

May 9, 1933.

E. F. SIBBERT

1,907,597

CURTAIN OPERATING DEVICE

Filed April 21, 1932

4 Sheets-Sheet 1

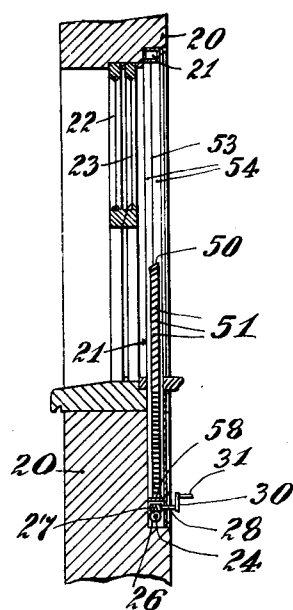


Fig. 2.

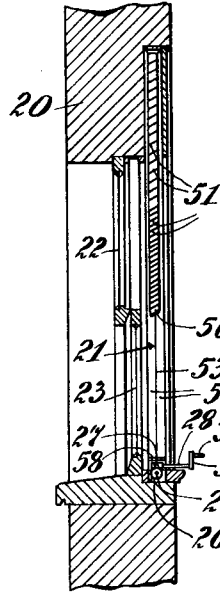


Fig. 10.

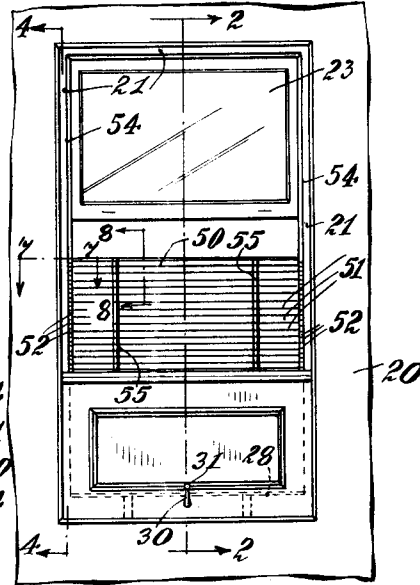


Fig. 1.

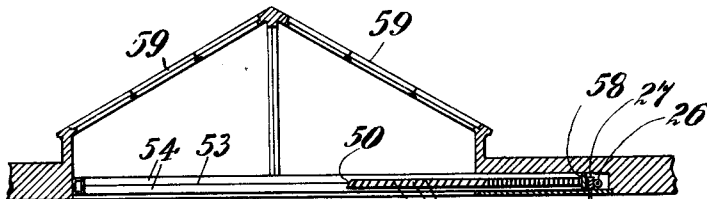


Fig. 11.

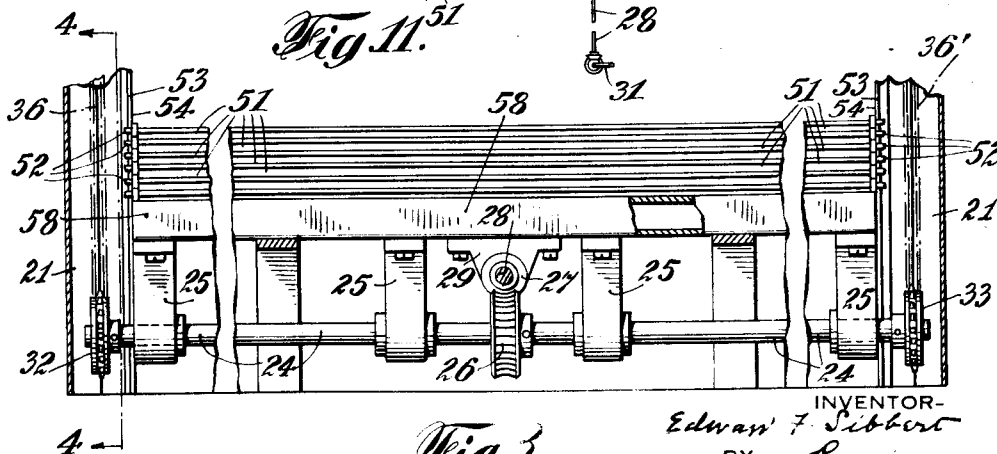


Fig. 3.

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May 9, 1933.

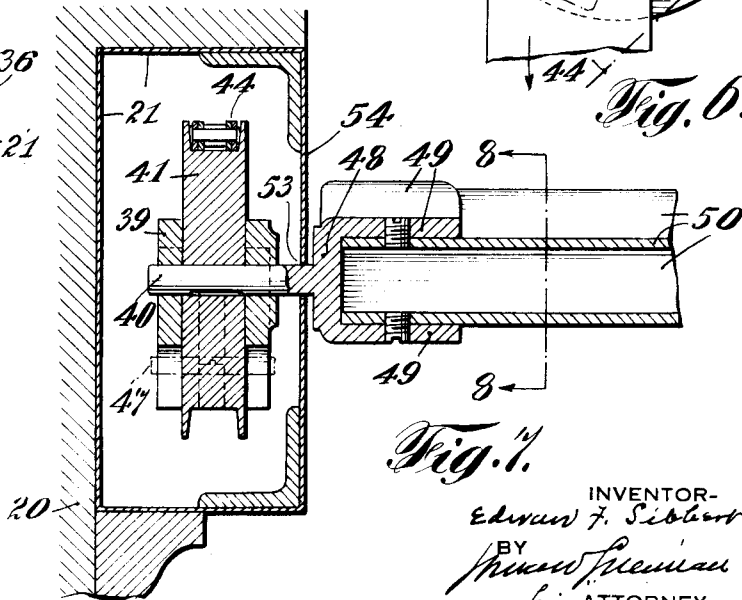
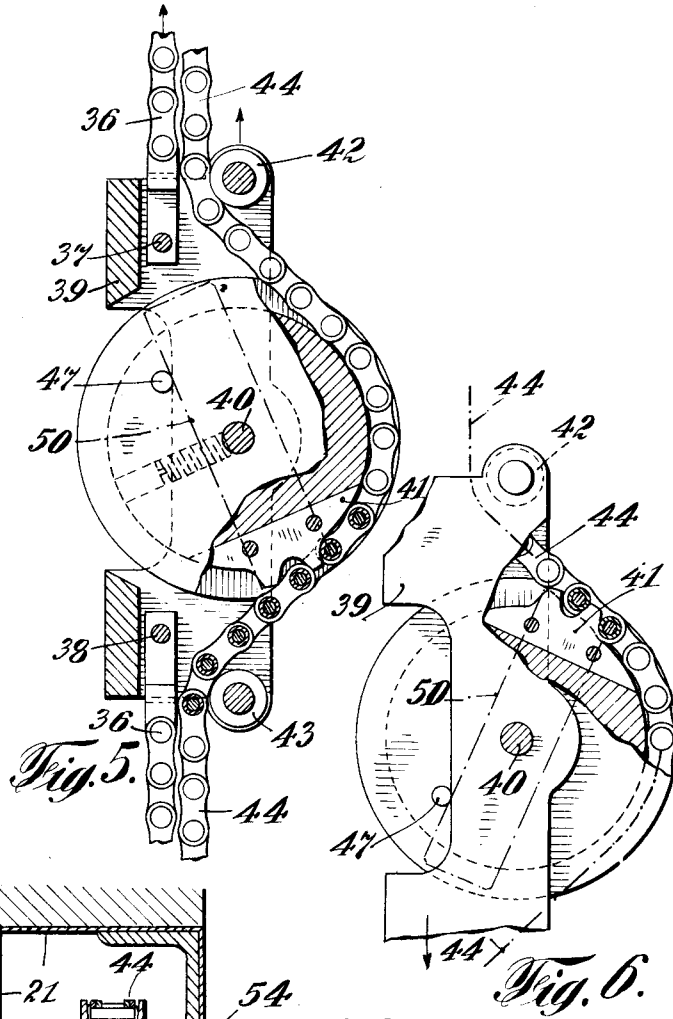
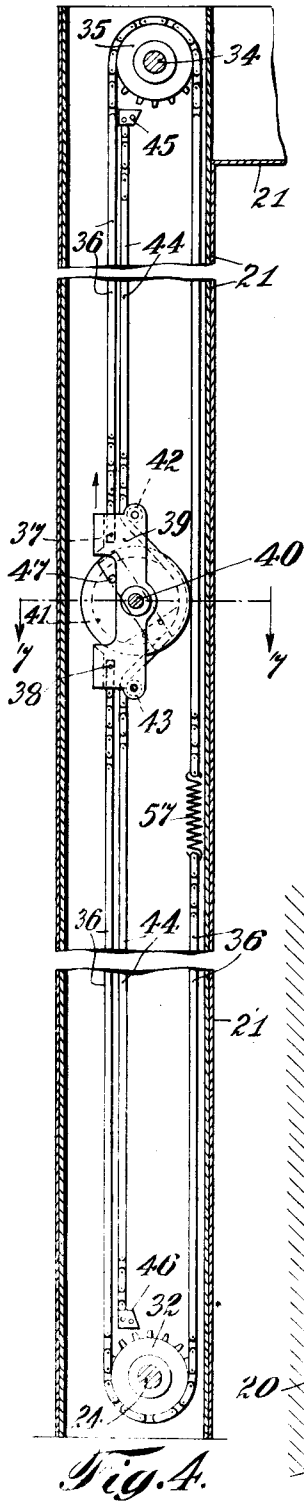
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CURTAIN OPERATING DEVICE

Filed April 21, 1932

4 Sheets-Sheet 2



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1,907,597

CURTAIN OPERATING DEVICE

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4 Sheets-Sheet 3

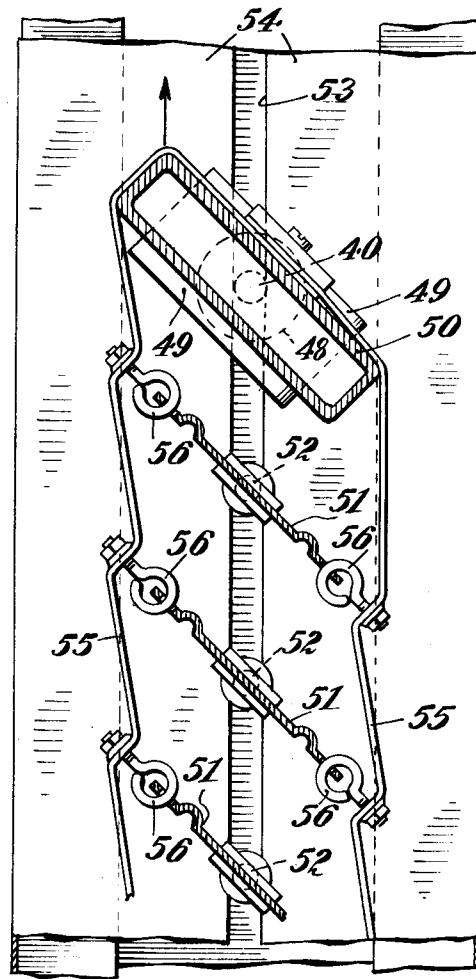


Fig. 8.

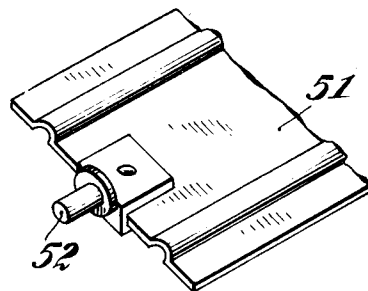


Fig. 9.

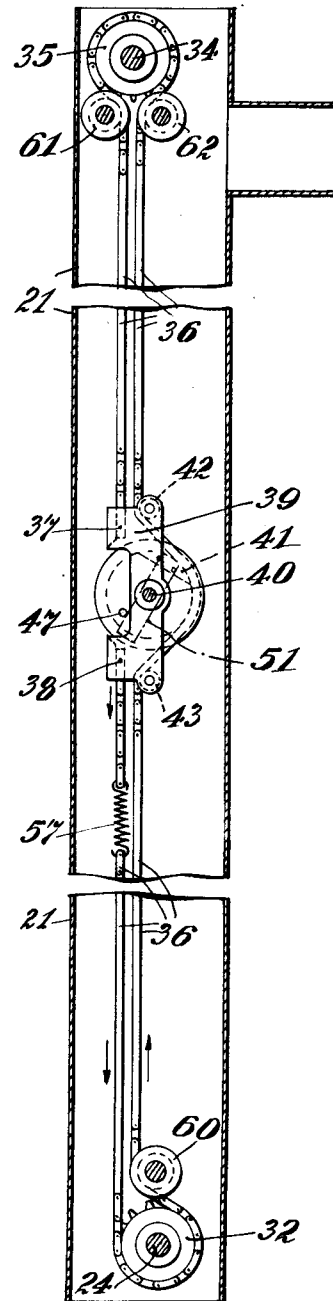


Fig. 12.

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CURTAIN OPERATING DEVICE

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4 Sheets-Sheet 4

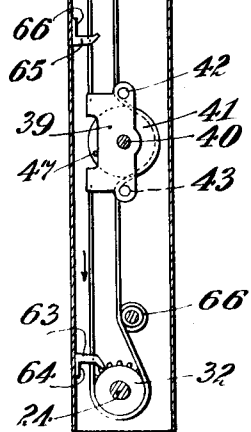
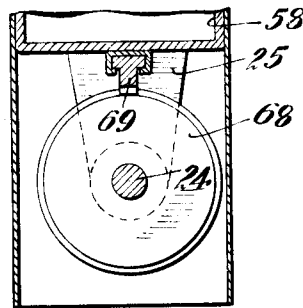
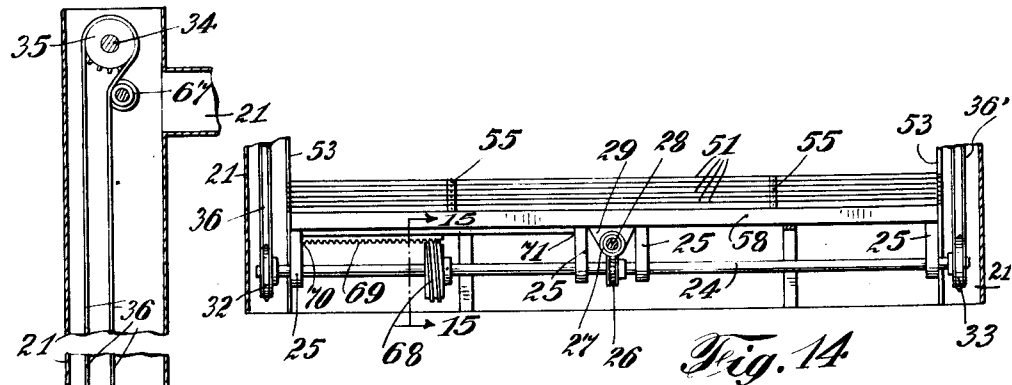


Fig. 13.

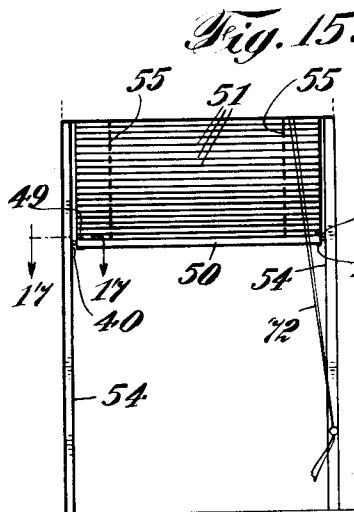


Fig. 16.

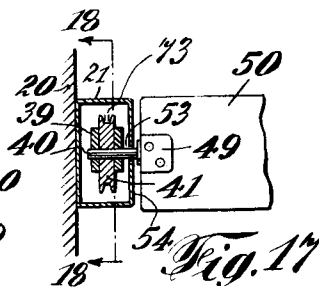


Fig. 17.

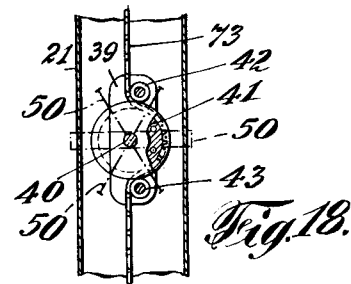


Fig. 18.

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UNITED STATES PATENT OFFICE

EDWARD F. SIBBERT, OF BROOKLYN, NEW YORK

CURTAIN OPERATING DEVICE

Application filed April 21, 1932. Serial No. 606,634.

My invention relates to curtain operating devices and refers particularly to devices for moving and operating louvre curtains.

Among the objects of my invention is a device whereby any desired number of louvres of a louvre curtain may be raised, or lowered, across a window and whereby these louvres may be revolved upon their axes to produce desired openings between them for purposes of ventilation or admission of light.

There are two distinct movements necessary for the proper operation of louvre curtains, to wit, the movement of the curtain across the window in order to cover a portion, or all, thereof, and a movement of the louvres in order to admit, or prevent the admission of, light and air.

These two operations are usually conducted by two separate mechanisms, which in many devices are difficult of operation and ineffective in results.

The device of my invention presents means whereby a single mechanism is employed to perform both of the above mentioned curtain and louvre movements insuring certainty of operation with a minimum of manual effort.

The simplicity of my device, its positive action of performance, its adaptability to windows of different construction, its possibility of remote control, its capability of concealment, its ease of operation and its many other novel and valuable features will be evident upon a consideration of my specification and its accompanying drawings, illustrating modifications of my device and in which similar parts are designated by similar numerals.

Figure 1 is an interior view of one form of the device of my invention adapted to a window.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged front view of the operating mechanism of the device of Figure 1.

Figure 4 is an enlarged section taken on the line 4—4 of Figures 1 and 3.

Figure 5 is an enlarged view of the louvre

operating mechanism of the device of Figure 1 with the louvres in one inclination.

Figure 6 is a view similar to that of Figure 5 with the louvres in a different inclination.

Figure 7 is an enlarged section taken on the line 7—7 of Figure 1 and on the line 7—7 of Figure 4.

Figure 8 is an enlarged section taken on the line 8—8 of Figure 1 and the line 8—8 of Figure 7.

Figure 9 is a perspective detail of a louvre of the device of Figure 1.

Figure 10 is a vertical section of a modified form of my device.

Figure 11 is a vertical section of another modified form of my device applied to a sky-light.

Figure 12 is a vertical section of another modified form of my device.

Figure 13 is a vertical section of a modified form of my device for limiting the movement of a curtain.

Figure 14 is a front view of a modified form of my device for limiting the movement of a curtain.

Figure 15 is an enlarged section taken on the line 15—15 of Figure 14.

Figure 16 is a front view of my device applied to an ordinary venetian curtain.

Figure 17 is an enlarged section taken on the line 17—17 of Figure 16.

Figure 18 is an enlarged section taken on the line 18—18 of Figure 17.

The particular form of the device of my invention shown in Figures 1 to 9 inclusive, is shown in conjunction with wall 20 within which is a housing frame 21 and upper and lower window sashes 22 and 23.

The operating mechanism consists of a revoluble shaft 24 supported by the hangers 25, 25. The shaft 24 carries the fixedly attached worm gear 26 meshing with the worm 27 fixedly attached to the drive shaft 28 supported by the hanger 29. The shaft 28 has the extended arm 30 and the handle 31. The shaft 24 carries the fixedly attached sprockets 32 and 33.

Figure 4 illustrates one side of the device. A revoluble shaft 34 is positioned within the

upper portion of the window casing and carries the fixedly attached sprocket 35. A chain belt 36 passes over the sprockets 32 and 35, the two ends of the chain 36 being attached at 37 and 38 to the movable bracket 39.

The bracket 39 carries the revoluble stub shaft 40, to which the sprocket 41 is fixedly attached, and the two revoluble idlers 42 and 43. A chain belt 44 fixedly attached at 45 and 46 passes over the sprocket 41 as shown particularly in Figures 5 and 6, the chain belt 44 thus being stationary and not movable with the belt 36. The sprocket 41 carries a stop-pin 47 abutable upon the bracket 39 limiting the revolution of the sprocket 41 as shown in Figures 5 and 6.

A similar movable bracket and chains are similarly positioned and connected to the sprocket 33 of the shaft 24.

The revoluble stub shaft 40 is extended into the member 48 having the two arms 49, 49. A louvre operating member 50 is fixedly attached between the two arms 49, 49, extends across the window and is similarly carried by a stub shaft member of the movable bracket upon the other side of the casement.

The curtain consists of a plurality of louvres 51, 51, each having an extended pin 52 at each end capable of longitudinal movement within a slot 53 of the face plate 54.

A plurality of flexible tapes 55, 55 are fixedly attached to the member 50 and each side of a louvre 51 by means of hooks 56, 56.

In order to prevent sudden shocks to the chain 36, and the corresponding opposite chain, and to indicate when the curtain movement is complete, the chain is broken and a spiral spring 57 employed to connect the two ends thereof.

For clearness of explanation of the operation of my device, I will refer to the movement of the elements upon one side of the casement, but it is to be understood that the same movements occur simultaneously in the elements upon the other side of the casement, in order that the curtain may be moved properly.

A revoluble movement of the handle 31 will cause the revolution of the shaft 28, the shaft 24 and the sprocket 32, causing the chain 36 to move in the direction of the arrow of Figures 4 and 5. As the chain 36 moves upwardly, the sprocket 41 will be revolved clock-wise by the fixed chain 44, until the stop pin 47 assumes the position shown in Figure 5, and the louvre 51 assumes the inclined position shown in that Figure. A further upward movement of the chain 36 will carry the movable bracket 39 upwardly thus moving the member 50 and all of the louvres 51, 51 upwardly as shown in Figure 8.

It will thus be seen that the curtain can be raised to any desired height.

If the handle 31 be moved in the opposite direction, the fixed chain 44 will first revolve the sprocket 41 in a counter clock-wise direction, causing the stop pin 47 and the louvres 51, 51 to assume the position shown in Figure 6, a further movement causing the louvres to descend and rest upon the supporting platform 58.

It will thus be noted that the inclination of the louvres can be changed for the desired admission of air and light by a slight movement of the handle 31 and this can be accomplished irrespective of the number of louvres employed as a curtain.

In the modified form of my device illustrated in Figure 10, the positions of the louvres 51, 51 and the member 50 are reversed from that shown in Figures 1 to 9, the louvres being collapsible in an upward direction into the upper part of the window frame, instead of downwardly into the lower part of the window frame as previously described.

Figure 11 illustrates a modified form of my device adapted for a skylight window 59, 59. In this modification the louvres move in a horizontal plane and the operating bar 28 is extended to allow of remote control.

Figure 12 illustrates a modified form of my device in which the stationary chain 44 previously described is omitted. In this modified form the chain 36 passes over the sprockets 32, 35 and 41. Idlers 60, 61, and 62 maintain the two flights of the chain 36 in parallel position with respect to each other. Assuming the device to be in the position shown in Figure 5, the movement of the chain in the direction of the arrows of Figure 12, will revolve the sprocket 41, causing the louvres 51, 51 to move from the position shown in Figure 5 to that shown in Figure 12, a further movement of the chain 36 causing the louvres to move downwardly within the window frame.

The modified form of my device illustrated in Figure 13 shows a means for preventing the further movement of the chain 36 when the louvres 51, 51 have reached their extreme upper and lower position. This movement-limiting means consists of a hooked member 63 having an extended member 64 abutable upon and slidable over the face of the housing frame, and a corresponding hooked member 65 having an extended member 66 abutable upon and slidable over the face of the housing frame. When the louvres have reached their desired lower position the member 63 engages the teeth of the sprocket 32 preventing further movement, and the member 65 when it engages the teeth of the sprocket 35 prevents further upward movement. The two flights of the chain 36 are maintained in parallel position by the idlers 66 and 67.

The modified form of the device of my invention shown in Figures 14 and 15 illus-

trates a modified means for limiting the movement of the chains 36 and 36'. The shaft 24 carries a fixedly attached worm gear 68 meshing with the slidable rack member 69.

5 The revolution of the shaft 24 moves the rack 69 until it abuts upon either stop 70 and 71, thus preventing further revoluble movement of the shaft 24.

10 Figures 16, 17 and 18 illustrate my device applied to the ordinary venetian shades having the louvres 51, 51 and being operated by the flexible cord, or tape, 72.

In this modification of my device, I employ a fixed chain 73 which passes over the 15 sprocket 41. As the cord, or tape, 72 is pulled downwardly, or allowed to move upwardly by the weight of the louvres 51, 51, the bracket 39 and its several elements move along the chain 73, resulting in a movement 20 of the louvres such as described in the other forms of my device.

It will be noted that my device can be readily incorporated as a unit within a window frame.

25 My invention, therefore, presents means whereby a louvre-curtain can be readily moved across an opening, such as a window, to cover a predetermined portion of said opening or window, and whereby the louvres 30 can be revolved a predetermined distance upon their axes, the mechanism of my device being of such construction that it performs both the movement of the curtain and the movement of the louvres.

35 I do not limit myself to the particular size, shape, number, arrangement or material of parts as specifically shown and described as these are given simply as a means for clearly describing the device of my invention.

40 What I claim is:—

1. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, 45 two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a curtain-carrier carried by each chain, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers adapted to revolve said louvres a 50 predetermined distance upon their axes and means adapted to revolve said sprockets simultaneously with one another and positively to hold said sprockets stationary for 55 thereby positively maintaining said louvre curtain at any position to which it may be moved across a window or the like.

2. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, 60 two oppositely positioned revoluble sprockets at the upper portion of said window, a traveling chain passing over and connecting said lower and upper sprockets upon each 65

side of said window, a curtain-carrier carried by each chain to travel therewith, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers adapted to revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another and positively to hold said sprockets stationary for thereby positively 70 maintaining said louvre curtain at any position to which it may be moved across a window or the like, and means independent of said louvres and cooperating with a said chain thereby to limit the traveling movements of said curtain-carrier. 75

3. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble curtain-carrier carried by each said chains including a sprocket with which said chain meshes, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers and connected with said louvres to revolve said louvres a predetermined distance upon their axes and means adapted to revolve said pairs of sprockets simultaneously with one another. 80 85 90 95

4. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a traveling chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble and traveling curtain-carrier carried by each said chains including a sprocket with which said chain meshes, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers and connected with said louvres to revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another, and means independent of said louvres and cooperating with a said chain thereby to limit the traveling movements of said curtain carrier. 100 105 110 115

5. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a curtain-carrier carried by each said chains, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers whereby the movement of said chains will revolve said louvres a predetermined distance upon their axes and means 120 125 130

adapted to revolve said sprockets simultaneously with one another.

6. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a traveling chain passing over and connecting said lower and upper sprockets upon each side of said window, a curtain-carrier carried by each said chains to travel therewith, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers whereby the movement of said chains will revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another and means independent of said louvres and co-operating with a said chain thereby to limit the traveling movements of said curtain-carriers.

7. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble curtain-carrier carried by each said chains including a sprocket with which said chain meshes, a louvre curtain carried by said curtain carriers, means carried by said curtain-carrier whereby the movement of said chains will revolve said louvres a predetermined distance upon their axes and means adapted to revolve said sprockets.

8. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a traveling chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble and traveling curtain-carrier carried by each said chains including a sprocket with which said chain meshes, a louvre curtain carried by said curtain carriers, means carried by said curtain-carrier whereby the movement of said chains will revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another and means independent of said louvres and co-operating with a said chain thereby to limit the traveling movements of said curtain-carriers.

9. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a movable chain passing over and connecting said lower and upper sprockets upon each side of said window, a fixed chain, a curtain-

carrier carried by each movable chain, a louvre curtain carried by said curtain carriers, means carried by said curtain-carrier whereby the movement of said movable chains will cause the fixed chain to revolve said louvres a predetermined distance upon their axes and means adapted to revolve said sprockets simultaneously with one another.

10. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a movable chain passing over and connecting said lower and upper sprockets upon each side of said window, a fixed chain, a curtain-carrier carried by each movable chain to move therewith, a louvre curtain carried by said curtain carriers, means carried by said curtain-carrier whereby the movement of said movable chains will cause the fixed chain to revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another and means independent of said louvres and co-operating with a said movable chain thereby to limit the movements of said movable chain and thus of said curtain-carrier.

11. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a movable chain passing over and connecting said lower and upper sprockets upon each side of said window, a fixed chain, a revoluble curtain-carrier carried by each movable chain to move therewith, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers and connected with said louvres whereby the movement of said movable chains will cause the fixed chain to revolve said curtain-carriers and thus to revolve said louvres a predetermined distance upon their axes and means adapted to revolve said sprockets simultaneously with one another.

12. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a movable chain passing over and connecting said lower and upper sprockets upon each side of said window, a fixed chain, a revoluble curtain-carrier carried by each movable chain to move therewith, a louvre curtain carried by said curtain-carriers, means carried by said curtain-carriers and connected with said louvres whereby the movement of said movable chains will cause the fixed chain to revolve said curtain-carriers and thus to revolve said louvres a predetermined distance upon their axes, means adapted to revolve said sprockets simultaneously with one another.

other and means independently of said louvres and co-operating with a said movable chain thereby to limit the movements of said movable chain and thus of said curtain-carrier.

13. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a curtain-carrier carried by each said chains, a louvre curtain carried by said curtain carriers, means whereby the movement of said chains will first revolve said louvres a predetermined distance upon their axes, a further movement of said chains moving said curtain-carriers and louvres bodily therewith and means adapted to revolve said sprockets simultaneously with one another.

14. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a traveling chain passing over and connecting said lower and upper sprockets upon each side of said window, a curtain-carrier carried by each said chains to travel therewith, a louvre curtain carried by said curtain carriers, means whereby the movement of said chains will first revolve said louvres a predetermined distance upon their axes, a further movement of said chains bodily moving said curtain-carriers and louvres to travel therewith, means adapted to revolve said sprockets simultaneously with one another and means independent of said louvres and co-operating with a said chain thereby to limit the traveling movements of said curtain-carriers and louvres.

15. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble curtain-carrier carried by each said chains including a sprocket with which said chain meshes, a louvre curtain carried by said curtain-carriers, means whereby the movement of said chains will first revolve said louvres a predetermined distance upon their axes, a further movement of said chains moving said curtain-carriers and louvres bodily therewith and means adapted to revolve said sprockets simultaneously with one another.

16. In a curtain-operating device, in combination, two oppositely positioned revoluble sprockets at the lower portion of a window, two oppositely positioned revoluble sprockets at the upper portion of said window, a travel-

ing chain passing over and connecting said lower and upper sprockets upon each side of said window, a revoluble curtain-carrier carried by each said chains to travel therewith and including a sprocket with which said chain meshes, a louvre curtain carried by said curtain-carriers, means whereby the movement of said chains will first revolve said louvres a predetermined distance upon their axes, a further movement of said chains bodily moving said curtain-carriers and louvres to travel therewith, means adapted to revolve said sprockets simultaneously with one another and means independent of said louvres and co-operating with a said chain thereby to limit the traveling movements of said curtain-carriers and louvres.

17. In a curtain-operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their inclination, a single unitary operating mechanism for such curtain and its louvres comprising operable means to be operated for changing the angle of inclination of said louvres, and operating means in common for operating said operable means and for moving said curtain across the window opening.

18. In a curtain-operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their inclination, a single unitary operating mechanism for such curtain and its louvres comprising means for moving said curtain across the window opening, and means to be operated for changing the angle of inclination of said louvres connected to said operating means so as to be operated thereby.

19. In a curtain operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their inclination, a single unitary operating mechanism for such curtain and its louvres comprising a curtain carrier mounted for bodily traveling movement to traverse the window opening and also for limited rocking angular movement to change its angle of inclination, connections whereby the louvres partake of each of said movements of the curtain carrier, operating means for moving said curtain including an actuating member to be moved for transmitting traveling movement to said curtain carrier and to be moved in the opposite direction for transmitting oppositely traveling movement to said curtain carrier, and means operable to change the inclination of said louvres whereby movement of said actuating member immediately imparts rocking torque to said curtain carrier and movement of said actuating member in the opposite direction

immediately imparts rocking torque to said curtain carrier in the reverse direction so that thus a slight movement of said actuating member will be effective to change the inclination of said louvres and further movement of said actuating member in the same direction will be effective to move said louvre curtain across the window opening.

20. In a curtain-operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their inclination, a single unitary operating mechanism for such curtain and its louvres comprising a curtain carrier mounted for bodily traveling movement to traverse the window opening and also for limited rocking angular movement, connections whereby the louvres partake of each of said movements of the curtain carrier, operating means for imparting traveling movement to the curtain carrier, an element having a convexly curved periphery fixed on the curtain carrier, stop means for limiting the rocking movement of said element and curtain carrier, and an independently mounted longitudinally extending member in operative engagement with the periphery of said element and relatively to which said element in its traveling movement may have rolling followed by sliding engagement thereby to change the inclination of said louvres while providing for the movement of said louvre curtain across the window opening.

21. In a curtain-operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their angle of inclination, a single unitary operating mechanism for such curtain and its louvres comprising operating means for moving said curtain across the window opening, a curtain carrier mounted for limited rocking movement and for bodily traveling movement with said curtain connections between the curtain carrier and the louvres whereby rocking movement of the curtain carrier will change the inclination of the louvres, a traveling bracket providing a bearing for said curtain carrier, a sprocket wheel fixed to the curtain carrier and having a toothed peripheral portion and a smooth peripheral portion in circumferential alignment with its toothed portion, a pair of chain-guides on said bracket respectively at opposite sides of said sprocket wheel in the direction of said traveling movement, and a sprocket chain relatively to which said bracket is movable and extending in said direction of traveling movement between said chain-guides and said sprocket wheel in operative engagement with the periphery of the latter so that thereby relative traveling movement between said bracket and sprocket

chain will be effective to change the angle of inclination of the louvres.

22. In a curtain-operating device, in combination with a louvre curtain mounted to be moved across a window opening and having its louvres mounted for angular movement to change their angle of inclination, a single unitary operating mechanism for such curtain and its louvres comprising means for moving said curtain across the window opening, a curtain carrier mounted for limited rocking movement and for bodily traveling movement with said curtain, connections between the curtain carrier and the louvres whereby rocking movement of the curtain carrier will change the inclination of the louvres, a traveling bracket providing a bearing for said curtain carrier, a sprocket wheel fixed to the curtain carrier and having a toothed peripheral portion and a smooth peripheral portion in circumferential alignment with its toothed portion, a pair of chain-guides on said bracket respectively at opposite sides of said sprocket wheel in the direction of said traveling movement, and a fixed sprocket chain extending in the direction of said traveling movement between said chain-guides and sprocket wheel in operative engagement with the periphery of the latter to have meshing engagement with its teeth followed by sliding engagement thereby to be effective to change the inclination of said louvres while providing for the movement of the louvre curtain across the window opening.

23. In a curtain-operating device, in combination, an operating shaft extending transversely along an end of a window opening or the like, means for rotating said shaft including worm gearing for locking said shaft against incidental rotation, a sprocket wheel fixed upon each of the opposite ends of said shaft, an endless flexible member at each side of the window opening including a sprocket chain passing around each of said sprocket wheels and having its two runs extending therefrom towards the other end of the window, a supporting guide at the said other end of the window for each of said flexible members around which it passes and from which its two runs extend to said sprockets and a louvre curtain carried by a run of each of said flexible members which moves in the same direction thereby to move said curtain across the window opening and hold it in any position to which it may be moved.

24. In a curtain-operating device, in combination, a single unitary operating mechanism comprising an operating shaft extending transversely along an end of a window opening or the like, means for rotating said shaft including worm gearing for locking said shaft against incidental rotation, a sprocket wheel fixed upon each of the opposite ends of said shaft, and endless flexible

member at each side of the window opening including a sprocket chain passing around each of said sprocket wheels and having its two runs extending therefrom towards the other end of the window, a supporting guide at the said other end of the window for each of said flexible members around which it passes and from which its two runs extend to said sprockets, a unitary housing frame within which said operating mechanism is mounted, and a louvre curtain carried by a run of each of said flexible members which moves in the same direction thereby to move said curtain across the window opening and hold it in any position to which it may be moved.

25. In a curtain-operating device, in combination, an operating shaft extending transversely along an end of a window opening or the like, means for rotating said shaft including worm gearing for locking said shaft against incidental rotation, a sprocket wheel fixed upon each of the opposite ends of said shaft, an endless flexible member at each side of the window opening including a sprocket chain passing around each of said sprocket wheels and having its two runs extending therefrom towards the other end of the window, a supporting guide at the said other end of the window, for each of said flexible members around which it passes and from which its two runs extend to said sprockets, a bracket carried by a run of each of said flexible members which moves in the same direction, a curtain carrier mounted for limited rocking movement on each of said brackets, a louvre curtain carried by said curtain carriers and connected therewith to have the inclination of its louvres changed by rocking movement of the curtain carriers, a wheel element fixed to each of said curtain carriers, chain-guides on each of said brackets, and a fixed flexible member extending in the same direction as the runs of each of said endless flexible members and guided by said chain-guides in operative engagement with one side of the periphery of said wheel element so as thereby to be effective to change the inclination of said louvres while providing for the movement of the louvre curtain across the window opening.

26. In a curtain-operating device, in combination, an operating shaft extending transversely along an end of a window opening or the like, means for rotating said shaft including worm gearing for locking said shaft against incidental rotation, a sprocket wheel fixed upon each of the opposite ends of said shaft, an endless flexible member at each side of the window opening including a sprocket chain passing around each of said sprocket wheels and having its two runs extending therefrom towards the other end of the window, a supporting guide at the said other end of the window for each of said flex-

ible members around which it passes and from which its two runs extend to said sprockets, a bracket carried by a run of each of said flexible members which moves in the same direction, a curtain carrier mounted for limited rocking movement on each of said brackets, a louvre curtain carried by said curtain carriers and connected therewith to have the inclination of its louvres changed by rocking movement of the curtain carriers, a wheel element fixed to each of said curtain carriers, and guides on each of said brackets for maintaining the other run said endless flexible member at that side in operative engagement with one side of the periphery of said wheel element so as thereby to be effective to change the inclination of said louvres while providing for the movement of the louvre curtain across the window opening.

27. In a curtain-operating device, in combination, a unitary housing frame to be mounted in position to surround a window opening or the like, a louvre curtain mounted in said frame to be moved across the window opening and having its louvres mounted for angular movement to change their inclination, and a single unitary operating mechanism for such curtain and its louvres mounted within and supported by said unitary housing frame; said operating mechanism comprising two similar two-run sprocket chains respectively extending within the housing frame along the sides thereof, a pair of similar sprocket wheels around which adjacent ends of the runs of said chains respectively pass, a pair of supporting guides around which the other ends of the runs of said chains respectively pass, operating means for concomitantly rotating said sprocket wheels in unison, a bearing bracket carried by a run of each of said chains which moves in the same direction, a curtain carrier journaled for limited rocking movement on each of said brackets and connected with said louvres for imparting angular movement and also bodily traveling movement thereto, a sprocket wheel fixed to the curtain carrier and having a toothed peripheral portion and a smooth peripheral portion in circumferential alignment with its toothed portion, a pair of chain-guides respectively on the ends of said bracket in alignment with said sprocket wheel in the direction of traveling movement of said bracket, and a fixed sprocket chain fixedly anchored at its ends within said housing frame and passing between said chain guides and the periphery of said sprocket wheel in operative engagement with one side of the periphery of the latter to have meansing engagement with its teeth for changing the inclination of the louvres and to have relative sliding engagement which provides for the movement of the louvre curtain across the window opening.

28. In a curtain-operating device, in com-

ination, a unitary housing frame to be mounted in position to surround a window opening or the like, a louvre curtain mounted in said frame to be moved across the window opening and having its louvres mounted for angular movement to change their inclination, and a single unitary operating mechanism for such curtain and its louvres mounted within and supported by said unitary housing frame; said operating mechanism comprising two similar two-run sprocket chains respectively extending within the housing frame along the sides thereof, a pair of similar sprocket wheels around which adjacent ends of the runs of said chains respectively pass, a pair of supporting guides around which the other ends of the runs of said chains respectively pass, operating means for concomitantly rotating said sprocket wheels in unison, a bearing bracket carried by a run of each of said chains which moves in the same direction, a curtain carrier journaled for limited rocking movement on each of said brackets and connected with said louvres for imparting angular movement and also bodily traveling movement thereto, a sprocket wheel fixed to the curtain carrier and having a toothed peripheral portion and a smooth peripheral portion in circumferential alignment with its toothed portion, and a pair of chain-guides respectively on the ends of said bracket in alignment with said sprocket wheel in the direction of traveling movement of said bracket for maintaining the reversely moving other run of said sprocket chain in operative engagement with one side of the periphery of said sprocket wheel on the bracket to have meshing engagement with its teeth for changing the inclination of the louvres and to have relative sliding engagement therewith to provide for the movement of the louvre curtain across the window opening.

Signed at New York in the county of New York and State of New York this 18th day of April, 1932.

EDWARD F. SIBBERT.

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