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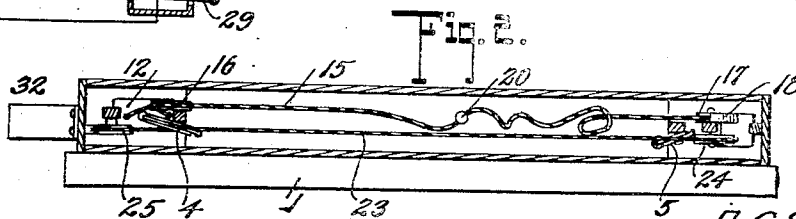
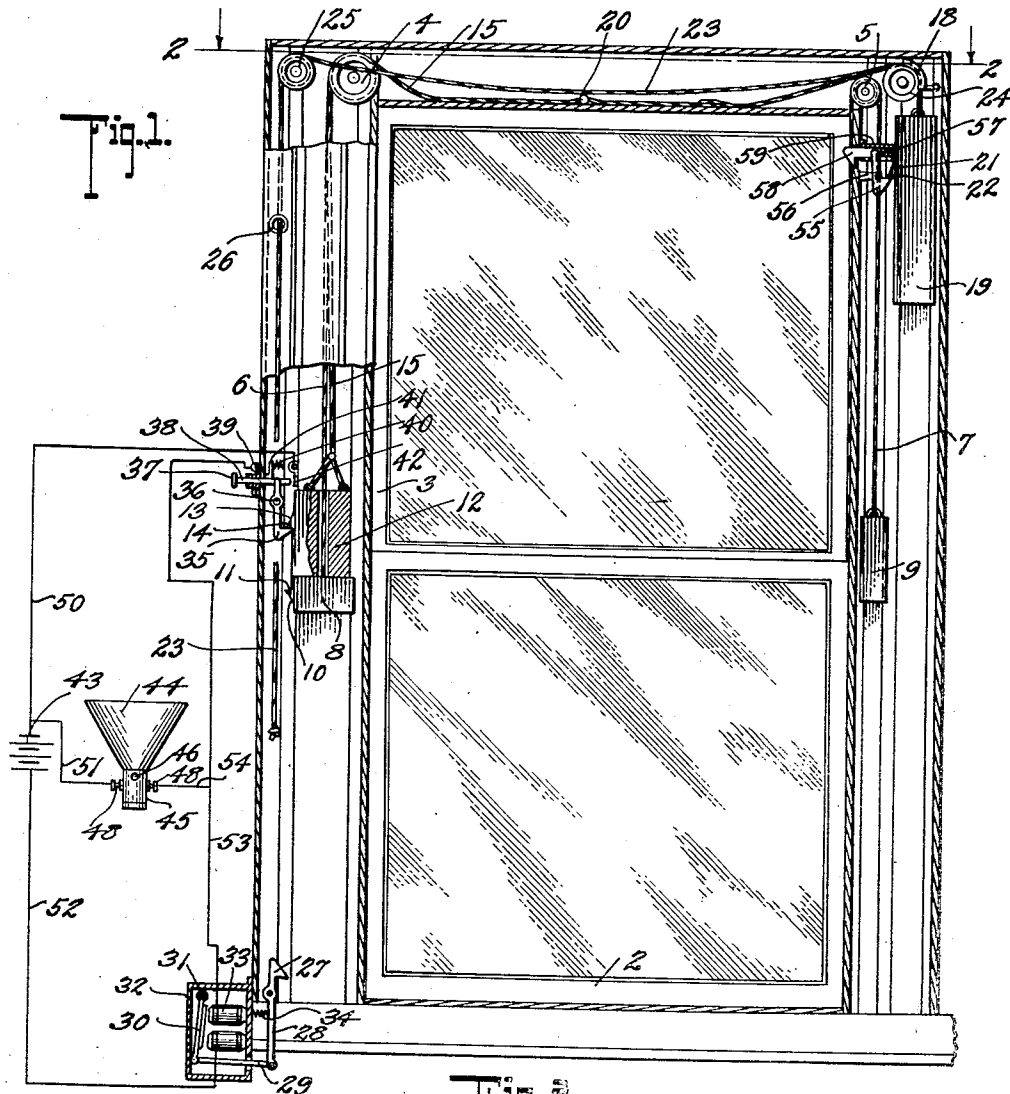
WINDOW.

APPLICATION FILED OCT. 6, 1914.

Patented July 20, 1915.

3 SHEETS—SHEET 1.

1,147,559.



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3 SHEETS—SHEET 2.

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Fig. 3.

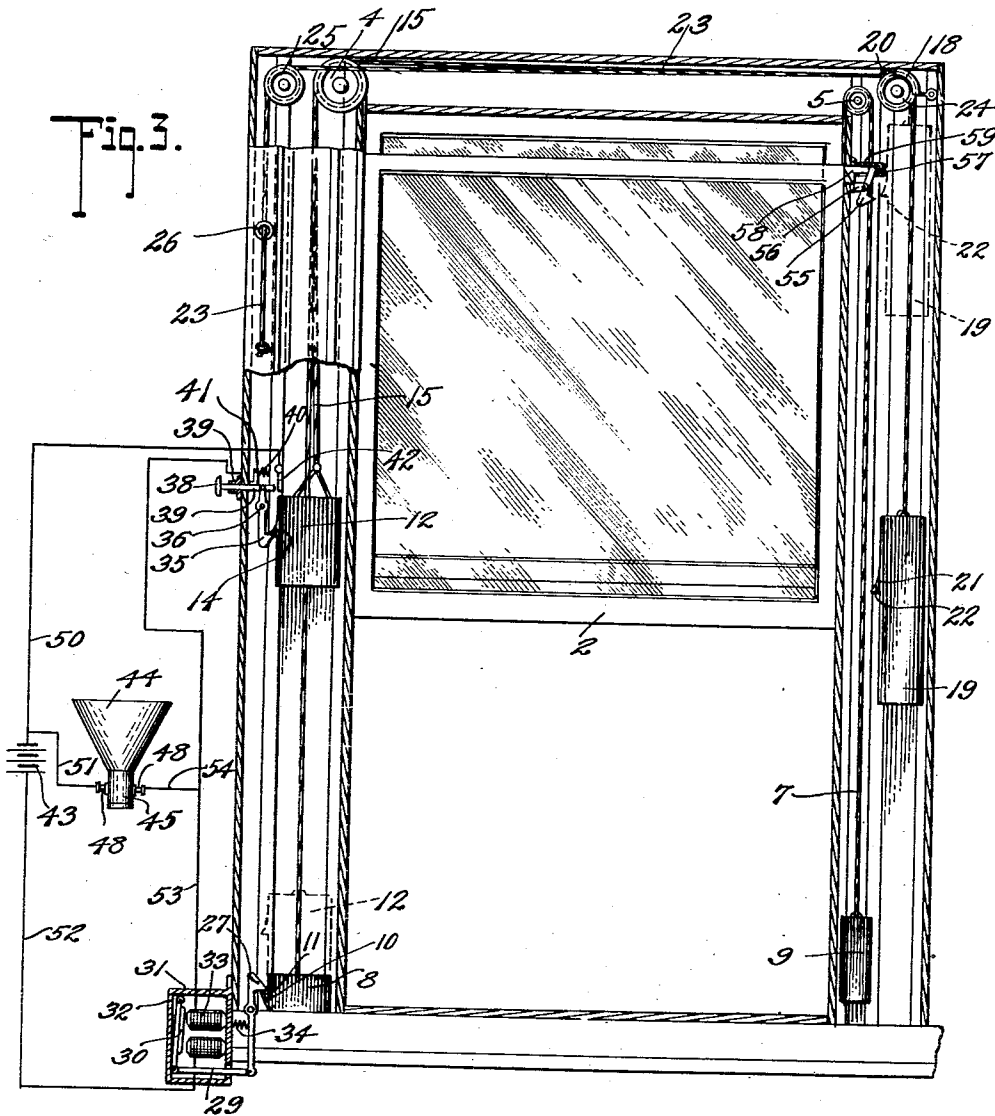
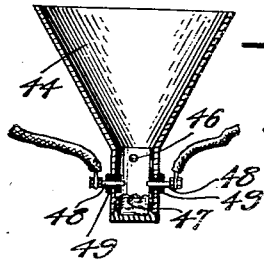


Fig. 4.



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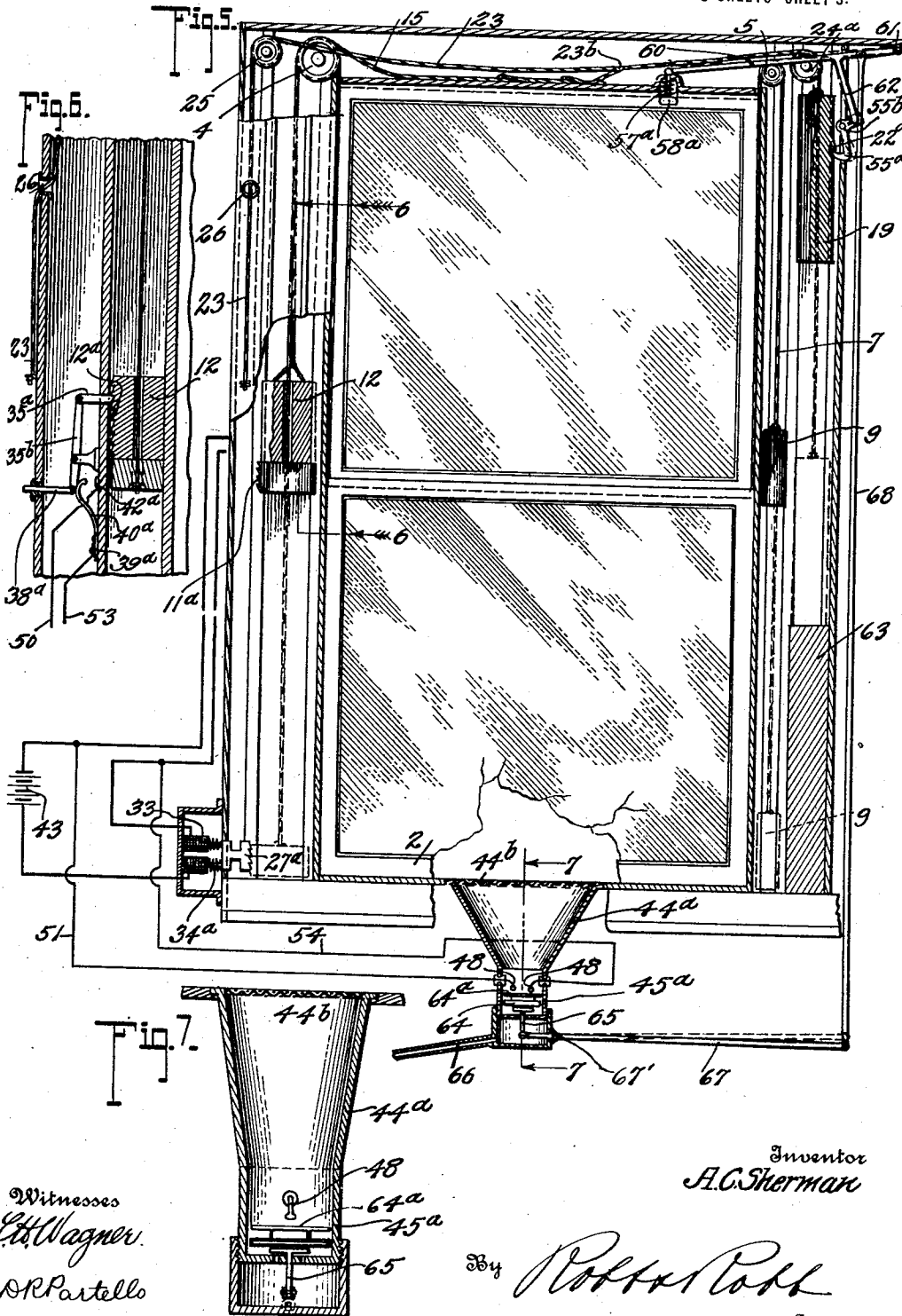
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3 SHEETS—SHEET 3.



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WINDOW.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALZA C. SHERMAN, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented certain new and useful Improvements in Windows, of which the following is a specification.

This invention appertains to improvements in windows or more strictly speaking to operating mechanism for the window sash.

The object in view is to provide means for raising or lowering the window sash through the instrumentality of a manual releasing member, the mechanism for carrying out the above operation including electrically actuated apparatus by means of which the lowering of the sash or closing of the window may take place without intervention of the human element under abnormal conditions, such as when rain enters through the open window in sufficient quantity to cause actuation of said electric apparatus. To this end a special circuit closer is employed which involves a valve also automatic in action in opening or closing for the purpose of emptying or retaining the collected rain water.

These and such other objects as may hereinafter appear are attained by the novel construction, combination and arrangement of parts to be hereinafter specifically described and claimed.

Reference will now be had to the accompanying drawings forming a part of this specification, wherein:

Figure 1 is an elevation partly in section of a window and sash operating apparatus therefor constructed in accordance with my invention, partly in section and with the lower sash in lowered or closed position. Fig. 2 is a sectional view of the same on the plane indicated by the line 2—2 of Fig. 1. Fig. 3 is a view similar to Fig. 1 and showing the lower sash in raised or open position. Fig. 4 is an enlarged sectional view of the rain controlled circuit closer. Fig. 5 is a view similar to Fig. 1, showing a slightly modified adaptation of the invention. Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 5; and Fig. 7 is an enlarged sectional view on the line 7—7 of Fig. 5 showing the circuit closer valve mechanism.

Throughout the following detail descrip-

tion, and on the several figures of the drawings, similar parts are referred to by like reference characters.

The window frame is indicated at 1, the lower sash at 2 and the upper sash at 3. Pulleys 4, 5 are mounted near the upper corners of the frame and the lower sash is provided with cords 6, 7 which respectively pass over said pulleys, a weight 8 being attached to the cord 6 and a weight 9 being secured to the cord 7. The combined weight of the weights 8 and 9 is less than that of the lower sash. The weight 8 is provided on one side with a cam face 10 and a stop shoulder 11 to which the cam face leads.

A weight 12 which is heavier than either of the weights 8, 9 has an opening in its center through which the cord 6 freely passes. This weight is also provided with a cam face 13 and a stop shoulder 14 and is attached to a cord 15. Said cord passes over a pulley 16, (see Fig. 2) extends across in the upper portion of the frame and also passes over a pulley 17 on one side of the upper portion of which is a guide and stop shoe 18. A weight 19 which is heavier than the weight 12 is attached to the opposite side of the said cord 15. Said cord has a stop button 20 at a point intermediate its ends which is adapted to engage the stop shoe 18 and thus prevent the weight 19 from dropping to the bottom of the window frame. Said weight 19 has a cam face 21 and a stop shoulder 22 to which said cam face leads. A cord 23 which I will call an operating cord is also attached to the weight 19 and passes over pulleys 24, 25 near the upper corners of the frame, the free end of the cord being led out through an opening 26 in the frame.

At one side of the window at the bottom, is a pivotally mounted catch 27 which is adapted to engage the shoulder 11 of the weight 8 when the latter is lowered and hence hold said weight in lowered position. This catch has a depending arm 28 which is connected by a link 29 to an armature 30. The armature is pivotally mounted as at 31 and arranged in a casing 32. An electric magnet 33 to attract the armature is also arranged in the same casing. A spring 34 is connected to the casing 27 to normally hold the catch in engaging position. A similar catch 35 is also provided which is pivotally

mounted at a suitable elevated point in the window frame as at 36 and is adapted to engage the shoulder 14 of the weight 12 and hold the latter in elevated position. This catch 35 has a push button 37 to operate the end and it is pivotally connected to the stem 38 of said push button, the stem being slidably arranged in a guide 39. A spring 40 acts on a lug 41 to normally press the button outwardly and hold the catch 35 in engaging position. The guide 39 and the stem of the button are electrical conductors and the button stem when pressed inwardly for engagement is adapted to engage an electrode 42. The button is hence an element of a circuit closer which is normally open.

A suitable source of electric energy such as a battery is shown at 43. I also provide and employ a rain collecting funnel 44 which is arranged adjacent to the window and in a position to catch rain water. This funnel has a cup 45 at its lower end into which it discharges and may be provided with an overflow opening 46. The cup may hold an electrolytic substance such as salt indicated at 47 and is provided in opposite sides with electrodes 48 which are insulated from its walls as at 49. A conductor 50 leads from one pole of the battery to the electrode 42 and is also connected by another conductor 51 to one of the electrodes 48. A conductor 52 leads from the other pole of the battery to the electromagnet 33. A conductor 53 leads from the electromagnet to the guide and electrode 39 and is connected by a conductor 54 to the other electrode 48.

A catch 55 is pivotally mounted as at 56 and adapted to engage the stop shoulder 22 of the weight 19 and hold the latter in elevated position. A spring 57 acts to normally hold said catch in engaging position. A trip 58 is provided to release the catch and is slidably fitted in a guide 59 near the upper side of the window. This trip projects into the path of the lower sash so that when the latter is raised it causes the trip to release the catch 55 from the weight 19 so that said weight drops until the stop button 20 of its cord 15 catches against the stop guide 18 of the pulley 17.

Let it be assumed that the lower sash is in initial lowered position as shown in Fig. 1 and all of the weights raised, the weight 19 having been raised by drawing down manually on the cord 23 and engaged and held in raised position by the catch 55 and the weight 12 being engaged and held by the catch 35. To raise the sash it is only necessary to press the button 37 thus causing the catch 35 to be released from the weight 12 and the cord 15 being slack, weight 12, together with the weights 8, 9, and the combined weight of which exceeds that of the lower sash, drops and hence cause the lower sash to be raised.

When the lower sash reaches the upper limit of its movement it actuates the trip 58 to disengage the catch 55 from the weight 19. Hence the weight 19 drops and pulls on the cord 15, thus causing weight 19 to raise the weight 12 which acts in turn to retard the fall of the heavier weight mentioned. Downward movement of the weight as well as upward movement of the weight 12 is limited by coaction of the button 20 with the stop 18 and substantially at this point the catch 35 reengages with the shoulder 14 on the weight 12, holding it in the raised position.

The raising of the lower sash as above stated also causes the weights 8, 9 to be lowered and causes said weight 8 to be engaged and held in lowered position by the catch 27. The operating mechanism is now set for automatically actuating or causing the closing or lowering of the lower sash as will be described, merely by the manual raising of the weight 19 by the operating cord 23.

Assuming that the lower sash is raised, but not to its full extent and the weight 19 held in elevated position by the catch 55 as indicated in dotted lines in Fig. 3, and that the weight 12 is also raised and held by the catch 35 and the weights 8, 9 lowered, with weight 8 engaged by the catch 27 and it should begin to rain, rain water is caught by the funnel 44 and supplied rapidly to the cup 45 so that as the column of water rises in said cup the water will close a circuit between the electrodes 48 thereby causing the electromagnet 33 to be energized and the catch 27 released from the weight 8 so that the sash then lowers by its own weight and raises the weights 8, 9.

If it be desired to manually cause the lower sash to be lowered this can be accomplished by pressing on the button 37 thus closing the circuit at 38, 42 and hence cause the electromagnet 33 to be energized and actuate the armature, the latter disengaging the catch 27 from the shoulder 11 of the weight 8. Hence the sash drops, it being heavier than the weights 8, 9.

In Figs. 5, 6 and 7 I have shown a slightly modified adaptation of my improvements, the elements of the structure shown which are common to both forms being designated by similar reference characters, and those parts which depart from the hereinbefore described structure are given distinguishing designations.

It will be observed by reference to Fig. 5 that the window frame is provided at its upper portion with an operating member or button 58* which has threaded engagement with a lever 60 pivotally mounted in the frame at 61 so that the push button is capable of being adjusted with respect to the lever in a manner which will control the

projection of said button from the window frame. This button is arranged in the path of the sash so as to be engaged by the latter when at its upper limit of movement and the button is normally held projected from the frame by means of the spring 57^a surrounding its stem. The lever 60 is formed with a depending arm 62 which has connection with the slotted extremity of the catch 55^a pivotally mounted at 55^b, said catch being adapted to engage with a shoulder 22^a formed on the weight 19. This weight is connected to the operating cord 23^a by means of which it is adapted for manual actuation and also has connection with the cord 15^a carrying the weight 12 at one end and which cord joins the cord 23^a as at 23^b. Instead of employing a stop button as described with reference to the first form I preferably employ a stop block 63 in the frame and which limits the downward movement of the weight 19 as is obvious. The weight 12 as particularly shown in Fig. 6 is provided with a serrated face 12^a and is adapted to be engaged and held in its upper position by means of the dog 35^a pivotally connected to the lever 35^b at one end, said lever having a push button or rod 38^a pivotally connected to its opposite extremity. The dog 35^a is normally held in engaging position by means of the spring 40^a which also constitutes a circuit closing member operable by said lever in a manner to close the circuit through the terminals 42^a and 39^a to which the circuit wires 53 lead. The weight 8 which coöperates with the weight 12 is provided with a serrated face 11^a so that said weight may be interlocked in its lower position when the sash is raised by means of the catch member 27^a adapted to be actuated by the magnet 33. The catch is normally held in engaging position by springs 34^a. Arranged adjacent to and within the window frame is disposed the circuit closer of this embodiment of the invention and which comprises the receptacle 45^a in which the spaced electrodes 48, 48 are located. The receptacle 45^a has leading thereto the funnel 44^a, provided with a screen, preferably, 44^b, by means of which rain entering through the open window may be collected and delivered to the receptacle 45^a. Within the latter is disposed a float member 64 having on its upper surface a circuit closing plate 64^a and the receptacle is furthermore provided with a valve member 65 for closing an opening in the bottom and by means of which the rain may be held in the receptacle or emptied therefrom through the drain conduit 66 as will be more particularly described. The valve is connected through the horizontal rod 67 pivoted as at 67^a and the vertical rod 68 to the lever 60 and it will be obvious by reference to Fig. 5 that the valve 65 is normally held

in closed position when the window sash 2 is in its uppermost position coacting with the operating member 58^a. With this in mind it will be obvious that when the window is left open and rain enters there- through it will be collected in the receptacle 45^a. When a predetermined amount is thus received sufficient to raise the float 64 until the plate 64^a closes the circuit 51, 54 through the electrodes 48, the magnet 33 is energized and the weights 8, 9 released so that the sash automatically closes by reason of its heavier weight as hereinbefore described. When the window is again opened the sash 2 contacting with the operating member 58^a will raise the lever 60 and through the connections 67, 68 the valve will be automatically opened and the rain collected in the receptacle allowed to drain therefrom. The circuit is thus broken the moment the window begins its descent.

The operation of manually closing the sash through the instrumentality of the button 38^a is exactly the same as described with reference to the first form shown in Figs. 1 and 3.

Having thus described my invention, what I claim as new is:

1. Window sash operating mechanism of the class described comprising in combination, a sash, a weight member connected thereto, of less weight than the sash, a counterbalance weight disposed in position to combine with the weight member first mentioned to overbalance the sash, a locking member automatically engageable with the counterbalance weight for maintaining the sash inactive, a manual releasing member adapted to disengage the locking member whereby to permit automatic actuation of the sash by the weights aforesaid, and means to operate said counter-balance weight.

2. Window sash operating mechanism of the class described comprising in combination, a sash, a weight member connected thereto, counterbalance means arranged to coact with the weight member to cause opening movement of the sash, releasable means normally coöperating with the counterbalance means aforesaid to maintain the sash inactive or in closed position and adapted upon operation to cause automatic opening of the sash, means adapted to interlock with the weight member when the sash reaches open position to maintain the same inoperative, and means for restoring the counterbalance means to normal position.

3. Window sash operating mechanism of the class described comprising in combination, a sash, a weight member connected thereto, counterbalance means arranged to coact with the weight member to cause opening movement of the sash, releasable means

normally cooperating with the counterbalance means aforesaid to maintain the sash inactive or in closed position and adapted upon operation to cause automatic opening of the sash, means adapted to interlock with the weight member when the sash reaches open position to maintain the same inoperative, means for restoring the counterbalance means to normal position, and actuating means operable by the sash in opening to restore the counterbalance means to normal position.

4. Window sash operating mechanism of the class described comprising in combination, a sash, a weight member connected thereto, counterbalance means arranged to coact with the weight member to cause opening movement of the sash, releasable means normally cooperating with the counterbalance means aforesaid to maintain the sash inactive or in closed position and adapted upon operation to cause automatic opening of the sash, means adapted to interlock with the weight member when the sash reaches open position to maintain the same inoperative, means for restoring the counterbalance means to normal position, actuating means operable by the sash in opening to restore the counterbalance means to normal position, and means controllable by the releasable means aforesaid for disengaging the weight member whereby to permit automatic closing of the sash.

5. Window sash operating mechanism of the class described comprising in combination, a sash, a weight member connected thereto, counterbalance means arranged to coact with the weight member to cause opening movement of the sash, releasable means normally cooperating with the counterbalance means aforesaid to maintain the sash inactive or in closed position and adapted upon operation to cause automatic opening of the sash, means adapted to interlock with the weight member when the sash reaches open position to maintain the same inoperative, means for restoring the counterbalance means to normal position, and actuating means operable by the sash in opening to restore the counterbalance means to normal position, said actuating means comprising an operating member arranged in the path of the sash and operably connected with the counterbalance member normally, which latter is adapted to be released through actuation of the operating member by the sash whereby the weight member aforesaid is drawn into raised position.

6. In combination with a window sash adapted to be raised and lowered, a pair of weights whose combined weight is less than that of said sash, cords attached to said sash and weights, pulleys for said cords, a catch to engage and hold one of said weights in lowered position when the sash is raised, a

third weight arranged for movement above the last named weight and whose weight when combined with that of the other two weights exceeds the weight of said sash, and means to raise the third weight, and means to hold the said weight in releasably raised position.

7. In combination with a window sash adapted to be raised and lowered, a pair of weights whose combined weight is less than that of said sash, cords attached to said sash and weights, pulleys for said cords, a catch to engage and hold one of said weights in lowered position when the sash is raised, a third weight arranged for vertical movement above the last named weight and whose weight when combined with that of the other two weights exceeds the weight of said sash, a fourth weight of greater weight than the third weight, a cord connecting the third and fourth weights, pulleys for said cord, and means to releasably hold the third weight in raised position.

8. In combination with a window sash adapted to be raised and lowered, a pair of weights whose combined weight is less than that of said sash, cords attached to said sash and weights, pulleys for said cords, a catch to engage and hold one of said weights in lowered position when the sash is raised, a third weight arranged for movement above the last named weight and whose weight when combined with that of the other two weights exceeds that of the weight of said sash, a fourth weight of greater weight than the third weight, a cord connecting the third and fourth weights, pulleys for said cord, and means to releasably hold the third weight in raised position, and an operating member for raising the fourth weight.

9. In combination with a window sash adapted to be raised and lowered, a pair of weights whose combined weight is less than that of the said sash, cords attached to said sash and weights, pulleys for said cords, a catch to engage and hold one of said weights in lowered position when the sash is raised, a third weight arranged for vertical movement above the last named weight and whose weight when combined with that of the other two weights exceeds the weight of said sash, a fourth weight of greater weight than the third weight, a cord connecting the third and fourth weights, pulleys for said cord, means to releasably hold the third weight in raised position, an operating cord for raising the fourth weight, a catch to hold the fourth weight in raised position, and a releasing trip for said catch, said releasing trip being adapted to be operated by the sash when the latter is opening.

10. Window sash operating means including a pair of movable weights, locking members to hold one of said weights in raised position and the other in lowered position,

electrically actuated apparatus to operate the last-named locking member, and manually operating releasing means for the other member, said manually operated releasing means including a circuit closer for the circuit of the electrically operating releasing means.

11. Window sash operating means including independent weight members, locking catches to hold one of said members in raised position and the other in lowered position, an electric circuit including a source of electric current in which the locking catches are included, and manually operating releasing means for the first mentioned locking catch, said means constituting a circuit closer for the circuit of the second mentioned catch whereby the latter will release the sash for lowering action.

12. Window sash operating means including independent weight members, locking catches to hold one of said members in raised position and the other in lowered position, an electric circuit including a source of electric current in which the locking catches are included, manually operating releasing means for the first mentioned locking catch, said means constituting a circuit closer for the circuit of the second mentioned catch whereby the latter will release the sash for lowering action, and an independent circuit closer included in the electric circuit for releasing the last mentioned catch to cause automatic closing of the sash.

13. Window sash operating means including independent weight members, locking catches to hold one of said members in raised position and the other in lowered position, an electric circuit including a source of electric current in which the locking catches are included, manually operating releasing means for the first-mentioned locking catch, said means constituting a circuit closer for the circuit of the second mentioned catch whereby the latter will release the sash for lowering action, and a liquid collecting circuit closer included in the electric circuit for releasing the last-mentioned catch to cause automatic closing of the sash upon collection of a predetermined amount of fluid.

14. Window sash operating means of the class described comprising in combination, a sash, means for operating said sash to raise and lower the same, and means for causing automatic closing thereof comprising an electric circuit including a source of electric current in which the closing means is included, a circuit closer in said circuit having spaced electrodes and comprising a liquid collecting receptacle in which the electrodes are located, and a float in said receptacle adapted to close the circuit upon

collection of a predetermined amount of liquid in the receptacle.

15. Window sash operating means of the class described comprising in combination, a sash, means for operating said sash to raise and lower the same, and means for causing automatic closing thereof comprising an electric circuit including a source of electric current in which the closing means is included, a circuit closer in said circuit having spaced electrodes and comprising a liquid collecting receptacle in which the electrodes are located, a float in said receptacle adapted to close the circuit upon collection of a predetermined amount of liquid in the receptacle, a valve in the receptacle, and means for closing said valve actuated by the sash.

16. Window sash operating means of the class described comprising in combination, a sash, means for operating said sash to raise and lower the same, and means for causing automatic closing thereof comprising an electric circuit including a source of electric current in which the closing means is included, a circuit closer in said circuit having spaced electrodes and comprising a liquid collecting receptacle in which the electrodes are located, a float in said receptacle adapted to close the circuit upon collection of a predetermined amount of liquid in the receptacle, a valve in the receptacle, and means to automatically open said valve to drain the receptacle upon closing of the sash.

17. Window sash operating means of the class described comprising in combination, a sash, means for operating said sash to raise and lower the same, and means for causing automatic closing thereof comprising an electric circuit including a source of electric current in which the closing means is included, a circuit closer in said circuit having spaced electrodes and comprising a liquid collecting receptacle in which the electrodes are located, a float in said receptacle adapted to close the circuit upon collection of a predetermined amount of liquid in the receptacle, a valve in the receptacle, means maintaining said valve normally closed when the sash is open, said means including an operating member disposed in the path of the sash, and means to automatically actuate the operating member to open the valve upon disengagement from the sash in closing of the latter.

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

ALZA C. SHERMAN.

Witnesses:

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JERE AUSTILL.