March 1, 1932. V. H. VOLLAND 1,848,086

CURTAIN OPERATING MECHANISM

Filed May 20, 1931

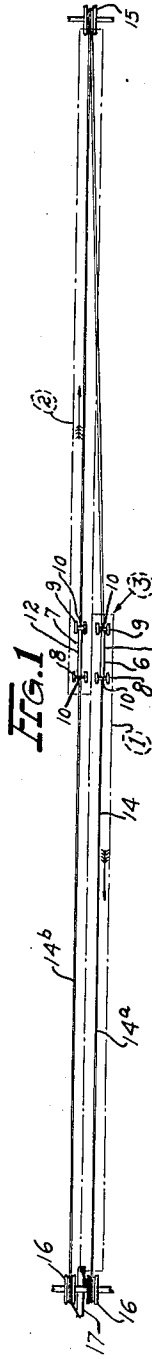

Fig. 1

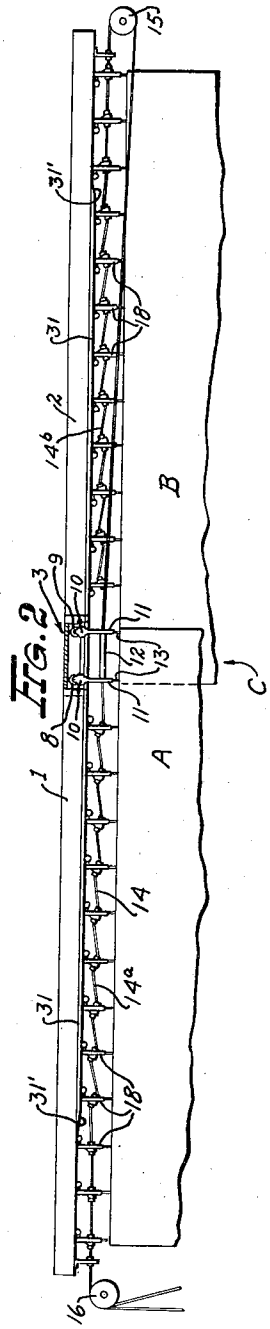

Fig. 2

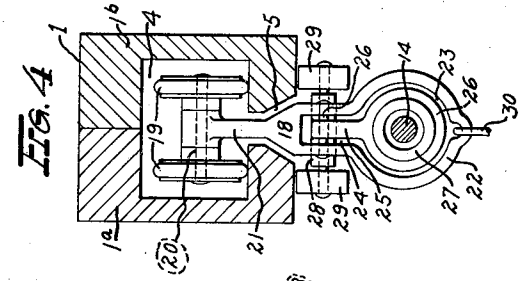

Fig. 4

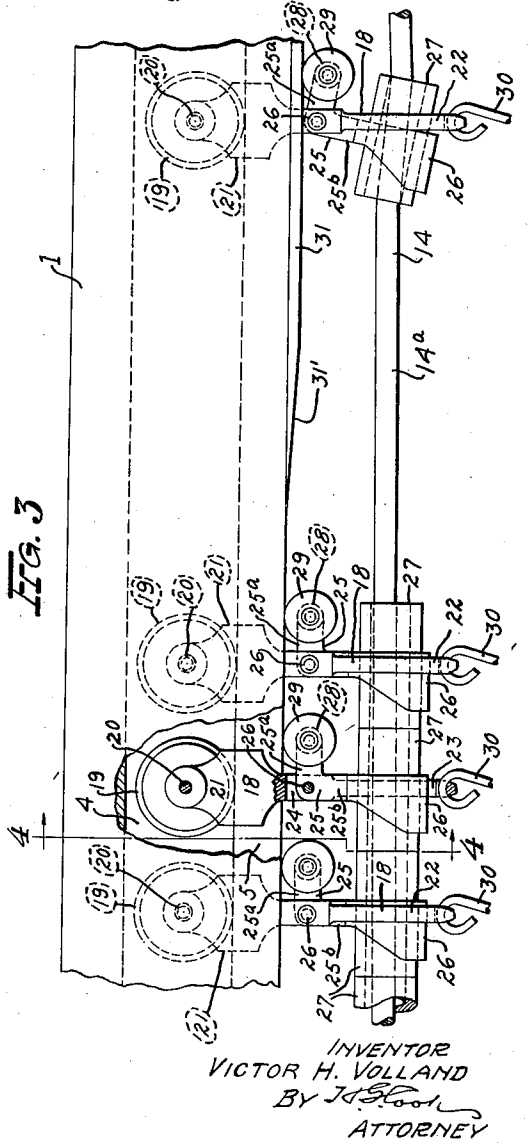

Fig. 3

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UNITED STATES PATENT OFFICE

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CURTAIN-OPERATING MECHANISM

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This invention relates generally to means for operating curtains, and more specifically to such means adapted for use with stage curtains of the type which are supported at the top, and which when operated to disclose the stage are parted vertically at the center and are drawn in both directions so that the sections of the curtains are concealed from the front by the opposite sides of the proscenium arch of the stage.

The predominant object of the invention is to provide an improved and extremely simple operating mechanism for curtains of the type described which performs its function in such manner that substantially no gathering of the curtain sections takes place anywhere except at the extreme outer end portions of the curtain when the curtain is drawn away to disclose the stage. Because of this arrangement an effect which is very pleasing to the eye is presented and the strains and exertions incident to the operation of the curtains are reduced to a minimum.

Fig. 1 is a diagrammatic view in plan of the operating line, showing the curtain in a closed condition.

Fig. 2 is a fragmentary elevation of the upper portion of the curtain and the associated operating mechanism.

Fig. 3 is an enlarged fragmentary view of a portion of the operating mechanism.

Fig. 4 is a cross-section on line 4—4 of Fig. 3.

In the drawings, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A and B designate curtain sections which comprise a curtain of the type which when operated to disclose the stage with which the curtain is associated parts vertically at the center, said curtain sections moving in opposite directions to points where they are concealed behind the opposite sides of the proscenium arch of the stage. The curtain sections A and B overlap slightly at the approximate center of the curtain, as shown at C in Fig. 2.

Arranged immediately above the upper edges of the curtain sections A and B is a pair of trackways 1 and 2, which, as in the case of said curtain sections, are overlapped slightly at their inner ends as indicated at 3 in Figs. 1 and 2. Preferably each trackway is constructed as illustrated in Fig. 4; that is to say, each trackway is formed of a pair of sections 1^a and 1^b, which are so shaped and so fixedly associated with each other that a cavity 4 is provided within said trackway which extends from end to end thereof, said cavity being bordered by top, bottom, and side walls. In the bottom wall of the cavity referred to an elongated opening 5 is provided which likewise preferably extends from end to end of the trackway. The opening 5 by preference has the cross-sectional shape illustrated in Fig. 4, said opening having parallel wall portions at its upper end, and outwardly and downwardly flared wall portions in its lower portion.

Disposed immediately above the inner end portions of the curtain sections A and B are travelers 6 and 7 which are supported by the trackways 1 and 2, respectively, and for the sake of clearness of description herein these travelers will be referred to as rigid travelers. The rigid travelers each comprise pairs of rollers 8 and 9 which are spaced apart in a direction longitudinally of the associated trackway, each pair of rollers being rotatably supported by an element 10 which includes a downwardly extended portion 11, and the downwardly extended portions 11 of each traveler being rigidly connected together by a tubular element 12, as shown in Fig. 2. The pairs of rollers 8 and 9 of the rigid travelers are arranged in rolling contact with the top surfaces of the bottom walls of the cavities 4 within the trackways 1 and 2, the elements 10 of said travelers passing downwardly through the elongated openings 5 of the trackways. Associated with the lower ends of the downwardly extended portions 11 of the rigid traveler 6 are connectors 13 which connect the inner end portions of the curtain section A to said traveler, and associated with the downwardly extended portions of the traveler 7 are similar connectors which connect the inner end portion of the curtain section B with the latter traveler.

Associated with the curtain sections A and

B is an operating line 14 by which said curtain sections are moved to open and closed positions. The operating line 14 is passed around a sheave 15 located at one end of the curtain, and at the opposite end of the curtain a pair of horizontally spaced sheaves 16 are provided over which the line 14 passes. From the sheaves 16 the line 14 passes to a suitable winding mechanism, such, for instance, as a windlass, a portion of which is shown in Fig. 1 and designated therein by the reference character 17. The arrangement of the sheaves 15 and 16 is such that portions 14^a and 14^b of the line 14 are arranged in a horizontal plane one in advance of the other, and the rigid traveler 6 is fixedly connected to the line portion 14^a while the rigid traveler 7 is fixedly connected to the line portion 14^b.

Arranged above the upper edges of the curtain sections A and B are precisely and regularly spaced travelers 18. Each of the travelers 18 comprises a pair of rollers 19 which are rotatably mounted on a rod 20, and suspended from the rod 20 is a supporting element 21 which at its lower end is provided with an enlarged circular portion 22 in which a circular opening 23 is formed. Communicating with the circular opening 23 is an upwardly extended opening 24 which is formed in the portion of the supporting element 18 located above the circular portion 22 thereof. The rollers 19 of each of the travelers 18 are arranged in rolling contact with the upper surface of the bottom wall of the cavity 4 within the associated trackway, said rollers being located at opposite sides of the elongated opening 5 in said bottom wall of said cavity, and said supporting element 21 being extended through said elongated opening.

Associated with each of the travelers 18 is a bell-crank lever 25 which is pivoted to the supporting element 21 at the point designated by the reference character 26. The bell-crank lever 25 is provided with a short leg 25^a which is normally disposed in a substantially horizontal position, and a longer leg 25^b which normally is disposed in a somewhat vertical position. The pivoted portion of the bell-crank lever 25 is disposed within the opening 24 formed in the supporting element 21, a pin being extended through portions of said supporting element at opposite sides of said opening 24 and through said bell-crank lever to effect the pivotal connection between the bell-crank lever and the supporting element. At the lower end of the longer leg 25^b of the bell-crank lever 25 a circular portion 26^b is provided through which an opening is formed, and extended through said opening and frictionally gripped therein is a tubular element 27 formed preferably of stiff rubber or other slightly yieldable material. At the outer end of the shorter leg 25^a of the bell-crank lever 25, a transversely extended arm 28 is provided which supports at its opposite ends a pair of rollers 29. Also, each traveler 18 has associated therewith a connector 30 which connects the lower portion of the supporting element to the associated curtain section.

The operating line 14 is passed through the tubular elements 27 of all of the travelers 18, as shown clearly in Figs. 2 and 3; that is to say, the portion 14^a of said operating line passes through the tubular elements 27 of all of the travelers 18 associated with the curtain section A, while the portion 14^b of said operating line passes through the tubular elements 27 of all of the travelers associated with the curtain section B. Also, the lower faces of the bottom walls of the trackways 1 and 2 are provided with strips 31 which are located at opposite sides of the elongated openings 5 in said bottom walls of said trackways, said strips associated with each trackway extending from the inner overlapping end of the guideway to a point short of the opposite end of said guideway. At the ends thereof which are disposed at a point located inwardly of the outer ends of the associated trackways the strips 31 are provided with beveled faces 31′ which merge into the lower faces of the bottom walls of said trackways. The rollers 29 associated with the bell-crank levers 25 of the travelers 18 are adapted to contact with the strips 31.

In explaining the operation of my improved curtain-operating mechanism, it will be assumed that the curtain sections are in their closed positions and that it is desired to draw said curtain sections aside to disclose the stage with which the curtain is associated. When the curtain sections are in their closed positions as suggested, the rollers 29 of the bell-crank levers 25 comprising parts of the travelers 18 which are located inwardly of the beveled faces 31′ of the strips 31 will be in contact with the lower faces of said strips, with the result that said rollers 29 will be depressed, thereby moving the bell-crank levers to the position illustrated at the right-hand end of Fig. 3. Such position of the bell-crank levers will cause the tubular elements 27 thereof to be disposed at an angle to the axis of the line 14 which passes through said tubular elements, with the result that said line will be firmly gripped by said tubular elements.

With the line 14 gripped by the tubular elements of the travelers 18 as described, it is plain that when the winding mechanism associated with said line is operated to move the portions 14^a and 14^b of said line in the directions indicated by the arrows in Fig. 1, said travelers will move with said line portions in a manner to maintain the spaced relation of the various travelers. Thus the portions of the curtain sections located inwardly of the beveled faces of the strips 31 will be drawn

toward the opposite sides of the stage without any substantial gathering of the curtain sections. However, as each traveler 18 reaches the ends of the strips 31 associated with the trackway by which said traveler is supported, the rollers 29 of said travelers will be free to move upwardly and gravity will cause the longer and heavier leg 25^b of the bell-crank lever to swing to a vertical position, whereby the tubular element 27 of said bell-crank will assume a position substantially parallel with respect to the line 14. This will permit the line 14 to move through the parallel tubular element with the result that movement will no longer be imparted to the traveler with which such tubular element is associated.

As each traveler reaches the end of the strips 31 associated with the trackway by which said traveler is supported, the grip between said traveler and the line 14 is relieved, so that movement of said traveler with the line is arrested, and said traveler remains stationary until the next succeeding traveler strikes it and moves it an additional distance toward the end of the associated trackway. In this manner all of the travelers will be grouped in the space outwardly beyond the beveled faces of the strips 31, and because all of the relative movement between said travelers takes place in the spaces beyond the outer ends of the strips 31, all of the gathering of the curtain sections will take place in said spaces, and because such spaces are located behind the opposite side portions of the proscenium arch of the stage the gathering of the curtain sections will be concealed from view of the audience before the stage. Because it is the ends of the rubber tubular elements 27 that strike when the travelers come together as described, such contact of said travelers will be noiseless.

When the curtain sections are being moved in the reverse direction, or from open to closed positions, the pull on said curtain sections imparted by the line 14 tends to maintain the curtain sections taut, and as the curtain moves toward the center of the stage the travelers which are connected to the curtain sections also move outwardly in their proper spaced relation. Also, as such movement of the travelers takes place, the rollers 29 will be depressed by contact with the strips 31 so as to cause the tubular elements 27 of said travelers to grip the line 14, as already explained.

I claim:

1. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, and means associated with said travelers for releasably connecting said travelers to said operating line.

2. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, and means for causing the last-mentioned means to connect said travelers to said operating line.

3. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, pivoted means associated with said travelers adapted to connect said travelers to said operating line, and means for causing the last-mentioned means to connect said travelers to said operating line.

4. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, and means for causing the last-mentioned means to connect said travelers to said operating line, said means associated with said travelers comprising pivoted members provided with tubular portions through which said operating line passes.

5. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, and means for causing the last-mentioned means to connect said travelers to said operating line, said means associated with said travelers comprising bell-crank levers provided with tubular elements through which said operating line passes.

6. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising members pivoted to said travelers, tubular elements associated with said pivoted members, and means for subjecting said pivoted members to movement in a manner to cause said travelers to be connected to said operating line.

7. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising bell-crank levers pivoted to said travelers, tubular elements associated with said bell-crank levers through which said operating line passes, and means for subjecting said bell-crank levers to movement in a manner to

cause said travelers to be connected to said operating line.

8. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising bell-crank levers pivoted to said travelers, tubular elements associated with said bell-crank levers through which said operating line passes, and means for subjecting said bell-crank levers to movement in a manner to cause said travelers to be connected to said operating line, the last-mentioned means comprising an abnormal face with which portions of said bell-crank levers contact.

9. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising bell-crank levers pivoted to said travelers, tubular elements associated with said bell-crank levers through which said operating line passes, and means for subjecting said bell-crank levers to movement in a manner to cause said travelers to be connected to said operating line, said pivoted members being provided with rollers and the last-mentioned means comprising an abnormal face with which said rollers contact.

10. An apparatus of the character described comprising a curtain, travelers for supporting said curtain, a trackway for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising members pivoted to said travelers, tubular elements associated with said pivoted members, and means for subjecting said pivoted members to movement in a manner to cause said travelers to be connected to said operating line, the last-mentioned means comprising an abnormal face which terminates short of one end of said trackway so as to permit said travelers to be released from said operating line at a predetermined point with respect to said trackway.

11. An apparatus of the character described comprising a curtain formed of curtain sections movable in opposite directions to and from the center of the opening with which the curtain is associated, travelers for supporting said curtain, trackways for said travelers, an operating line for moving said curtain, means associated with said travelers adapted to connect said travelers to said operating line, said means comprising members pivoted to said travelers, tubular elements associated with said pivoted members, and means for subjecting said pivoted members to movement in a manner to cause said travelers to be connected to said operating line.

In testimony that I claim the foregoing I hereunto affix my signature.

VICTOR H. VOLLAND.