

F. W. ADLOF.
WINDOW CURTAIN OPERATING MECHANISM.
APPLICATION FILED MAY 2, 1911.

1,059,257.

Patented Apr. 15, 1913.

6 SHEETS—SHEET 1.

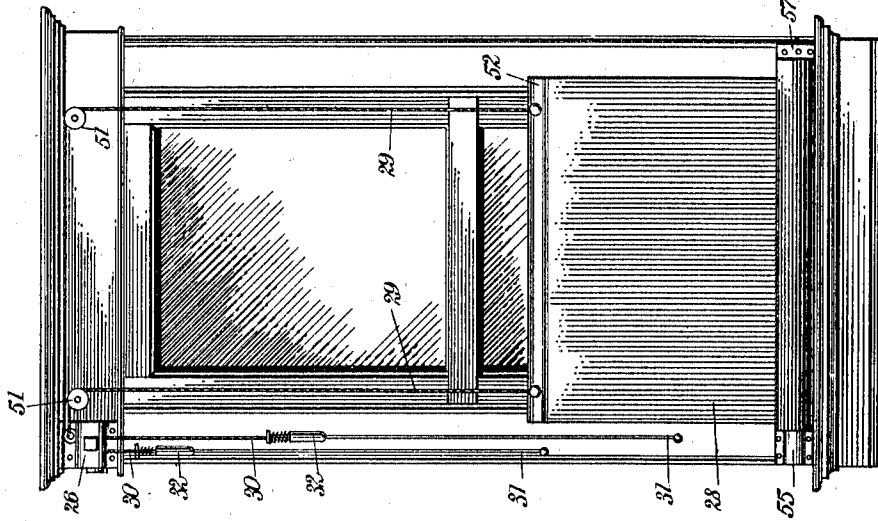


Fig. 2

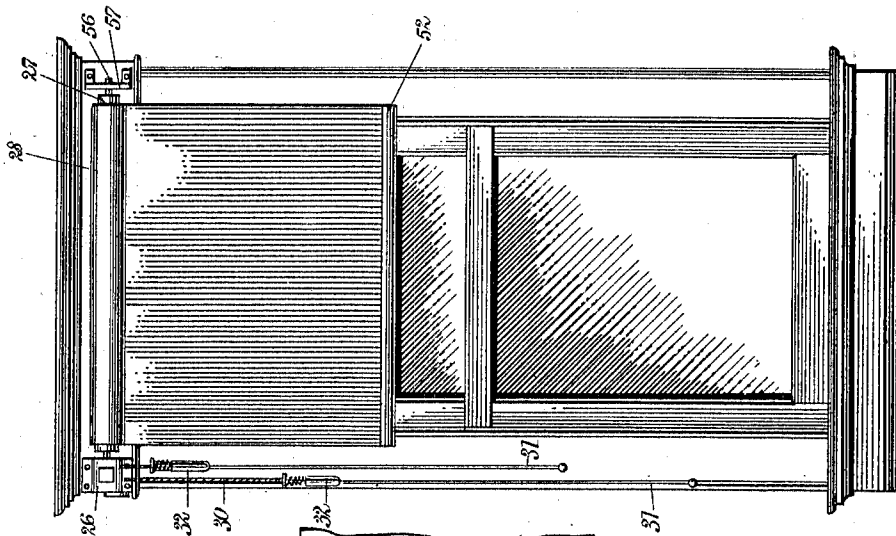


Fig. 1

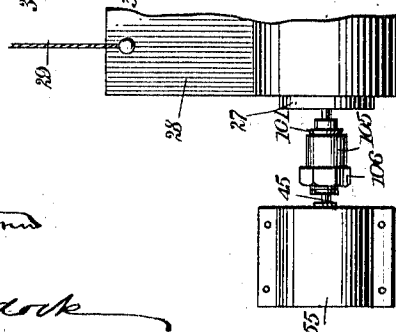


Fig. 3

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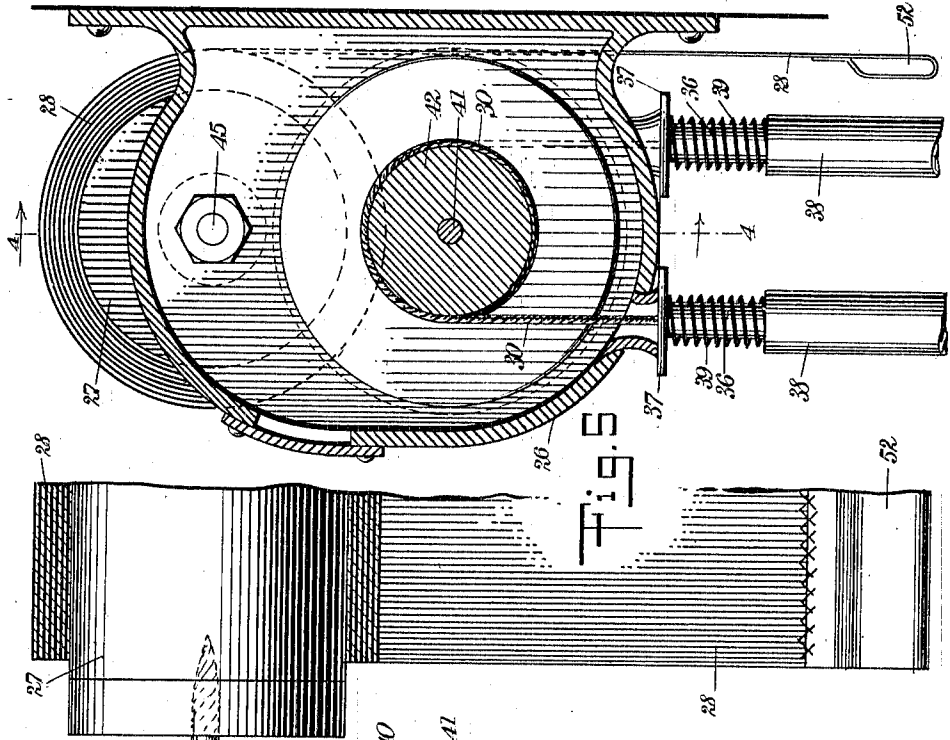


Fig. 5

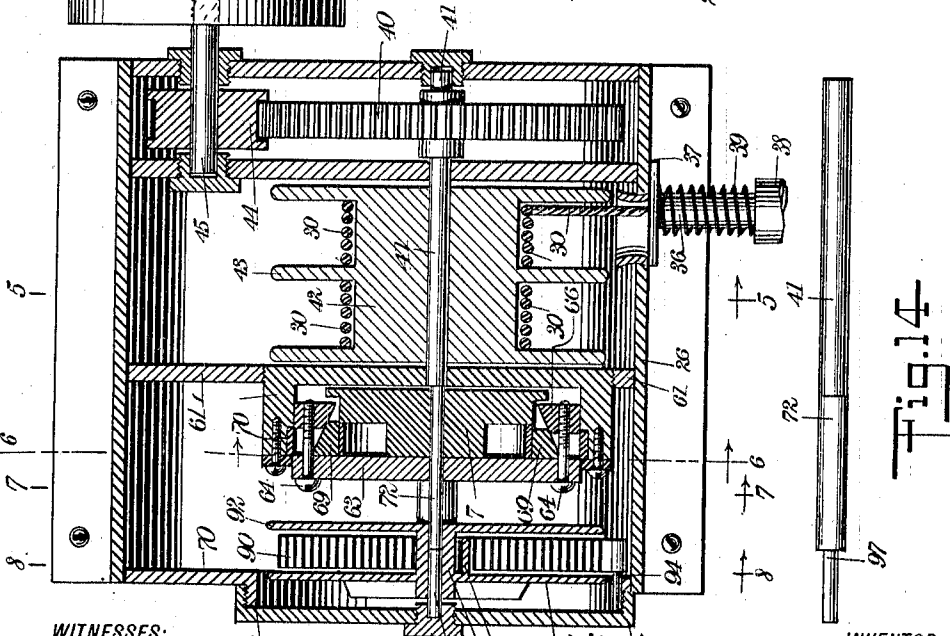


Fig. 4

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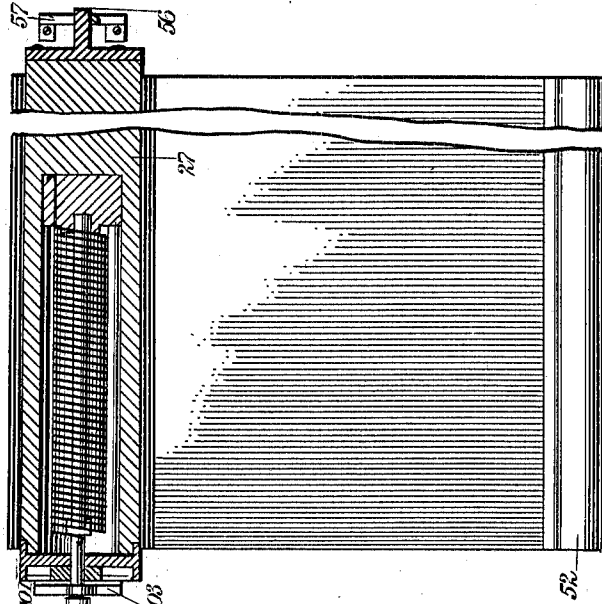


Fig. 16

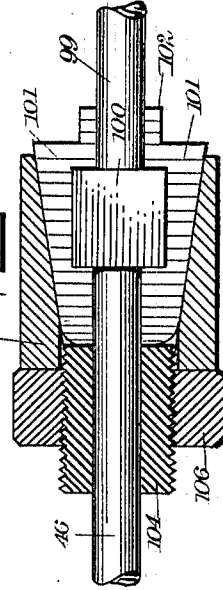


Fig. 17

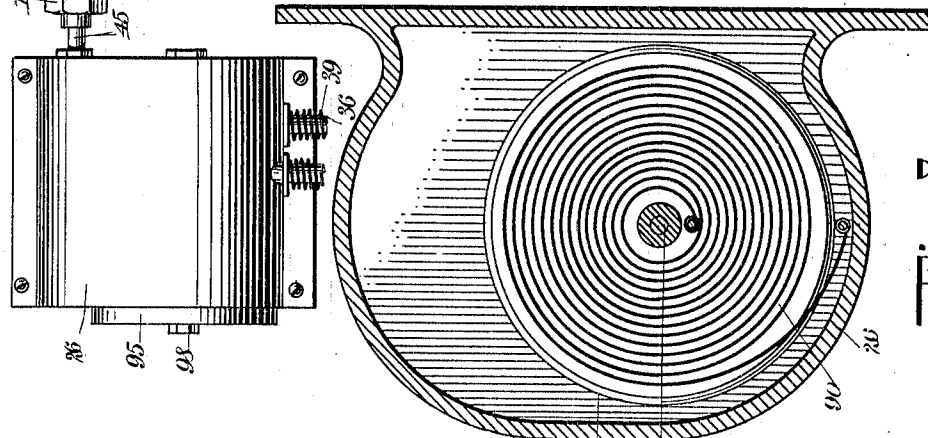


Fig. 18

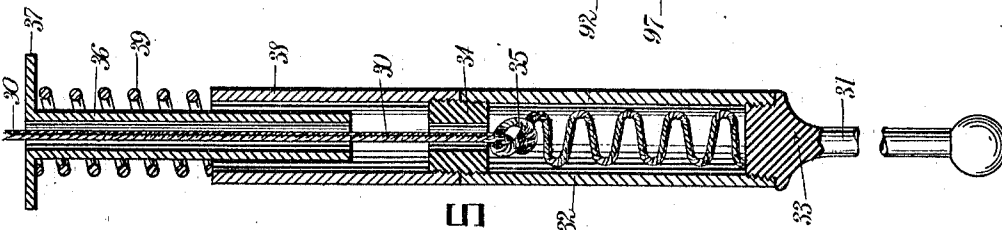


Fig. 19

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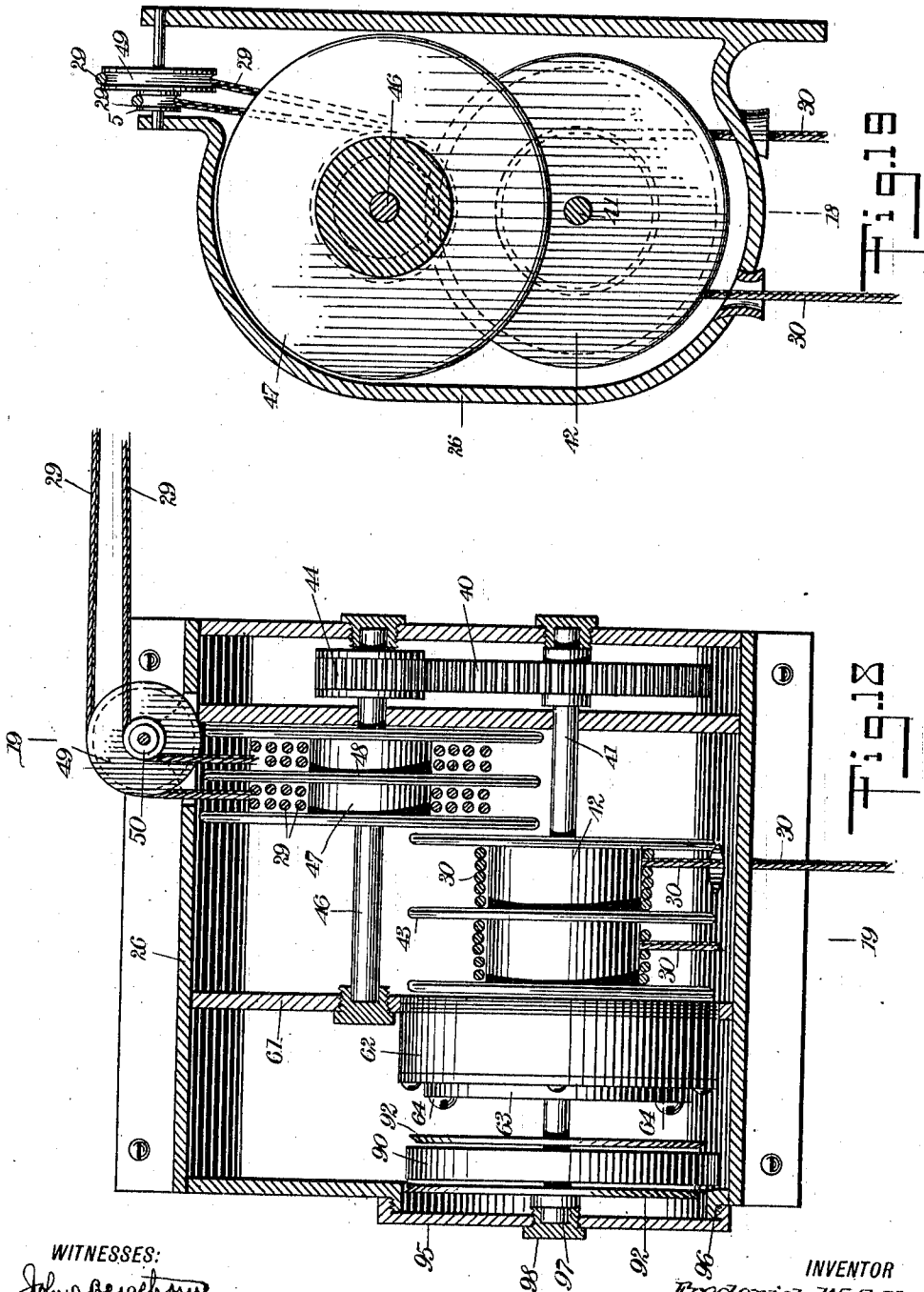
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6 SHEETS—SHEET 5.



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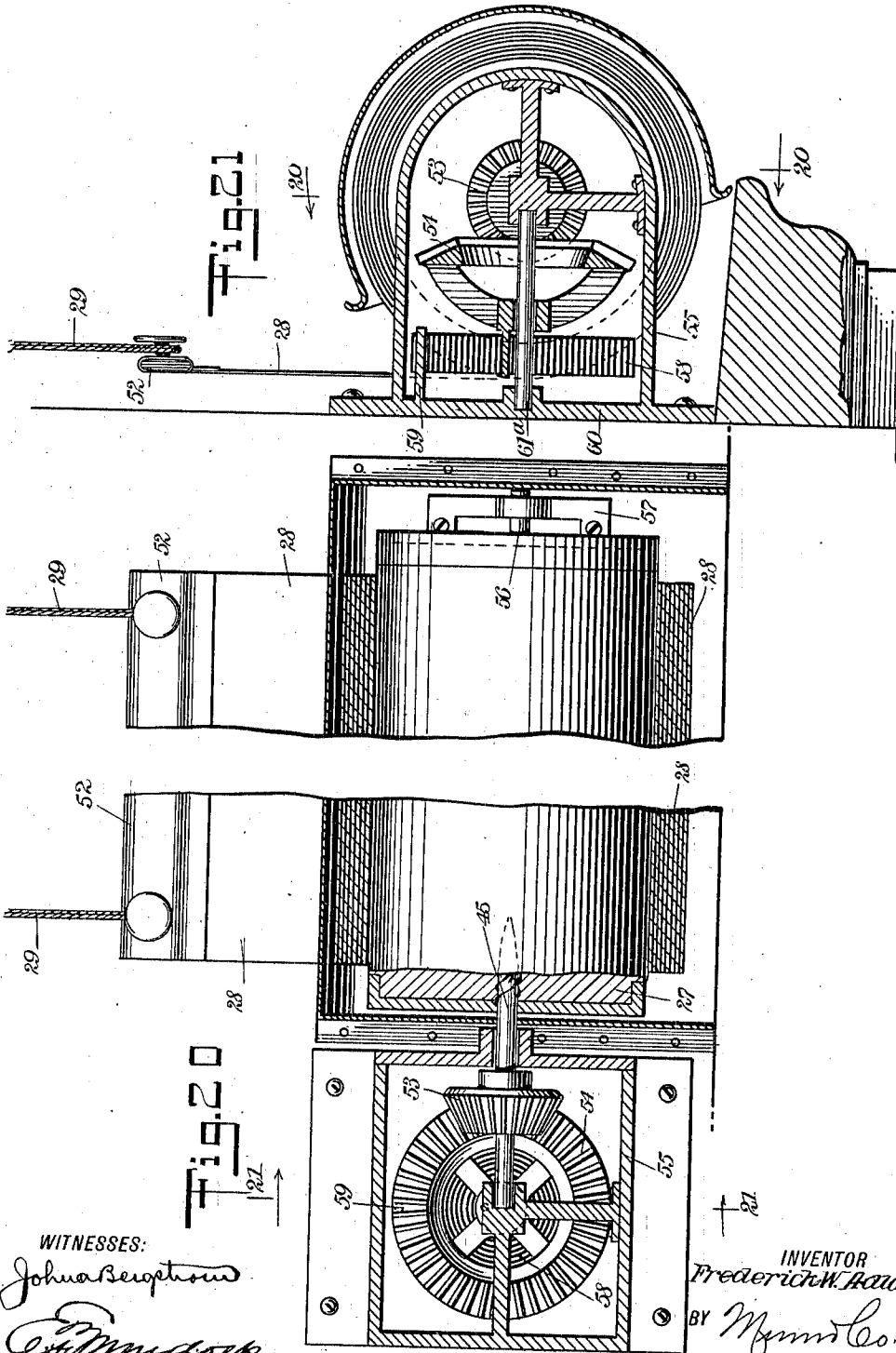
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UNITED STATES PATENT OFFICE.

FREDERICK W. ADLOF, OF NEW KENSINGTON, PENNSYLVANIA.

WINDOW-CURTAIN-OPERATING MECHANISM.

1,059,257.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed May 2, 1911. Serial No. 624,539.

To all whom it may concern:

Be it known that I, FREDERICK W. ADLOF, a citizen of the United States, and a resident of New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented a new and Improved Window-Curtain-Operating Mechanism, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide means for operating a window curtain which is positive and independent of springs or other devices subject to disorganization; to provide a mechanism for adjusting a curtain the operation whereof is simplified and accelerated; and to provide a mechanism of the character mentioned adapted for operation to lift the curtain from the sill of the window upward.

With these objects in view the invention consists in producing a winding mechanism manually operable to rotate the curtain roller.

It further consists in forming a mechanism of the character mentioned having incorporated therein a balancing spring and holding brake, the operation of which permits the accurate adjustment of the window curtain.

It further consists in constructing a casing for a winding mechanism of the character named affording easy and ready access to the mechanism within said casing.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a front elevation of a window having applied thereto a curtain and operating mechanism therefor constructed and arranged in accordance with the present invention; Fig. 2 is a similar view showing the curtain adjusted at the sill to operate toward the head of the window; Fig. 3 is a detail view, on an enlarged scale, showing a means for adjusting curtains of usual construction to the operating mechanism constructed in accordance with the present invention; Fig. 4 is a vertical longitudinal section taken on the line 4—4 in Fig. 5; Fig. 5 is a detail view in vertical cross section taken on the line 5—5 in Fig. 4; Fig. 6 is a detail view in vertical cross section taken

on the line 6—6 in Fig. 4; Fig. 7 is a similar view taken on the line 7—7 in Fig. 4; Fig. 8 is a similar view taken on the line 8—8 in Fig. 4; Figs. 9 to 13 inclusive are detail views forming a part of the brake mechanism; Fig. 14 is a detail view showing the driving shaft of the operating mechanism; Fig. 15 is a detail view in vertical cross section of one of the operating rods for controlling the operating mechanism; Fig. 16 is a view showing the window curtain operating mechanism in conjunction with a window curtain of ordinary construction, the spring actuated roller thereof being shown in section; Fig. 17 is a detail view on an enlarged scale, showing the method of connecting the curtain roller or ordinary construction to the operating mechanism herein disclosed; Fig. 18 is a vertical longitudinal section taken on the line 18—18 in Fig. 19; Fig. 19 is a vertical cross section taken on the line 19—19 in Fig. 18; Fig. 20 is a vertical longitudinal section taken on the line 20—20 in Fig. 21; and Fig. 21 is a vertical cross section taken on the line 21—21 in Fig. 20.

As shown in the accompanying drawings, and in Figs. 1 and 2 thereof, the containing case 26 is mounted upon the window frame and upon the head thereof. In Fig. 1 the case is shown as directly connected with the curtain roller 27 upon which the curtain 28 is rolled. In Fig. 2 the curtain roller 27 is adjusted in suitable bearings adjacent the sill of the window, and the curtain 28 is connected with the operating mechanism contained in the case 26 by means of cords 29. In both installations the operating mechanism contained in the case 26 is actuated by the pull cords 30, to manipulate which there are provided the rods 31. The rods 31 are connected with the cords 30 by means of pocket sockets 32. The socket 32 is best seen in Fig. 15 of the drawings. The lower section of the socket is constructed from a short tube the end whereof is tapped to form a screw thread thereon, one of said threads being thread engaged with the head 33 of the rod 31. The other end of the short tube is thread engaged with a plug 34. The plug 34 is provided with a central perforation for the passage of the cord 30, a knot 35 being formed in the said cord after the same has passed through the perforation in the plug 34. To cushion the blow of the sockets 32 against the case 26 there are pro-

vided thimbles 36, at the upper end whereof are formed extended flanges 37. The thimbles 36 are guided by short tubular sections 38, which sections 38 are thread engaged with the plug 34. Interposed between the flange 37 of the thimble 36 and the end of the tubular section 38 is a spiral spring 39. It will be understood that there is a socket 32 and thimble 36, with the parts above described therewith, mounted on each of the cords 30.

In both forms of installation shown in Figs. 1 and 2 the rotation of the curtain roller 27 is accomplished by operatively connecting the same with a driving gear wheel 40. The wheel 40 is fixedly mounted upon a shaft 41 upon which is also mounted the double sectioned winding spool 42. The spool 42 is equally divided by a flange 43, forming thereby on the said spool adjacent winding compartments for the two cords 30. The cords 30, 30, it will be understood are wound upon the spool 42 in opposite directions so that the pull exerted on one of the cords 30 will rotate the spool 42 and shaft 41 connected therewith in one direction, while the pull on the other cord 30 will rotate the said spool and shaft in the opposite direction. The motions thus imparted to the spool 42 are transmitted from the shaft 41 by the wheel 40 to the pinion 44 and shaft 45 to which the said pinion is rigidly secured. In the form of installation shown in Fig. 1 the shaft 45 is screw threaded at the outer end and directly connected with the curtain roller 27 in such manner as to rotate the said roller in unison with the said shaft.

In the form of installation shown in Fig. 2 of the drawings, the shaft 45 is substituted by the shaft 46, upon which shaft is fixedly mounted a two-sectioned winding spool 47. The spool 47 is divided into two compartments by a central flange 48, as seen best in Fig. 18 of the drawings. When operating the construction shown in Fig. 18 the spool 42 is rotated by manipulating the same through the cords 30, and the shaft 46 and spool 47 are rotated to wind or unwind as the case may be, the hanging cords 29.

The ratio of the diameters of the wheel 40 and the pinion 44 may be varied to suit the operating conditions desirable for the curtain. When operating the curtain 28 from the sill of the window, and employing the cords 29, the same are guided by two pulleys 49 and 50, which pulleys have different dimensions. The difference in diameter of the pulleys 49 and 50 is such that the cord 29 is guided by each pulley to feed upon the spool 47 and into the opposite winding sections provided thereon. The cords 29, 29 are supported on the head of the window frame by means of guide pulleys 51.

In the form of installation shown in Fig.

1 the slack of the curtain is taken up by the weight of the same and the rod usually mounted in the looped end 52 of the curtain. In the form shown in Fig. 2 the looped end 52 being inverted the installation necessitates the employment of some special device for taking up the slack in the curtain. The mechanism employed by me for this purpose is best shown in Figs. 20 and 21. The curtain roller 27 is here shown as carrying the shaft 45. The shaft 45 in this form of the installation has fixedly attached thereon a bevel pinion 53. The pinion 53 is meshed with a matched bevel gear wheel 54 which is suitably mounted in bearings formed in the casing 55. The casing 55, as seen in Fig. 2 of the drawings, is rigidly mounted on one of the vertical rails of the window frame. The trunnion 56 mounted in the opposite end of the roller 27 has a bearing 57 provided therefor on the vertical rail of the frame at the opposite side of the window. The roller 27 and bevel pinion 53 connected therewith are normally rotated to wind the roller 27 by the bevel gear wheel 54 and the spiral spring 58 operatively connected therewith and mounted in the casing 55. The fixed end of the spring 58 is anchored in a post 59 set out from the base 60 of the casing 55. This construction is best seen in Fig. 21 of the drawings. The normal operation of the spring 58 is to rotate the shaft 61^a, gear 54, pinion 53 and roller 27 connected therewith. The rotation of the roller 27 is only prevented by the cords 29, 29 by which the curtain 28 is suspended. It will be understood that whenever the cords 29, 29 are slacked the spring 58 and transmission mechanism connected therewith operate to rotate the roller 27 and gather thereon the curtain 28. Against the strain of the spring 58 in the one case, and the weight of the curtain in the other case, the shaft 41 is held from rotation by a brake fixedly connected to rotate with the shaft 41. The brake referred to is mounted in the case 26 and in a chamber thereof separated from that containing the spool 42 by a partition 61. The partition 61 is provided with an enlarged opening concentric with the shaft 41, the edge of the opening being provided with a screw thread to support the brake box 62. The box 62 is held fixedly in the partition 61, and is centrally bored to form a bearing for the shaft 41, as is best seen in Fig. 4 of the drawings. The box 62 contains the various members forming the brake employed in the present invention, and is closed by a cover 63. The cover 63 is fixedly mounted on the shaft 41, the section 72 thereof being flattened to extend through the said cover to key the same on the said shaft. The flattened portion 72 of the shaft 41 is also extended through a disk 71, an elliptical perforation 73 being provided

therefor. Upon the disk 71 are raised bosses 74. The bosses 74 have formed therein threaded holes 75 to be engaged by the screws 76. The screws 76 are extended through suitable perforations provided in the cover 63, and when driven home bind the disk 71 and the cover 63 together. Mounted between the disk 71 and the cover 63 are the brake shoes 70. One of the shoes 70 is shown in detail in Fig. 9 of the drawings. As there seen, the shoe is provided with a central recess 77, the straight sides whereof form a guide for the movement of the brake blocks 69 when the same are deposited in the recesses 77. The brake block 69 and the brake shoe 70 are shaped to receive the leaf springs 78. The springs 78 are shaped as shown in Fig. 13, having a central bend 79 which fits within the recess 80 formed in the block 69. See Fig. 11. At the outer end of the springs are formed the curled pivot portions 81. The pivot portions 81 are adapted to rest in the pivot seats 82 formed at the end of the slots 83 in each shoe 70. Each of the brake shoes 70 and blocks 69 connected therewith is mounted upon a disk 71, the bosses 74 extending between the bowed extensions of the springs 78. In this position the plates 84 extend into the narrow channel 85 formed between the bowed extensions of each of the springs, as seen best in Figs. 6 and 13 of the drawings. The pressure exerted outwardly by the springs 78 upon the shoes 70 is regulated by means of the wedge blocks 66, which are manipulated by means of the screws 64 to become jammed between the blocks 69 and the shoes 70. To this end the blocks 66 are provided with a screw threaded perforation 65 and an inclined surface 67. To receive and guide the blocks 66 the shoes 70 are provided with a recess 86, at the opening whereof is formed two projections 87 which extend within the grooves 88 formed in the opposite sides of the blocks 66. The blocks 69 are for the same purpose, to wit, to form a guide for the blocks 66 provided with the recess 68, shown best in dotted lines in Fig. 11 of the drawings.

It will be noted that the recess 80 is provided with a slightly flattened side 89, which when the block 69 is moved toward the center of the disk 71 compresses and flattens the bent portion 79 of the spring 78. The bended portion 79 being incased within the recess 80 forms a seated spring. When the wedge block 66 is drawn toward the cover 63 in the first part of the operation the bowed extensions of the spring yield, bending from the flared ends of the bosses 74, as shown best in Fig. 6 of the drawings. When the extent of the action of the bowed extensions of the spring has been reached the flattened surface 89 of the block 69 is forced against the bended portion 79 of

the spring, and compresses the said bended portion. It will be noted that by means of this arrangement a spring cushion is formed for the shoes 70. The tension of the pressure of the shoes 70 against the side of the brake box 62 is varied at will. To vary the said tension the screws 64 are manipulated to draw the blocks 66 toward the cover 63 or extend the same away therefrom. It will be understood that when the tension is once set it so remains until the screws 64 are again manually manipulated.

It is to counterbalance the weight of the curtain 28 in its various extensions that I have provided the coiled spring 90. The spring 90 is coiled upon a spool 91, the flanges 92 whereof form guides for the said spring. The inner end of the spring 90 is anchored to a binding post 93 formed adjacent the center of the hub of the spool 91. The outer end of the spring is held in a binding post 94 extended from the side of the case 26. The cover 95 is screw threaded to engage the screw threads formed in the annular flange 96 extended from the side of the case 26. The spool 91 with spring 90, is inserted over the section 72 of the said shaft to counterbalance the rotary effect thereon of the curtain 28. The end of the section 97 of the shaft 41 is mounted in the bearing formed in the screw threaded button 98.

The purpose of the cover 95 is to permit the adjustment of the spring 90 to vary the initial tension thereof on the shaft 41. The cover 95 is unscrewed from its engagement with the flange 96, and the spool 91 is then exposed for manipulation by the operator. It will be understood that from time to time the tension of the spring will be thus varied as the same weakens from age or from other reasons. The spring 90 is so arranged that as the curtain is extended the spring is wound so that as the weight of the curtain gradually increases in like proportion the tension of the spring is increased. The spring is selected for qualities rendering it acceptable for the purpose of counterbalancing the increasing weight of the curtain.

In Figs. 16 and 17 is shown the arrangement whereby is adapted for use, in conjunction with the present operating mechanism, an automatic roller of the common type. The shaft 99 of the ordinary roller, having the flattened end 100 as seen in Fig. 17, is held between loose chuck jaws 101. The jaws 101 are provided with a boss 102 adapted to rest against the ratchet plate 103 of the common Hartshorn roller. Either of the shafts 45 or 46, as the case may be, is provided with a screw block 104 which is fixedly mounted upon the said shaft. An internally tapped collar 105 is loosely mounted upon the jaws 101, as seen in Fig. 17. A follower nut 106 is provided which is

thread engaged with the block 104 so that when manipulated it is forced against the collar 105 to move the same over the jaws 101 and to contract the same upon the shafts 46 and 99 and imprison therebetween the flattened end 100.

With an operating mechanism constructed and arranged as shown in the accompanying drawings and as above described the operating for raising and lowering the window curtain is as follows: The installation having been made either as shown in Fig. 1 or as shown in Fig. 2, one of the rods 31 is grasped by the operator, the selection being made with reference to whether the operation is to raise or lower the curtain. By then pulling upon the selected rod the spool 42 is rotated to transmit its rotary motion to the curtain roller 27 in the manner above described through the gear wheel 40 and the pinion 44. The ratio between the gear wheel 40 and pinion 44 is such as to accelerate the rotary speed produced on the roller 27 over and above that produced on the shaft 41. The rotation of the shaft 41 and parts connected therewith is against the hold of the brake shoes 70. When the curtain has been properly adjusted the grip of the shoe 70 on the box 62 is sufficient to hold the shaft 41 from further rotation. This action of the brake shoes 70 is assisted by the operation of the balancing spring 90 in the manner as above set forth.

While I have herein described a certain form of mechanism for effecting the purposes set forth, it will be understood that I am not confined to the details of structure of the parts thereof nor to the particular assemblage described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In combination; a window curtain; a roller for said curtain, a rotary drum; a driving shaft fixedly mounted on said drum; a connecting shaft for engaging the window curtain roller; a transmission mechanism operatively connecting said shafts; a brake member fixedly mounted on said driving shaft adapted to hold said driving shaft against the pull of the window curtain; and a plurality of cables adapted to wind on said drum to rotate the same in opposite directions while being unwound from said drum.

2. In combination; a window curtain; a roller provided with supporting trunnions therefor; a driving shaft; a transmission mechanism connecting said trunnions and said driving shaft; a rotary drum fixedly mounted on said driving shaft; an operating cable wound upon said drum in opposite directions; a manually operated mechanism for manipulating said drum; and a balancing spring mounted on said driving

shaft to balance the weight of said curtain, said spring adapted to wind on said shaft as the said curtain is unwound on its roller.

3. In combination; a window curtain; a roller; a cord driven mechanism for rotating said roller; a holding brake for said roller adapted to control the rotation thereof; a counter-balancing device for said curtain; and manually controlled means for operating said cord driven mechanism.

4. In combination; in a window curtain; a roller for said curtain, a cord operated driving mechanism having a driving shaft; a winding drum fixedly mounted thereon; two cables wound on said drum to rotate the same as the said cables are unwound from said drum; manually operated means for manipulating said cables to rotate said drum alternately in opposite directions; a brake having a fixed drag and fixedly connected with said shaft; a brake shoe for said brake; and a coiled spring anchored to said shaft and adapted to be wound thereon in unison with the unwinding of the curtain on its roller to counter-balance the increasing rotary strain of said curtain on said roller.

5. In combination; in a window curtain; a roller for said curtain, a brake having a stationary cylindrical wearing member; a plurality of shoes to bear upon said member; resilient means to normally move said shoes toward said wearing member; and means for increasing the operative tension of said resilient means.

6. In combination; in a window curtain; a roller for said curtain, a brake having a rotary body portion; a stationary cylindrical wearing member surrounding and concentric with said body portion; a plurality of brake shoes connected to rotate with said body portion; resilient means mounted on said body portion to normally thrust said brake shoes to bear against said wearing member; and means carried by said brake shoes for varying the pressure of said resilient means upon said brake shoes.

7. In a window curtain operating mechanism, a brake having a rotary body portion; a stationary cylindrical wearing member infolding said body portion and mounted concentric therewith; a plurality of curved brake shoes having wearing surfaces shaped to the curve of said wearing member; a plurality of springs mounted on said body portion to normally move said brake shoes to engage said wearing member; a plurality of blocks interposed between said shoes and said springs to vary the effective tension of said springs upon said shoes; and means for varying the relative disposition of said blocks and said shoes.

8. In a window curtain operating mechanism, a brake having a rotary body portion; a stationary cylindrical wearing member infolding said body portion and mount-

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ed concentric therewith; a plurality of curved brake shoes having wearing surfaces shaped to the curve of said wearing member; a plurality of springs mounted on said body portion to normally move said brake shoes to engage said wearing member; a plurality of blocks interposed between said shoes and said springs to vary the effective tension of said springs upon said shoes; and a plurality of wedge-shaped members

disposed between said blocks and said shoes to vary the relative disposition of said blocks and said shoes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

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Witnesses:

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