S. G. Bailey.
MEANS FOR HANDLING HANGING SCENERY IN THEATERS.
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To all whom it may concern:

Be it known that I, Seth G. Bailey, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Means for Handling Hanging Scenery in Theaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing and to the characters of reference marked thereon, which form a part of this specification.

My invention relates generally to improvements in means for handling hanging scenery in theaters, but more specifically to a special construction and arrangement of ropes and pulleys adapted for use in connection with suitable hoisting mechanism arranged in units, there being as many units as there are curtains or flies to be handled in the theater, auditorium or other structure where the same is employed.

It is of the utmost importance in constructions of this class that the mechanism be so arranged that the rope and pulley construction for handling each fly be confined within narrow limits; and the mechanism covered by my present improvement may be located within a space of four inches in a horizontal direction. The necessity for mechanism that can be confined within such a limited space will be understood when it is stated that in a theater or auditorium of ordinary or medium size, from 55 to 60 curtains or flies are employed, thus necessitating that a corresponding number of hoisting mechanism units be employed and located within the space corresponding with the length of the stage from front to rear.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing which illustrates a single hoisting unit together with the curtain or fly and the rope and pulley mechanism employed in connection therewith and forming the basis for my present application.

In this drawing let the numeral 5 designate the framework of the operating mechanism upon which upper and lower shafts 6 and 7 are journaled. Upon these shafts are respectively mounted upper and lower drums 8 and 9, connected by a cable 13. The upper drum is adapted to receive a cable 14 connected with a pulley block 11 carrying pulleys 15, 16 and 17, which respectively engage the three cables 18, 19 and 20 employed in connection with each scenic member 21, the said pulleys engaging the cables in running relation intermediate the cable extremities, the latter being respectively attached to the scenic member and the pin-rail 22. Between the pulley block 11 and the pin-rail three pulleys 23, 24 and 25, and three other pulleys 26, 27 and 28, are located, the said pulleys forming an anti-frictional support for the cables 18, 19 and 20 when the apparatus is in use. Between the pulley block and the scenic member, pulleys 29, 30, 31, 32, 33 and 34 are located, the said pulleys forming anti-frictional supporting guides for the cables 18, 19 and 20 between the traveling pulley block and the scenic member.

Attention is called to the fact that the pulleys 15, 16 and 17 carried by the pulley block 11, vary in size, the lowermost pulley 15 being the largest and the other pulleys gradually diminishing in size, the uppermost pulley 17 being smallest. The object of this construction is to make it practicable to employ a relatively short pulley block and at the same time prevent the interference of the cables with each other as the sharpness of their angles varies during the downward movement of the pulley block. It is important to employ a relatively short pulley block, since by so doing the block is permitted to travel vertically a comparatively long distance without coming in contact with the stationary structure 35 above, or the framework 5 of the operating mechanism below. This construction and arrangement permits the raising and lowering operation to be performed within a space of less height than would have been required were a longer pulley block used.

Attention is called to the fact that the framework 35 is arch-shaped and carries on one side thereof the pulleys 23, 24 and 25, and on the other side the pulleys 29, 30, and 31. This framework is made arch-shaped in order to make as large a space as possible for the vertical movement of the pulley block within an inclosure of a given height.

It is evident that if the pulleys 16 and 17...
were of the same size as the pulley 15, the cables, where they engage these pulleys, would be considerably nearer together at all times, and hence during the downward movement of the pulley block, by reason of the changing of the angles of the cables with reference to a vertical line passed through the axes of the pulleys, the cables would engage each other after a comparatively short downward movement of the block. With the same object in view the pulleys 26, 27 and 28 mounted on a stationary support 36 are made of varying size, but in the reverse order, the uppermost pulley being largest and the other pulleys diminishing in size downwardly. It may be noted that from these pulleys 26, 27 and 28, the cables extend downwardly in a direction nearly vertical to the pin-rail 22, and by virtue of the varying size of the pulleys which lie in the same vertical plane, the cables are prevented from rubbing against each other during the original adjustment of the scenic member. It may be stated in this connection that structural advantages which permit the economical use of space in a construction of this character are of the utmost importance, since the space available is always limited and constructions which require relatively large units in connection with the various scenic members are virtually prohibitive so far as their use for the purpose intended is concerned. It is for this reason that it is important that all of the pulleys employed in connection with the three cables used with each scenic member should lie in the same vertical plane, since by so doing they may be kept within the width of space required by each operating unit of the structure.

This feature will be better understood when it is remembered that in a theater of medium or average size from 55 to 60 flies or scenic members are employed, requiring an equal number of operating units, all of which in order to be practicable, must be crowded within a length of space approximately equal to the length of the stage from front to rear. Hence in practice I have found it necessary to limit the width of each operating unit to approximately a space of four inches.

In the operation of the device any suitable hoisting mechanism may be employed, since it will be understood that the invention is not limited to the special construction of hoisting mechanism which has been only briefly described herein, as nothing is claimed thereon in this application, the same being fully protected by a copending application, Serial No. 594,496, and further by Patent No. 977,500 issued to me Dec. 6, 1919. Hence assuming that suitable mechanism be employed for raising and lowering the curtain 21 by moving the pulley block 11 up and down, by virtue of the connection of the cable 14 with said mechanism, the ropes 18, 19 and 20 are so adjusted as to leave the required length for the purpose between the pin-rail 22 and the curtain. These ropes are then fastened to the pin-rail and no further manipulation of the ropes is necessary in "trimming" the curtain. During the downward movement of the pulley block in raising the curtain, it will be observed that by virtue of the fact that the pulleys 17, 16 and 15 diminish in size from top to bottom, there is no conflict between the various ropes 15, 16 and 18 or the pulleys on the block which they engage. Furthermore the cables 18, 19 and 20 may be drawn downwardly in a single plane to the pin-rail from the pulleys 26, 27 and 28, without material interference, since the last named pulleys increase in size from the bottom toward the top.

Having thus described my invention, what I claim is:

1. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum, a block connected with the cable and carrying a number of pulleys arranged one above another and diminishing in size from the bottom toward the top, ropes connected with the scenic member at one extremity and engaging the respective pulleys of the block in running relation, guide pulleys mounted on a stationary support and engaging the said ropes, and a pin-rail to which the opposite extremities of the ropes are detachably connected, the pulley block being located intermediate the pin-rail and the scenic member.

2. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum, a block connected with the cable and carrying a number of pulleys arranged one above another and varying in size from top to bottom, the uppermost pulley being smallest and all of the said pulleys lying between the same vertical planes, ropes connected with the scenic member at one extremity and engaging the respective pulleys of the block in running relation, guide pulleys mounted on a stationary support on opposite sides of the pulley block, and a pin-rail to which the opposite extremities of the ropes are detachably connected, the pulley block being located intermediate the pin-rail and the scenic member.

3. The combination with a movable scenic member, of an operating drum, a cable connected with the drum, a block connected with the cable and carrying a number of pulleys varying in size from top to bottom, the top pulley being smallest and all of the said pulleys lying between the same vertical planes, ropes connected with the scenic member at one extremity and engaging the respective pulleys of the block in running relation, guide pulleys mounted on a V-
shaped stationary support and engaging the said ropes, and a pin-rail to which the opposite extremities of the ropes are detachably connected, the pulley block being located intermediate the pin-rail and the scenic member, substantially as described.

4. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum, block connected with the cable and carrying a number of pulleys all lying in the same vertical plane and varying in size from top to bottom, the uppermost pulley being smallest, ropes connected with the scenic member at one extremity and engaging the respective pulleys of the block in running relation, guide pulleys mounted on a stationary arch-shaped support and engaging the said ropes, the stationary pulleys, the pulleys of the block and the scenic member all lying between the same vertical planes, and a pin-rail to which the opposite extremities of the ropes are connected, the pulley block being interposed between the pin-rail and the scenic member, substantially as described.

5. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum, block connected with the cable and carrying a number of pulleys all lying between the same vertical planes and varying in size from top to bottom, the uppermost pulley being smallest, flexible devices connected with the scenic member and engaging the pulleys of the block in running relation, a stationary device with which the extremities of the flexible devices are detachably connected, and pulleys mounted on a stationary arch-shaped support for guiding the flexible devices connected with the scenic member, the space below the arch-shaped support being available for the vertical movement of the pulley block, which is interposed between the scenic member and the stationary device with which the flexible devices are connected.

6. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum at one extremity, a pulley block with which the opposite extremity of the cable is connected, pulleys mounted on the said block arranged one above another, lying in the same vertical plane and varying in size from top to bottom, the uppermost pulley being smallest, flexible devices connected with the scenic member and engaging the pulleys of the block in running relation, a stationary device with which the extremities of the flexible devices are connected, pulleys mounted on the arch-shaped stationary support, the pulley block being arranged to move within the space inclosed by the arch, the last named pulleys forming guides for the flexible devices on opposite sides of the pulley block, the stationary pulleys, the pulleys of the block and the scenic member all lying between the same vertical planes, the said plane cutting the axis of the drum transversely, substantially as described.

7. The combination with a movable scenic member or other load, of an operating drum, a cable connected with the drum, a block connected with the cable and carrying a number of pulleys arranged one above another between the same vertical planes and varying in size from top to bottom, the uppermost pulley being smallest, ropes connected with the scenic member at one extremity and engaging the respective pulleys of the block in running relation, guide pulleys mounted on the arch-shaped stationary support and engaging the said ropes, a pin-rail to which the opposite extremities of the ropes are detachably connected, and other guide pulleys also mounted on a stationary support which the cables engage between the pulleys of the arch-shaped support and the pin-rail, the said intermediate pulleys varying in size from top to bottom, the uppermost pulley being largest, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SETH G. BAILEY.

Witnesses:
F. E. Bowen,
Hortense Uhlig.

Copies of this patent may be obtained for five cents each, by addressing the “Commissioner of Patents, Washington, D. C.”