May 10, 1932. J. E. FLYNN ET AL 1,857,368

CURTAIN DEVICE

Filed May 6, 1930

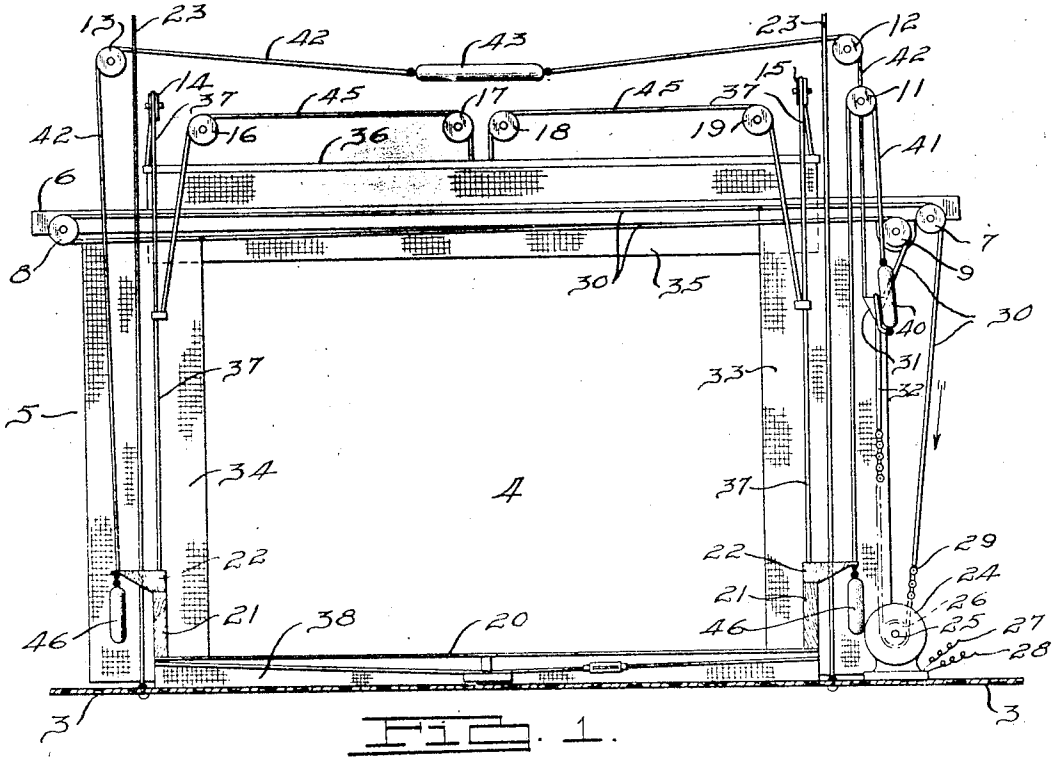


FIG. 1.

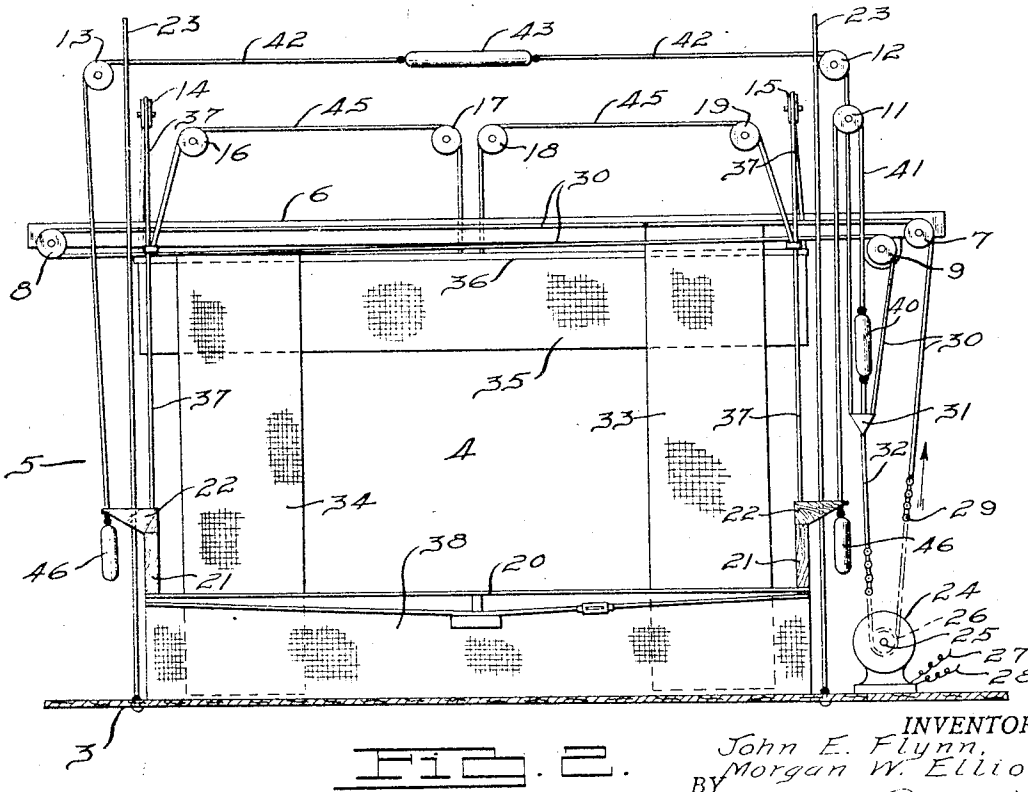


FIG. 2.

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CURTAIN DEVICE

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This invention relates to picture screens, and particularly to means for varying the effective area thereof, the principal object being the provision, in connection with a picture screen of desired maximum size, of curtains, drapes or like devices disposed around the margins of said screen and movable towards and away from the center of the screen, whereby to define thereon, by suitable positioning of the inner edges of such curtains or the like, the effective margins of any one of a number of smaller screen sizes that it may be desirable to employ.

Another object is to provide suitable means for varying the size of the effective portion of a picture sheet.

Another object is to provide, in combination with a picture screen, a curtain close-in in which the curtains move inwardly and outwardly from all sides to vary the effective size of the screen.

Another object is to provide a close-in for a picture sheet composed of drapes or curtains on all sides of the picture sheet arranged to be simultaneously moved by a common actuating means.

Another object is to provide a device as above described with a lost motion connection between the respective drapes or curtains so that certain of these drapes will move before other of the drapes begin to move.

Another object is to provide, in combination with a picture screen, a curtain close-in that is mechanically simple and very unlikely to get out of order, and will operate at all times smoothly and without danger of stoppage or overload on the driving motor.

Another object is to provide means as above described whereby an initial movement will be imparted to the vertically extending curtains on each side before the upper and lower curtains begin to move (as they may have a greater distance to travel) and then both sets of curtains will move together.

Another object of this invention is to provide a cheap, simple and inexpensive curtain close-in that may be easily installed or removed, operated, serviced and repaired by unskilled labor due to its inherent simplicity and few parts.

Numerous other objects and features of novelty will be either specifically pointed out, or will be apparent, in the following specifications, claims and drawings, which describe and show an illustrative embodiment of our invention wherein like reference numerals apply to like parts throughout the figures of the drawings.

In the drawings—

Fig. 1 is a front elevational view of a curtain close-in embodying an illustrative form of our invention and showing the close-in in open or fully extended position.

Fig. 2 is a view similar to Fig. 1 showing the curtain close-in in closed in or contracted position.

In the projection of moving or other pictures upon picture sheets in various picture theatres, difficulties have been experienced in providing a suitable picture sheet.

These difficulties relate to the problem of focusing the picture upon the picture sheet and to the effective size of the picture and picture sheet.

If the picture sheet is of fixed size and the picture thrown thereon is a little larger than the size of the sheet the marginal portions of the picture are completely lost. If the picture that is thrown on the sheet is smaller than the size of the sheet a disconcerting eye-straining light grey border is produced around the margin of the picture due to the diffused lights from the picture being reflected by the unusual marginal portion of the light picture sheet.

Because of these undesirable effects considerable difficulty is experienced in focusing the picture properly on the sheet.

Due to undesirable effects the effective size of the picture sheet is limited to a single size of picture, whereas it is often desirable to be able to project pictures of different sizes upon the sheet.

Applicants avoid these difficulties of losing the marginal portion of the picture or of having a marginal light grey border around the picture, and provide means whereby different sizes of pictures may be shown upon the same screen, by providing a picture screen of desired maximum dimen-

sions and interposing a movable close-in, preferably composed of opaque and non-reflecting curtains or drapes, between the audience and the picture sheet, whereby the exposed area of the screen may be expanded and contracted in size to meet the required size of picture.

In Fig. 1 a moving picture theater stage 3 is shown as being provided near its rearward portion with a picture sheet 4 extending vertically and perpendicularly thereto. The picture sheet 4 is assumed to be of a size sufficient to completely receive thereon a picture of the maximum size which may be desired to be shown.

Mounted on this stage immediately forward of, and between the audience and the picture sheet, is an illustrative embodiment of our invention comprising a close-in generally designated as 5. For the purpose of simplicity in the drawings, the various operating mechanisms for the close-in are shown in front thereof, it being understood that in actual practice such mechanism will be concealed behind the close-in.

The close-in includes a suitably supported rigid side-curtain traveler support 6 mounted a slight distance above and parallel to the upper edge of the picture sheet 4 and provided with side-curtain traveler sheaves 7, 8 and 9 pivotally mounted thereon at opposite ends thereof.

Pivotally secured to the framework of the building (not shown) are lift line sheaves 11, 12, 13, 14 and 15 and equalizing line sheaves 16, 17, 18 and 19.

At the lower edge of the picture sheet 4 and in vertical alignment with the traveler support 6 is a curtain batten truss 20. The truss 20, at either end thereof is provided with a rigid upstanding pedestal 21 the upper ends of each of which are provided with outwardly projecting arms 22. The arms 22 slidably embrace corresponding vertically disposed rigid guide rods or bars 23 suitably supported in any convenient manner, thus serving to guide the truss 20 for bodily vertical movement.

Mounted rigidly on the stage 3 adjacent the structure is an electric motor 24 having a drive shaft 25. On the end of the drive shaft is mounted a chain sprocket wheel 26 (indicated by dotted lines). The motor receives its energy through wires 27 and 28 and any suitable control means may be provided therefor.

The motor may be any suitable motivating means, and need not be an electric motor, as the invention is not limited to the type of motivating means employed.

A chain 29 is engaged over the sprocket 26 and to one end thereof is secured one end of the side-curtain traveler or traveler line 30 which extends upwardly and over the sheave 7, thence over the sheave 8 and thence back and over the sheave 9 from which it extends downwardly to a block 31 to which it is suitably secured. The block 31 is, in turn, connected to the remaining end of the chain 29 by the line 32, thus completing the circuit. The lines 30 and 32 and the chain 29 are maintained under suitable tension so that the weight of the curtains, which will be presently described and which are carried by the line 30, does not cause a material sag in the line.

From the above it will be apparent that when the motor 24 is rotated in a clock-wise direction as viewed in the drawings, the line 30 will move from the sheave 9 towards the sheave 8, and from the latter towards the sheave 7; and when the motor is rotated in a counter-clock-wise direction, the direction of movement of the line 30 will be reversed.

Taking advantage of this fact, a vertical curtain 33 is hung from its upper edge from that portion of the line 30 between the sheaves 7 and 8, and is positioned at the right hand side of the screen 4 as viewed in the drawings.

A similar curtain 34 is hung from that portion of the line 30 extending between the sheaves 8 and 9 and is located at the left hand side of the screen 4.

It will be apparent that with the curtains 33 and 34 hung as described, if the motor 24 is now rotated in a counter-clock-wise direction, the curtains 33 and 34 will be moved horizontally towards the center of the screen from the position shown, for instance, in Fig. 1, and may be brought, for instance, to the position indicated in Fig. 2. If, while the curtains 33 and 34 are in the position indicated in Fig. 2, the motor 24 is caused to rotate in a clockwise direction, the curtains will be carried away from the center of the screen to a position such as, for instance, is indicated in Fig. 1.

In this manner, by suitably controlling the direction of rotation of the motor, the curtains 33 and 34 may be caused to move to cover or uncover any desired amount of the side portions of the screen 4.

It may be here noted that altho we have shown the curtains 33 and 34 as being supported directly by the line 30, it will be obvious that the primary function of the line 30 is a means for imparting movement to the curtains 33 and 34, and the latter may be supported independently of the line 30 for suitably sliding movement in any one of a number of well known or conventional manners, without affecting the invention herein disclosed.

A horizontally extending curtain 35 is normally positioned adjacent the upper edge of the screen and is shown as being supported by the horizontal batten 36, the opposite ends of which are supported by means of the lines 37 which extend up over the sheaves 14 and 15 and then extend down to the corresponding

arms 22 of the pedestals 21 for the lower batten truss 20, to which arms they are suitably secured. The truss 20 supports a horizontally extending curtain 38, which, when the truss 20 is in its lowermost position, may simply fold up on the floor.

From the above it will be apparent that the connection between the curtains 35 and 38 thru the lines 37, is such that as the curtain 38 is raised the curtain 35 is lowered, and vice versa. The means for driving these curtains in timed relation to the movement of the curtains 33 and 34, preferably with an initial movement of the latter included, will now be described.

Two lines 41 and 42 connect the block 31 with the opposite arms 22 of the truss 20, the line 41 extending upwardly over the sheave 11 and then downwardly to the corresponding arm on the right-hand side of the screen, and the line 42 extending upwardly over the sheave 12, thence horizontally over the sheave 13 and then downwardly to the arm 22 on the left hand side of the screen. Thus it will be apparent that when the motor 24 is rotated in a counter-clockwise direction in order, as previously described, to move the side curtains 33 and 34 inwardly towards the center of the screen from the position indicated in Fig. 1 to the position shown in Fig. 2, the lines 41 and 42 at their point of attachment with the block 31 will be drawn downwardly, thus lifting the truss 20 and its corresponding curtain 38, and permitting the curtain 35 to move downwardly towards the center of the screen in opposed relationship to the direction of movement of the curtain 38.

When the curtains are in a position indicated in Fig. 2 and the motor 24 is rotated in a clockwise direction the side curtains 33 and 34 will be drawn outwardly away from the center of the screen, as from the position indicated in Fig. 2 towards the position indicated in Fig. 1, and the block 31 will be raised, thus permitting the truss 20 to move downwardly. To assist this downward movement of the truss 20 and its corresponding curtain 38 and to insure corresponding upward movement of the batten 36 and curtain 35, weights such as 46 are preferably fixed relative to the lower truss 20, for instance, to the arms 22 as indicated.

It may be desirable in certain cases, because of the normally greater width of a screen of this type than the height thereof, in order to better maintain the relative proportions of the height and width of the effective screen as varied by the curtains, to move the side screens further than the top and bottom curtains. This may be accomplished in a simple and economical manner as indicated in the drawings in the following manner. A weight may be interposed in line 41 between the lift block 31 and the sheave 11 and with its lower point of attachment to the line 41 at a distance above the lift block 31 a distance equal to the distance which it is desired that the side curtains 33 and 34 shall move in excess of the movement of the bottom curtain 38. A similar weight may be similarly inserted in the line 42 either at its point of connection with the lift block 31 or with its corresponding arm 22, but we prefer to insert it between the sheaves 12 and 13 as indicated at 43.

The introduction of these weights 40 and 43 into the lines 41 and 42 is such that when the curtains are moved to their extreme position away from the center of the screen 4, the truss 20 comes into contact with the floor 3 before the side curtains have reached their outer limit of the travel. As soon as the truss 20 contacts with the floor downward movement of the truss 20 and lower curtain 38 and upward movement of the batten 36 and upper curtain 35 is stopped, and as the motor continues to rotate and the side curtains 33 and 34 continue to move outwardly the weight 40 moves downwardly and creates a slack in the line 41 and the weight 43 moves downwardly and creates a sag in the line 42, as indicated in Fig. 1.

When it is desired to move the curtains inwardly from the position indicated in Fig. 1 to the position indicated in Fig. 2 and the motor 24 is operated to carry out this movement, it will be obvious that the moment the motor 24 starts to rotate in a counter-clockwise direction the block 31 in moving downwardly will immediately start to move the curtains 33 and 34 inwardly, but the curtains 35 and 38 will remain stationary until the slack in the line 41 created by the weight 40 has been eliminated and the sag in the line 42 created by the weight 43 has been substantially eliminated, and as soon as this slack and sag have been taken up then the top and bottom curtains will also begin to move inwardly. By this arrangement a lost motion is introduced into the lines 41 and 42 permitting the side curtains 33 and 34 to have an initial movement inwardly towards the center of the screen 4 in advance of the movement of the curtains 35 and 38, and this permits the relative vertical and horizontal proportions of the two effective sizes of screen to be maintained substantially constant.

We also find that, although not essential in all cases, it is often preferable to introduce an equalizing means for the center of the upper curtain 35 and this may be accomplished as indicated in the drawings, in which two lines 45 are clamped at their lower ends to the lines 37 between the sheaves 14 and 15 and the arms 22, the line on the left-hand side extending upwardly over the sheave 16, thence across and over the sheave 17 and then to the batten 36 adjacent its center, and the other line 45 being correspondingly connected to the line 37 and extending upwardly over the sheave 19 and thence over the sheave 18, and

being connected to the batten 36 adjacent the center. This insures the center of the batten being supported in the same horizontal plane as the ends thereof.

The lost motion and counter-weight devices also provide means whereby the starting torque of the motor 21 is reduced because in moving from the position shown in Fig. 1 the side drapes are moved first and have considerable momentum when the bottom drape is picked up.

In starting from the position shown in Fig. 2, the weight of the bottom drape is such that as soon as the bottom drape lift lines become slack it will move down of its own accord, lifting the top drape with it.

The advantages of our invention are too numerous to enumerate but the most important may be stated briefly as follows. We provide a means whereby pictures of any size, due to desire on the part of the management to show different sized pictures, or difficulties in properly focusing the picture, can be shown on the same picture sheet and the effective size of the picture sheet may be changed, and the picture framed by very simple and trouble-proof means.

Another advantage is that the starting torque of the motor is reduced to the preliminary movement of certain of the drapes first and then the simultaneous movement of all of the drapes, caused by the lost motion elements and the movement of the side curtain traveler.

While we have shown in the drawings a particular illustrative form of our invention, various modifications may be made in the same, and in the various features of construction, without materially changing the invention therein, and formal changes may be made in the specific embodiment of the invention described, without departing from the spirit or substance of the broad invention, the scope of which is commensurate with the appended claims.

We claim:

1. In combination with a picture screen, drapes arranged around the border of said screen, a common means for moving said drapes towards and from the center of said screen whereby to vary the effective size of said screen, means initiating movement of part of said drapes in advance of movement of the remainder thereof comprising a lost motion connection between said drapes, and an equalizing means for preventing certain of the drapes from sagging.

2. A close-in for a picture screen comprising vertically extending horizontally movable drapes, horizontally extending vertically movable drapes, and means to move said drapes respectively in horizontal and vertical directions comprising a motivating means and lost motion means whereby the vertically extending horizontally movable drapes are moved upon inward movement thereof before the horizontally extending vertically movable drapes are moved.

3. In a projected picture reception device, a reception surface, top and bottom marginal curtains and two side marginal curtains, the top and bottom curtains forming one set of curtains connected for simultaneous equal movement in opposite directions, the two side marginal curtains forming another set of curtains connected for simultaneous equal movement in opposite directions, a lost motion connection between the respective sets, and operating means to simultaneously operate the sets.

4. Reception means for a projected picture, having in combination, a reception surface, marginal curtains movable parallel to the reception surface and perpendicular to its edges inward and outward from all sides to limit the effective size of the reception surface, and a motor and drive means to simultaneously move the curtains, said drive means having lost motion connections therein whereby to move one set of curtains before moving all the curtains during one direction of movement thereof.

5. In combination with a picture screen, drapes arranged around the border of the screen, means for moving said drapes toward and from the center of said screen, to vary the effective size of the screen, means including a plurality of weights oppositely connected to the first mentioned means for initiating movement of part of said drapes in advance of the movement of the remainder thereof and equalizing means co-acting with the first mentioned means for preventing certain of the drapes from sagging.

6. In combination with a picture screen, a pair of vertically disposed drapes, a pair of horizontally disposed drapes, the drapes so arranged as to form a border around the screen, means for moving said drapes toward and from the center of said screen, to vary the effective size of the screen, means including a plurality of weights oppositely connected to the first mentioned means for initiating movement of the vertically disposed drapes in advance of the movement of the horizontally disposed drapes, and equalizing means co-acting with the first mentioned means for preventing one of the horizontally disposed drapes from sagging.

7. In combination with a picture screen, a pair of vertically disposed drapes, a pair of horizontally disposed drapes, the drapes so arranged as to form a border around the screen, means including a plurality of sheaves and belting for moving said drapes toward and from center of screen, to vary the effective size of said screen, means including a plurality of weights operatively connected to the first mentioned means for initiating movement of the vertically disposed drapes

in advance of the movement of the horizontally disposed drapes, equalizing means co-acting with the first mentioned means for preventing one of the horizontally disposed drapes from sagging and a pair of arms, each arm co-acting with a rod for guiding the other horizontally disposed member in vertical movement.

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