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D. L. CHANDLER ET AL

2,303,434

ELECTRICAL SWITCH

Original Filed June 22, 1940

4 Sheets-Sheet 1

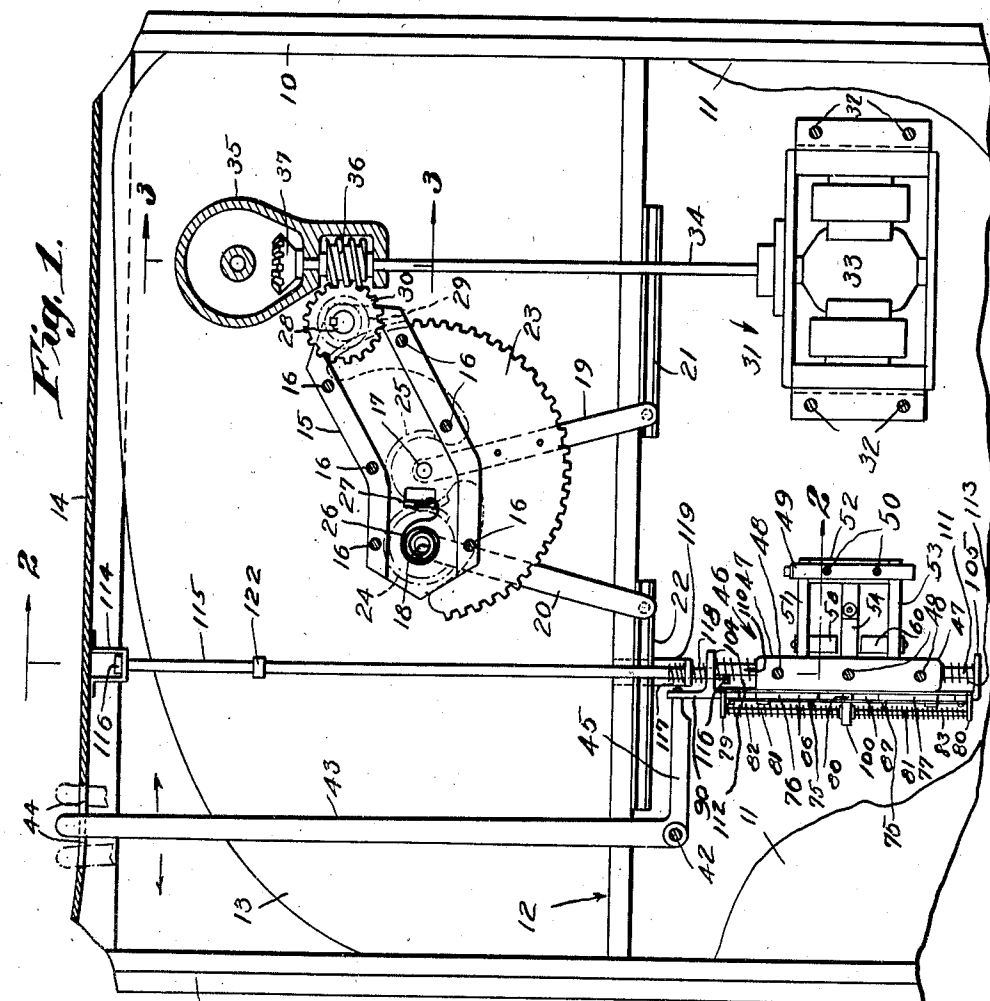


Fig. 2.

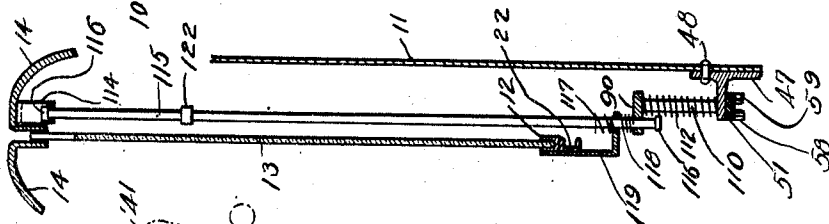
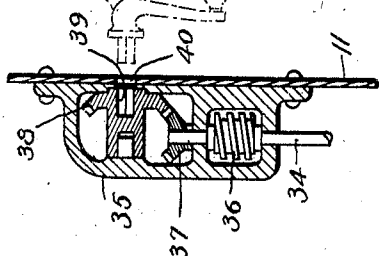


Fig. 3.



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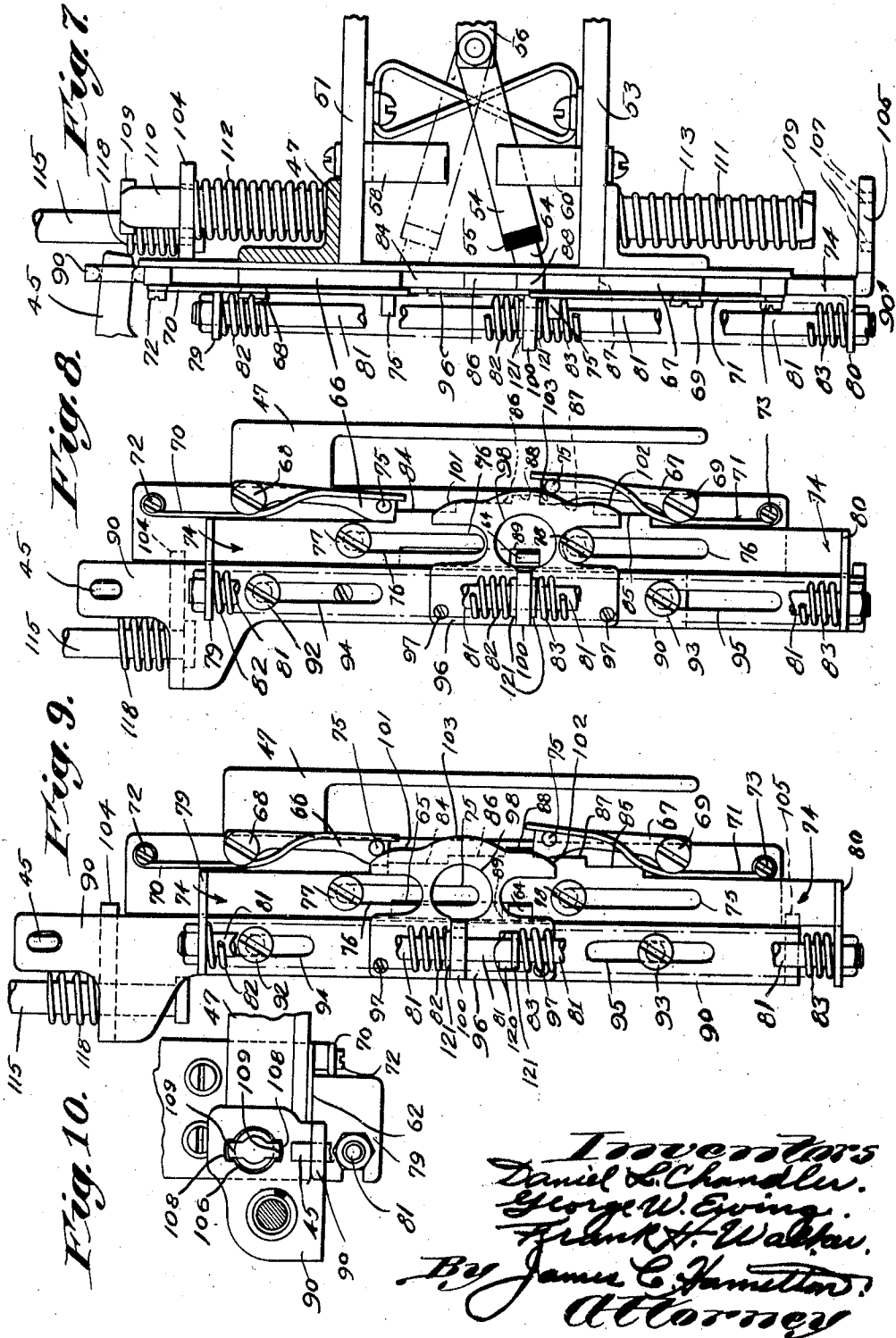
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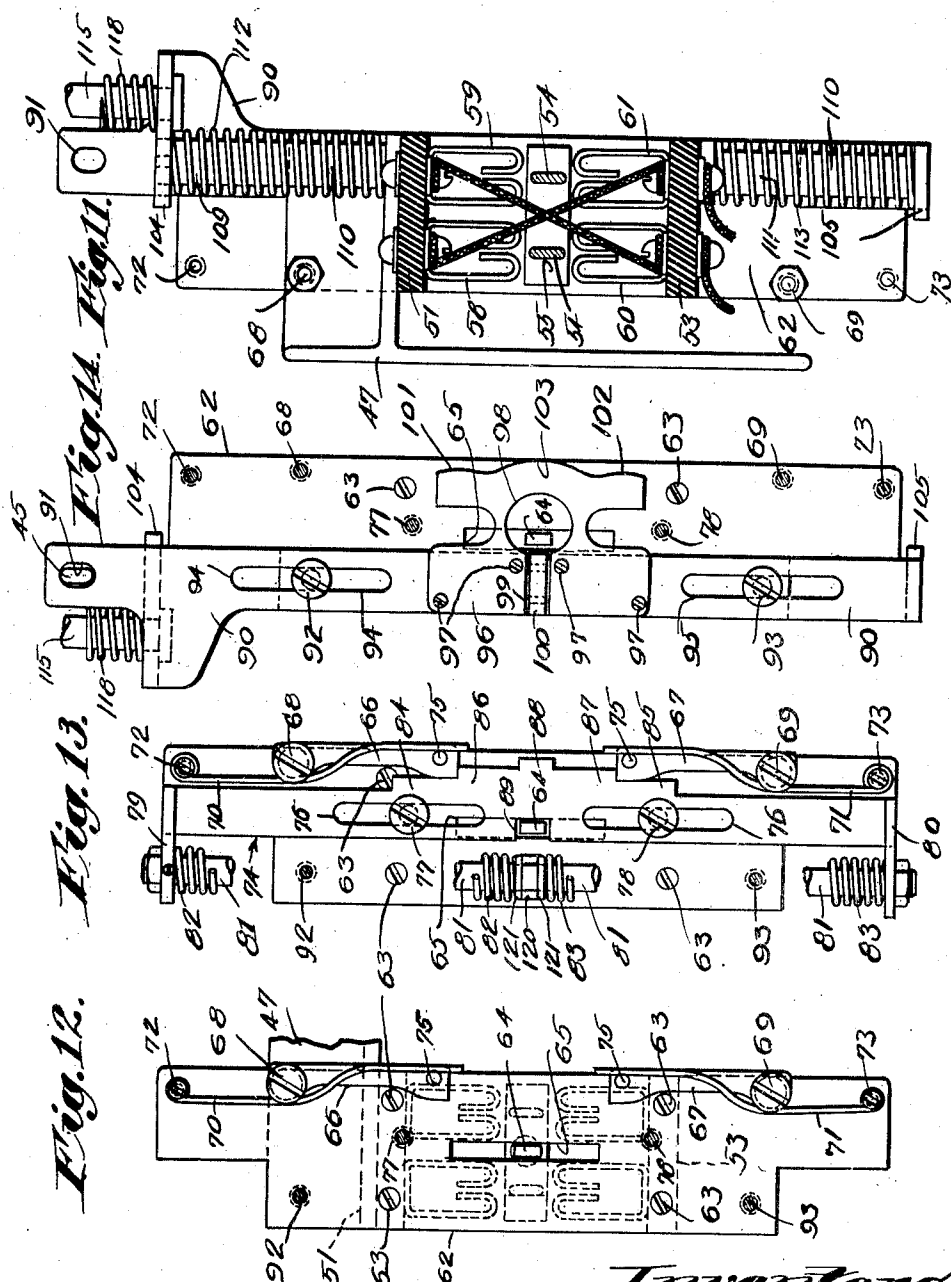
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UNITED STATES PATENT OFFICE

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ELECTRICAL SWITCH

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Original application June 22, 1940, Serial No. 341,838. Divided and this application January 2, 1941, Serial No. 372,936

4 Claims. (Cl. 200—15)

Our present invention relates to automobile window-sash control mechanism and especially to reversible electrical switch mechanism, being a division of Ser. No. 341,838, filed June 22, 1940.

Heretofore, it has been the practice, in automobile manufacture, to provide hand-operated mechanical means of a more-or-less automatic type in which the automobile window-sash is raised and lowered by means of a crank, lever, or other hand motivated mechanisms. In all such devices, it is necessary for the operator of the window-sash to perform a continuous sustained movement of the hand, arm, and body, in order to continue the movement of the window-sash in either direction.

In the engineering field, it is well known and recognized that more and more, automatic control is fast superseding hand-operated mechanisms in which the operator's hand performs a continuous sustained movement during the operation of the mechanism.

In the present day manufacture of automobiles, this full-automatic development of controlling devices is making itself evident in many improvements which contribute to the ease and comfort of the operator.

Such automatic development not only contributes to the convenience of the operator but at the same time increases the safety factor in the operation of the vehicle by relieving the operator from many minor physical duties heretofore necessary and thereby giving him more time in which to direct his attentions to road hazards requiring his full attention.

In our present invention, we have designed and developed new automatic control mechanism for automobile window-sash which is not only very convenient for the operator of the motor vehicle but does not require any continuous sustained movement of his hand when it is desired to raise or drop the window-sash of the automobile.

Our present invention involving automatic control of the window-sash substitutes electricity for manual power in the sustained movement of the window-sash so that one initial movement of the operator's finger sets in motion the movement of the window-sash, either up or down, and the release of pressure exerted by the operator, instantly stops the movement of the window-sash, in either direction. Furthermore, automatic mechanism is provided which makes it impossible for the operator to continue the direction of movement of the window-sash in either direction beyond a certain point thereby making it impossible for the operator to damage the ap-

paratus, and at the same time making it unnecessary for the operator to keep his eye on the movement of the window-sash when his attention may be needed other places. In other words, when the window-sash reaches its maximum top or bottom movement, as the case may be, the movement is automatically checked and the operator cannot continue such movement further even though his attention may be centered elsewhere. To reverse the movement of the window-sash, a reverse movement by the operator is necessary. This is a very important feature in any automatic apparatus of this type because the operator cannot always be watching the window-sash in its movement while he is driving in traffic or at other times when his vision may have to be directed in front of him on the road, intersections, or oncoming vehicles, also it is important that such window movement ceases when the limit of travel is reached in order to prevent damage to the apparatus.

The principal object of our invention is an improved electrical switch;

Another object is an improved electrical switch combined with automobile window raising mechanism;

Still another object is an electrical switch combined with automobile window-sash operating mechanism which automatically reverses and stops the movement of the automobile window-sash in its up and down movement and returns the operating lever to a neutral position, and

Other objects and novel features comprising the construction and operation of our improved device will be apparent as the description of the same progresses.

In the drawings illustrating our invention,

Fig. 1 is a partial side elevation and cross-section of an automobile door to which our invention has been applied, the top and bottom of the door and the inner panel of the door being eliminated and removed for the purpose of convenience;

Fig. 2 is a fragmentary cross-section taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary cross-section taken on the line 3—3 of Fig. 1, the dot-and-dash lines indicating an emergency crank handle;

Fig. 4 is an enlarged side elevation, parts being broken off and others shown in cross-section for convenience, and showing the switch illustrated in Fig. 1;

Fig. 5 is an end elevation of the switch, as viewed from the left-hand side as illustrated in Fig. 1;

Fig. 6 is back side elevation of the switch, as viewed in Fig. 1;

Fig. 7 is a side elevation of the switch shown in Fig. 4, parts of which are broken out for clarity, and showing the switch depressed downwardly, as would be the case when the operating lever, also shown in Fig. 1, is pulled to the dot-and-dash positions;

Fig. 8 is a right-angle projection of Fig. 7, similar parts being broken away for clarity, and showing the various parts in their proper relation with respect to Fig. 7;

Fig. 9 is an elevation of Fig. 8, similar parts being broken out for clarity, and showing certain parts raised just prior to final position after the operating lever has been raised;

Fig. 10 is a fragmentary plan view of the top portion of the switch, as shown in Fig. 9;

Fig. 11 is a cross-section taken on the line 11—11 of Fig. 6;

Fig. 12 is a cross-section taken on the line 12—12 of Fig. 6 and particularly showing the base plate of the switch certain superimposed parts being removed;

Fig. 13 is a view similar to Fig. 12 but showing one of the slidable superimposed members in place, portions of which have been removed or broken out to better illustrate its relationship to the base plate shown in Fig. 12;

Fig. 14 is another view similar to Fig. 12. In this illustration portions are shown broken off and the slide member shown in Fig. 13 has been removed. A second slide member has been mounted on the base plate by itself for the purpose of clearly defining the structure separate from that shown in Fig. 13. When both slide members and base plate are combined in proper engagement, in a neutral position, the assembly appears as shown in Fig. 5 with the exception of the mounting bracket which is attached separately to the switch member, as indicated in Fig. 12.

Referring more in detail to the drawings illustrating our invention, 10 indicates the side frames of an automobile door. In conventional automobile door design an inside panel 11 is provided upon which the window-sash glass 13 is slidably mounted in the door frames 10 so that the glass 13 and the channel sash member 12 in which the glass is mounted can be moved up and down.

A split window sill 14 is provided between the slide frames 10 and is positioned so that the glass 13 can be moved up and down between the sill members to any degree of height desired by the operator.

In Fig. 1 it will be noted that we have provided a frame member 15 having bolts 16, the bolts being shown in cross-section and normally adapted to be fastened in the panel 11 which is cut away. Pivoted in the frame member 15 at 17 and 18 are lever arms 19 and 20. The lower ends of the arms 19 and 20 are provided with rollers which engage in the channel members 21 and 22 which are fixed to the bottom face of the glass channel member 12. On the far side of the frame member 15 and attached to the lever arm 19 is a segmental gear 23. The lever arm 20 is engaged with the lever arm 19 through gears 24 and 25. A counter balance spring 26 is fixed to the pivot 18 and anchored at 27 to a struck-up portion of the frame 15.

Assuming that the frame 15 is stationarily mounted to the door panel 11 and the gear segment 23 is rotated, it will be apparent that the arms 19 and 20 will swing in opposite directions

about the pivots 17 and 18 and raise or lower the member 12 and attached glass 13.

In conventional door design a shaft 28 is journaled in the frame 15 and is provided on the far side, as viewed in Fig. 1, with a pinion 29 which is engaged with the teeth of the segment member 23, and on the near end of the shaft 28 a crank member is placed so that the operator can rotate the pinion 29 and gear 23 for the purpose of elevating or lowering the glass 13.

In our present invention it will be noted that we have eliminated the conventional crank and in place thereof we have mounted on the shaft 29 an additional gear 30 on the near side of the frame 15.

Also attached to the panel 11 in the lower portion of the door we have provided a motor generally indicated at 31, the motor frame bolts 32 being shown in cross-section. The motor 31, as shown in Fig. 1, is of the reversible type, the rotor 33 being directly connected to a vertical shaft 34 which is journaled at its upper end in a housing 35 which is also attached to the panel 11, see Fig. 3. Attached to the rotor shaft 34 is a worm 36 which is directly engaged with the worm gear 30. It will thus be seen that when the motor 31 is energized in either direction the segment member 23 will be turned. Provision has been made, and will be described further along in our description, for automatically stopping the motor 31 at either end of the travel of the glass 13 and for reversing the direction of said motor.

In addition to providing a direct electrical motor drive to the segment member 23, we have also provided an emergency control apparatus so that should for any reason the electrical control fail to function, the glass may be operated by hand control.

Attached to the top end of the motor shaft 34 and located within the housing 35 is a bevel gear 37 engaging with another lever gear 38 which is journaled in the upper portion of the housing 35. It will be noted that the gear 35 is provided with a hub recess 39 preferably square in shape and an opening 40 is provided through the panel 11. In the event that the motor 31 should fail to operate from any cause, an emergency handle 41, shown in dot-and-dash lines in Fig. 3, may be inserted in the gear recess 39 and the shaft 34, worm 36, and worm gear 30 rotated by hand thereby turning the segment gear 23 and raising or lowering the window glass 13. When the motor 31 is driving the apparatus the bevel gears 38 and 37 idle freely within the housing 35.

At 42 we have provided a pivot, also mounted on the cut away panel 11, on which is provided the operating lever 43. In the upper side of the inner window sill member it will be noted that we have provided a slot 44 through which projects the upper end of the operating lever 43. The dot-and-dash positions of the top of the operating lever 43 indicate the position taken by the lever when the window glass 13 is being elevated or lowered, the full line position, as shown in Fig. 1 indicating the neutral position at which position the electrical motor 31 is cut off from electrical current. The lower end of the operating lever 43 is provided with a right angle extension lever portion 45 which is directly engaged with the electrical switch, generally indicated at 46. The electrical switch 46 is also suspended from the panel 11 by means of a bracket 47 and connecting bolts 48, and a secondary bracket 49 and the connecting bolts 50.

The switch 46, indicated in Fig. 1, is in a more or less diagrammatic form, and is more fully shown in detail in Figs. 4 to 14 inclusive. This switch is provided for the control of the motor 31 and is actuated in part by means of the control lever 43.

Prior to describing the switch in detail we first wish to set forth the functions performed by the mechanism comprising the switch in a general way so that it will be apparent just what duties are required from it in operation.

As previously mentioned, provision has been made to eliminate any possibility of the motor 31 continuing to operate after the limit of movement of the glass 13 has been reached therefore the switch in combination with other apparatus shown in Figs. 1 and 2 automatically opens the electrical circuit when the window glass 13 reaches its either extreme movement. This function takes place without any attention from the operator, in fact, if the operator holds the operating lever in either position too long without releasing it no damage occurs as the lever 43 is automatically returned to the neutral position at which point the electrical circuit to the motor is opened. The glass 13 may be stopped at any position by releasing the lever 43, the switch mechanism automatically returning it to its neutral position and thereby opening the electrical circuit. When the window glass 13 is in its uppermost position, for instance, the operator cannot throw it into any other than a reverse position which will lower the window. When the lever is in a reverse position, as when the window is fully lowered, the operator cannot throw the lever into any other than the position which raises the window glass 13.

The switch 46 is composed of two parts mounted together. One part comprises a double pole double throw electrical switch which carries the electrical current, and the second part of the said switch comprises the automatic mechanism which controls and operates the double pole double throw switch. In Figs. 4 and 6 opposite sides of the double throw switch are shown in its neutral position, in 51, 52, and 53 indicate the insulated frame, the center lever 54 being a parallel knife blade insulated at the free end 55 and pivoted at 56 and 57 to contact brackets. The free end of the blades 54 engage with the upper contact members 58 and 59 and lower contact members 60 and 61, see Fig. 7, which shows reversed positions of the blade 54.

In Fig. 12, we have provided a base plate member 62 which is fixed to the ends of the insulated frames 51 and 53 by means of the screws 63. This base plate 62 forms the base upon which is mounted the other parts making up the automatic elements of the mechanism which operates the knife members 54. It will be noted that attached to the insulated member 55 is an extension lever 64 which projects up through the slot 65 provided in the base plate 62. This extension lever member 65 projects above the top face of the base plate 62 and is engaged by other mechanism, as will be explained further along in the description.

Pawls 66 and 67 are pivoted to the base plate 62 under screws 68 and 69. Also pawl springs 70 and 71 are pivoted to the base plate 62 and 72 and 73 respectively. Pawl spring pins 75 and 75 are provided on pawls 66 and 67 respectively against which bear the springs 70 and 71. The pawls normally tend to swing to the left due to the springs 70 and 71.

In Fig. 13 we have shown the addition of a switch slide member 74 which actuates the switch extension lever 64. This switch slide member 74 is provided with elongated slots 76 and 76 and is held in place on the base plate 62 by means of the screws 77 and 78. At each end of the extension switch slide member 74 are provided end members 79 and 80 which are positioned at ninety degrees to the top face of the said slide and forming end brackets through which is mounted a rod 81 over which the switch slide equalizing springs 82 and 83 are mounted. On the right-hand side of the switch slide member 74 are provided stepped stop members which are adapted to engage with the free end of the pawls 66 and 67. These stepped stop portions of the switch slide member 74 are indicated at 84, 85, 86, and 87 and 88. Surrounding the three sides of the extension switch member 64 is a recess 89 which is provided in the left hand-side of the said slide member 74 and which controls the movement of the said extension switch member 64.

In the position of the switch slide member 74, shown in Fig. 13, it will be noted that when the switch slide member 74 is moved on the plate 62 in an upwardly direction from the position shown in Fig. 13, the extension switch lever member 64 will be swung upwardly, as shown in dot-and-dash lines in Fig. 7 thereby causing the knife blade members to engage with the contact members 58 and 58. When this action takes place the motor rotor 33 is caused to rotate in a counterclockwise direction rotating the segment gear in a clockwise direction and consequently raising the window glass 13. At such time the operating lever 43 is pushed to the left-hand side, as shown in dotted lines in Fig. 1. When the switch slide member 74 is moved downwardly, as viewed from Fig. 13, the reverse movement of the motor rotor 33 takes place and the window glass 13 moves downwardly. At such time, the operating lever 43 is pulled to the right, as viewed in Fig. 1, into the dot-and-dash position indicated.

In Fig. 14 we have shown a second slide member 90 which is also mounted on the base plate 62, on the left-hand side of the switch slide member 74. In Fig. 14 the switch slide member 74 has been removed for the purpose of clarity and to prevent confusion with the slide 90. The slide 90, hereinafter referred to, as the actuating slide member, is directly connected to the extension lever 45 of the operating lever 43, the end of the extension lever 45 operating through the slot 91 at the top of the actuating slide member 90.

The actuating slide member 90 is also slidably mounted on the base plate 62 in a similar manner to the switch slide member 74. In the case of the actuating slide member, the screws 92 and 93 are fixed in the plate 62 and guide the actuating slide member 90 in the slots 94 and 95 provided for the purpose.

Attached to the top surface of the actuating slide member 90 is a cam plate 96 which is attached to the actuating slide member by means of screws 97. The cam plate 96 is provided with a central recess 98 and a communicating slot extending all the way out to the left-hand side of the said cam plate 96 and the actuating slide member 90, as indicated at 99, in Fig. 14. In actual practice this communicating slot 99 engages the sides of a right-angled bracket member 100 which is solidly attached to the face of the actuating slide member 90. The cam plate

96 is provided with cam edges 101 and 102 which are adapted to engage the pawl pins 75 and 75 respectively. A central cam edge 103 also engages the pawl pins 75 and 75 at the extreme point of movement of the actuating slide member 90 in either an upwardly or downwardly direction.

At each end of the actuating slide member 90 are provided right angled bracket portions 104 and 105 solidly connected to the actuating slide member. These brackets 104 and 105 are provided with openings indicated at 106 and 107, better illustrated in Fig. 10. The openings 106 and 107 are slotted on opposite sides, as shown in Fig. 10, and as indicated at 108, for the purpose of admitting the key portion 109, see Figs. 7 and 10 of the studs 110 and 111 which are mounted on the bracket 47 and switch frame 53 respectively. It will be noted, by an observation of Fig. 7, that the key portion 109 formed on the studs 110 and 111 can pass through the slotted opening 106 in the brackets 104 and 105 formed on the actuating slide 90 freely in either an upwardly or downwardly position without interference. Located between the key portions 109 and the base of the studs 110 and 111 are compression equalizing springs 112 and 113. The key members 109 limit the upward movement or outward movement of the springs 112 and 113, as shown in Fig. 7, but when the brackets 104 and 105 are depressed over the studs 110 and 111, the springs 112 and 113 act in compression tending to react against such movement.

Referring back to Fig. 1, it will be noted that we have provided on the under side of the rear portion of the window sill 14, a bracket member 114 through which is slidably mounted a slidable rod 115. The rod 115 is provided at its top end with a cap member 116 which limits its downward movement in the bracket member 114. The bottom end of the rod 115 extends downwardly passing through the bracket portion 104 of the actuating slide member 90 and terminating thereunder in a cap or stop member 116. Cushion springs 117 and 118 may be provided if desired.

Attached to the channel member 12 carrying the window glass 13 is a bracket member 119 through which the rod 115 passes and which is located above the cushion spring 118 and below the cushion spring 117.

Referring back to Fig. 9, it will be seen that the switch slide rod 81 is provided in its central portion with a key member 120 slidably journaled through a slotted opening in the bracket member 108 of the actuating slide member 90. This key portion 120 of the rod 81 is similar in all respects to the key portion 109 and the studs 110 and 111 previously described excepting that a washer 121 is provided under the ends of the switch slide equalizing springs 82 and 83 and against the key portions 120 when the key portions are compressed against the springs 82 and 83, as illustrated in Fig. 9.

In operation, assuming that it is desired to raise the window glass 13 from the lowermost position shown in Fig. 1, the operating lever 43 is pushed to the left and the glass 13 raises, and a push to the right on the lever 43 lowers the glass. In the illustrated position shown in Fig. 1, the glass is at rest because the lever 43 is in a neutral position. In Figs. 4, 5, and 6, the apparatus is illustrated in the neutral position. This neutral position represents any position or the termination of any action after the operator's hand has been removed from the operating lever 43. It also represents any position comprising

the extreme movement of the glass 13 either up or down.

In Figs. 7 to 10 inclusive, we have illustrated various positions of the apparatus after the lever 43 has been pulled to the right-hand side, as viewed in Fig. 1. Fig. 7 shows the position of switch blades 54 contacting electrical contacts 60 and 61. In this position, the motor 31 is energized and the window glass 13 moves upwardly and will continue to move up until the operator releases the lever 43, or the bracket 119 attached to the glass channel member engages the fixed collar 122 mounted on the rod 115. When the bracket 119 reaches the collar 122 the limit of movement of the glass 13 has been reached in an upwardly direction and if the lever is still held over to the right side the rod 115 will lift bringing the lower capped end up under the actuating slide bracket 104 and allowing the switch blades 54 to return to a neutral position at which point all electrical current is cut off from the motor 31.

In similar operation, assuming that the window glass 13 is moving downwardly, the operating lever 43 is then thrown to the left-hand side, and if the operator continues to hold it when the glass is fully down the bracket 119 compresses the spring 113 until the actuating slide bracket 104 is depressed and the switch blades 54 are moved from the dot-and-dash lines shown in Fig. 7 to the center neutral position at which point all electrical current is disconnected from the motor 31.

When the automatic cut-out of the electrical circuit takes place the operator is instantly reminded because the lever 43 is pulled from his grasp into the neutral position.

Assuming that the operator wishes to move the glass 13 part way up and stop it at that point, the action is as follows: The lever 43 is pushed to the right-hand side and the actuating slide member 90 is depressed downwardly compressing the heavy equalizing spring 112 on the stud 110 and at the same time the bracket 105 slides down on the rod 81 compressing the switch slide equalizing spring 83. When this action takes place, the cam plate 96 becomes engaged on the cam surface 103 with the pawl pin 75 which raises the pawl 67 from the step 85. When the pawl 67 is raised from the surface 85 on the switch slide member 74, the compressed switch slide equalizing spring 83 snaps the slide 74 down into the position shown in Figs. 7 and 8. The downward movement of the switch slide 74 is stopped by the pawl 67 when it engages the side of the step 88 on the slide. At this point it will be noted that the switch blade extension lever 64 has been acted upon by the recess 89 in the left-hand side of the switch slide member 74 causing the switch blades 54 to engage the electrical contacts 60 and 61. While the operating lever 43 is held to the right-hand side the actuating slide 90 will hold the above described mechanism in place and the window glass 13 will continue to move upwardly, and at this point the pawl 66 on the upper side will be engaged against the step 84 of the switch slide 74.

If during the upward movement of the glass 13 the operator releases the lever 43 the following movements will take place: The equalizing spring 112 on stud 110 immediately pushes the actuating slide 90 up to the position shown in Figs. 4, 5 and 6. At Fig. 9 we have stopped the movement of the actuating slide 90 just before it reaches its neutral position to better illustrate the next movement of the various parts affected.

It will be noted in Fig. 9 that although the ac-

tuating slide 90 has moved up from the position shown in Fig. 9, yet the switch slide 74 still remains in its lowermost position being held there by means of the pawl 66 engaged against the end of the slide step 84. In Fig. 9, the cam plate surface 101 is in the act of lifting the pawl pin 75 from the end of the step 84. At this point, it will be noted that the actuating slide central bracket 100 is now compressing the upper switch slide equalizing spring 82 while the collar is engaged against the key portion 120 of the rod 81 and the spring 85 is in a neutral position. As the movement of the actuating slide member 90 continues and finally releases the pawl 66, the switch slide equalizing spring 82 snaps the switch slide 74 upwardly carrying the knife blade extension lever 64 into a neutral position thereby opening the electrical circuit to the motor 31. The upward movement of the switch slide 74 is limited by the pawl 66 which now engages against the end of the switch slide step 88. At this point, the apparatus is back in a neutral position shown in Figs. 4, 5 and 6.

Should the operator now wish to reverse the action, the operating lever 43 is pushed to the left-hand position and the actuating slide 90 moves upwardly bringing the bracket 105 into compression against the equalizing spring 113 on the stud 111. In this position the operation is repeated in reverse causing the switch slide 74 to throw the switch blade extension lever 64 up against and into the dot-and-dash position indicated in Fig. 7.

It will be noted throughout the above description that no movement of the knife blade 54 takes place until certain of the mechanism reaches a predetermined position at which time the movement of the switch is very quick thereby reducing any tendency for arcing or fluctuations in the movement of the motor 31, and at the same time all positions of the switching mechanism are locked in place.

Throughout our invention, as disclosed in Figs. 1 to 14 inclusive, we have used a reversible electrical motor in combination with an automatic reversing switch mechanism and stop members associated with the window glass channel member 12. This mechanism is controlled by means of an operating lever 43 which protrudes through the window sill 14.

Having thus described our invention what we claim as new is:

1. A reversing mechanism for double throw electrical switches comprising in combination, a base plate attached to the frame of an electrical switch, an actuating slide member mounted on said plate, equalizing springs contacting with a bracket portion of said actuating slide member and said switch frame, a switch extension lever extending through said base plate, a switch slide mounted on said base plate, a recess located in said switch slide engaging said extension switch lever, stepped stop members located on said switch slide member, equalizing spring members attached to said switch slide member, a centrally located bracket member located on said actuating slide and engaged between the opposed ends of the equalizing springs attached to said switch slide, pawls pivoted on said base plate and pawl springs engaging said pawls and said base plate, a cam plate located on said actuating slide, pawl pins located on said pawls, said cam engaging

said pawl pins for the purpose of raising said pawls from said stepped stop members on said switch slide member.

2. A reversing mechanism for double throw electrical switches comprising in combination, a base plate attached to the frame of an electrical switch, an actuating slide member mounted on said plate, springs contacting with a bracket portion of said actuating slide member and said switch frame, a switch extension lever extending through said base plate, a switch slide mounted on said base plate, a recess located in said switch slide engaging said extension switch lever, stepped stop members located on said switch slide member, equalizing spring members attached to said switch slide member, a centrally located bracket member located on said actuating slide and engaged between the opposed ends of the equalizing springs attached to said switch slide, pawls pivoted on said base plate, a cam plate located on said actuating slide, pawl pins located on said pawls, said cam engaging said pawl pins for the purpose of raising said pawls from said stepped stop members on said switch slide member.

3. A reversing mechanism for double throw electrical switches comprising in combination, a base plate attached to the frame of an electrical switch, an actuating slide member mounted on said plate, equalizing springs contacting with a bracket portion of said actuating slide member and said switch frame, a switch extension lever extending through said base plate, a switch slide mounted on said base plate, a recess located in said switch slide engaging said extension switch lever, stepped members located on said switch slide member, spring members attached to said switch slide member, a centrally located bracket member located on said actuating slide and engaged between the opposed ends of the said springs attached to said switch slide, pawls pivoted on said base plate and pawl springs engaging said pawls and said base plate, a cam plate located on said actuating slide, pawl pins located on said pawls, said cam engaging said pawl pins for the purpose of raising said pawls from said stepped stop members on said switch slide member.

4. A reversing mechanism for double throw electrical switches comprising in combination, a base plate attached to the frame of an electrical switch, an actuating slide member mounted on said plate, spring members contacting with a bracket portion of said actuating slide member and said switch frame, a switch extension lever extending through said base plate, a switch slide mounted on said base plate, a recess located in said switch slide engaging said extension switch lever, stepped stop members located on said switch slide member, spring members attached to said switch slide member, a centrally located bracket member located on said actuating slide and engaged between the opposed ends of the said springs attached to said switch slide, pawls pivoted on said base plate and pawl springs engaging said pawls and said base plate, a cam plate located on said actuating slide, pawl pins located on said pawls, said cam engaging said pawl pins for the purpose of raising said pawls from said stepped stop members on said switch slide member.

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