May 24, 1927.

1,630,230

C. UNGERMAN

SASH REGULATING DEVICE

Filed Jan. 10, 1924

2 Sheets-Sheet 1

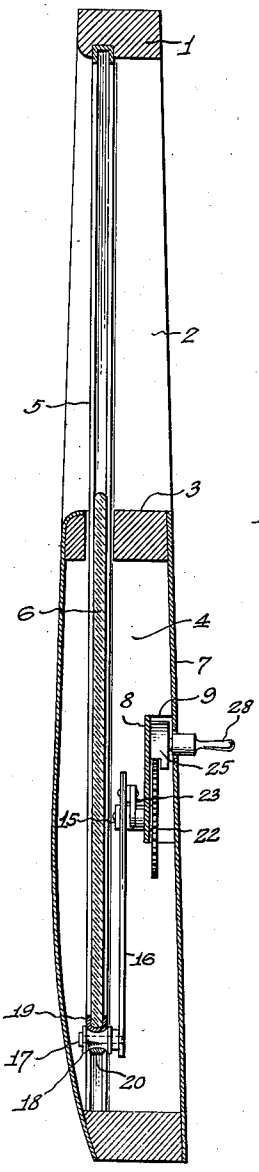


Fig. 2.

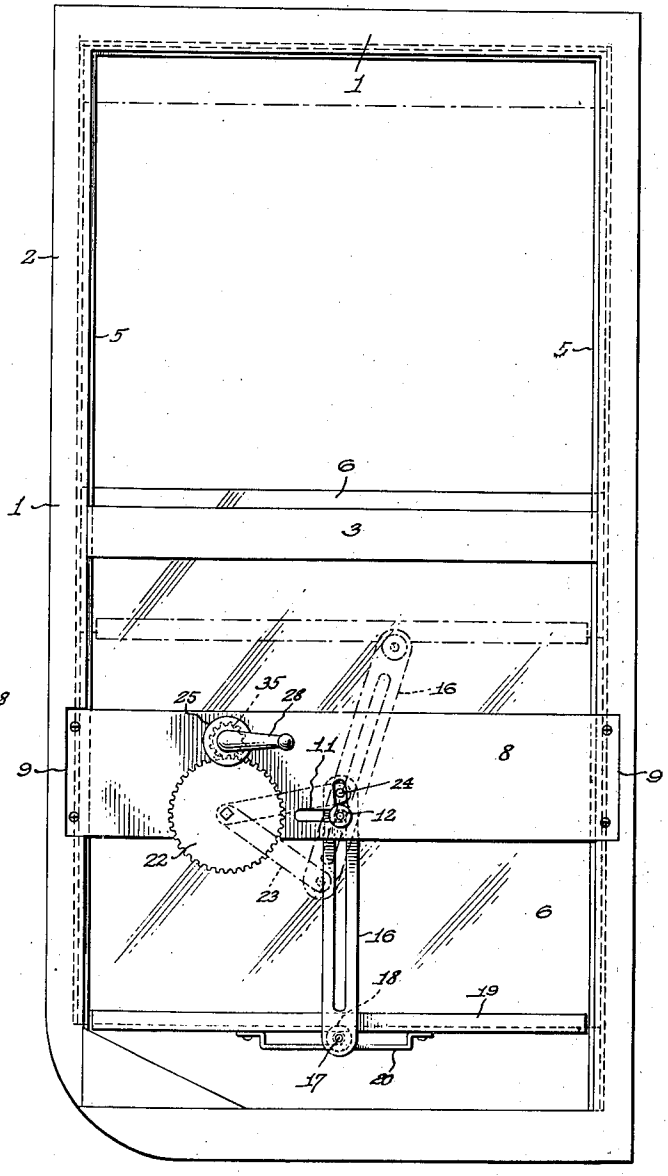


Fig. 1.

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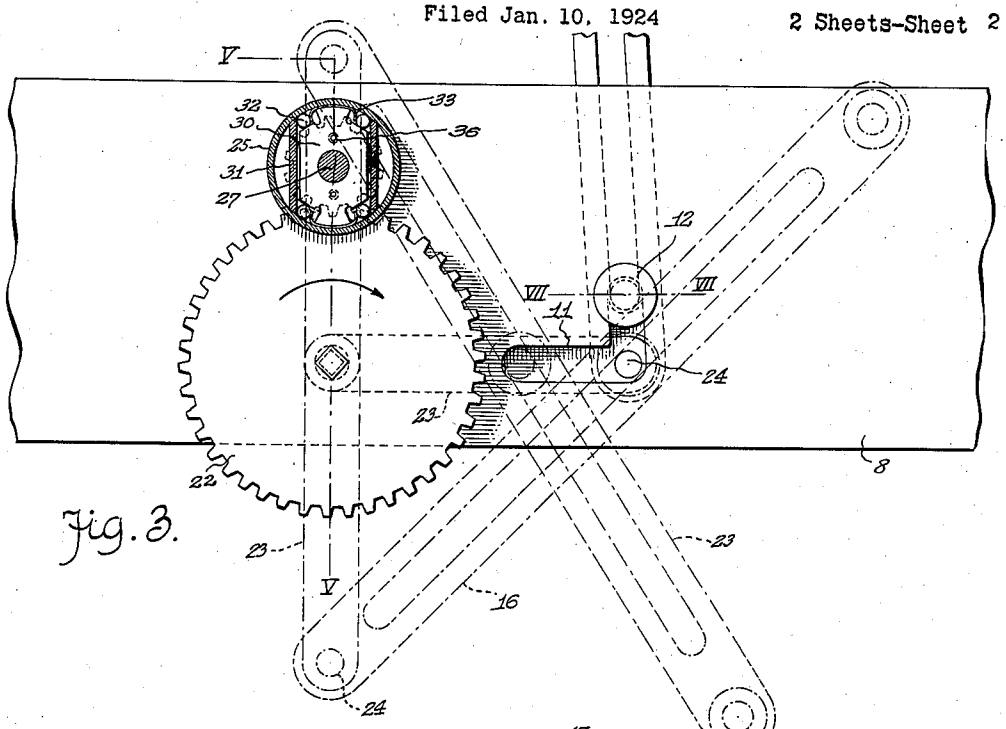


Fig. 3.

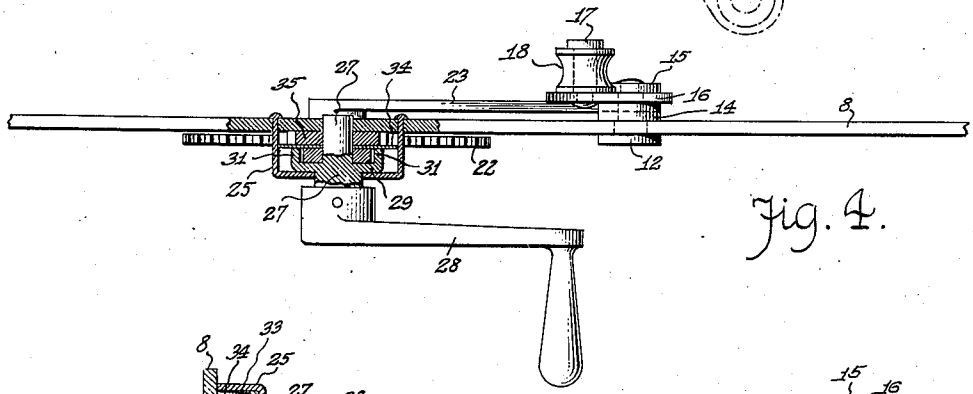


Fig. 4.

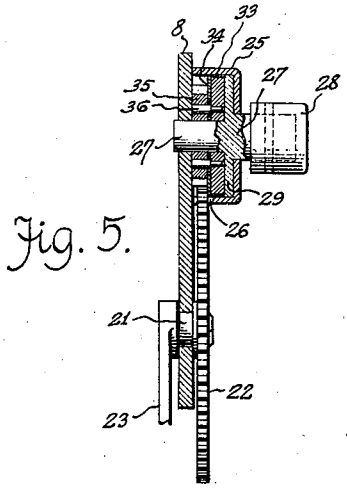


Fig. 5.

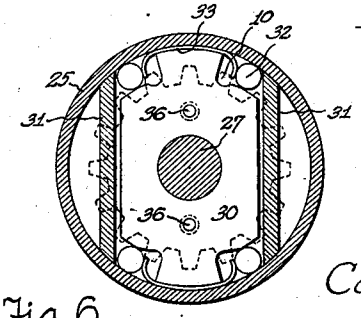


Fig. 6.

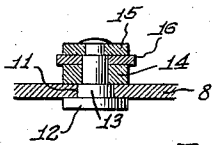


Fig. 7.

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Patented May 24, 1927. 1,630,230

UNITED STATES PATENT OFFICE.

CARL UNGERMAN, OF DETROIT, MICHIGAN.

SASH-REGULATING DEVICE.

Application filed January 10, 1924. Serial No. 685,329.

This invention relates to a sash regulating device and has special reference to that class of sash raising and lowering devices used in automobile bodies, doors and other structures for adjusting a sash relative to a sash frame and opening. Such devices are ordinarily located in a sash well or wall or door compartment with the devices operatable from the inner side of the wall or door, and in the case of an automobile, a sash may be shifted by the driver or one of the occupants of the automobile to provide proper ventilation.

My invention aims to provide a sash regulating device in which a novel arm or lever action is employed for adjusting a sash without any danger of the sash working hard or binding in its usual guides, the sash being raised and lowered perpendicular with minimum power, safety, and assurance that the sash will remain in adjusted position. To this end, the device includes a novel automatic clutch which precludes operation of the device because of the weight of the sash and in addition to the clutch there is a simple, durable and inexpensive mechanism that may be easily and quickly installed.

My invention will be hereinafter specifically described and then claimed, and reference will now be had to the drawings, wherein—

Figure 1 is a view of the inner side of a door frame with the side panel thereof removed to show an installation of my device;

Fig. 2 is a vertical sectional view of the same;

Fig. 3 is an enlarged elevation of a greater part of the device, partly in section, showing by dot and dash lines different positions which parts of the device may assume;

Fig. 4 is a plan of the device partly broken away and partly in section;

Fig. 5 is a cross sectional view taken on the line V—V of Fig. 3;

Fig. 6 is an enlarged detail sectional view of a clutch or locking device, and

Fig. 7 is a horizontal sectional view taken on the line VII—VII of Fig. 3.

The reference numeral 1 denotes by the way of an example, a wall or door frame provided with a sash opening 2, a slotted sill 3, a well 4, sash guides 5, a slidable sash 6, and an inside panel 7. The sash 6 normally extends into the slot of the sill 3 and is adapted to be adjusted in the guides 5 by being raised or lowered at or in the well 4.

8 denotes a transverse support that may be set in recesses 9 of the frame 1 and suitably attached to said frame so as to extend transversely of the well 4 at approximately its portion. The support 8, intermediate the ends thereof, has an angular slot 11, with one portion of said slot horizontal and the opposite portion vertical.

12 denotes a shiftable spool-like member slidable in the slot 11 of the support 8, said member being in the form of a shouldered stud which has a shoulder portion 13 in contact with walls of the slot 11 and on said stud is a spacer 14 and a washer 15.

16 denotes a longitudinally slotted arm or lever which is slidable on a stud 12 between the spacer 14 and the washer 15. The arm or lever 16 is shiftable relative to the stud and the support 8 and may be bodily inverted or swung about as will hereinafter appear.

17 is a stud or bearing on one end of the arm or lever 16 and said stud or bearing is provided with a grooved roller 18 normally engaging a rail 19 mounted on the lower or inner edge of the sash 6. Attached to the rail 19 is a stirrup 20 which retains the roller 18 in engagement with the rail 19. In some instances the rail 19 may be cut and stamped from metal to provide an integral stirrup and in either instance the rail and stirrup constitute an operative connection between the arm 16 and the sash 6 so that the former may move the latter without causing any binding action of the sash in its guides 5.

21 denotes a shaft journaled in the support 8 with one end of the shaft provided with a large gear wheel 22 and the opposite end of the shaft with a crank 23, said crank being pivotally connected, as at 24 to the opposite end of the arm 16 from the roller 18, and when the large gear wheel 22 is rotated the crank 23 is adapted to shift the arm 17 and cause adjustment of the sash 6, as will hereinafter appear.

25 denotes a casing suitably attached to the support 8 above the large gear wheel 22 and the lower side of said casing is provided with an opening 26 so that the large gear wheel may extend into said casing. Journaled in the casing and the support 8

is a winding arbor 27 provided with a crank 28, handle or other member which will facilitate manual rotation of the arbor 27. On the arbor 27 is a channel member 29 and loosely mounted in said channel member, over the arbor 27, is a head 30 the side walls of which may be engaged by the channel walls 31. The head 30 is provided with recesses 10 for clutch members 32, preferably in the form of small rollers and the recesses 31 have a configuration which permits of the clutch members 32 receding into the recesses to permit of the arbor 27 being rotated relative to the casing 25, otherwise, said clutch members prevent rotation of the arbor 27 especially by the large gear wheel 22 set in motion by the weight of the sash 6.

33 are springs or retaining members on the head 30 against the inner wall of the casing 25 and the ends of these springs are adapted to retain the clutch members 32 in distended positions, but not interfere with receding movement of said clutch members when engaged by the walls 31 of the channel member 29.

34 is a retaining washer at the side of the head 30 to retain the clutch members 32 on said head and at the side of said washer is a small gear wheel 35 meshing with the large gear wheel 22. The small gear wheel 35 is loose on the arbor 27, but is connected to the head 30 by pins 36 extending through the washer 34 into said head, said pins or like devices permitting the clutch parts to be easily assembled.

The panel 7 has an opening providing clearance for the crank or handle 28 and when said crank or handle is manually rotated, in one direction or the other, the integral channel member 29 of the arbor 27 engages certain of the clutch members 32 and then the walls of the head 30. The engaged clutch members will release the head relative to the casing 25 and the other clutch members will follow in the direction of rotation imparted to the channel member 29. With the head 30 rotated and the small gear wheel 35 carried thereby it is obvious that the large gear wheel 22 will be rotated and cause the shaft 21 to be rocked so that the crank 33 will actuate the arm or lever 16.

Assuming that the sash is in a raised position with the arm 16 vertical, as shown in Fig. 3, it will be noted that the shiftable member 12 is in a vertical portion of the slot 11 with the pivotal connection 24 under said shiftable member, consequently the walls of the vertical portion of the slot 11 will retain the slotted arm 16 perpendicular as a prop under the recessed sash.

Swinging the crank 23 in a clockwise direction, as indicated by the arrow in Fig. 3, causes the arm 16 to slide on the shiftable member 12 and said member to drop to the angular portion of the slot 11. The slotted arm 16 is gradually brought towards the horizontal and as said arm is inverted it slides on the shiftable member with said member free to ride in the horizontal portion of the slot 11 and the roller 18 free to ride against the rail 19.

From the foregoing it will be observed that the slotted arm 16 is inverted from an extreme low position of the sash to an extreme high position thereof, such being the opened and closed sash conditions, and it is obvious that at any intermediate position of the sash the clutch or locking device will prevent the weight of the sash from rotating the gearing, but not in the least interfere with manual operation of such gearing to adjust the sash. There are various kinds of clutches or locking devices that may be associated with the gearing to prevent movement of the arm 16 due to the weight of the sash or any pressure on the upper edge of the sash, and there are also various kinds of bearings, anti-rattling devices and appurtenances that may be adopted in connection with my regulating device. Therefore, I reserve the right to make such structural changes as are permissible by the appended claims and as may be necessary for different installations.

What I claim is:—

1. In a sash regulating device, the combination with a support, of a swingable and invertible sash supporting arm slidable relative to said support, and a crank operatable from said support and connected to said arm for imparting movement thereto.

2. A sash regulating device as called for in claim 1, and a shiftable member in said support slidably supporting said arm.

3. A sash regulating device as called for in claim 1, wherein said arm and said support are slotted and a member in said slots defines the movement of said supporting arm.

4. In a sash regulating device wherein a movable arm against the lower edge of a sash is adapted for raising and lowering said sash;—means for supporting said arm so that it may be bodily inverted, and means set to one side of the first mentioned means and connected to an end of said arm to shift said arm to an inverted position.

5. A sash regulating device as called for in claim 4, wherein the first mentioned means includes a shiftable supporting member in slidable engagement with said arm.

6. The combination of a sash, a support, an arm slidably supported by said support and suspended therefrom with the lower end of said arm supporting said sash in a lowered position, and means connected to the upper end of said arm adapted for manual actuation to swing the lower end of said arm above said support so that said sash will be raised thereby.

7. The combination of a sash, a slotted support, a shiftable member in the slot of said support, a slotted arm slidable on said shiftable member with one end of said arm connected to said sash for moving it, a crank connected to the opposite end of said arm to cause movement of said arm and said shiftable member, and gearing adapted for manual operation to move said crank.

8. In a window regulator, the combination of a window member to be operated, operating connections therefor comprising a supporting member having a fulcrum bearing thereon, an operating lever engaging said bearing and mounted to be slidable and rotatable thereon, a gear member suitably journaled upon the supporting member and pivotally connected to the operating lever and operatable to move said pivotal connection in a circular path extending above and below the fulcrum bearing whereby a translatory and rotary movement is imparted to the operating lever, and said fulcrum bearing being intermediate of said pivoted connection and the supporting end of the operating lever.

9. In a device of the character described, the combination of a movable member to be operated, of operating connections therefor, comprising a supporting plate, a fulcrum bearing mounted upon said plate, an operating lever having an elongated slot fitted to the fulcrum bearing, an operating gear suitably journaled upon the plate with its axis in substantial horizontal alinement with the fulcrum bearing, a pivotal connection between the gear and the operating lever arranged whereby upon the rotation of the gear said pivotal connection will be moved in a circular path extending above and below the fulcrum bearing thereby to transmit a translatory and rotary movement to the operating lever, an actuating pinion suitably journaled in engagement with the operating gear and means for rotating said pinion substantially as described.

In testimony whereof I affix my signature.

CARL UNGERMAN.