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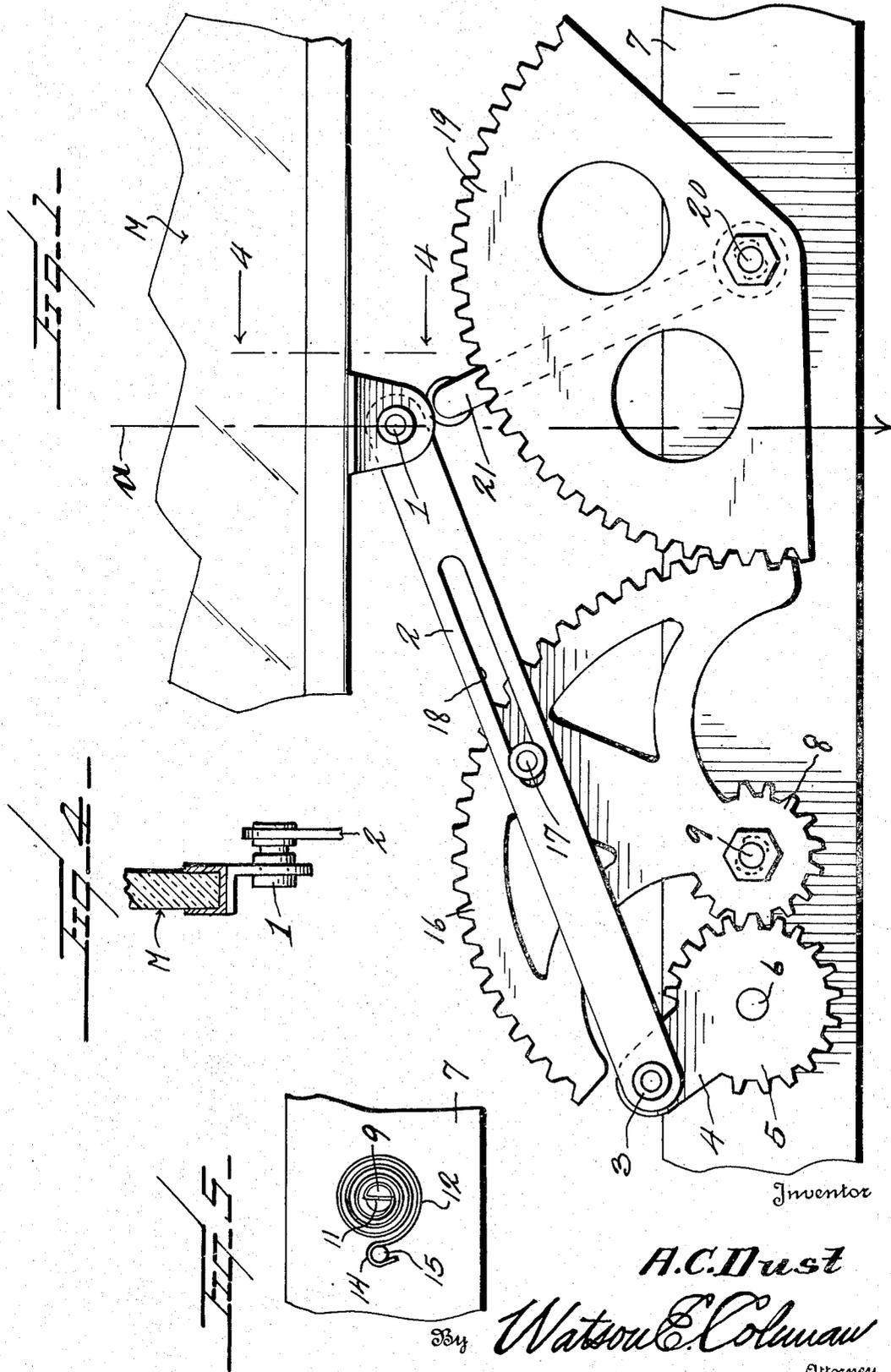
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2,070,941

WINDOW OPERATING MECHANISM

Filed June 4, 1936

2 Sheets-Sheet 1



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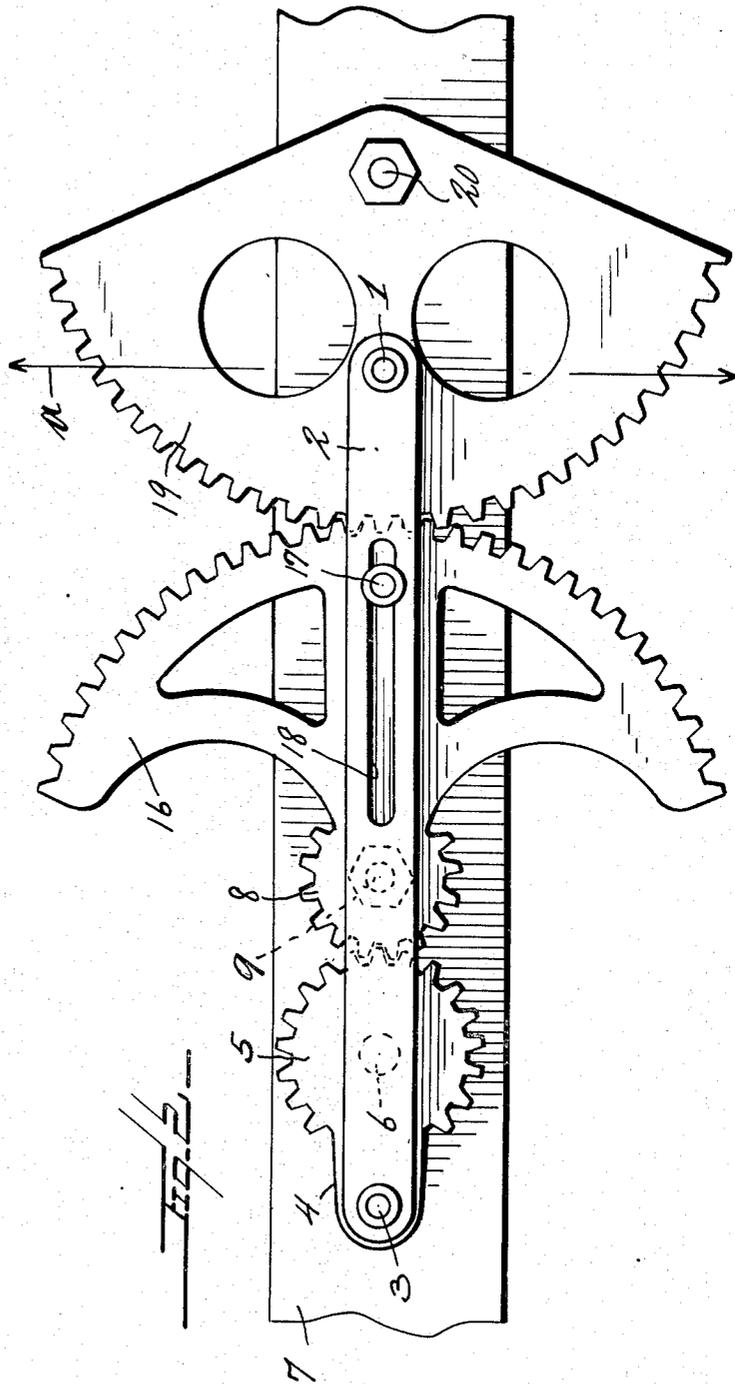
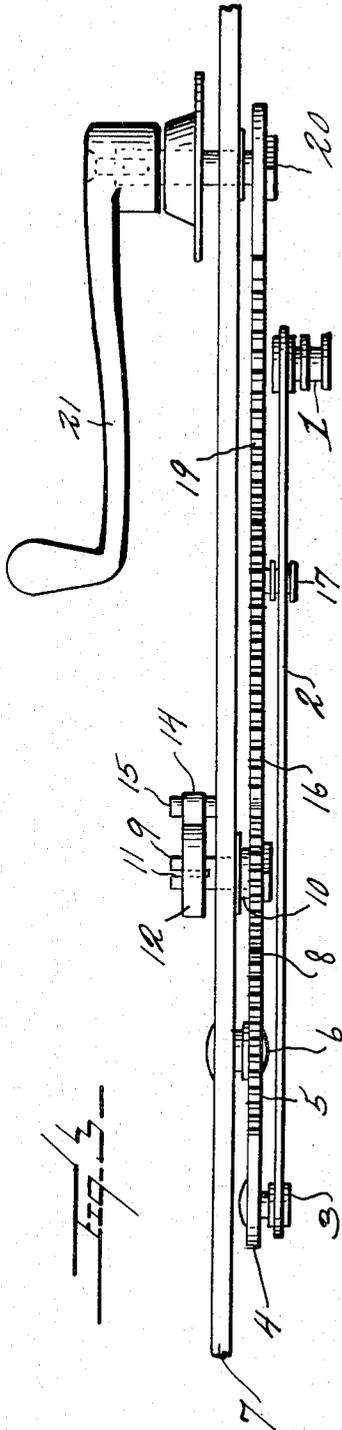
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2 Sheets-Sheet 2



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WINDOW OPERATING MECHANISM

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6 Claims. (Cl. 268—126)

This invention relates to a window operating mechanism and has relation more particularly to a mechanism of this kind including a lever operatively engaged with the window proper thus making it possible to produce an operating mechanism for rapidly moving the window into open or closed position.

The invention has for an object to provide a mechanism of this kind so constructed and arranged to allow a rapid movement of a window into open or closed position as a result of but a slight turn of an operating handle in contradistinction to the mechanisms now generally in use wherein a number of complete turns of the operating handle is necessary in order to move a window into either fully open or closed position.

The invention also has for an object to provide a mechanism of this kind including an operating lever for operative connection with a window and wherein said lever is so constructed and arranged to impose a push or pull as required upon the window without shifting the operative connection or engagement of the lever with the window.

A still further object of the invention is to provide a mechanism of this kind constructed and assembled in a manner to move a window into open or closed position without chattering and free of rubbing against or sticking to the frame or guide members for the window, thus assuring desired adjustment or shifting of the window without strain to the operator.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved window operating mechanism whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:—

Figure 1 is a fragmentary elevational view of somewhat a diagrammatic character illustrating an operating mechanism for a window constructed in accordance with an embodiment of my invention;

Figure 2 is a view somewhat similar to Figure 1 showing certain of the parts in a second position;

Figure 3 is a view in top plan of the structure as illustrated in Figure 2;

Figure 4 is a fragmentary sectional view taken substantially on the line 4—4 of Figure 1;

Figure 5 is a fragmentary elevational view of the side opposite to Figure 1 and particularly illustrating the balance spring coacting with one of the gears.

My improved mechanism as herein disclosed is particularly adapted for use in connection with a vertically movable glass closure member M such as is now generally used in connection with automobile bodies. This member M is mounted in any of the different ways now known for desired up and down movement in substantially a fixed path of travel, and as such mounting in itself forms no part of the present invention it is not believed that a detailed description and illustration thereof is required.

The lower marginal portion of the closure member M at preferably its longitudinal center has pivotally connected therewith, as at 1, an end portion of a lever 2 of desired length. The end portion of the lever 2 remote from its pivotal connection with the closure member M is pivotally connected, as at 3, with the outer portion of an arm 4 extending radially from and preferably integrally connected with a pinion 5 of desired diameter. This pinion 5 is mounted for rotation upon a stub shaft 6 carried by and extending laterally from a chassis 7. This chassis 7 or supporting member is mounted in any preferred manner within the well below a window opening in either a door or side wall of a vehicle body.

The pinion 5 constantly meshes with a second pinion 8 fixed to rotate on the shaft 9 rotatably supported by and disposed through the chassis 7. The chassis 7 carries a bearing 10 through which the shaft 9 is also directed.

The shaft 10 extends beyond the face of the chassis 7 opposite to the pinion 8 and secured, as at 11, to said extended portion of the shaft 9 is an end portion of a helical spring 12, the opposite or outer end portion of which being anchored, as at 14, to a post 5 extending outwardly from the chassis 7 at the same side as the spring 12. This spring 12 serves as a balance spring as will hereinafter be referred to.

The pinion 8 as herein disclosed is integrally formed with a segmental gear 16, the radius of this gear 16 is materially greater than the radius of the pinion 8 and the axial centers of the pinion 8 and gear 16 are coincident and at a point preferably midway the ends of the gear 16. The gear

16 adjacent to its periphery carries an outstanding pin 17 which extends through a slot 18 in the lever 2 and extending lengthwise thereof. The pin 17 is of a diameter substantially equal to the width of the slot 18. The arm 4 of the pinion 5 is of such length that as the gear 16 is rotating in either direction, the pivotal point 1 on the lever 2 will move up or down in a straight line as indicated at *a* in Figures 1 and 2. This is important as a similar pull is assured at all times upon the closure member M when being either pushed or pulled into fully open or closed position. This is of advantage as chattering is avoided and the member M has movement without resistance being offered by such movement as by rubbing or sticking to the conventional guideways for the member M.

The gear 16 constantly meshes with a segmental gear 19. In the present embodiment of my invention this gear 19 is illustrated as being on the same radius as the gear 16. This, however, can be varied in accordance with the preferred speed at which it may be desired to have the gear 16 operate.

This gear 19 is fixed to rotate with a shaft 20 disposed through the chassis or support 7 and said shaft 20 has engaged therewith in a conventional manner an operating handle 21. In Figure 1 the closure member M is illustrated in its fully lowered position whereas in Figure 2 the lever 2 is shown in its position when the closure member has been moved into half way position with respect to its opening. Attention is directed to this in view of the fact that it is to be emphasized that in order to move the closure member M into either fully open or closed position only approximately a one quarter turn of the handle 21 is required which is in contradistinction to the window operators now generally in use wherein the operating member or handle of necessity must be fully rotated a number of times.

As the mechanism is operated to move the closure member M downwardly, the balance spring 12 is placed under tension so that when the mechanism is operated to raise the member M such upward movement will be facilitated by the action of the spring 12 and thereby materially minimizing the effort on the part of the operator. It is to be stated, however, that the spring 12 in itself is at no time of a tension sufficient to automatically raise the closure member M.

From the foregoing description it is thought to be obvious that a window operating mechanism constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention is practice except as hereinafter claimed.

I claim:—

1. In combination with a window closure member for movement back and forth in substantially a fixed path of travel, an operating mechanism for said closure member comprising a lever, means for pivotally connecting said lever to an end marginal portion of the closure member, a pair of intermeshing gears, the end portion of the lever remote from the closure member being pivotally connected to one gear, said lever in its intermediate portion having a slot disposed lengthwise

thereof, and a part carried by the second gear extending within the slot of the lever, the ratio of the gears being such to oscillate the lever to move the closure pivot in a straight line.

2. In combination with a window closure member for movement back and forth in substantially a fixed path of travel, an operating mechanism for said closure member comprising a lever, means for pivotally connecting said lever to an end marginal portion of the closure member, a pair of intermeshing gears, the end portion of the lever remote from the closure member being pivotally connected to one gear, said lever in its intermediate portion having a slot disposed lengthwise thereof, and a part carried by the second gear extending within the slot of the lever, the ratio of the gears being such to oscillate the lever to move the closure pivot in a straight line, said gears being supported to one side of the connection between the lever and the closure member.

3. In combination with a window closure member for movement back and forth in substantially a fixed path of travel, an operating mechanism for said closure member comprising a lever, means for pivotally connecting said lever to an end marginal portion of the closure member, a pair of intermeshing gears, the end portion of the lever remote from the closure member being pivotally connected to one gear, said lever in its intermediate portion having a slot disposed lengthwise thereof, and a part carried by the second gear extending within the slot of the lever, the ratio of the gears being such to oscillate the lever to move the closure pivot in a straight line, said gears being of a radii to move the closure member into fully closed or open position upon rotation of the gears less than one-half of a complete revolution.

4. In combination with a window closure member for movement back and forth in substantially a fixed path of travel, an operating mechanism for said closure member comprising a lever, means for pivotally connecting said lever to an end marginal portion of the closure member, a pair of intermeshing gears, the end portion of the lever remote from the closure member being pivotally connected to one gear, said lever in its intermediate portion having a slot disposed lengthwise thereof, a part carried by the second gear extending within the slot of the lever, the ratio of the gears being such to oscillate the lever to move the closure pivot in a straight line, and a balancing spring associated with one of the gears and placed under tension when the gears are operated to move the closure member in one direction.

5. In combination with a window closure member for movement back and forth in substantially a fixed path of travel, an operating mechanism for said closure member comprising a lever, means for pivotally connecting said lever to an end marginal portion of the closure member, a pair of intermeshing gears, the end portion of the lever remote from the closure member being pivotally connected to one gear, said lever in its intermediate portion having a slot disposed lengthwise thereof, a part carried by the second gear extending within the slot of the lever, the ratio of the gears being such to oscillate the lever to move the closure pivot in a straight line, and an operating gear constantly in mesh with the second gear.

6. In combination with a window closure member for movement back and forth in substantially

a fixed path of travel, a pair of constantly meshing pinions mounted to one side of the transverse center of the path of travel of the closure member, a lever pivotally connected with an end marginal portion of the closure member and with one of the pinions, a segmental gear rotating with the second pinion about an axis coincident with the axis of rotation of said second pinion, the

radius of the segmental gear being materially greater than the radius of the second pinion, said lever having a slot in its intermediate portion extending lengthwise thereof, a part carried by the segmental gear extending within the slot of the lever, and an operating gear meshing with the segmental gear.

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