Aug. 22, 1933.

D. E. ROSS

1,923,233

WINDOW SASH OPERATING DEVICE

Filed Aug. 15, 1932

2 Sheets-Sheet 1

Fig. 1.

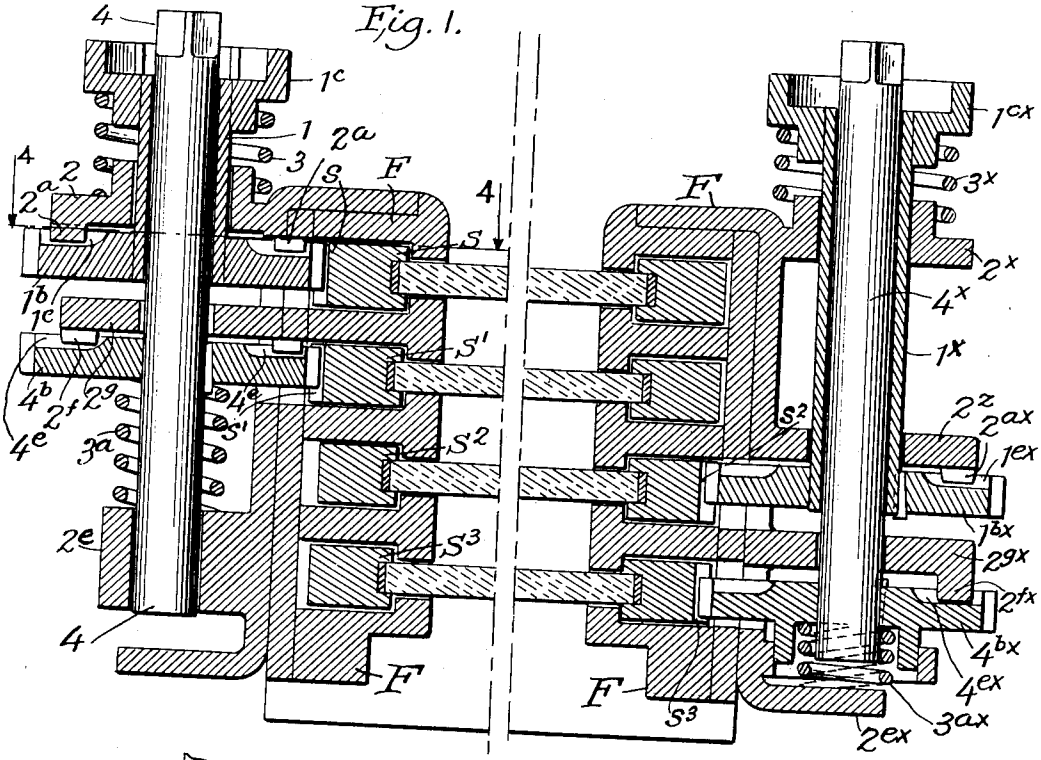
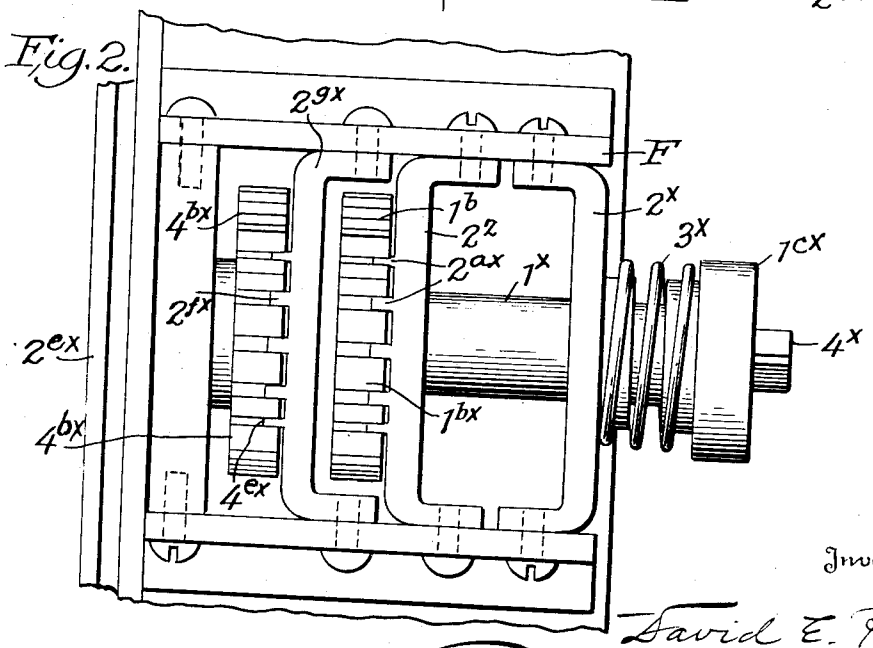


Fig. 2.



Inventor

David E. Ross

By Alexander & Farrell

Attorneys

Aug. 22, 1933.

D. E. ROSS

1,923,233

WINDOW SASH OPERATING DEVICE

Filed Aug. 15, 1932

2 Sheets-Sheet 2

Fig. 3.

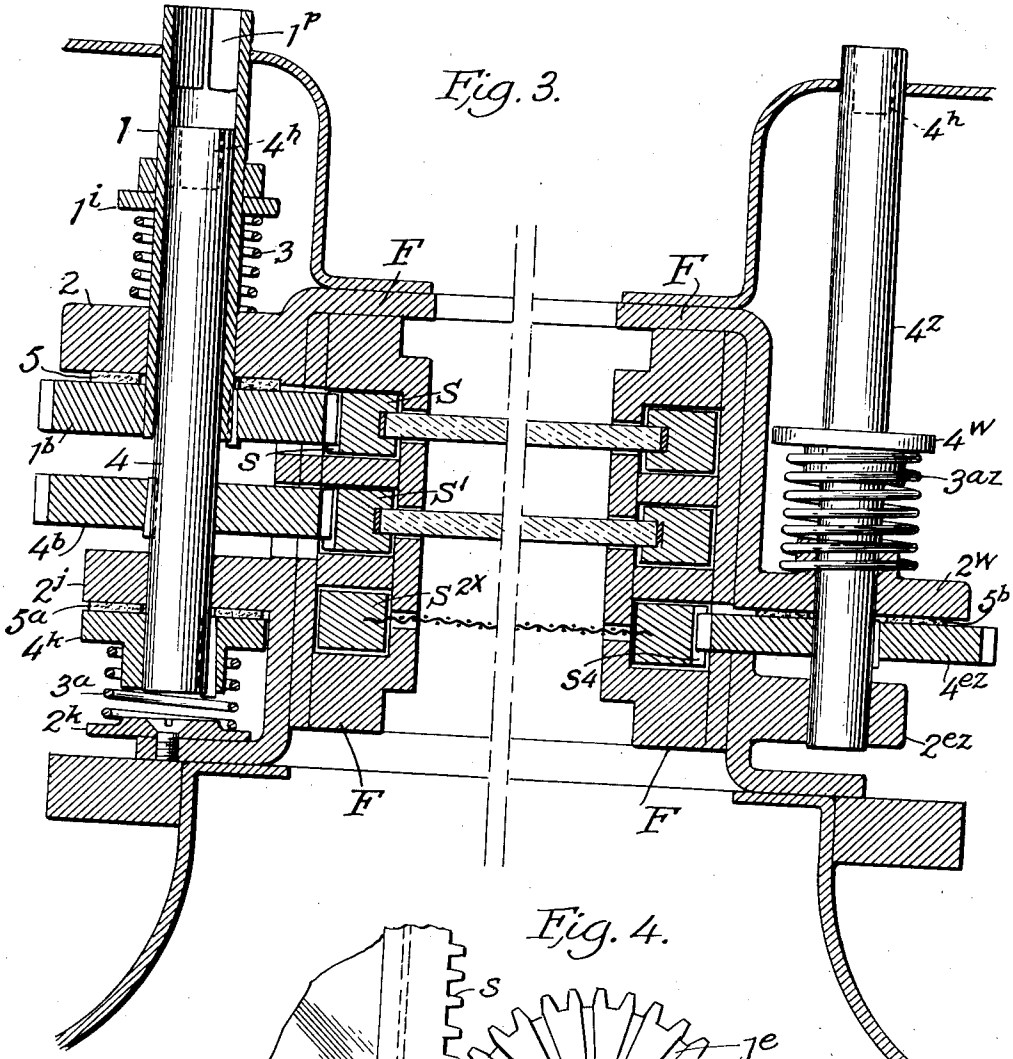
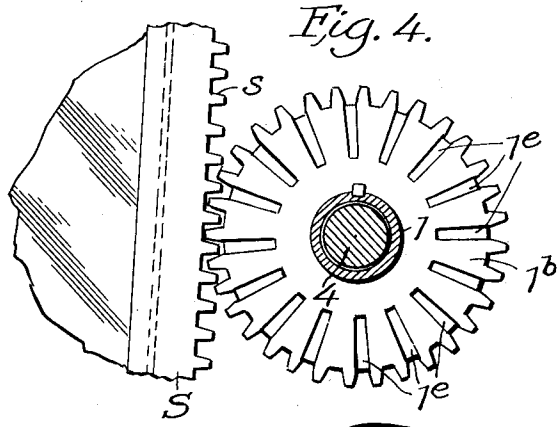


Fig. 4.



Inventor

David E. Ross

By Alexander Powell

Attorneys

Patented Aug. 22, 1933

1,923,233

UNITED STATES PATENT OFFICE

1,923,233

WINDOW SASH OPERATING DEVICE

David E. Ross, La Fayette, Ind., assignor to Rostone, Incorporated, La Fayette, Ind., a Corporation of Indiana

Application August 15, 1932. Serial No. 628,947

4 Claims. (Cl. 268—132)

This invention relates to window sash operating devices, and while designed for use in connection with the window sash and frame shown in my co-pending application filed July 18, 1932, Serial No. 623,266 (Case #7958) is applicable to other types of window construction, and the like, wherein slidable sashes, or the like, are employed.

The invention provides simple geared sash operating devices whereby any sash may be raised or lowered at will by the operator and held in any adjusted position.

The accompanying drawings illustrate the present preferred embodiment of the invention and some modifications thereof, and I will describe the same with reference thereto, and summarize in the claims the novel feature of construction and novel combinations of parts for which protection is desired.

In said drawings:

Fig. 1 is a transverse sectional view through a window frame and sashes, such as described in the aforesaid application, equipped with my novel sash operating devices, the sash being broken to show the sash operating parts more clearly.

Fig. 2 is a side view of the sash operating devices shown in the right side of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing modifications of the sash raising devices.

Fig. 4 is a detail section on line 4—4, Fig. 1.

In Fig. 1 four sashes S, S′, S^2 and S^3 are shown slidably mounted in the window frame F which sashes and frame are shown as constructed in my aforesaid application. One of the side bars of each sash is provided with a rack indicated at s, s', s^2 and s^3 in Fig. 1. The racks extend the length of the sash and are engaged by operating gears as hereinafter described. As shown in Figs. 1 and 4 the rack s of sash S meshes with a gear 1*b* on a tubular shaft 1 which is rotatably mounted in bracket 2 which may be formed on or attached to the outer side of the frame F, the shaft 1 being rotatable and also slidable in the bearing 2.

The outer end of the tubular shaft 1 may be provided with any suitable means for engagement with an actuating wrench or key (not shown) and as shown in Fig. 1 a socket member 1*c* is attached to the outer end of the tubular shaft 1 and is adapted to be engaged by any suitable tool by which it can be pushed inward and also turned. On the opposed faces of the bracket 2 and the gear 1*b* are interengaging lugs and slots. Preferably the lugs 2*a* are on the bracket 2 and the slots 1*e* are in the face of the gear 1*b*.

A spring 3 is arranged exterior to the tube between the socket member 1*c* and the bracket 2 to move the shaft 1 outwardly so as to hold the lugs and slots in engagement as shown in Fig. 1 and when so engaged it is impossible to turn the shaft 1 and gear 1*b*. It is evident that if a crank or key is properly inserted in the cap member 1*c* and pushed inwardly the shaft 1 will be moved inwardly and move the gear 1*b* out of engagement with the lugs 2*a* while maintaining its engagement with the rack s and then the shaft 1 may be turned so as to rotate the gear 1*b* and raise or lower the sash S by reason of engagement of the gear teeth therewith.

After the sash has been adjusted to the desired position the inward pressure on the operating member is released and the latter withdrawn and spring 3 moves the assembly (shaft 1 and gear 1*b*) outward interengaging the lugs and the slots 2*a* and 1*e* and firmly locking the sash S in adjusted position.

To operate the sash S′ a shaft 4 is extended axially through the shaft 1 and may have an inner bearing in the bracket 2*e* attached to the frame F as shown. On this shaft 4 is mounted a gear 4*b* which meshes with the rack s' on sash S′ and this gear 4*b* has radial slots 4*e* which are adapted to mesh with radial lugs 2*f* on an adjacent bracket 2*g* on frame F. A spring 3*a* is interposed between the gear 4*b* and bracket 2*e* and normally tends to push the shaft 4 and gear 4*b* outwardly and hold slots 4*e* in engagement with the lugs 2*f*.

The shaft 4 may be squared at the end and preferably projects beyond the member 1*c* sufficiently to enable a suitable lever or key to be applied thereto and when so applied the shaft 4 and gear 4*b* can be pushed inward so as to disengage the slots 4*e* and lugs 2*f* and when so disengaged the shaft 4 and gear 4*b* can be turned so as to raise or lower the sash S′.

Where a window has but two sashes to raise and lower, the devices described would be sufficient to operate same. In some cases, as described in the aforesaid application, four sashes are used and the operating devices are substantially duplicated at the opposite side of the frame F. In this case the rack s^2 on the sash S^2 meshes with a gear 1*bx* on a tubular shaft 1*x* which is journaled in the brackets 2*x* and 2*z* attached to the frame F. Gear 1*bx* has slots 1*ex* engaging lugs 2*ax* on the bracket 2*z*. The shaft 1*x* is provided on its outer end with a socket 1*cx* and is moved outwardly by a spring 3*x*, the parts described being operated similar to the shaft 1 and members connected therewith above described.

The rack s^3 on sash S^3 meshes with a gear

4*bx* on the shaft 4*x* similar to shaft 4, the gear 4*bx* having slots 4*ex* engaging lugs 2*fx* on the bracket member 2*gx*, the shaft 4*x* and gear 4*bx* being pushed outwardly by a spring 3*ax* interposed between the gear 4*bx* and part 2*ex* shown.

The shaft 4*x* and gear 4*bx* operate to raise or lower the sash S^3 in the manner above described for shaft 4 and gear 4*b*.

In the construction shown in Fig. 3 three sashes S, S′ and S^{2x} are shown. In this case the rack *s* on sash S is engaged by gear 1*b* on tubular shaft 1 which may be extended outwardly and have its outer end internally hexed as indicated at 1*p* for engagement of a suitable operating tool, the sleeve being journaled in a bracket 2 attached to the frame F. A spring 3 is interposed between the bracket 2 and a washer or collar 1*i* fast to the shaft 1 as shown. The aforesaid parts are operated as above described in connection with Fig. 1 to raise and lower sash S.

The rack on the sash S′ is engaged with the gear 4*b* on the shaft 4 which extends into the shaft 1 and through a bracket 2*j* on the frame F. In this instance the shaft 4 is provided with an internal square or hexed socket as indicated at 4*h* for engagement of a suitable operating tool. The shaft 4 and gear 4*b* are normally pushed outward by a spring 3*a* interposed between a collar 4*k* fixed on the end of the shaft 4 and a member 2*k* attached to the frame F. The parts are operable to raise or lower the sashes S′, Fig. 3, in the manner above described for similar parts in Fig. 1.

The third sash S^{2x}, shown in Fig. 3, may be a glazed sash but is shown as a screen sash; the rack s^4 thereon meshes with a gear 4*ez* on the shaft 4*z* similar to shaft 4, the shaft being journaled in brackets 2*ez* and 2 *w* attached to the frame F at opposite sides of the gear 4*ez*. The shaft 4*z* is normally forced outward by a spring 3*az* interposed between the bracket 2*w* and the collar 4*w* on shaft 4*z*. The outer end of shaft 4*z* has a socket 4*h* for engagement with an operative tool.

In the construction shown in Fig. 3, instead of a positive clutch engagement between the gears and brackets, friction clutches may be employed. As shown, a friction disk 5 is interposed between bracket 2 and the gear 1*b*. A friction disk 5*a* is interposed between bracket 2*j* and the collar 4*k*; and a friction disk 5*b* is interposed between bracket 2*w* and the gear 4*ez*. When the gear 1*b* is moved inwardly it will disengage clutch 5 but will be reengaged therewith as soon as the inward pressure on shaft 4 is released. Similarly when gear 4*b* is pushed inward the collar 4*k* will be disengaged from the clutch 5*a* but will be reengaged therewith when the shaft 4 is moved outward; and when gear 4*ez* is moved inward it will be disengaged from clutch 5*b* but will be reengaged therewith as soon as the pressure is released.

It is evident from the drawings and description that if a suitable crank or tool is engaged with the outer end of any one of the shafts and pushed inward the gear connected with such shaft will also be moved inward and disengaged from the clutch or device which normally prevents its rotation, and the sash can then be raised or lowered by turning the shaft. As soon as the endwise pressure on the shaft is released the spring will force the shaft and gear outwardly and the clutch will reengage and lock the gear to the frame and hold the sash in adjusted position.

The outer ends of the shafts can be arranged for either an exterior or interior means for non-rotarial engagement with the crank and when the crank is engaged and the shaft pushed in then the related sash can be raised or lowered at will.

I claim:

1. Window sash operating devices comprising a plurality of independently endwise movable and rotatable axially alined and nested shafts, a gear fixed on each shaft adapted to engage a rack on a related sash, spring means for holding each shaft in normal position, and means for locking the gear when its shaft is in normal position, the related locking means being disengaged by endwise movement of the shaft out of normal position and being re-engaged upon the return of said shaft to normal position.

2. In window sash operating devices comprising a tubular endwise movable shaft, a gear on said shaft adapted to engage a rack on a sash, a second endwise movable shaft disposed axially of and extending through the tubular shaft, a gear on the second shaft adapted to engage a rack on another sash, and means for locking each gear when its shaft is in normal position, springs for moving the shafts endwise to normal position; said shafts being independently longitudinally movable inward to disengage the related locking means and permit the shaft and gear to be rotated to raise or lower the related sash, the locking means being re-engaged on the return of the shaft to normal position.

3. In combination; a tubular endwise movable shaft mounted in fixed bearings, a gear on said shaft adapted to engage a rack on a sash; a second endwise movable shaft extending axially through the tubular shaft, a gear on said second shaft adapted to engage a rack on another sash; independent clutch devices for locking any gear when its related shaft is moved outward, and independent springs for moving the shaft outward; the related clutch being disengaged by the inward longitudinal movement of the related shaft and re-engaged upon the return of said shaft to normal position.

4. Sash operating devices for windows having a plurality of movable sashes each provided with a rack; comprising a support, a tubular endwise movable shaft mounted in bearings in said support; a gear on said tubular shaft engaging the rack on one sash; a second endwise movable shaft extending axially of and through the tubular shaft; a gear on said second shaft engaging the rack on the other sash; independent clutch devices for locking each gear to a relatively fixed member on the support when its shaft is moved outward to normal position; and independent springs normally moving the shafts outward to keep the related clutch members engaged; said clutches being respectively disengaged by the inward longitudinal movement of the related shaft; said shafts having their outer ends adapted to be engaged by a manually operable member and being independently longitudinally movable inward to disengage the related locking means and then rotated to raise or lower the related sash; the locking means being re-engaged on the return of the shaft to normal position.

DAVID E. ROSS.