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J. GRAHAM

2,359,518

WINDOW SASH OPERATING DEVICE

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Fig. 1.

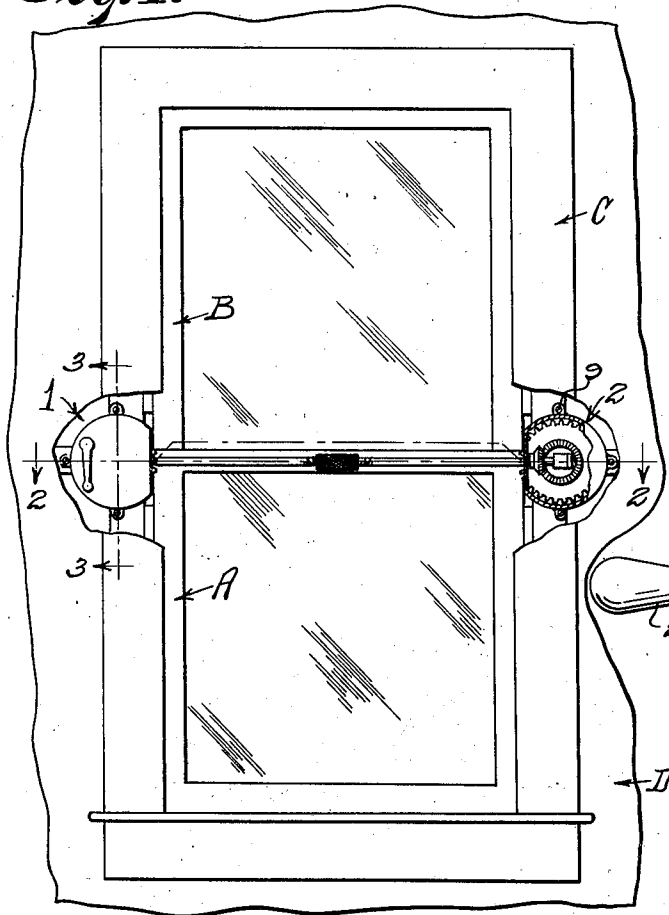


Fig. 3.

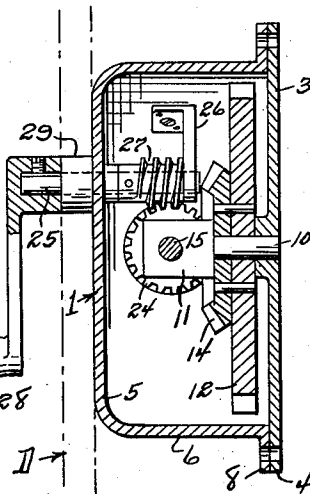


Fig. 2.

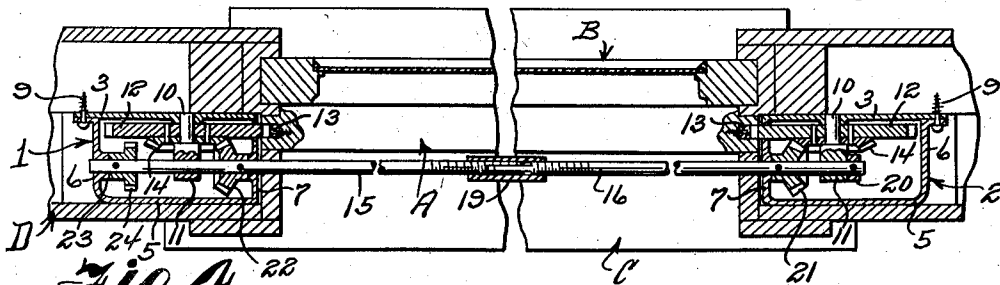
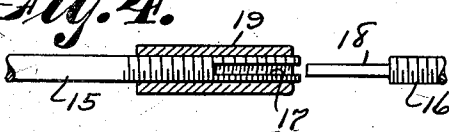


Fig. 4.



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WINDOW SASH OPERATING DEVICE

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3 Claims. (Cl. 268—132)

This invention relates to window sash operating devices and its general object is to provide a device that is primarily designed for raising and lowering sliding window sashes, in an easy and expeditious manner, in that such is accomplished merely by turning a hand crank, and the sash is held in closed position or any adjusted open position against movement other than by the crank, which of course is arranged on the interior side of the window, thus eliminating the usual latches, locks or the like.

A further object is to provide a window sash operating device that is adjustable for application to windows of various widths.

Another object is to provide a device of the character set forth, that is simple in construction, inexpensive to manufacture, and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a view looking toward the interior side of a sliding sash window, equipped with my device and with parts broken away.

Figure 2 is a sectional view taken approximately on line 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a sectional view taken approximately on line 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is a fragmentary view of a sectional adjustable shaft which makes it possible to install my device on windows of various widths.

Referring to the drawing in detail, it will be noted that I have illustrated one of my devices installed for operating the lower sash of a window, but a second device may be installed for operating the upper sash B. The frame of the window is indicated by the letter C and the inner wall of a room or the like by D.

The device includes a pair of substantially identical casings indicated respectively by the reference numerals 1 and 2, the casings being disposed upon diametrically opposite sides of the frame substantially midway the height thereof, as clearly shown in Figure 1. Each casing includes a disk like plate 3 providing the rear wall

therefor and the plate is formed with apertured ears 4 extending outwardly from its periphery. The remaining portion of the casing is of cup formation to provide an outer wall 5, a rounded wall portion 6 and a flat side wall 7. The rounded wall portion at the open end thereof is formed with outwardly directed apertured ears 8 engaged with the ears 4, and fastening means such as screws 9 extend through the ears 4 and 8, for not only fastening the cup portion of the casing to the plate or rear wall 3, but the fastening means secure the casings in place between the wall D and an intermediate portion of the window frame, as best shown in Figure 2, with the side walls 7 facing each other, as well as the side rails of the lower sash.

Each rear plate has fixed thereto a stub shaft 10 extending substantially centrally therefrom, for disposal within the casing, and the stub shaft 10 has a head 11 formed on its outer end. Rotatably mounted on the stub shaft is a relatively large spur gear 12. The gears 12 extend through slots in the side walls 7 of the casings and mesh with racks 13 fixed in grooves along the length of the side rails, as best shown in Figure 2, so that upon rotation of the gears 12 in one direction, the sash will be raised and in an opposite direction, the sash will be lowered. Fixed to each gear 12 for disposal between the same and the head 11 of the stub shaft 10 is a bevel gear 14, for a purpose which will be later apparent.

Bridging the casings is a drive shaft which includes a pair of aligned sections 15 and 16, the section 15 extending into the casing 1, while the section 16 extends into the casing 2. It might be mentioned here that the sectional drive shaft makes it possible to install the device on windows of different widths, in that the length of the shaft can be varied. For that purpose, the sections are threaded for a portion of their length from the confronting ends thereof, and one threaded portion from its end is slotted as at 17, the slot having flat walls, while a flat stem 18 is formed on the other section to fit within the slot, to prevent rotation of the sections relative to each other, and a sleeve 19 is threaded on the threaded portions to secure the sections together, as clearly shown in Figure 2.

The section 16 is rotatably mounted in and extends through the head of the stub shaft within the casing 2, and is held accordingly by a stop collar 20. A bevel gear 21 is fixed to the section 16 and meshes with the bevel gear 14 within the casing 2. The section 15 is rotatably mounted in and extends through the head of the stub

shaft within the casing 1 and the section 15 likewise has a bevel gear 22 fixed thereto and meshing with the bevel gear 14 within the casing 1. The section 15 extends throughout the diameter of the casing 1 and is mounted in a bearing 23 in the rounded wall portion 6 thereof, and fixed to the section 15 is a worm gear 24.

Mounted within the casing 1 and extending through the outer wall 5 thereof, as well as through the wall D, is a stub shaft 25 having its inner end supported by and rotatably mounted in a bracket 26 secured to the rounded wall portion 6, as shown in Figure 3, and secured to the inner portion of the stub shaft is a worm 27 that meshes with the gear 24. The outer portion of the stub shaft is reduced and fixed thereto is a hand crank 28. A bearing collar 29 which may be formed on the outer face of the outer wall 5 of the casing 1 is provided for the stub shaft 25 and the collar is mounted in the wall D, as shown in Figure 3.

From the above description and disclosure in the drawing, it will be obvious that when the hand crank is turned in one direction, the sash is raised and when turned in an opposite direction, the sash is lowered. It will be further obvious that the sash cannot be operated except by the crank handle, due to the locking association of the worm and its gear, therefore my device holds the sash in closed position or in any adjusted open position, thus eliminating latching means and the like now in general use for fastening the sash in any of the positions mentioned.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. An operating device for a window sash, comprising a pair of casings secured within the window frame upon opposite sides thereof, each casing including a rear wall and a cup like portion secured to the rear wall, said cup like portion having a slot in the side thereof, racks secured to the side rails of the sash, a relatively large gear in each casing and mounted for rotation, a bevel gear fixed to the large gear, the large gears extending through the slots and meshing with the racks, a shaft bridging the casings, bevel gears fixed to the shaft and meshing with the first bevel gears, a worm gear in one of said casings

and fixed to the shaft, a stub shaft rotatably mounted in and extending through the last mentioned casing, a worm fixed to the inner portion of the stub shaft and meshing with the worm gear, and a hand crank secured to the outer end portion of the stub shaft.

2. An operating device for a window sash, comprising a pair of casings secured within the window frame upon diametrically opposite sides thereof, each casing including a disk like rear wall and a cup like portion detachably secured to the rear wall, said cup like portion having a slot in one side thereof and the slots facing the side rails of the sash, said side rails being grooved along the length thereof, racks secured within the grooves, headed stub shafts fixed to the rear walls of the casings, a relatively large spur gear rotatably mounted on each stub shaft and extending through the slots and meshing with the racks, a bevel gear secured to each large gear concentrically thereof, a drive shaft bridging the casings and rotatably mounted in the heads of the stub shafts, bevel gears fixed to the drive shaft and meshing with the first mentioned bevel gears, a worm gear fixed to the drive shaft and disposed in one of said casings, a stub shaft rotatably mounted in and extending through the last mentioned casing, a worm fixed to the inner portion of the last mentioned stub shaft and meshing with the worm, and a hand crank secured to the outer end portion of the last mentioned stub shaft.

3. An operating device for a window sash, comprising a pair of casings secured within the window frame upon opposite sides thereof, racks secured to the side rails of the sash, gears mounted for rotation in the casings and meshing with the racks, gears secured to the first gears, a shaft bridging the casings, gears secured to the shaft and meshing with the second gears, means for rotating the shaft for raising and lowering the sash through the medium of the gears and the racks, said shaft including a pair of aligned sections to vary the length thereof for the device to fit windows of various widths, said sections being threaded for a portion of their length from the inner ends thereof, one of said sections being slotted longitudinally for a portion of its length from its inner end, a stem formed on the inner end of the other section and fittingly mounted in the slot, said slot and stem being shaped for rotation of the sections with each other, and a sleeve threaded on the threaded portions of the sections for securing the sections together.

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