July 13, 1965 V. SUSSIN 3,194,298

CURTAIN INSTALLATION

Filed Oct. 8, 1962 3 Sheets-Sheet 1

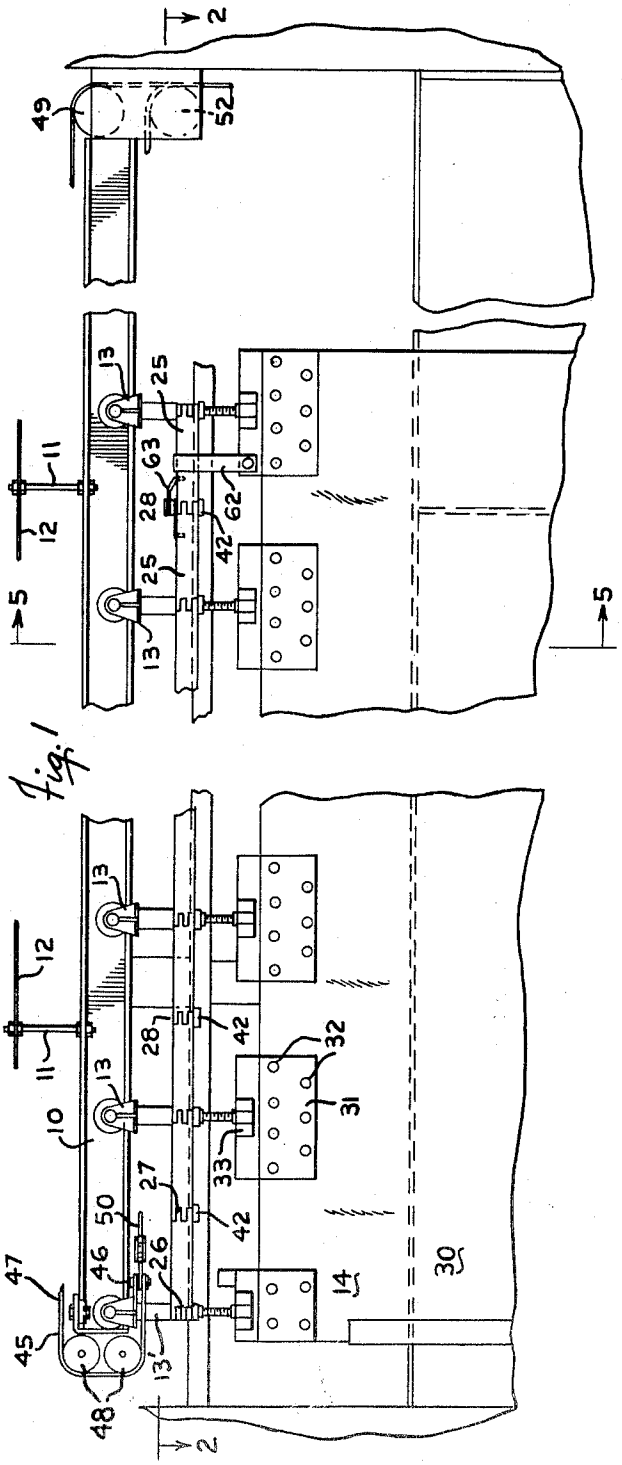


Fig. 1

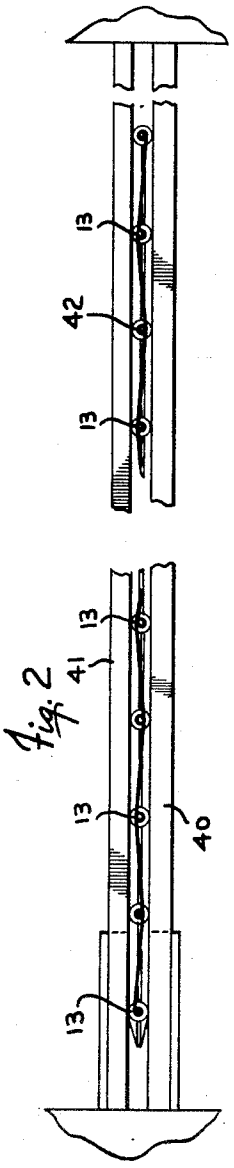


Fig. 2

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July 13, 1965 V. SUSSIN 3,194,298

CURTAIN INSTALLATION

Filed Oct. 8, 1962 3 Sheets-Sheet 2

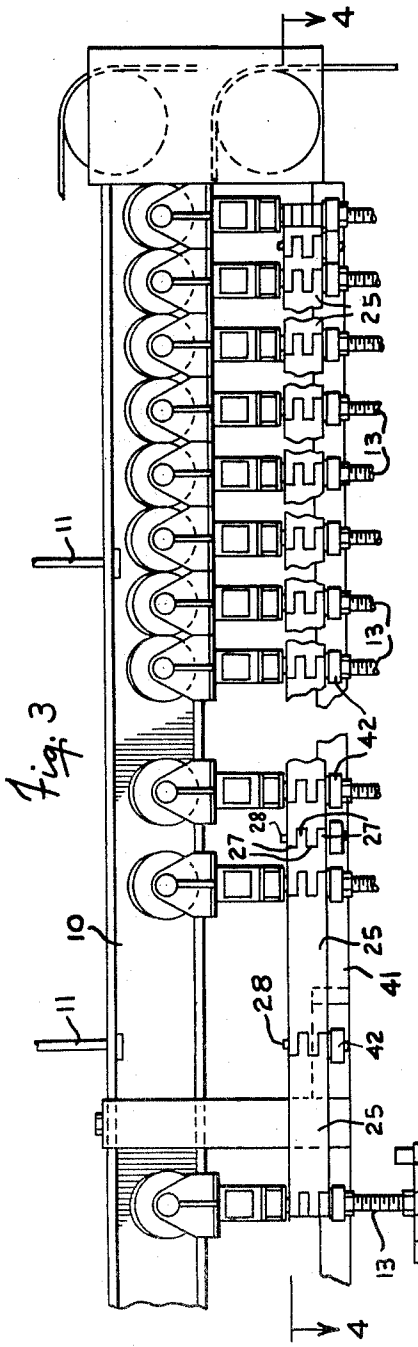


Fig. 3

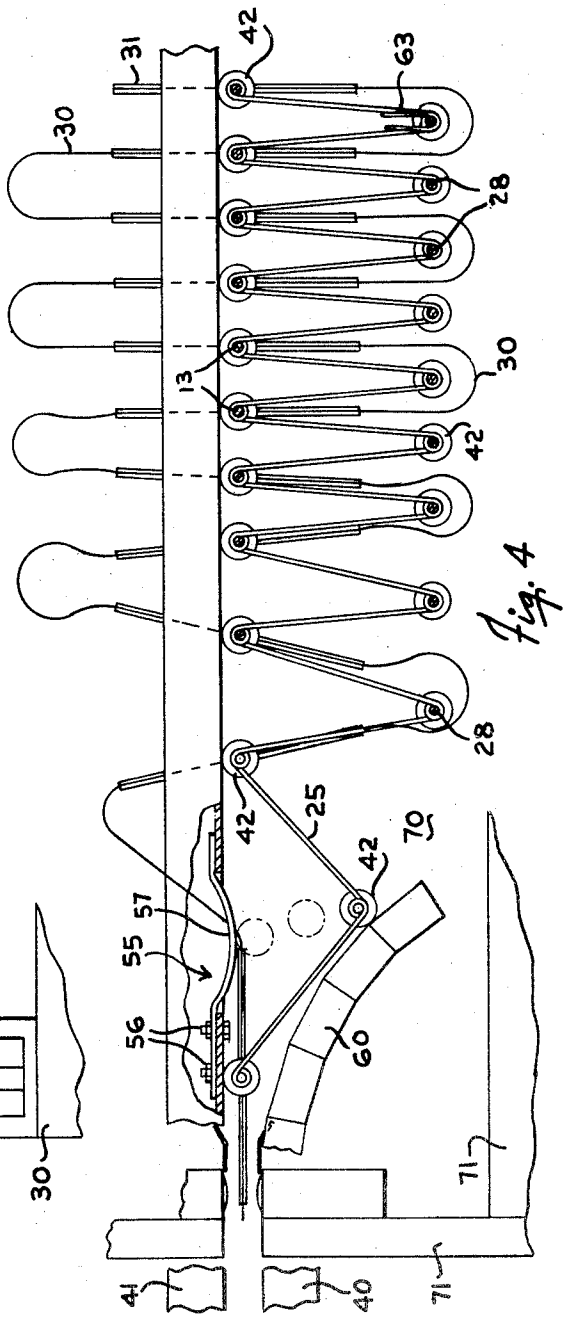


Fig. 4

July 13, 1965 V. SUSSIN 3,194,298

CURTAIN INSTALLATION

Filed Oct. 8, 1962 3 Sheets-Sheet 3

Fig. 5

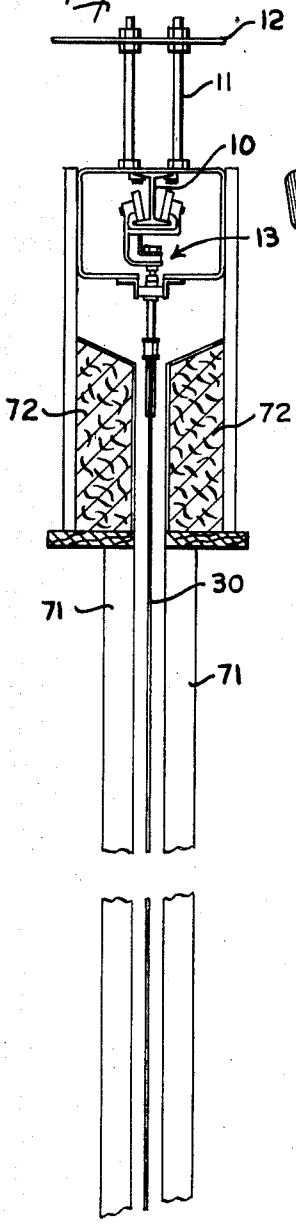
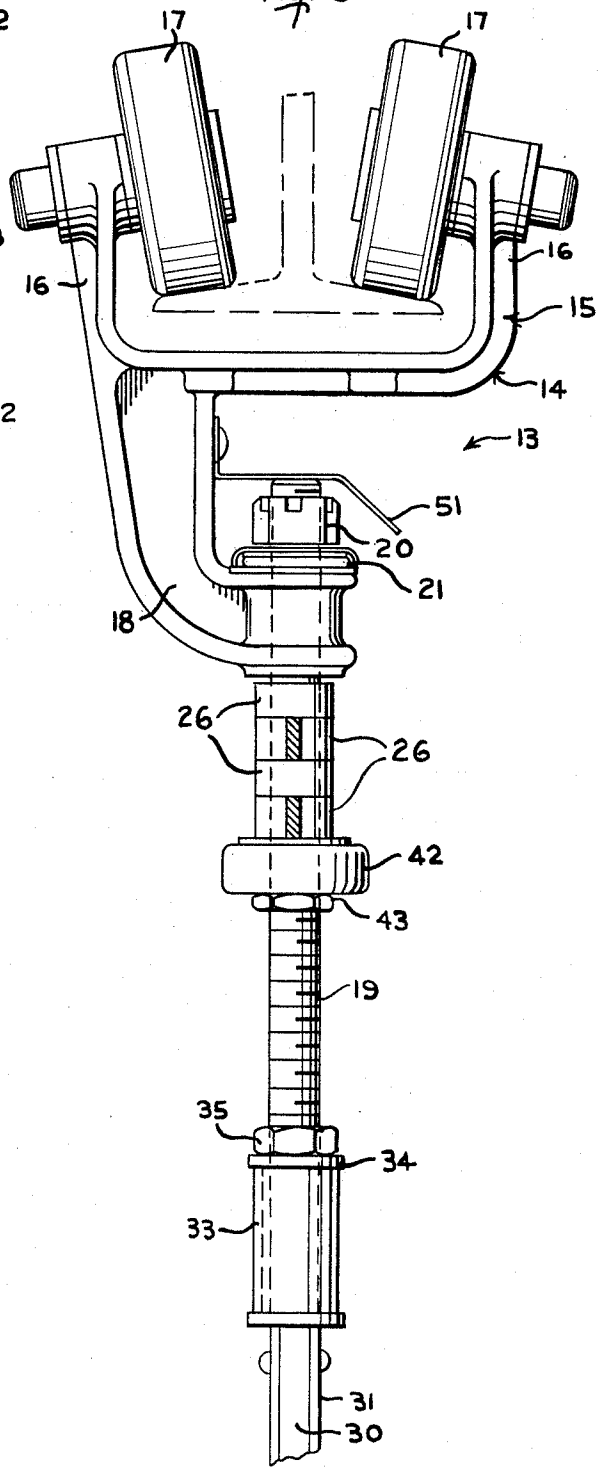


Fig. 6



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3,194,298

CURTAIN INSTALLATION

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5 Claims. (Cl. 160—35)

This invention relates to a curtain installation, and more particularly to a traversing mechanism for a curtain installation.

A primary object of this invention is to provide a new and useful curtain installation.

The desirability of providing easily handled room dividers has led to increased use of various forms of curtains which are usually suspended from a ceiling or other suitable supporting structure and mounted for traversing between retracted and extended positions. Such curtains may take various forms, and the use of flexible curtains has been found to be particularly desirable, in part because of the wide range of materials available in providing a curtain having certain desired characteristics such as soundproofing properties, and because of a soft and pleasing appearance of such curtains.

However, mounting flexible curtains has entailed certain difficulties, partially in provision of adequate means for operating the curtain between retracted and extended positions. This difficulty is particularly pronounced with large, heavy curtains. For example, in order to provide a neat appearing curtain when it is extended, e.g., to a room dividing position, suitable means should be provided for neatly folding the curtain is retracted position, e.g., for storage, whether or not the curtain is visible when folded. Neat folds cannot be expected to form in a curtain by merely shoving the leading end of the curtain toward retracted position, and it is desirable that the curtain remain aligned and spaced out so as to provide a neat appearance in operation between retracted and extended positions, and when partially retracted. These desirable features have not been readily obtainable in a practical traversing mechanism for such a curtain.

An important object of this invention is to provide a new and useful installation mounting for a flexible curtain operable between retracted and extended positions.

A further object is to provide a new and useful curtain installation wherein the curtain is operated from one end so that portions of the curtain is retracted position are always unfolded.

Another object is provision of a new useful installation for hanging a flexible curtain and moving the curtain between retracted and extended positions in such a manner that the curtain is folded from its inner end and is neatly folded from this end as it moves to retracted position.

Other objects and advantages of the invention will become readily apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a fragmentary elevational view of a prefered embodiment of the invention in the form of a curtain mounting installation in extended position, with parts broken away for clearer illustration;

FIGURE 2 is a fragmentary vertical sectional view taken generally along the line 2—2 of FIGURE 1, with parts broken away for clearer illustration;

FIGURE 3 is a fragmentary, enlarged elevational view similar to FIGURE 1 but with the curtain in generally retracted position, and parts broken away for clearer illustration;

FIGURE 4 is a fragmentary vertical sectional view taken generally along the line 4—4 of FIGURE 3 with parts broken away for clearer illustration;

FIGURE 5 is a fragmentary vertical sectional view

taken generally along the line 5—5 of FIGURE 1 with parts broken away for clearer illustration; and

FIGURE 6 is an enlarged elevational view of a trolley removed from the previously illustrated installation.

While an illustrative embodiment of the invention is shown in the drawings and will be described in detail herein, the invention is susceptible of embodiment in many different forms, and it should be understood that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

The prefered embodiment of the invention is, in brief, directed to an installation in which a flexible curtain traversing assembly is mounted on a track for operation of the curtain between retracted and extended positions. The installation is such that upon retracting the curtain it folds progressively as it seats in its normal retracted position. The traversing assembly includes a plurality of supports in the form of trolleys mounted on the track and connected in series by links hinged to the trolleys and between the trolleys to each othere thereby providing a "push-chain" assembly. Guide means retain both the traversing assembly and the curtain in alignment as the curtain is retracted and extended, and means is provided for neatly folding the curtain in a compact storage area when in retracted position.

Referring to the drawings, and particularly to FIGURES 1–4, in the illustrated embodiment an I-beam track **10** is suspended by hangers **11** from a suitable ceiling support **12** and carries a traverse assembly including a series of supports in the form of trolleys **13** depending from the track.

As may best be seen in FIGURE 6, each trolley **13** includes a body **14** having an upper U-shaped portion **15** with opposed upwardly extending arms **16**, each arm mounting a roller **17** inclined to ride along an inclined upper face of a lower flange of the I-beam defining track **10**. Depending from one arm **16** is an L-shaped leg **18** having a vertical bore which telescopically receives a shank **19** pivotally secured on the leg by a nut **20** with a suitable thrust bearing **21** between the nut and the upper face of the leg so that shank **19** is free to rotate with respect to trolley body **14**.

Thus, trolleys **14** are mounted for traversing track **10** by means of rollers **17** riding on track **10**, and these trolleys are connected in series by rigid links **25**. Each link is hingedly connected with an adjacent trolley **13** by means of an eye portion **26** at an end of the link receiving shank **19** immediately below trolley leg **18**. The opposite end of each link is pivotally connected to a link extending from an adjacent trolley in the series, this pivotal connection being provided by an eye portion **27** receiving a suitable pivot pin.

A curtain **30**, which may be of any suitable type, and in the illustrated embodiment is preferably a flexible curtain of sound proofing or sound deadening construction, is mounted on the traversing assembly. More particularly the curtain is mounted on the lower extremity of each trolley shank **19** by means of opposed rigid plates **31**, one on either face of the top edge portion of the curtain and tightly sandwiching the curtain therebetween my means of suitable fasteners such as bolts or rivets **32** extending through the plates and top edge portion of a curtain. Each pair of plates is secured to trolley **13** as by a bracket **33** suitably secured to one of the plates and therewith embracing a spool **34** threaded on the lower end of shank **19** and fixedly held thereon by a lock nut **35**. Thus, curtain **30** is mounted for movement between an extended position as shown in FIGURES 1 and 2, and a retracted position generally as shown in FIGURES 3 and 4 wherein the leading portion (left end) of the curtain is slightly

out of retracted position and the right end of the curtain is seated in retracted position.

Guide means is provided for maintaining the traversing assembly and curtain 30 in alignment when out of retracted position, and herein this means is in the form of a pair of guides as rails 40 and 41 suitably suspended from the ceiling or other structure in position below and generally parallel to track 10. These guide rails are spaced apart at a distance just sufficient to receive rollers 42, one mounted for rotation on each trolley shank 19 immediately below links 25 and retained in position by a nut 43; and one roller secured to each pivotal connection between adjacent links 25 and as illustrated rotatably received on pivot pins 28 and suitably held thereon.

Means for operating the traversing assembly and curtain 30 between retracted and extended positions is provided in the illustrated embodiment by a cable 45 connected with a leading trolley, hereinafter designated 13', at the left end of the traversing assembly. This cable is connected to leading trolley 13' by a suitable anchor 46 herein the form of a bolt extending through the trolley and an eye in the cable. A curtain extending portion 47 of the cable extends from anchor 46 around a pair of pulleys 48 at the left end of track 10 and above the track to the inner (right-hand) end of the track from which end the cable passes around a pulley 49 to a suitable cable-operating mechanism (not shown). Thus, when the traversing assembly and curtain are in retracted position, tensioning of cable portion 47 moves the traversing assembly and curtain toward extended position. A curtain retracting portion 50 of cable 45 extends from anchor 46 below track 10, and above suitable cable guards 51 which may be secured to trolley legs 18, if desired, and toward the inner end of track 10 from which end cable portion 50 passes about a pulley 52 to the cable-operating mechanism. Upon tensioning cable portion 50, the traversing assembly and curtain are moved toward the right from extended toward retracted position with the curtain and traversing assembly remaining in alignment because of the connection of trolleys 13 by links 25 and the guide means previously described. Thus, the traversing assembly provides a "push chain" construction wherein the free end of the chain may be pushed against itself to move curtain 30 from extended toward retracted position.

Means is provided for neatly folding the curtain from its inner end rather than from its outer end so as to provide a neater appearance by providing for normal hang of the curtain when partially extended either through operation of the curtain from retracted position toward partially extended position or from fully extended position toward partially retracted position. In the illustrated embodiment, and with particular reference to FIGURE 4, this means is in the form of a detent or cam assembly including a leaf spring 55 secured at one end in any suitable manner as by bolts 56 to guide rail 41. Spring 55 has bowed portion 57 extending outwardly through a slot in guide rail 41 and generally into the path of rollers 42. At the inner end of guide rail 40 a general arched guide 60 diverges from guide rail 41 so that as rollers 42, which are mounted on pivot pin 28 of the pivotal connection between adjacent links 25, strike the bowed portion 57 of the spring, these rollers and links are deflected in one direction away from guide rail 41 and from normal alignment as in extended position to a zig-zag pattern as may best be seen in FIGURE 4. Guide rollers 42 of trolleys 13 depress spring bowed portion 57 as they pass into retracted position so that they remain generally against guide rail 41 in retracted position of the traversing assembly and curtain 30. In order to assure folding of curtain 30 from its inner (right-hand) end, the innermost plate 31 is provided at its leading end with an upwardly extending finger 62 positioned to engage the innermost link 25 as this link moves into zigzag position, thus pivoting the innermost pair of plates 31 and the portion of a curtain extended therefrom into a similar zigzag pattern whereupon the remainder of a curtain extending outwardly from the inner end thereof follows naturally into the zigzag pattern as shown in FIGURE 4. In order to assure movement of the innermost pair of links 25 into zigzag arrangement, a suitable spring 63 is provided on the innermost pivot pin 28 for urging these links into zigzag arrangement while permitting these links to become aligned if the curtain is pulled outwardly far enough. As the curtain moves from retracted to extended positions, it should be noted that rollers 42 on pivot pins 28 engage diverging portion 60 of guide rail 40 to move links 25 into alignment as they enter between the parallel guide rails 40 and 41.

In order to conceal the retracted curtain, a suitable storage pocket area 70 may be provided as by walls 71 and suitable sound insulation, as 72, may be provided if desired.

In operation, the leading (left hand) portion of the traversing assembly, which is attached to cable 45 at anchor connection 46, initiates movement of the assembly during retracting and extending operation. As the traversing assembly and curtain are retracted, cable portion 50 moves the leading trolley 13' inwardly toward storage area pocket 70, and because of the cooperating guide means defined by guide rails 40 and 41, and guide rollers 42, the curtain remains in alignment until after entering storage area 70 whereupon it is neatly folded in zigzag manner. Because of the rigid links 25, the retracting force is applied through these links from trolley to trolley, and the curtain is not crumpled. Similarly, as the curtain is closed by operation of cable portion 47 acting on leading trolley 13', the links 25 are tensioned during movement of the traversing assembly and the curtain toward extended position, and as the guide rollers 42 pass between the guide rails the curtain retracts in alignment such that by providing slight slack in the extended curtain such retracting occurs without tensioning the curtain.

I claim:

1. In a curtain installation operable between retracted and extended positions: a storage area; a track having an inner end within said storage area and an outer end extending from said storage area; trolleys mounted on said track for movement therealong; rigid links connecting said trolleys in series, each link having one end hinged to a trolley and an opposite end having a pivotal connection with a link extending from an adjacent trolley; a curtain of flexible material; means mounting spaced apart portions of said curtain on said trolleys and including spaced apart rigid members having mid-portions pivoted respectively on said trolleys, said members extending generally parallel to said track when in extended position; spaced apart rigid guides extending from said storage area generally parallel to said track and one guide having an end terminating at said storage area and spaced outwardly of an adjacent end of said track; guide rollers, one on each trolley and link pivotal connection, and when out of said storage area closely received between said guides for retaining said curtain and said links aligned during retracting and extending operation; a resilient cam mounted on the other guide within said storage area and extending into the path of said rollers and engaging said rollers to deflect said pivot connections away from said other guide to one side thereof to cause said links to fold in zig-zag fashion within said storage area upon retracting operation, said cam being deflected by engagement with the trolley rollers; cooperating means including the rigid member adjacent the inner end of said track and the adjacent link to cause said curtain to fold loosely in zig-zag fashion, extending equal distances to opposite sides of the track upon retracting operation; and means connected with and acting through a trolley adjacent said outer track end for moving said trolleys and said curtain during retracting and extending operation.

2. In a curtain installation operable between retracted and extended positions, a storage area, a track having an inner end within said storage area and an outer end extending from said storage area, trolleys mounted on said track for movement therealong, rigid links connecting said trolleys in series, each link having one end hinged to a trolley and an opposite end having a pivotal connection with a link extending from an adjacent trolley, a curtain of flexible material, means mounting spaced apart portions of said curtain on said trolleys to rotate relative thereto during retraction and extension, guide means extending from said storage area generally parallel to said track and cooperating guide members on each of said trolleys and link pivotal connections engageable with said guide means for straightening said links and curtain when extended, cam means at one side of the track adjacent the storage area and engageable by said guide members upon retraction to deflect said pivot connections to one side of the track to fold said links in zig-zag fashion at one side of the track, and cooperating means on the link end hanger nearest the storage area to deflect said curtain upon retraction to fold in zig-zag fashion to opposite sides of said track.

3. The curtain installation as defined in claim 2, wherein the link pivotal connection nearest the storage area includes spring means mounted thereon, biasing said connection away from said track and tending to fold the associated links to initiate folding of the curtain.

4. In a curtain installation operable between retracted and extended positions: a track having opposite ends; a traversing assembly having opposite ends and including, travelers mounted on said track for movement therealong toward one end of said track in retracting operation and toward the other end of said track in extending operation, and rigid links connecting said travelers in series, each link having one end hinged to a traveler and an opposite end pivoted to a link extending from an adjacent traveler; a flexible curtain; means mounting the curtain on said traversing assembly for folding movement relative to the links; guide means extending along said track and retaining the curtain and said links in substantial alignment when extended; means to deflect said links out of alignment adjacent said one track end during retracting operation to fold in a zig-zag pattern; and means to fold said curtain in a zig-zag pattern different from the zig-zag pattern of the links at said one track end upon retracting operation.

5. In an installation for operation of a curtain between retracted and extended positions, a track having opposite ends, a plurality of travelers mounted for movement along said track, pivotal link means connecting said travelers for movement relative to each other on the track between retracted and extended positions, a plurality of spaced apart hangers rotatably suspended respectively from the travelers for rotatable movement relative to the link means, a curtain of flexible material having spaced portions fixedly secured respectively to said spaced apart hanger, means for retaining the link means and curtain in substantial straight-line alignment when extended, means for directing said link means out of alignment during retraction to fold the link means in zig-zag pattern adjacent said one end of said track, and means for deflecting said curtain out of alignment upon retraction of the link means to loosely fold the curtain in a zig-zag pattern different from the zig-zag pattern of the link means with broadly rounded bends between the spaced hangers.

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