Sept. 16, 1924. 1,508,609

J. McARTHUR

SASH OPERATING MECHANISM

Filed Feb. 14, 1922 2 Sheets-Sheet 1

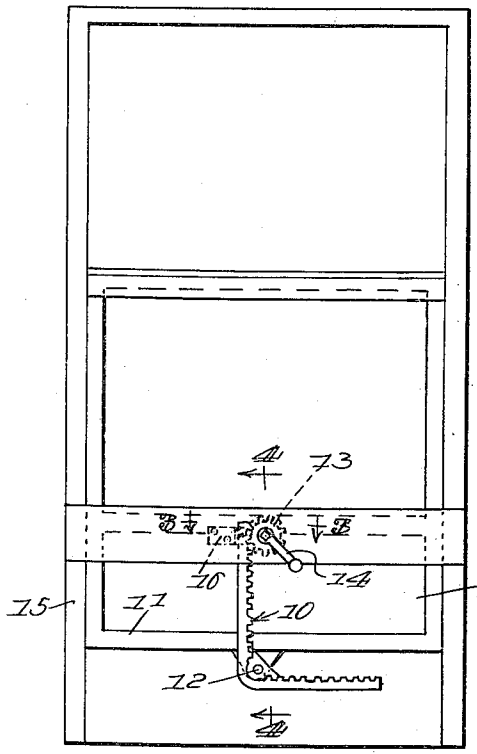


Fig. 1.

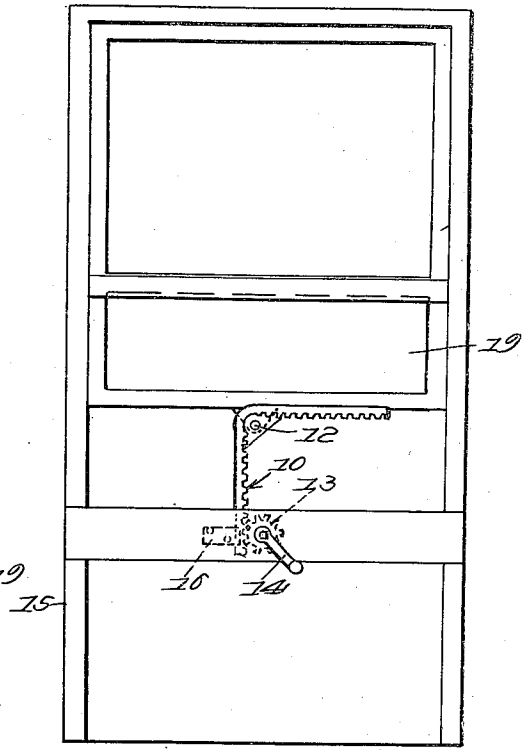


Fig. 2.

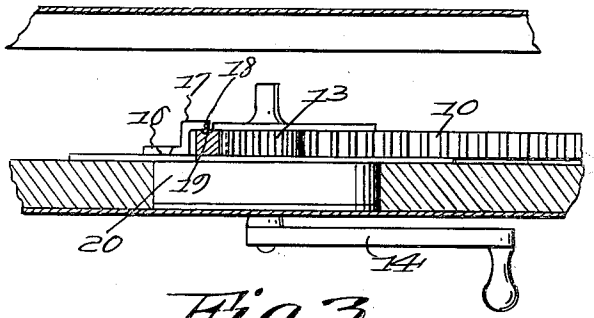


Fig. 3.

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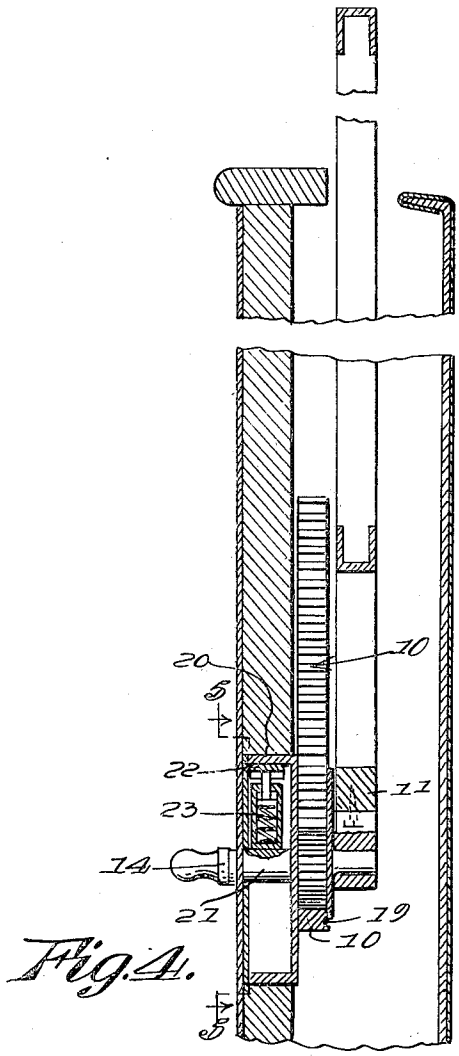


Fig. 4.

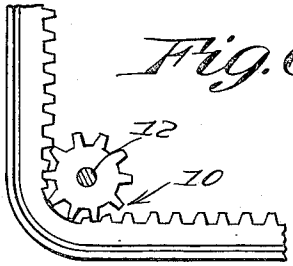


Fig. 6.

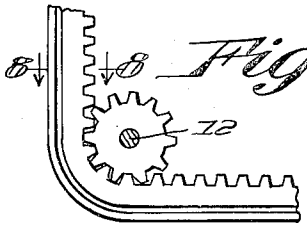


Fig. 7.

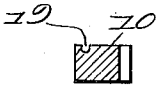


Fig. 8.

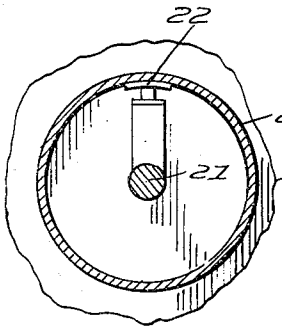


Fig. 5.

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Patented Sept. 16, 1924. 1,508,609

UNITED STATES PATENT OFFICE.

JOHN McARTHUR, OF DETROIT, MICHIGAN.

SASH-OPERATING MECHANISM.

Application filed February 14, 1922. Serial No. 536,480.

To all whom it may concern:

Be it known that JOHN MCARTHUR, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, has invented new and useful Improvements in Sash-Operating Mechanism, of which the following is a specification.

The object of the invention is to provide a sash operating mechanism for use in connection with the sashes of closed body vehicles of the motor driven type such as limousines, cabs, sedans, coupes and the like and in relation to railway street car and under bus windows which for convenience should be positively movable in the direction to either open or close the same, which can not under ordinary circumstances be provided with counterweights, which should be held at any desired intermediate adjustment without the operation of any specific locking means, which may not when released be subject to fall or drop with the attendant risk of breaking the glass forming the light thereof, and wherein the operating means is inaccessible to the occupant or passenger; and with these objects in view the invention consists in a construction and combination of parts of which a preferred embodiment is shown in the accompanying drawings, wherein:—

Figure 1 is an inner view of a sash operating mechanism arranged in operative relation with a sash and frame, a portion of the frame being omitted to show the operating mechanism and the sash being shown in a lowered or open position.

Figure 2 is a similar view showing the sash in a closed position.

Figure 3 is a horizontal section taken in the plane indicated by the line 3—3 of Figure 1.

Figure 4 is an enlarged detail vertical section on the plane indicated by the line 4—4 of Figure 1 and showing the sash in an intermediate position with the angular rack at the intermediate or mid-way portion of its travel or path of movement.

Figure 5 is a detail sectional view on the plane indicated by the line 5—5 of Figure 4.

Figure 6 is a detail view of the pinion and rack with the latter in its intermediate position.

Figure 7 is a view of the same wherein the series of teeth is made continuous throughout the angle between the arms of the rack.

Figure 8 is a detail section on the plane indicated by the line 8—8 of Figure 7.

The mechanism consists essentially of a tilting angular rack 10 pivotally mounted upon and carried by the sash 11, the pivotal point of mounting being indicated at 12 and a pinion 13 mounted upon the frame in mesh with the teeth of the rack and provided with an operating handle or crank 14, the rack and pinion preferably being arranged within and housed by the window casing 15 so as to be concealed and protected, and the crank 14 only being visible at and accessible from the interior of the vehicle. The advantage in the use of the angular rack resides in the fact that it provides for a positive operation of the sash through a path of which the length is a multiple of that of each arm of the rack bar or is equal to the combined lengths of the arms of said rack bar which in the construction illustrated are disposed in right angular relation. In the construction illustrated the rack is guided and held in proper relation with the pinion by means of a clip 16 secured to the window frame or any suitable stationary support with an overhanging finger 17 provided with a stud or pin 18 operating in a groove 19 of the rack, and with the parts in the position indicated in Figure 1 if the pinion is turned clockwise the rack bar will be fed upward, carrying with it the sash until the rack reaches the intermediate position indicated in Figure 4 and also shown in Figures 6 and 7 with the pinion engaged with the teeth at the angle between the arms of the rack whereupon the rack will turn about its pivotal point 12 to bring the previously operative arm thereof into a horizontal position shown in Figure 2 and thereby dispose the other arm in a vertical position or in a position in alignment with the path of movement of the sash, so that the movement of the latter may be continued until the sash reaches the fully closed position indicated in Figure 2. Obviously the opening or lowering of the sash involves a reversal of the above described movement of the rack bar. Thus the maximum extension of the rack above the pinion is not in excess of one-half of the length of the rack bar or one-half of the path of movement of the sash between its closed and open positions.

In order that the sash may be released by the operator and retained at any desired ad-

justment between the limits of its movement, and may also be secured in the closed position without relying upon separate fastening means, a brake band 20 of cylindrical form is disposed in concentric relation with the axis of the pinion, and the spindle 21 of the latter carries a plunger shoe 22 in frictional contact with the inner surface of the brake band and yieldingly held in contact therewith by a suitable spring 23. This brake mechanism also is enclosed within the housing afforded by the window frame so that there is no portion of the mechanism exposed for contact with adjacent objects.

Having described the invention, what is claimed as new and useful is:—

1. A sash operator having cooperative rack and pinion elements of which the former is of angular construction and pivotally mounted adjacent the angle, the pinion successively engaging the arms of the rack and rotating the same about its pivot to dispose the last engaged arm in parallelism with the path of movement of the sash.

2. A sash operator having cooperative rack and pinion elements of which the former is of angular construction and is pivotally mounted to successively dispose its arms in parallelism with the path of movement of the sash, in combination with a brake band and a shoe arranged in cooperative relation, one of which is rotatable with the pinion.

3. A sash operator having cooperative rack and pinion elements of which the former is of angular construction and is pivotally mounted to successively dispose its arms in parallelism with the path of movement of the sash, the rack element being guided by a clip disposed in overhanging relation therewith and provided with a stud or pin operating in a groove in the rack.

4. In combination with a sash and frame therefor, of a sash operator having co-operating rack and pinion elements of which the pinion is rotatably mounted on the frame and the rack pivotally mounted on the sash, the rack comprising two sections angularly disposed with respect to each other and the pivotal mounting being adjacent the point of juncture of said sections.

In testimony whereof he affixes his signature.

JOHN McARTHUR.