

F. KARSITZ.
WINDOW OPERATING AND LOCKING MECHANISM.
APPLICATION FILED SEPT. 22, 1909.

976,575.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

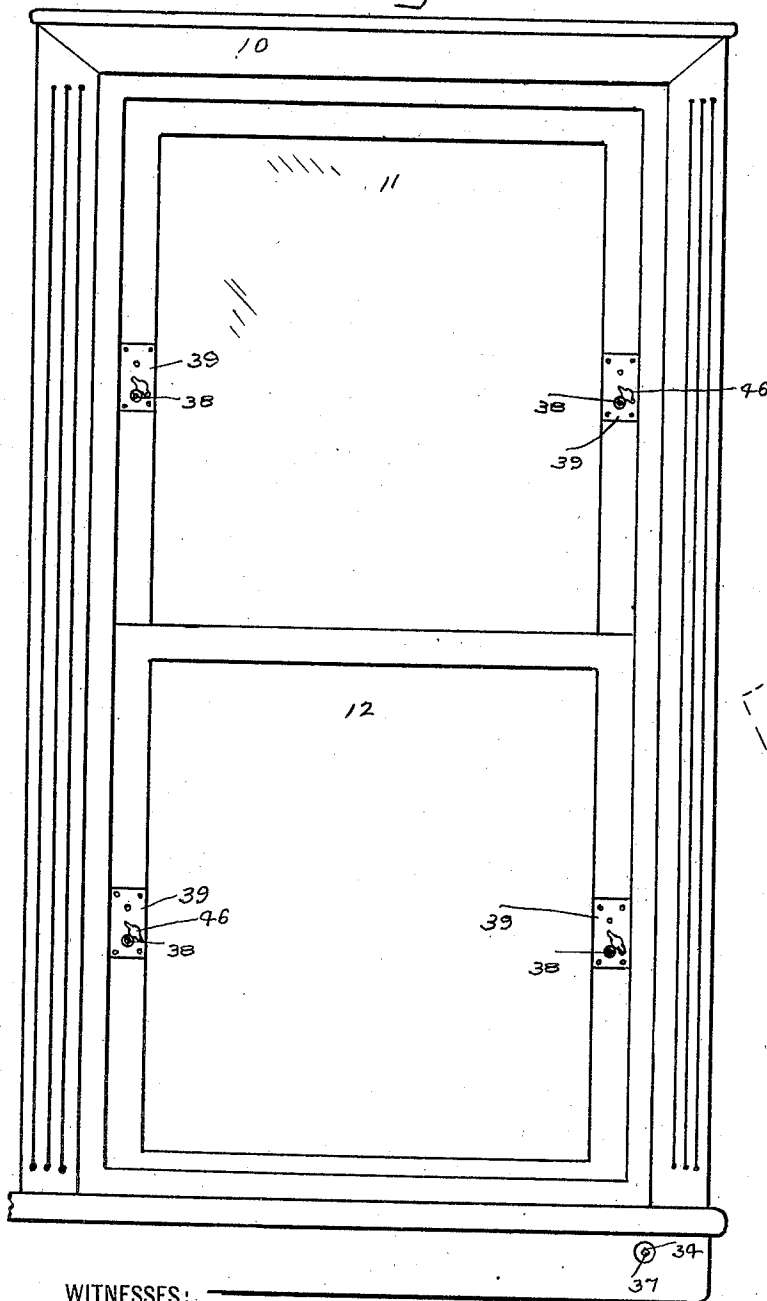
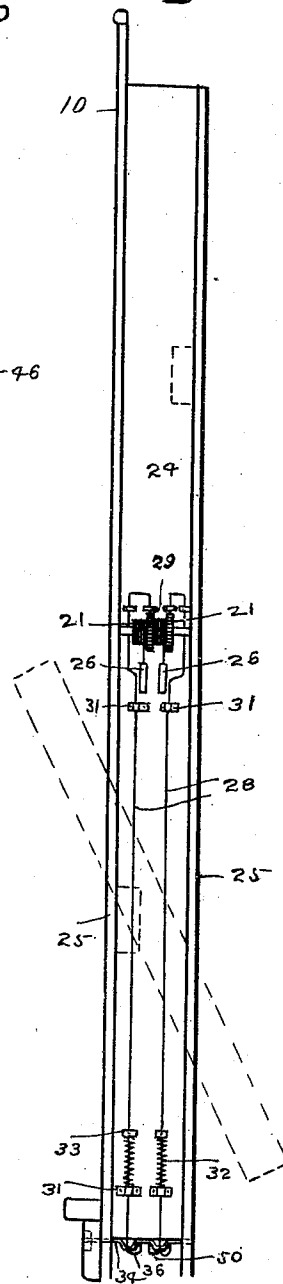


Fig. 2.



WITNESSES:

H. A. Lamb
S. W. Atherton

INVENTOR
Frank Karsitz

BY
A. M. Wooster
ATTORNEY

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2 SHEETS-SHEET 2.

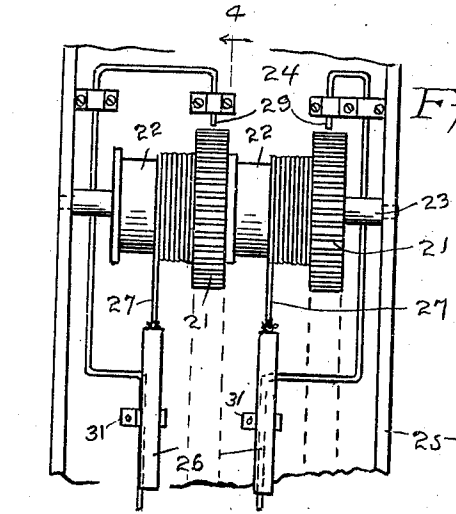


Fig. 3.

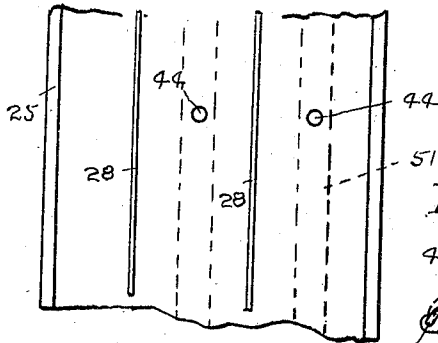


Fig. 7.

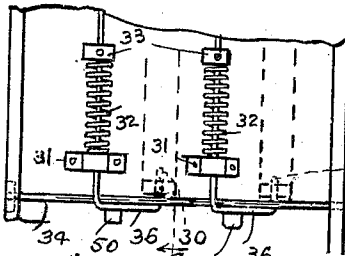


Fig. 6.

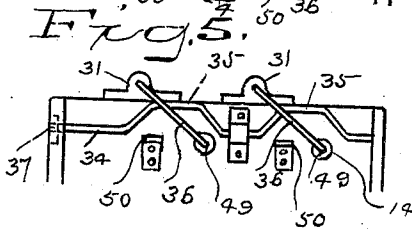


Fig. 5.

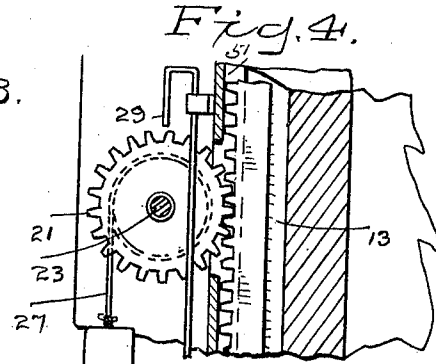
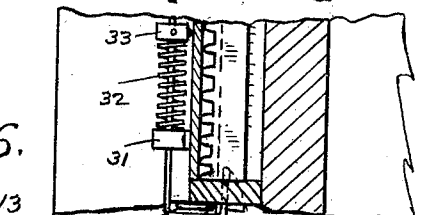
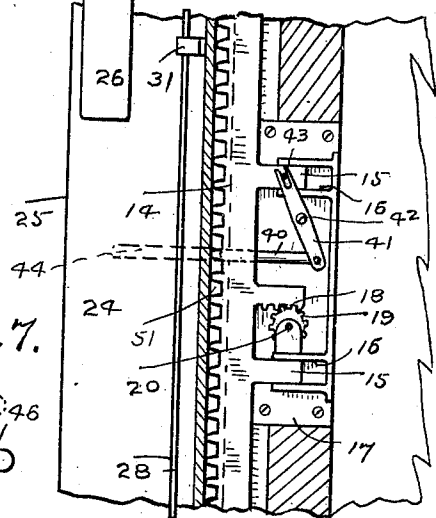
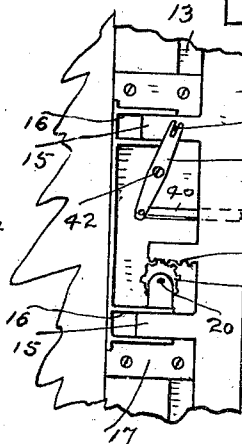


Fig. 4.



WITNESSES:

H. H. Lamb,
S. W. Atterton.



INVENTOR

Frank Karsitz

BY

A. W. Wooster
ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK KARSITZ, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF TO WILLIAM EHOUS, OF BRIDGEPORT, CONNECTICUT.

WINDOW OPERATING AND LOCKING MECHANISM.

976,575.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed September 22, 1909. Serial No. 518,948.

To all whom it may concern:

Be it known that I, FRANK KARSITZ, a subject of the King of Hungary, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Window Operating and Locking Mechanism, of which the following is a specification.

This invention has for its object to produce operating mechanism for windows that will make both sashes weather-proof, will counterbalance the sashes, will lock both sashes in any required position, either closed or partly open, and will permit either sash to be swung on a horizontal axis when in the lowered position.

With these and other objects in view, I have devised the novel mechanism which I will now describe, referring to the accompanying drawings forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is an elevation of a window having my novel operating mechanism applied thereto; Fig. 2 an elevation of the operating mechanism as seen from the inner side of the casing, that is, looking in the direction of the sashes, the sashes being locked against movement; Fig. 3 an enlarged detail view of the operating mechanism from the same point of view, the sashes being unlocked and the racks locked against movement; Fig. 4 an elevation as seen from the right in Fig. 3, the side piece of the well being removed; Fig. 5 an inverted plan view corresponding with Fig. 3; Fig. 6 a detail elevation illustrating a form in which a horizontally sliding bead is substituted for a horizontally sliding rack; and Fig. 7 is a detail view on an enlarged scale from a point of view the reverse of that in Fig. 1, illustrating means for locking the pinions when used in connection with a horizontally sliding bead instead of a rack.

10 denotes the casing, 11 an upper sash and 12 a lower sash. Each sash is provided in its edges with longitudinal recesses or grooves 13 to receive a rack 14 which is movable in the horizontal plane. Where the sashes are of ordinary size and moderately light it is only necessary to provide a rack upon one side of a sash, a horizontally sliding bead 45 being substituted for the rack on the opposite side, the principle of the invention being the same whether racks are pro-

vided in both sides of the sashes or in only one side. These horizontally sliding racks or beads in their retracted position lie wholly in the sashes and in their projected position pass into grooves 51 in the casing, thereby closing the slight spaces between the sashes and the casing and making the sashes effectually weather-proof. Each rack is provided with tongues 15 which extend rearwardly therefrom and slide in ways 16 on a plate 17 recessed into the sash and with a rearwardly extending operating rack 18 which is engaged by a pinion 19 rigidly secured to an operating shaft 20 which is mounted to rotate on plate 17.

21 denotes gear wheels and 22 drums formed integral with or rigidly secured to the gear wheels. Each combined drum and gear wheel is mounted to rotate independently of the other on a shaft 23 which extends across the well 24 and is fixed to the side pieces of the well indicated by 25. In the normal position of the parts, the racks will engage the gear wheels as shown in Fig. 4 and the sashes are counterbalanced by weights 26 suspended from cords or chains 27 which are wound upon the drums, the inner ends of the cords or chains being secured to the drums in any ordinary or preferred manner not shown in the drawings.

28 denotes sliding locking rods having engaging ends 29 and 30, engaging ends 29 being adapted to engage the gear wheels and lock them against rotation and engaging ends 30 being adapted to engage sockets 49 in the lower ends of the racks to lock them against horizontal movement when the sashes are lowered, as will be more fully explained. The locking rods are movable longitudinally in guides 31 and are normally held in the raised position by means of springs 32 which bear against guides and against collars 33 on the rods. The action of these springs is to normally retain engaging ends 29 out of engagement with the gear wheels, leaving the gear wheels free to rotate when the sashes are raised or lowered and to retain engaging ends 30 in engagement with sockets 49 in the lower ends of the racks when the sashes are lowered locking said racks against horizontal movement (see Figs. 4 and 5.) The locking rods are operated in any convenient manner to unlock the racks and to lock the gear wheels. In the present instance I have shown the locking rods as operated by means

of operating shafts in the casing which may be placed wherever most convenient; in the present instance they are shown as placed under the sill. The operating shafts are provided with bends or offsets 35 which engage angle arms 36 upon the locking rods. The ends of the operating shafts are made angular as at 37 and extend through the casing into position to be engaged by a key, or they may be provided with a knob if preferred. It will be obvious from the drawing that when an operating shaft is oscillated by means of a key or knob (not shown) the offsets 35 will engage the angle arms of the locking rods and will draw the locking rods downward against the power of the springs causing the engaging ends 29 to pass between teeth of the gear wheels and to lock the gear wheels against rotation, which will of course lock the sashes against movement either upward or downward no matter in what position the sashes may be. Simultaneously with the locking of the gear wheels by engaging ends 29, the racks are unlocked through the disengagement therefrom of engaging ends 30. The racks are moved in the horizontal plane into and out of engagement with the gear wheels by means of shafts 20 and pinions 19 mounted in the sashes. The ends of these shafts are made angular as at 38 and extend through plates 39 on the face of the sashes into convenient position for operation by a key or knob.

It will be noted in Figs. 3, 4 and 5, that the offsets 35 of operating shaft 34 lie in substantially the horizontal plane and rest upon angle arms 36 of locking rods 28. When it is required to lock the gear wheels and consequently to lock the sashes against movement, the operating shaft is given a quarter turn swinging the offsets downward and consequently through the engagement of the offsets with the angle arms of the operating rods drawing said rods downward and causing engaging ends 29 to engage and lock the gear wheels. The offsets are now substantially in vertical alinement with or slightly past vertical alinement with the center of rotation of the operating shaft, in which position they will remain and will lock the gear wheels and the sashes against movement as shown in Fig. 2. In order to unlock the gear wheels and the sashes it is necessary to operate the locking shaft again by means of a key or knob (not shown). Stops 50 are provided against which the offsets swing to limit their movement when swung to the locking position and retain them against swinging past the locking position.

In order to provide for swinging the sashes on a horizontal axis when the lower sash is in its normal position, or when the upper sash is lowered and the lower sash raised for the purpose of cleaning or otherwise, I provide at the mid-length of each

sash on each side a pivot pin 40 which is adapted to slide in the side rail of the sash and to engage a socket 44 in the casing. The inner end of each pivot pin is loosely pivoted to a lever 41, which is pivoted in the side rail of the sash as at 42, the other end being connected in any suitable manner, as by a pin and slot connection 43, to one of the tongues 15 which extend backward from the rack, or in case a sliding bead is used, from the bead. The operating mechanism for the pivot pins is precisely the same whether a horizontally sliding bead or a horizontally sliding rack is used (see Fig. 6 in connection with Fig. 4).

46 denotes levers pivoted in plates 39 and the side rails of the windows which may serve as cover plates for the angular ends 38 of shafts 20. Where the racks are dispensed with on one side of the sashes, the locking rods are also dispensed with and the pinions 19 which are operated by the beads and operate the pivot pins upon that side may be locked against movement to retain the beads in the projected position and the pivot pins in the retracted position by means of catches 48 at the inner ends of shafts 47 to which levers 46 are attached (see Fig. 7 in connection with Fig. 1), the lever and catch being retained by gravity in the locking position as shown in full lines in Fig. 7. When it is desired to retract the bead and to project the pivot pin for the purpose of swinging a sash on a horizontal axis, the lever is raised thereby disengaging the catch from the pinion as shown in dotted lines in Fig. 7. Shaft 20 may then be operated by means of a key or knob to retract the bead and to project the pivot pin.

The operation will be readily understood from the drawings and the description already given. In the normal position of the parts as in Fig. 4, the racks are locked against movement by the engaging ends 30 of the locking rods, and the beads if used are locked by the catches. In this position of the parts the sashes may be raised and lowered in the usual manner, the racks engaging the gear wheels and the weights serving to counterbalance the weight of the sashes. To lock the sashes, operating shafts 34 are operated by means of a key or knob (not shown), applied to their angular ends and the locking rods, either or both of them, are moved downward carrying engaging ends 29 into engagement with the teeth of the gear wheels, thereby locking the gear wheels against rotation and consequently locking the sashes in any position in which they may be placed, that is, either closed or partly open. The operating levers will remain in the locking position and will retain the gear wheels and sashes locked through the engagement of the offsets with the angle arms of the locking rods, as already explained.

When it is required to swing either sash upon a horizontal axis, the sash to be swung being at the lowered position, operating shafts 34 are operated as already described to lock the gear wheels and weights by means of engaging ends 29 and to disengage engaging ends 30 from the racks, after which shafts 20 are operated in the manner described to move racks 14 or rack and bead backward out of engagement with the gear wheels and by means of levers 41 to move the pivot pins forward into engagement with sockets 44 in the casing. When either sash is in the lowered position and the rack or racks corresponding therewith are moved backward out of engagement with the gear wheels and the pivot pins are moved into engagement with the sockets in the casing the windows may be swung on the pivot pins as indicated by dotted lines in Fig. 2.

It will be noted that the pivot pins 40 can only enter the sockets 44 when the sashes are lowered. In this position, however, the racks are locked by engaging ends 30 and can only be unlocked by operating the locking rods which then lock the gear wheels by means of engaging ends 29, so that the weight cannot run down when the racks are disengaged from the gear wheels.

Having thus described my invention, I claim:—

1. In a window operating and locking device, the combination with a sash, a rack in the side rail thereof, a gear wheel and means connected with the gear wheel for balancing said sash, of means for moving said rack into and out of engagement with said gear wheel, and a lock operable upon either the gear wheel or the rack when the other is disengaged.

2. In a window operating and locking device, the combination with a sash, a rack in the side rail thereof, a gear wheel and means connected with the gear wheel, for balancing said sash, of means for moving said rack into and out of engagement with said gear wheel, and a lock operable upon either the gear wheel or the rack when the other is disengaged, and a spring for holding the racks normally locked.

3. The combination with a sash, a rack in the side rail thereof, a gear wheel, and means connected with said gear wheel for balancing the sash, of means for moving the rack into and out of engagement with the gear wheel, a locking rod provided with means for locking either the gear wheel or the rack when the other is free, and a spring acting to normally retain said rod in engagement with the rack and leaving the wheel unlocked.

4. The combination with a sash, a rack in the side rail thereof, a gear wheel, and means connected with said gear wheel for balancing the sash, of means for moving the rack

into and out of engagement with the gear wheel, a locking rod having engaging ends adapted to engage either said gear wheel or the rack when the other is disengaged, and a spring acting to normally retain said rod in engagement with the rack and leave the wheel unlocked.

5. The combination with a sash, a rack in the side rail thereof, a gear wheel, and means connected with said gear wheel for balancing the sash, of means for moving the rack into and out of engagement with the gear wheel, a locking rod having angular ends adapted to engage either the gear wheel or the rack when the other is disengaged, a spring acting to normally retain said rod in engagement with the rack and leave the gear wheel unlocked, and an operating shaft for actuating said locking rod.

6. The combination with a sash, a rack in the side rail thereof, a gear wheel engaging the rack, means connected with said gear wheel for balancing said sash, of means for moving the rack into and out of engagement with the gear wheel, a sliding locking rod adapted to engage the gear wheel and rack respectively when the sash is lowered leaving one locked when the other is unlocked, a spring acting to retain the rack locked and the gear wheel unlocked and means for moving the locking rod against the power of the spring to lock the gear wheel and unlock the rack.

7. The combination with a sash, a rack and a bead in the side rails thereof, and a gear wheel engaging the rack, of means for moving the rack into and out of engagement with the gear wheel and for moving the bead, a lock operable upon either the gear wheel or rack when the other is disengaged and when the sashes are lowered, sliding pivot pins in the sashes adapted to engage the casing, and operating connections between the pivot pins and the rack and bead for the purpose set forth, whereby said pivot pins are rendered inoperative when the racks and beads are projected.

8. The combination with a sash, a rack and a bead in the side rails thereof provided with rearwardly extending tongues and operating racks, a gear wheel engaging the rack, and sash balancing means connected to said gear wheel, of pinions engaging the operating racks, operating shafts by which the pinions are carried, a sliding locking rod adapted to engage either the gear wheel or the rack when the other is disengaged, a spring acting to retain the locking rod in engagement with the rack leaving the gear wheel unlocked and means for moving the locking rod against the power of the spring to disengage the rack and to lock the gear wheel.

9. The combination with a sash, members in the side rails thereof, one of said members

having rack teeth, a gear wheel adapted to mesh with said rack teeth, and means connected with said gear wheel for balancing said sash, of means for moving said members to bring said rack teeth into engagement with said gear wheel, a lock operable upon either the gear wheel or rack when the other is disengaged and when the sash is lowered, means for pivoting said sash, and
 10 levers controlled by the movement of said members for moving said pivoting means into and out of operative position.

10. The combination with a sash, members in the side rails thereof provided with
 15 tongues, one of said members having rack teeth, a gear wheel engaging said rack teeth, and means connected with said gear wheel for balancing said sash, of means for moving the said members to bring said rack teeth
 20 into and out of engagement with said gear wheel, pivot pins for said sash, and operating levers for said pivot pins operatively connected with said tongues.

11. The combination with a sash, members in the side rails thereof provided with
 25 tongues, one of said members being provided with rack teeth, a gear wheel engaging said rack teeth, and means connected with said gear wheel for balancing said sash, of means for moving the rack into and out
 30 of engagement with said gear wheel, pivot pins for said sashes, and operating levers for said pivot pins operatively connected with said tongues, and means for locking
 35 either the gear wheel or the rack when the other is free.

12. The combination with a sash, members in the side rails thereof provided with rearwardly extending tongues and operating
 40 racks, one of said members having longitudinal rack teeth, a gear wheel engaging said longitudinal rack teeth, and means connected with the gear wheel for balancing

the sash, of actuating pinions engaging said operating racks, pivot pins for said sash, 45 and operating levers for said pins operatively connected with said tongues.

13. The combination with a sash, members in the side rails thereof provided with rearwardly extending tongues and operating 50 racks, one of said members having longitudinal rack teeth, a gear wheel engaging the longitudinal rack teeth, and means connected with the gear wheel for balancing the sash, of actuating pinions engaging said 55 operating racks, pivot pins for said sash, and operating levers for said pins operatively connected with said tongues, and means for locking either the gear wheel or the members when the other is free. 60

14. The combination with a casing having grooves and a sash having a rack in one side rail and a bead in the other, of a gear wheel engaging the rack, means connected with the gear wheel for balancing said sash, means 65 for retracting the rack and bead, for the purpose set forth, and means for locking the rack leaving the gear wheel unlocked and for locking the gear wheel leaving the rack unlocked. 70

15. The combination with a sash and a rack in the side rail thereof, of a gear wheel engaging the rack, means connected with the gear wheel for balancing said sash, a locking rod adapted to engage the gear 75 wheel, a spring acting to retain the locking rod out of engagement with the gear wheel, and an operating shaft for moving said rod in engagement with the gear wheel, said operating shaft serving to lock said rod. 80

In testimony whereof I affix my signature in presence of two witnesses.

FRANK KARSITZ.

Witnesses:

A. M. WOOSTER,
 S. W. ATHERTON.