

Jan. 7, 1941.

D. L. CHANDLER ET AL

2,227,703

WINDOW MECHANISM

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2 Sheets-Sheet 1

Fig. 1.

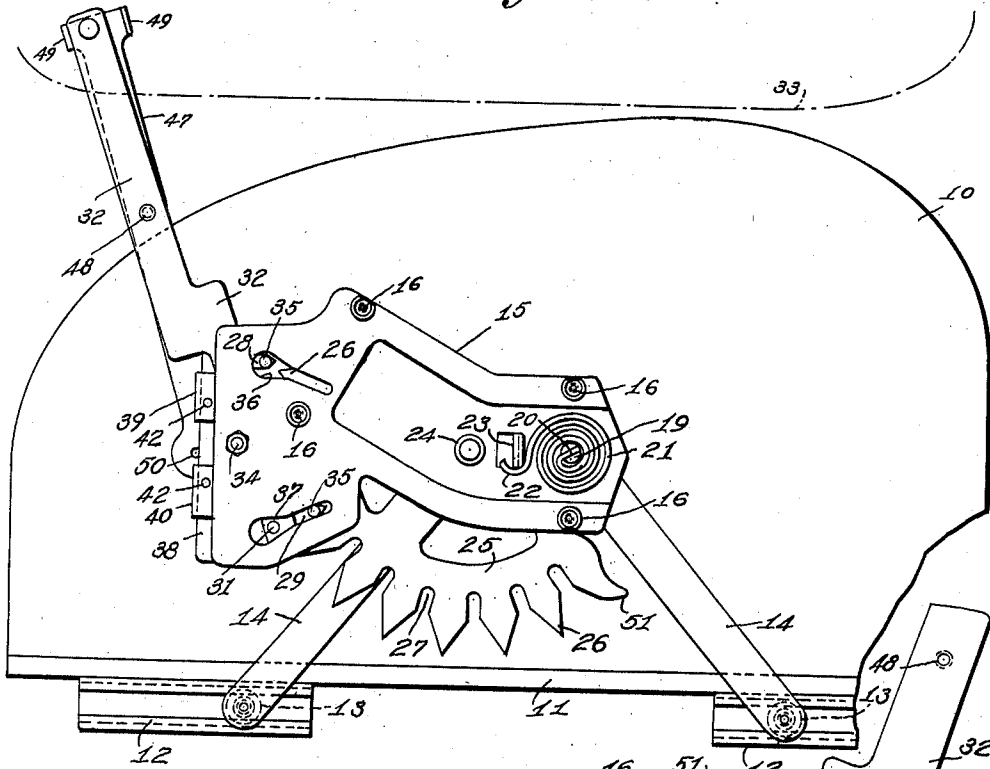
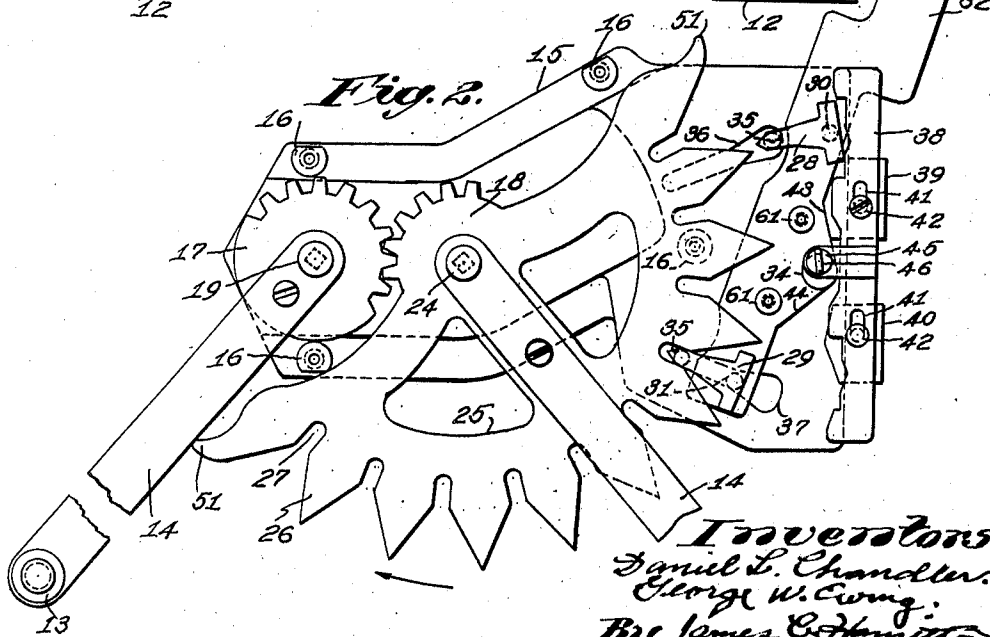


Fig. 2.



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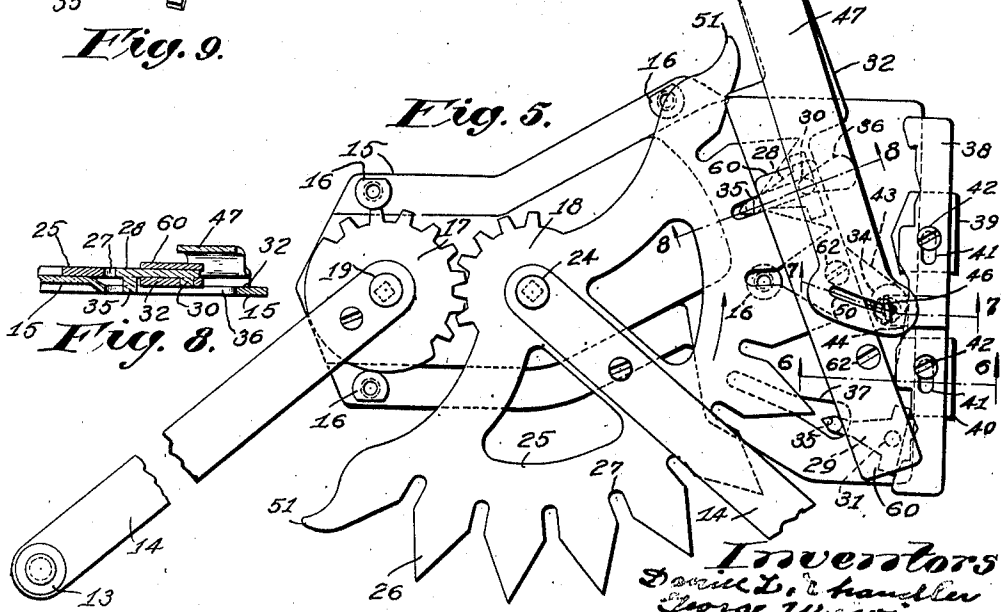
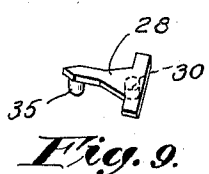
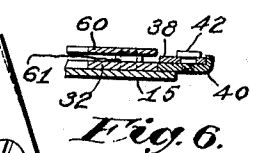
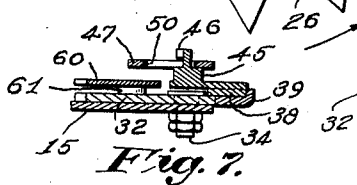
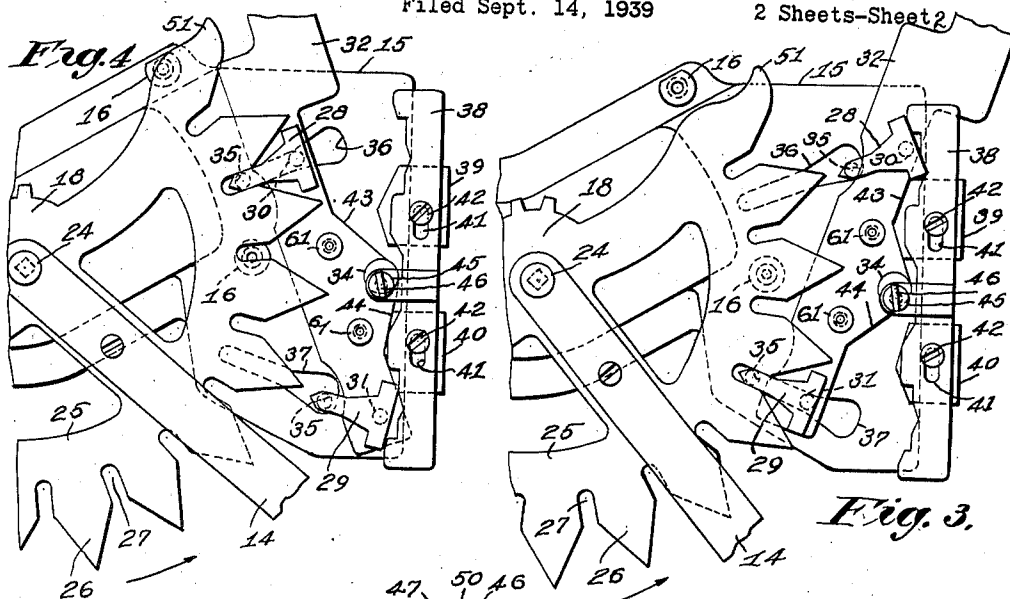
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WINDOW MECHANISM

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2 Sheets-Sheet 2



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2,227,703

WINDOW MECHANISM

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Application September 14, 1939, Serial No. 294,858

3 Claims. (Cl. 74-157)

Our present invention relates to window mechanism, and more particularly to an improved window mechanism which raises, lowers, and automatically locks the window sash in its movement either up or down.

The principal object involved in our invention comprises an improved window mechanism;

Another object is a window elevating and lowering mechanism which may substantially be constructed from sheet metal material thereby greatly reducing the cost of manufacture because of the use of dies;

Still another object is a window mechanism which not only elevates and lowers the window sash but also provides a positive lock for same at any point in the range of its operation making it impossible to raise or lower the sash without operating the hand control;

And still another object is a novel method and apparatus of reversing the direction of movement of the window sash, either up or down, while still using the same movement of the operating hand lever, etc., and

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

In the drawings illustrating the preferred embodiment of our invention:

Fig. 1 shows a back-side elevation of the apparatus, as mounted in an automobile door, and as viewed from the inside of the automobile. The sheet metal door frames and supporting material has been eliminated to better illustrate the mechanism concerned in this application. A portion of the figure is cut away for convenience.

Fig. 2 is an enlarged front side elevation of the mechanism removed from the door, parts being broken away for convenience. In this figure, the apparatus is set in a position to lower the window sash and is almost at the lowermost position, the direction arrow indicating the direction in which the apparatus is moving;

Fig. 3 shows a fragmentary view of the apparatus illustrated in Fig. 1, the direction reversing slide having been reversed and the apparatus in a condition to raise the window sash on the next movement of the operating lever;

Fig. 4 is another fragmentary side elevation similar to Figs. 1, 2 and 3 but showing the apparatus operating in a counter-clockwise direction to Fig. 2 being a continuation of movement from the position shown in Fig. 3.

Fig. 5 is similar to Fig. 4 with respect to all parts shown in Fig. 4 but further adding the reversing lever, cover plate over the operating mechanism and other parts shown in Fig. 2. The extreme ends of the elevating levers and the operating lever have been broken away for convenience.

Fig. 6 is a fragmentary cross-section taken on the line 6-6 of Fig. 5;

Fig. 7 is another fragmentary cross-section taken on the line 7-7 of Fig. 5;

Fig. 8 is still another fragmentary cross-section taken on the line 8-8 of Fig. 5, and

Fig. 9 is a perspective view of one of the operating fingers which turn the apparatus and raise or lower the window sash.

Referring more in detail to the drawings illustrating the preferred embodiment of our invention, 10 indicates a windowpane, the lowermost edge of which is inclosed in the conventional U shaped channel member 11. On the lower edge of this channel member is affixed slide-way members 12 having an internal channel area in which are guided the rolls 13 of the arms 14.

The base member 15 is secured to the automobile door or its equivalent at predetermined points, as at 16, and are adapted to raise the sash 10 when the pinions 17 and 18 are rotated. The pinion 17 is journaled on the base member 15 by means of the shaft 19 which is provided with a slot 20 on the back side through which is anchored the counterbalance spring 21 on one end the opposite end 22 being hooked around a vertical anchor member 23 which is struck up from the plate 15. The pinion 18 is freely journaled in the plate 15 by means of the shaft 24. On the side of the pinion 18 remote from the teeth 30 is a large segment 25 the outer periphery of which is provided with special teeth 26 having V shaped ends and separated from each other by the slots 27. The segment 25 is rotated to the right or left by means of fingers 28 and 29 which are pivoted at 30 and 31 respectively on the member 32 which is also the operating lever of the apparatus the upper end of which extends a short way above the window sill 33, as shown in Fig. 1. The operating lever member 32 is pivoted at 34 to the plate 15. The teeth 26 on the member 25 are alternately engaged on the upper or lower sides of the V shaped teeth in a progressive manner as the lever 32 is moved to the right and left by the V pointed ends of the fingers 28 and 29. At the end of each stroke of the lever 32 the sharp end of the finger 28 or 29 enters the slots thereby locking the apparatus. The V pointed ends of the fingers 28 and 29 in their back position are either positioned just above or below the point of the V shaped teeth 26, as the case may be. On the under side of the fingers 28 and 29 is provided a pin 35 which projects through cam slots 36 and 37 located in the base plate member 15. The rear end of this cam slot is enlarged for the purpose of allowing the fingers 28 and 29 to swing to either side of the point of the V teeth 26 when the fingers are in the back position. As the fingers 28 or 29 are forced into engagement with the teeth 26 the

pins 35 engage with the edges of the cam slots 36 or 37, as the case may be, and force the segment gear 25 up or down a distance equal to one-half of the distance between two adjacent slots 27.

5 The back position of the fingers 28 or 29 are controlled by means of a reversing slide 38 which is mounted to the rear of the plate 15 in the following manner. Back stop members 39 and 40 are mounted on the plate 15 and preferably are provided with right angled sides against which the slide 38 bears. The slide is provided with elongated slots 41 through which are located shouldered screws 42 which limit the movement of the slide 38. The front faces of the back stop members 39 and 40 are cut off at an angle and provide stops against which the back edge of the lever 32 engages when thrown to the extreme right or left positions, the stops being located above and below the pivot point on the lever 32 and engaging the angle edges 43 and 44. The reversing slide member 38 is composed of a flat piece of metal the front edge being cut out adjacent each end to form recesses and projections which engage the rear edges of the fingers 28 and 29 when they are brought into engagement with the slide 38 and thereby tip such fingers above or below the V points of the teeth 26.

On the top surface of the slide 38 at its central portion is affixed a strap member having a vertical stud on the top of which is an overhanging key member, the stud being indicated at 45 and the key portion at 46. Pivoted to the operating lever 32 is a reversing lever 47. The lever 47 is pivoted at 48 and the upper end is provided with offset right angled flanges 49 which engage against the edges of the adjacent operating lever 32 and limit the throw of the reversing lever. On the lower end of the reversing lever is located a cam slot 50. The under side of the lever 47 adjacent the cam slot 50 is adapted to ride on the upper surface of the stud just under the key portion 46, the key member holding the slotted end of the lever 47 from becoming disengaged from the stud 45. When the lever 47 is pivoted to the right or left the cam slot 50 moves the slide 38 up or down, as the case may be.

Fig. 2 shows the apparatus in a position to turn the segment 25 in a clockwise direction, as indicated by the arrow. If the lever is thrown to the left the finger 28 will engage the upper side of the pointed tooth 26 and move down into the last upper slot. It will be noted that the last tooth on each end of the segment 25 is provided with a longer point 51 the end of which is curved outwardly. The purpose of this is to prevent the fingers from advancing over this tooth and if the lever 32 is further operated without changing the reversing slide 38 it will not advance the segment member 25 further but merely operate in and out of the last slot 27 thereby doing no damage nor becoming disengaged with the member 25.

Fig. 3 shows a fragment of the apparatus shown in Fig. 2 except that the reversing slide has been moved from its upper position shown in Fig. 2 to its lowermost position. It will now be observed that the finger 28 having been engaged at its back with the cut-out portion of the slide is now pointing down on the under side of the pointed tooth 26.

Fig. 4 shows another position being the position in which the apparatus will be when the

lever 32 shown in Fig. 3 has been thrown to the left. In this figure it will be seen that the finger 28 has engaged the tooth 26 and moved down into the slot 27 thereby turning the segment member 25 in a counterclockwise direction. At the same time it will be observed that the receding finger 29 has engaged the slide 38 and has also been tipped down in position to engage the lower side of the adjacent tooth 26 when the lever 32 is pivoted to the right which would then advance the segment member 25 again in the same direction.

In the Figures 2, 3 and 4, the reversing lever 47 has purposely been eliminated to better show the mechanism below. Also a cover plate 60 15 which is spaced away from the lever 32 by means of the spacers 61 has also been removed for the sake of clarity. This is a flat plate being held in place by means of screws 62 threaded into the lever 32.

Fig. 5 shows the complete assembly the position of the various parts being the same as indicated in Fig. 4.

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

1. In a window raising and lowering mechanism having a base member and a segmental member pivoted thereon with V pointed teeth located on its periphery, and an operating lever having V pointed cam fingers pivoted thereon with back portions engaging with a cam finger slide slidably mounted on said base member, the V pointed portions of said cam fingers engaging against the V sides of said V pointed teeth on said segmental member, a cam lever pivotally mounted on said operating lever, said cam lever having a cam track located within its lowermost portion, a pin attached to said finger slide engaged in said cam track for the purpose of sliding said slide and pivoting said fingers up or down, as the case may be.

2. In a window raising and lowering mechanism having a base member, and a segmental member pivoted thereon with V pointed teeth located on its periphery, and an operating lever having V pointed cam fingers pivoted thereon with back portions engaging with a cam finger slide slidably mounted on said base member, the V pointed portions of said cam fingers engaging against the V sides of said V pointed teeth on said segmental member, a cam lever pivotally mounted on said operating lever, the said cam lever having a cam track, a pin attached to said finger slide and engaged in said cam track for the purpose of moving said fingers up and down when said actuating lever is operated.

3. In a window raising and lowering mechanism having a base member and a segmental gear member pivoted on said base, the said segmental member having V shaped teeth located on its periphery, and an operating lever having V pointed cam fingers pivoted thereon with back portions engaging with a cam slide setting member slidably mounted on said base member, and V pointed front portions engaging against the V sides of said segmental V shaped teeth, an operating lever having a cam track located therein, connecting means located on said slide and engaging with said cam track for the purpose of sliding said cam slide.

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