member. In curved track operation, the operating cable, when placed under tension, will shift laterally from side to side depending on the direction of the curved path in a natural attempt to approximate a straight line. This is shown diagrammatically in FIGURE 11. The poblem with curved track operation, which the present invention overcomes, resides in the connection of the operating cable with the master carriers. It will immediately be recognized that in curved track operation, the customary integral connection of the operating cable to the master carriers will be feasible only along the straight-run portions of the track, but will lead to excessive jamming or binding of the carriers and their respective curtain hangers when the cable shifts laterally as the carriers travel along the curved portions of the track. Moreover, the operating cable, when placed under tension, will tend to assume the position of least resistance, which will usually be at the position shown in FIGURE 5; i.e., in a horizontal plane passing through or near the central axis of the track member. Connection of the operating cable to the master carrier in this case would thus cause a tendency for the master carrier to "ride up" to this cable position or even "jump" the track. Obviously, smooth, unhindered drapery operation cannot be achieved under such conditions.

As mentioned, the unique aspect of the present invention which avoids the above problems is the provision of the aforedescribed horizontally and longitudinally apertured master carriers 21 or 21A. As shown in FIGURE 5, run 23A of the cable can freely assume any lateral position in a horizontal plane passing through or near the central axis of track member 10. Since run 23A of cable 23 is not physically connected to master carriers 21 or 21A, binding or jamming difficulties cannot arise owing to the free lateral shifting of the cable from side to side. A similar provision is made for run 23B of cable 23 which rides freely over top surfaces 25 of the master carriers.

An additional advantage inherent in the traverse as-

sembly of the invention resides in the total enclosure of both runs 23A and 23B of the operating cable 23 within the track member 10 so that external cable fouling is avoided and the need for external attachments is obviated. Furthermore, by separation of the two runs 23A and 23B of cable 23, by means of upper wall 26 of apertures 22, internal fouling and tangling of the two runs is also avoided.

Whereas no physical connection between operating cable 23 and master carriers 21 or 21A is utilized in the invention, some provision must of course be made for imparting longitudinal movement to the master carriers, which in turn motivates the intermediate carriers. This is accomplished by means of collar member 27 (FIGURES 1 and 2) which engages run 23A of operating cable 23 by means of set screw 28 and threaded hole 29; and by means of recessed slot 24 in the upper surfaces of the master carriers. As indicated in FIGURES 1 and 2, recessed slot 24 has an essentially rectangular cross section and extends horizontally across the relatively flat upper surface 25 of the master carrier thus longitudinally intersecting aperture 22. Recessed slot 24 is dimensioned to receive collar member 27 which is attached to run 23A of cable 23, so that collar member 27 will ride laterally in recessed slot 24 as cable run 23A shifts from side to side. When cable 23 is placed under tension, longitudinal movement thereof will cause collar member 27 to bear against a sidewall of recessed slot 24, thus providing the means for movement of master carrier 21 or 21A. For convenience of installation, hole 30 (FIGURE 2) is provided in master carrier communicating with the bottom wall of recessed slot 24 for insertion of set screw 28 into frictional engagement with cabe 23. Collar member 27 is provided with threaded hole 29 for reception of set screw 28. While collar member 27 is shown as a U-shaped piece, other shapes, e.g., cylindrical, can be employed.

To further contribute to stability of both the master and intermediate carriers, annular members (or washers) 31 are provided. These annular members 31 are rotatably supported by run 23A of cable 23 in concentric relation therewith and are preferably positioned within recessed slot 24. Preferably, two such washers will be supplied for each master carrier at opposite sides of collar member 27 as shown in FIGURE 1. One such washer will preferably be provided for each intermediate carrier, as shown in FIGURE 7 to be later described. The washers or annular members 31 will thus ride laterally on run 23A of cable 23 within recessed slot 24. The annular members 31 will have a portion thereof adapted to project outwardly and come into contact with the respective inner surface of track member 10 when run 23A of cable 23 shifts laterally to an extreme sidewise position such as that shown in FIGURE 5. The radial width of the ring portion 32 (FIGURES 1 and 5) of annular member 31 is so dimensioned that the aforedescribed contacting with the inner surface of track member 10 will prevent the contacting of cable run 23A with the sidewalls 22A or 22B of aperture 22. Referring to FIGURE 5, it will be observed that lateral shifting of cable run 23A to the right will cause annular member 31 to bear against the inner surface of track member 10 at the point designated X. It will also be observed that cable run 23A is prevented from contacting aperture sidewall 22B at this position because the radial thickness of the ring portion 32 of annular member 31 is larger than the thickness of sidewall 22B. The provision of annular members 31 thus provides additional prevention of contact between cable run 23A and the master and intermediate carriers, thereby contributing further to their stability and smooth travel around the curved portions of the track. Moreover, the presence of annular members 31 and their consequent bearing against the inner surfaces of track member 10 at the critical curved portions of the track path, tends to prevent tipping or tilting of the carriers which would again hinder smooth traverse operation.

Master carriers 21 and 21A and intermediate carriers 41 and 51 are all provided with cup-shaped holes 33 which communicate with the bottom surface of each carrier and are adapted to receive and support curtain hangers 34 in depending relation to said carriers. Curtain hangers 34 are composed of a ball portion 35 and a hook portion 36 which are preferably attached by threaded engagement. Hole 33 has a top ball-carrying portion 33A and a bottom cylindrical portion 33B for passage of the hook portion 36 therethrough. Hooks 36 extend downwardly through longitudinal slot 11 in track member 10 for support of the curtain or drapery. For purposes of simplicity, the use of hooks has been illustrated but it will be understood that any of a number of available connecting means can be utilized.

The master carrier used with a relatively lightweight curtain has been described with reference to FIGURES 1 and 2, although certain features are more readily observable in FIGURES 4 and 5. The intermediate carrier 41 used with the relatively lightweight curtain is shown in FIGURE 3 and, as indicated, is generally similar in shape to the lower portion of master carrier 21. As mentioned, in the lightweight curtain embodiment, both runs of the operating cable 23 will ride freely over the flat top surface 42 of intermediate carrier 41. Intermediate carrier 41 is also provided with the curtain hanger arrangement described above.

FIGURES 4, 5 and 6 illustrate the master carrier or portions thereof intended for use with a relatively heavyweight curtain. The details of construction are essentially similar to those described previously for the lightweight embodiment except for the provision of ball receiving cavities 37 and metal T-member 39. Four substantially coplanar ball receiving cavities 37 are preferably provided in the lower cylindrical surface of master carriers 21A for reception of rotatable balls 38. When the carriers 21A are in position on the track member 10, balls 38 will thus be disposed between the lower surface of the carriers and the inner track surface. The ball receiving cavities 37 have a diameter only slightly greater than balls 38 so that the latter will be retained thereby but freely rotatable therein. Further, the depth of cavities 37 will be slightly less than the diameter of balls 38 so that the latter will protrude slightly from the lower surface of the carriers to thereby partially support the carriers and provide relatively friction free operation.

As shown in FIGURE 5, metal T-member 39 is disposed beneath aperture 22 and its top surface 39A forms the bottom wall of aperture 22. As indicated in FIGURE 6, cup-shaped holes 33 for reception of curtain hangers 34 are formed in the top surface 39A of T-member 39 and extend downwardly through carriers 21A as shown in FIGURE 5. T-member 39 is provided in the heavyweight curtain embodiment for purposes of added strength and to provide a partial bearing surface for balls 38. As indicated, each flange of the T-member together with the trunk of the T forms the uppermost surfaces of ball receiving cavities 37. FIGURE 6 illustrates the metal T-member in perspective with the balls 38 and curtain hangers 34 in normal position. As shown, a portion of recessed slot 24 bisects T-member 39.

FIGURES 7, 8 and 8A illustrate the intermediate carriers used in the heavy track embodiment herein, which are peculiarly adapted for rear-fold operation. As shown in FIGURE 7, intermediate carrier 51 is similar to master carrier 21A in certain respects, such as recessed slot 52, annular member 53, aperture 54, T-member 55, cup-shaped hole 56, balls 57, curtain hangers 58, etc. It will be observed that run 23A of cable 23 is again capable of shifting laterally in aperture 54 and carries annular member 53 with it as it moves in slot 52. Intermediate carriers 51 differ from master carriers 21A, however, in certain critical respects. Firstly, the rear wall 51A of intermediate carrier 51 is relatively perpendicular to cylindrical bottom 51B (FIGURE 8). Secondly, U-shaped clamp member 27 used in conjunction with master car-

rier 21A is omitted thus creating the need for only one annular member 53. Thirdly, the front end 51C of intermediate carrier 51 inclines upwardly forming an acute angle with track member 10 when the intermediate carrier is in normal position thereon. Fourthly, cup-shaped holes 56 are biased in one direction wherein a front wall 56A is essentially perpendicular to the front bottom wall 51C of intermediate carrier 51, and rear wall 56B is essentially perpendicular to bottom 51B of said carrier. These features may be more clearly seen in FIGURE 9 which is a cross sectional view of T-member 55 of intermediate carrier 51. It will be observed that the provision of the unidirectional bias to cup-shaped hole 56 creates a pivotal retention of ball portion 58A of curtain hanger 58 which is, in part, responsible for the rear-fold operation. When the carriers move in the direction in which the curtain is closed, as indicated by arrows A in FIGURES 8 and 9, intermediate carriers 51 assume the normal position shown in FIGURE 8 wherein run 23A of cable 23 can pass freely through apertures 54, bottom wall 51B rests on track member 10, and wherein hook portion 58B of curtain hanger 58 is flush against the normally vertical rear wall 56B of cup-shaped hole 56 (FIGURE 9). When the carriers move in the direction in which the curtain is opened, as indicated by arrows B of FIGURES 8A and 10, the center of gravity of the intermediate carrier 51 is caused to shift slightly to the right by the weight of the curtain, thereby causing the carrier 51 to rotate in clockwise direction over ball portion 58A of curtain hanger 58 so that its normally inclined front end 51C becomes flush with track member 10. It wil be observed that, due to the vertically downward pull of the curtain, curtain hanger 58 will always assume a relatively vertical position so that the unidirectional bias of cup-shaped hole 56 will allow the carrier 51 itself to rotate over onto its inclined front bottom wall 51C. The two positions of curtain hanger 58 are shown in FIGURE 10, wherein its instantaneous position prior to rotation of the carrier is indicated in dotted line.

The rotation of intermediate carrier 51 into the position shown in FIGURE 8A will cause the upper and lower walls of aperture 54 to frictionally engage run 23A of operating cable 23. Thus, as each intermediate carrier 51 is rotated into frictional engagement with cable run 23A, the latter will be deformed slightly, and will no longer be able to freely pass through aperture 54. The net effect of this frictional engagement will be a gripping contact of run 23A of cable 23 by each intermediate carrier 51. Consequently, the intermediate carriers will be simultaneously pulled together in relatively evenly spaced relation so that the curtain or drapery will be taken offstage in essentially one piece to create the desirable "rear-fold" illusion. As each intermediate carrier 51 reaches the end of the track member 10 (as pictured, this would be to the extreme right), its front end will bump against the intermediate carrier ahead of it, and it will be uprighted by the weight of the curtain and by its reverse rotation over ball portion 58A of curtain hanger 58 into the original position of FIGURE 8. The cable 23 thus becomes disengaged from the snubbing effect of the carrier and is able to to again pass freely through aperture 54 when the cable moves in the direction of arrow A in FIGURE 8 to close the curtain in conventional manner.

FIGURE 11 illustrates diagrammatically the relative positions of a master carrier 21A such as shown in FIGURE 4, two intermediate carriers 51 such as shown in FIGURE 7, and one run of the operating cable 23 together with a reversely curved section of track member 10. As indicated, the operating cable shifts laterally from side to side depending on the instantaneous direction of the track path.

The traverse assembly of the invention is, of course, subject to variations and refinements within the contemplation of those skilled in the art. The carriers are preferably constructed of a plastic type material such as polyethylene. For convenience, the track member is preferably made of steel tubing or pipe. To the extent that other details of construction and/or configuration are conventional, they have been omitted for the benefit of clarity. For exampie, the operating cable 23 is conventionally supported and motivated by pulley mechanisms at opposite end of track member 10.

It is to be understood that the traverse assembly of the invention is not to be limited to the particular design illustrated but that changes may be made within the scope of the following claims.

I claim:

1. A traverse assembly comprising a hollow track member having a longitudinal slot in its underside; an elongated operating cable disposed within said track member; a plurality of longitudinally slidable carriers supported within said track member having depending hanger means extending through said slot; and a master carrier responsive to movement of said operating cable, said master carrier having an aperture for passage of a portion of said operating cable therethrough, said aperture being so positioned and dimensioned as to allow substantially unrestricted movement of said operating cable when said cable is placed under tension and tends to assume its natural position within said track member so as to avoid substantial disturbance of said master carrier from its normal operating position within said track member regardless of the direction of the track member path.

2. The traverse assembly of claim 1, wherein said track member is tubular in nature, and wherein each of said carriers has a downwardly disposed lower convex portion and a horizontally disposed upper portion, the clearance between said convex portion and the adjacent inner surface of the track member being less than the diameter of said operating cable.

3. The traverse assembly of claim 2 comprising master carriers and intermediate carriers, the master carriers being provided with said aperture for passage of portions of said operating cable therethrough, wherein other portions of said operating cable ride freely over the upper portion of each of said carriers.

4. The traverse assembly of claim 2 comprising master and intermediate carriers, all of said carriers being provided with said aperture, wherein a first run of said operating cable passes through the aperture in each carrier, and a second run of said operating cable rides freely over the horizontally disposed upper portion of each carrier generally parallel to said first run.

5. The traverse assembly of claim 4, which additionally comprises antifriction means disposed between the lower convex portions of said carriers and said track member.

6. The traverse assembly of claim 2 which additionally comprises means responsive to longitudinal movement of said operating cable for engaging said master carrier without interfering with lateral movement of said operating cable when said tension is applied.

7. The traverse assembly of claim 3, which additionally comprises means responsive to lateral movement of said operating cable projecting outwardly therefrom and proximate said carriers, said projecting means adapted to contact the inner surface of said track member before said operating cable bears against the side walls of said aperture when it shifts laterally so that the stability of the master carrier is not substantially disturbed to the extent that said hanger means bind at said slot.

8. The traverse assembly of claim 4, wherein the hanger means depending from said intermediate carriers are retained in pivotal relation thereto, and wherein each intermediate carrier is adapted to rotate over said pivoted hanger means into gripping contact with the portion of the operating cable passing through its aperture when the operating cable moves in one direction, whereby said intermediate carriers are pulled in spaced relation by said cable for a portion of its length.

9. A curtain traverse assembly capable of operating on a curved path comprising a hollow tubular track of relatively circular cross-section having a longitudinal slot in its underside; an elongated operating cable disposed within said track; a plurality of longitudinally slidable carriers supported within said track having depending curtain supporting means extending through said slot, said carriers having a downwardly disposed partially cylindrical bottom surface conforming to a portion of the inner surface of said track and a relatively horizontally disposed top surface over which a portion of said operating cable freely rides; at least one of said carriers being a master carrier provided with a horizontal and longitudinal aperture for passage of another portion of said operating cable therethrough, said aperture extending laterally substantially across the cross-sectional diameter of said track and so positioned and dimensioned with respect to said track as to allow substantially unrestricted movement of said operating cable within said track when said cable is placed under tension and tends to assume its natural position within said track so as to avoid disturbing said master carrier from its normal operating position within said track and to prevent binding of curtain supporting means at said slot regardless of the direction of the track path; and means connected to said cable for effecting longitudinal movement of said master carrier.

10. The traverse assembly of claim 9, wherein a cross-section of said carriers approximates a semi-circle, said cross-section being representative of a substantial portion of each carrier.

11. The traverse assembly of claim 9, wherein said means for effecting longitudinal movement of said master carrier comprises a collar member secured to said operating cable positioned to engage said master carrier without substantial interference with the movement of said cable when said tension is applied.

12. The traverse assembly of claim 11, wherein said master carrier is provided with a laterally extending recessed slot in its top surface, and wherein said collar member is sceured to the portion of said operating cable passing through said aperture and rides laterally in said recessed slot, whereby longitudinal movement of the operating cable will cause corresponding movement of the master carrier by means of said collar member bearing against one side wall of said recessed slot.

13. The traverse assembly of claim 9, wherein said master carrier is provided with substantially coplanar ball receiving cavities in said bottom surface, said assembly additionally comprising balls freely rotatable in said cavities and disposed between said bottom surface and in the inner surface of said track.

14. The traverse assembly of claim 9, comprising master and intermediate carriers, all of said carriers being provided with said aperture, wherein a first run of said operating cable passes through the aperture in each carrier, and a second run of said operating cable rides freely over the top surface of each carrier generally parallel to said first run.

15. The traverse assembly of claim 9, which additionally comprises an annular member rotatably supported by and in concentric relation to said operating cable, and means for maintaining said annular member in a position proximate said master carrier, the ring portion of said annular member having a radial thickness larger than the thickness of the sidewalls between the ends of said aperture and the coplanar outer surfaces of said carrier, said annular member being thus adapted to contact the inner surface of said track before said operating cable bears against the sidewalls of said aperture when it shifts laterally, so that the stability of said master carrier is not substantially disturbed to the extent that said curtain supporting means will bind at said slot.

16. The traverse assembly of claim 14, wherein all of said carriers are provided with substantially coplanar ball receiving cavities in their bottom surfaces, and wherein

said assembly additionally comprises balls freely rotatable in said cavities and disposed between said bottom surfaces and the inner surface of said track, said assembly further comprising a plurality of annular members rotatably supported by and in concentric relation to said operating cable, and means for maintaining said annular members proximate each of said carriers, the ring portion of said annular members having a radial thickness larger than the thickness of the sidewalls between the ends of the corresponding aperture and the coplanar outer surfaces of the corresponding carrier with which the annular members are associated, the annular members being thus adapted to contact the inner surface of the track before the operating cable bears against the sidewalls of said aperture when it shifts laterally, so that the stability of said carriers is not substantially disturbed to the extent that said curtain supporting means will bind at said slot.

17. The traverse assembly of claim 14, wherein the curtain supporting means depending from said intermediate carriers are retained in pivotal relation thereto, and wherein each intermediate carrier is adapted to rotate over said pivoted curtain supporting means into gripping contact with the portion of the operating cable passing through its aperture when the operating cable moves in one direction, whereby said intermediate carriers are pulled in spaced relation by said cable for a portion of its length.

18. A certain traverse assembly for supporting a relatively lightweight curtain in depending relation thereto and capable of operating on a curved path comprising:

(A) a hollow tubular track of relatively circular cross-section having a longitudinal slot in its underside;

(B) an elongated operating cable disposed within said track;

(C) a plurality of longitudinally slidable carriers including master and intermediate carriers supported within said track having depending curtain hangers extending through said slot in a plane essentially perpendicular to the horizontal diameter of said cross section, said carriers having a downwardly disposed partially cylindrical bottom surface conforming to a lower portion of the inner surface of said track and a relatively horizontally disposed upper surface over which a portion of said operating cable freely rides, the clearance between said bottom surface and the adjacent inner surface of said track being less than the diameter of said operating cable;

(D) the master carriers provided with a horizontal and longitudinal aperture for passage of another portion of said operating cable therethrough, said aperture extending laterally substantially across the horizontal cross-sectional diameter of said track and so positioned and dimensioned with respect to said track as to allow substantially unrestricted movement of said operating cable within said track when said cable is placed under tension and tends to assume its natural position within said track so as to avoid disturbing said master carriers from their normal operating position within said track and to prevent binding of said curtain hangers at said slot regardless of the direction of the track path; said master carriers also being provided with a laterally extending recessed slot in their upper surfaces;

(E) collar members secured to the portions of said operating cable passing through the apertures in said master carriers and riding laterally in said recessed slot, whereby longitudinal movement of said operating cable will cause corresponding movement of the master carriers by means of the collar members' bearing against the sidewalls of said recessed slot; and

(F) washers rotatably supported by and in concentric relation to the same portions of said operating cable to which the collar members are secured, the

diameter of said washers being dimensioned to contact the inner surface of said track before said operating cable bears against the sidewalls of said apertures when it shifts laterally, so that the stability of the master carriers is not substantially disturbed to the extent that said curtain hangers will bind at said longitudinal slot;

wherein a first run of said operating cable passes through the apertures in said master carriers and over the upper surfaces of the intermediate carriers, and a second run of said operating cable rides freely over the upper surfaces of all of said carriers generally parallel to the first run.

19. A curtain traverse assembly for supporting a relatively heavy curtain in depending relation thereto and capable of operating on a curved path comprising:

(A) a hollow tubular track of relatively circular cross-section having a longitudinal slot in its underside;

(B) an elongated operating cable disposed within said track;

(C) a plurality of longitudinally slidable carriers including master and intermediate carriers supported within said track having depending curtain hangers extending through said slot in a plane essentially perpendicular to the horizontal diameter of said cross-section, said carriers having

(1) a downwardly disposed partially cylindrical bottom surface conforming to a lower portion of the inner surface of said track and a relatively horizontally disposed upper surface over which a first run of said operating cable freely rides, the clearance between said bottom surface and the adjacent inner surface of said track being less than the diameter of said operating cable,

(2) substantially coplanar ball-receiving cavities in said bottom surface,

(3) a horizontal and longitudinal aperture through which a second run of said operating cable passes generally parallel to said first run, said aperture extending laterally substantially across the horizontal cross-sectional diameter of said track and so positioned and dimensioned with respect to said track as to allow substantially unrestricted movement of said operating cable within said track when said cable is placed under tension and tends to assume its natural position within said track so as to avoid disturbing said master carriers from their normal operating position within said track and to prevent binding of said curtain hangers at said slot regardless of the direction of the track path, and

(4) a laterally extending recessed slot in said upper surface;

(D) a plurality of balls freely rotatable in said ball-receiving cavities and disposed between said bottom surface and the inner surface of said track;

(E) a plurality of washers rotatably supported by and in concentric relation to said operating cable thereby riding laterally on said cable within said recessed slot, the diameter of said washers being dimensioned to contact the inner surface of said track before the operating cable bears against the sidewalls of the aperture in the corresponding carrier when it shifts laterally, so that the stability of each carrier is not substantially disturbed to the extent that its curtain hanger will bind at said slot; and

(F) collar members secured to those portions of said operating cable passing through the apertures in said master carriers and riding laterally in said recessed slot in the upper surface of the master carriers, whereby longitudinal movement of said operating cable will cause corresponding movement of the master carriers by means of said collar members' bearing either directly against a sidewall of said recessed slot or indirectly against one of said washers which in turn bears against said sidewall.

20. A curtain traverse assembly capable of operating on a curved path comprising a hollow tubular track having a longitudinal slot in its underside, an elongated operating cable within said track, master and intermediate carriers longitudinally slidable on said track and provided with apertures through which said operating cable passes, said carriers having depending curtain supporting means extending through said slot and pivotally attached to the curtain, said intermediate carriers being adapted to rotate over said curtain supporting means into gripping contact with the portion of said operating cable passing through its aperture when the cable moves in one direction, whereby said intermediate carriers are pulled in spaced relation by said cable for a portion of its length.

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