Oct. 11, 1955 C. N. VALENTINE 2,720,393

WINDOW SASH GEAR OPERATOR AND LOCK

Filed May 29, 1951

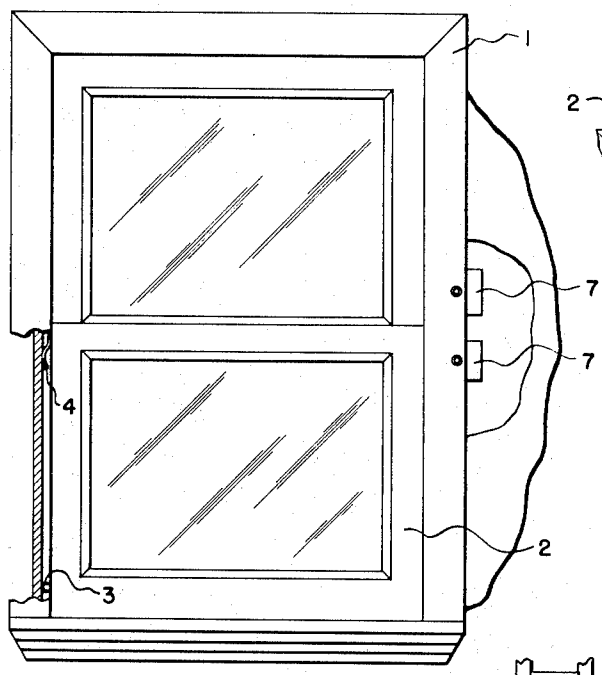
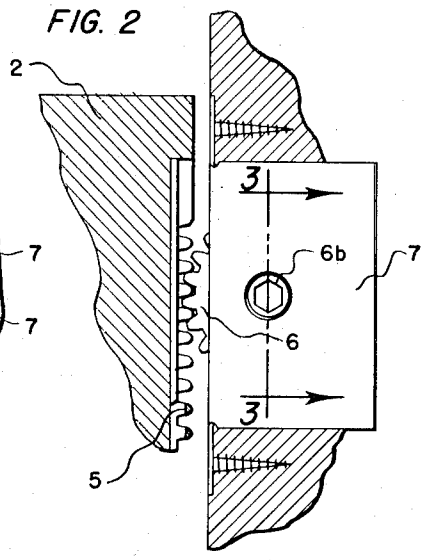


FIG. 1

FIG. 2



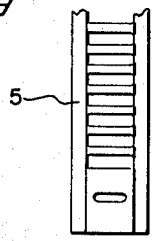


FIG. 5

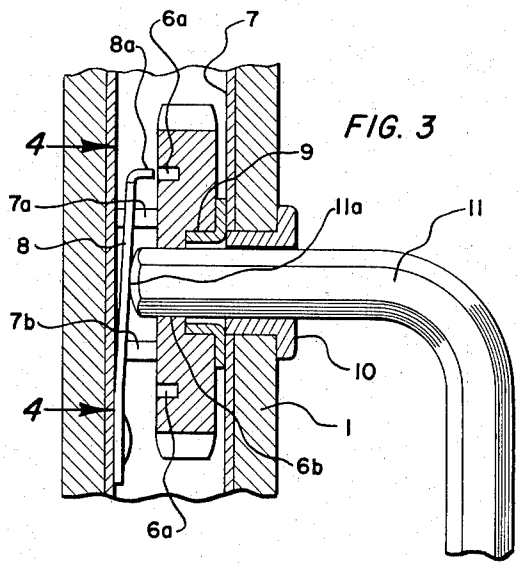


FIG. 3

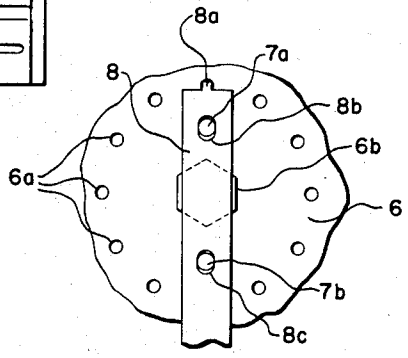


FIG. 4

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2,720,393

Patented Oct. 11, 1955

2,720,393

WINDOW SASH GEAR OPERATOR AND LOCK

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Application May 29, 1951, Serial No. 228,809

3 Claims. (Cl. 268—132)

My invention relates to a window sash gear operator and lock, and the objects of my invention are:

First, to provide a window operator of this class which is very simple and easy to operate, for raising or lowering windows, and which maintains said windows in certain fixed position in any desired elevated location relative to the window frame;

Second, to provide a window sash operator of this class in which latch means automatically lock the gear mechanism employed in raising the sash in the window frame;

Third, to provide a window sash operator of this class which is very easy to operate, due to the fact that insertion of the operating crank unlocks the latch means and permits the gear mechanism to be rotated for raising or lowering a window sash to the desired elevation;

Fourth, to provide a window sash gear operator and lock of this class which greatly promotes the safety of home owners from prowlers by preventing the raising of windows even though they are maintained slightly open for the purpose of ventilation;

Fifth, to provide a window sash gear operator and lock of this class which is very simple and easy to install;

Sixth, to provide a window sash gear operator and lock of this class which may be entirely concealed within the window frame; and

Seventh, to provide a window sash gear operator and lock of this class which is very simple and economical of construction, efficient in operation, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, forming a part of this application, in which:

Fig. 1 is a side elevational view of a window frame and sash, showing my window sash gear operator and lock in connection therewith, and showing portions broken away and in section to amplify the illustration; Fig. 2 is an enlarged fragmentary sectional view of the window frame and sash, showing my window sash gear operator and lock in connection therewith; Fig. 3 is an enlarged fragmentary sectional view, taken from the line 3—3 of Fig. 2; Fig. 4 is a fragmentary sectional view, taken from the line 4—4 of Fig. 3; and Fig. 5 is a fragmentary elevational view of a portion of the gear rack used in connection with the window sash.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

The window frame **1**, sash **2**, roller **3**, bearing plate **4**, rack **5**, gear **6**, gear box **7**, latch **8**, axle **9**, bushing **10**, and crank **11**, constitute the principal parts and portions of my window sash gear operator and lock.

The window frame **1** is conventional, and is provided with conventional sash **2**, vertically slidably mounted

therein. The sash **2** is provided with a roller **3** and resilient bearing plate **4** on one vertical side thereof, and is provided with a gear rack **5** on the opposed vertical side thereof, which meshes with the gear **6** in the gear box **7**, all as shown best in Fig. 2 of the drawings. This gear **6** is revolubly mounted on the axle **9** and is retained thereon by the latch-supporting pins **7***a* and **7***b*, projecting internally of the gear box **7**. The latch **8** is a plate spring member fixed to the inner side of the gear box **7** and provided with an angular end portion **8***a*, adapted to engage recess portions **6***a* in the gear **6** for locking the same against rotation about the axis of the axle **9**, all as shown best in Fig. 3 of the drawings.

It will be noted that the axle **9** is a hollow axle fixed to the inner side of the gear box **7**, and that the bore **6***b* of the gear **6** is adapted to engage the hexagonal in cross-section crank **11**, all as shown best in Figs. 2, 3 and 4 of the drawings. The inner end **11***a* of the crank **11** is engageable with the inner side of the latch **8**, as shown in Fig. 3, for the purpose of deflecting the same at its end portion **8***a* out of the plane of the holes **6***a* in the gear **6**. It will be noted that this latch **8** is provided with openings **8***b* and **8***c*, through which the pins **7***a* and **7***b* extend, all of which provides for rigidity of the latch **8** in resisting torsion of the gear **6** when the latch **8** is in locked position with the gear **6**.

It will be here noted that a train of gears in connection with the gear **6** may be provided to serve as a gear reduction for the purpose of reducing the load on the crank **11**, if desired. The bushing **10** forms a bearing and guide for the crank **11**, and is inserted in the frame **1**, as shown best in Fig. 3 of the drawings, in alignment with the axle **9** and bore **6***b* of the gear **6**.

The operation of my window sash gear operator and lock is substantially as follows:

When the crank **11** is inserted into the bore **6***b* of the gear **6**, through the bushing **10**, the end **11***a* thereof engages the latch **8** and inward pressure on the crank **11** causes the latch **8** to be deflected at its end **8***a* away from the plane of the hole **6***a* in the gear **6**, permitting the crank **11** to turn the gear **6** and cause traction thereof on the rack **5** for raising the sash **2**, as shown in Fig. 1 of the drawings.

When the sash **2** has been raised to the desired elevation, the crank **11** is removed and the end **8***a* drops into one of the openings **6***a* and holds the sash **2** in fixed position at the desired elevation, so that the sash **2** cannot be raised or lowered without latching or unlatching the latch **8** by means of pressure on the inner side thereof, through the bushing **10**, internally of the building room in which the window sash **2** is installed. The pins **7***a* and **7***b* engage the side of the gear **6**, maintaining the same on the axle **9**, and also provide guides for the latch **8**, to help resist torsion imposed by the gear **6**, all as shown best in Figs. 3 and 4 of the drawings.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a window sash gear operator and lock, a window frame, a sash vertically movable in said frame, a gear rack on said sash, a gear box stationarily mounted in said frame and having a gear rotatably mounted therein, said gear having a hollow axle, peripheral gear teeth and having a plurality of apertures concentrically arranged relative to said gear teeth intermediate said axle and said gear teeth, a spring latch of considerable width secured

to said gear box and extending across the projected axis of said axle, said latch having an end portion engageable with said apertures in said gear, spaced guide pins secured to said gear box and passing through said latch, said latch being slidable on said pins, a sleeve secured to said gear box, said gear being rotatable on said sleeve and retained thereon by abutment against said pins, said gear having a separable operating crank with a portion thereof extending through said hollow axle and engageable with said latch for releasing the same from said apertures.

2. In a window sash gear operator and lock, a window frame, a sash vertically movable in said frame, a gear rack on one side of said sash, a gear box stationarily mounted in said frame having a gear rotatably mounted therein, said gear having an operating crank peripheral gear teeth with a hollow axle and having apertures in the face of said gear intermediate said peripheral gear teeth and said hollow axle, a spring latch having guide means holding the latch against movement other than toward and away from said gear and being secured at one end to said gear box, said latch having an intermediate portion extending across the projected axis of said axle, the other end of said latch having means selectively engaging said apertures, said hollow axle permitting insertion of said crank for engaging said intermediate portion and disengaging the latch from said apertures while the crank is used to rotate said gear.

3. In a window sash gear operator and lock, a window frame, a sash vertically movable in said frame, a gear rack on one side of said sash, a gear box stationarily mounted in said frame and having an operating crank and a gear rotatably mounted therein, said gear having peripheral gear teeth with a hollow axle and having apertures in the face of said gear intermediate said peripheral gear teeth and said hollow axle, a spring latch having guide means holding the latch against movement other than toward and away from said gear and being secured at one end to said gear box and extending across the projected axis of said hollow axle, said gear having a separable crank with a portion thereof insertable through said hollow axle and engageable with said latch for releasing the same from said apertures in said gear.

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