April 10, 1945. C. L. OSTRANDER 2,373,197

CLOSURE HINGE AND OPERATING DEVICE

Filed April 13, 1942

Fig. 1.

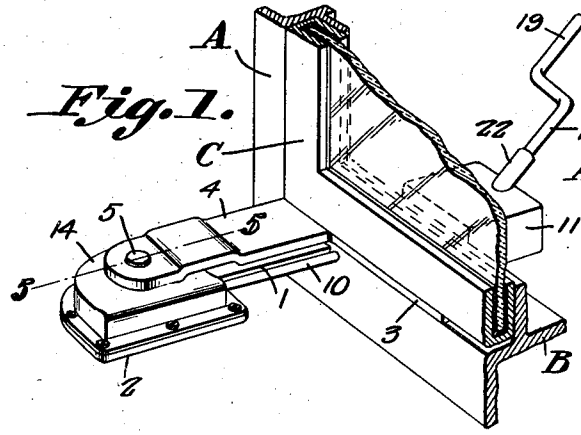


Fig. 2.

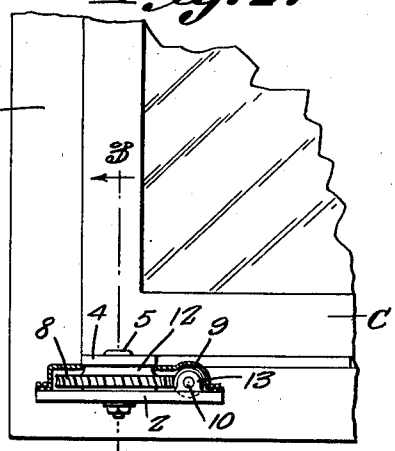


Fig. 3.

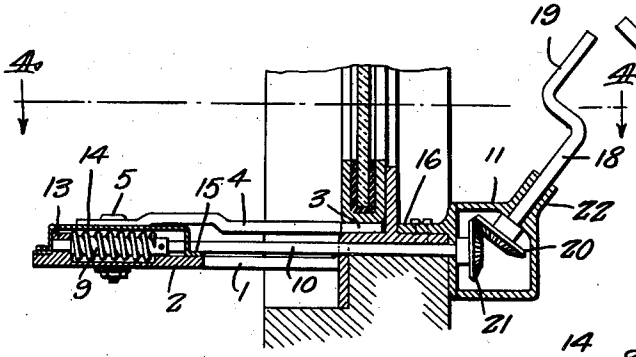


Fig. 6.

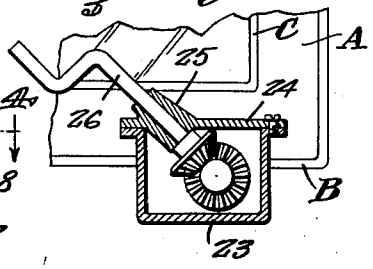


Fig. 5.

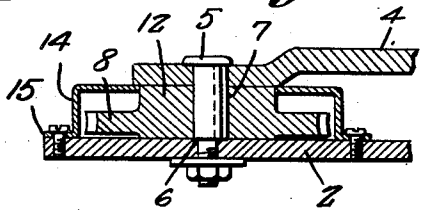
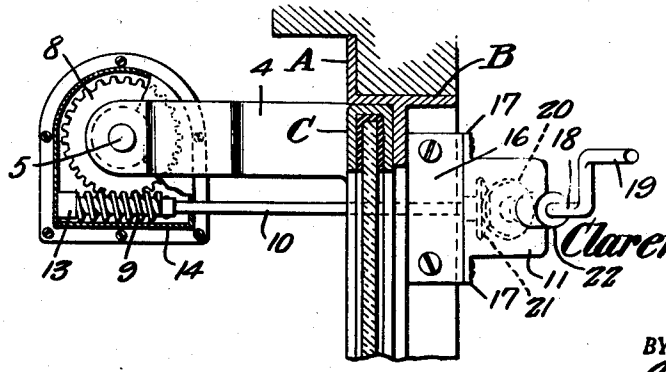


Fig. 4.



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2,373,197

CLOSURE HINGE AND OPERATING DEVICE

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Application April 13, 1942, Serial No. 438,851

1 Claim. (Cl. 268—119)

This invention relates to hinges and operating devices for closures, and its general object is to provide a device including a hinge primarily designed for a casement window sash, and means associated with the hinge for operating the sash to open and closed positions, the hinge making it possible to open the sash to a position at or greater than 180 degrees with respect to the closed position thereof, and the operating means can be actuated in an easy and expeditious manner, as well as retains the sash locked in any of its positions.

A further object is to provide a device of the character set forth that includes a crank handle arranged with respect to the sash frame to minimize the danger of a person contacting the handle, when passing the window, thus reducing the possibility of damaging the clothing of and injuring the person.

Another object is to provide a device 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 claim.

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 perspective view illustrating my device applied to a casement window, with the sash in closed position.

Figure 2 is a view looking from the left of Figure 1, with the worm and worm gear housing partially in vertical section.

Figure 3 is a sectional view taken approximately on line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a sectional view taken approximately on line 4—4 of Figure 3, looking in the direction of the arrows.

Figure 5 is a sectional view taken approximately on line 5—5 of Figure 1.

Figure 6 is a view partly in section of a modified form of bevel gear casing and arrangement of the crank handle shaft.

Referring to the drawing in detail, the letter A indicates a casement window frame, B the sill thereof, and C the window sash, all of which are of conventional metallic type but I want it understood that my device can be applied to a window in which the parts mentioned are made from wood plastic or other material.

The hinge in the form shown comprises a flat stationary leaf that includes a shank portion 1 formed on and extending horizontally and at right angles from the lower member of the sill B and at one end thereof for disposal exteriorly of the frame, and formed on the outer end of the shank portion is a plate 2 providing a bottom wall for a gear housing of the operating means, the plate having a rounded end merging into straight sides and the opposite end is straight, as best shown in Figure 4. Welded or otherwise fixed to the under face of the lower rail of the sash C for disposal along the length thereof is one arm 3 of a flat right angle bracket member that has its other arm extending exteriorly of the lower rail at one end thereof to provide a companion hinge leaf 4 which overlies the stationary leaf and parallels the same, when the sash is in closed position, as best shown in Figure 1.

The outer end portion of the leaf 4 is pivoted to the stationary leaf by a headed stub shaft 5 in the form of a bolt, the head bearing against the upper face of the leaf 4 and the shaft is provided with a reduced lower end portion extending centrally through the plate 2 for rotation therein and forming a shoulder 6 which bears against the upper face of the plate, as shown in Figure 5. The shaft is held in place by a nut threaded on the reduced lower end portion, and a washer is disposed between the nut and the plate to allow rotation of the nut with the shaft. Secured to the shaft 5 by a key 7 which also secures the leaf 4 to the shaft to be carried thereby, is a worm gear 8 having a worm 9 meshing therewith, the worm being fixed to the outer end portion of a horizontally disposed drive shaft 10 which is rotatably mounted in and extends through the sill and the rear wall of a bevel gear casing 11, for disposal interiorly of the frame and within the room, as best shown in Figure 3. The worm gear 8 is formed with a hub 12 of a thickness to fit between the leaf 4 and the plate 2, so that the hub rotatably bears against the plate 2, and the leaf 4 against the hub, for the latter to support the sash, through the medium of the leaf 4 to prevent sagging of the sash when in open position.

The outer end of the drive shaft 10 is mounted in a bearing 13 formed on and rising from the plate 2, and cooperating with the plate to provide a housing for the gear 8 and its worm 9 is a cover member 14 which is shaped to follow the contour of the plate and is formed with a mar-

ginal flange 15 secured to the plates by screws. The upper wall of the cover member is provided with a central opening for receiving the peripheral edge of the hub, as shown in Figure 5. By that construction, it will be obvious that the worm gearing is protected against weather elements.

The rear wall of the bevel gear casing 11 has formed thereon a rearwardly extending horizontally disposed flange 16 which is fixed to the upper face of the sill for securing the casing against the inner edge of the sill, and the casing includes top, bottom and side walls, the latter being formed with laterally extending flanges 17 that are secured to the rear wall by screw bolts.

Extending into the gear casing 11 and rising therefrom at an outward inclination is a crankshaft 18 formed with a cranked outer end portion providing a handle 19, the shaft 18 having a bevel gear 20 fixed to the inner end thereof and meshing with a bevel gear 21 fixed to the inner end of the drive shaft 10. By arranging the crankshaft as shown, it can be readily actuated, yet the liability of a person contacting the handle and damaging the clothing of and injuring the person when passing the window is reduced to a minimum. The crankshaft is mounted in a bearing sleeve 22 that is formed on the casing 11 and extends outwardly therefrom, as best shown in Figure 3.

From the above description and disclosure in the drawing, it will be obvious that upon turning the crankshaft, such will rotate the drive shaft to open and close the sash, through the medium of the worm gear mechanism and the leaf 4 of the hinge and that the worm gear mechanism will lock the sash in any of its positions.

In the modified form of Figure 6, the bevel gear casing 23 includes a detachable top wall 24 that is formed with a bearing sleeve 25 for the crank handle shaft 26, the latter extending at an upward inclination from the gear casing 23 and laterally with respect thereto for disposal in a plane parallel to the sash frame.

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 claim.

I claim:

In a hinge and operating device for windows, a flat elongated leaf member secured to the bottom of the window frame and projecting outwardly thereof, the outer end portion of said leaf being enlarged to form a casing base plate, a housing memger secured on said base plate to provide a gear casing, said base plate having an upstanding bearing formed thereon within the casing, a drive shaft extending through the frame and the casing, said drive shaft having a worm thereon in the casing and having its outer end journaled in said bearing, a stub shaft extended through and journaled on the base plate, a worm gear fixed on the stub shaft in the casing and in mesh with the worm, a flat right angular bracket having one arm extending along and secured to the bottom edge of the sash and its other arm projecting outwardly thereof in parallelism with said leaf member, the outer end of the bracket being fixed to the stub shaft for turning therewith to swing the sash, and crank operated mechanism having engagement with the inner end of the drive shaft for rotating the same.

CLARENCE L. OSTRANDER.