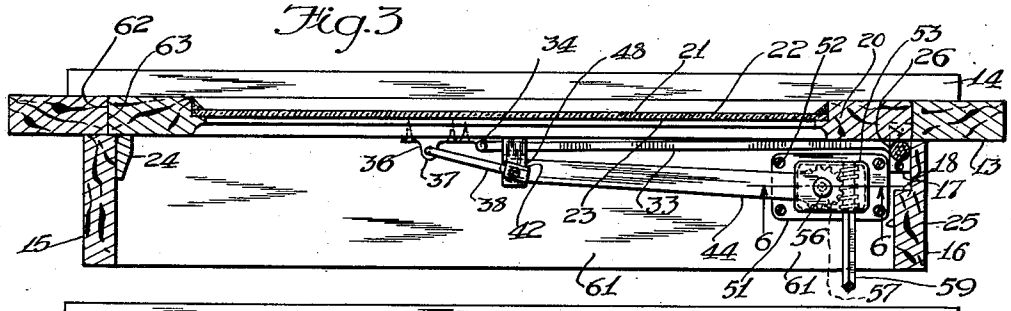
Jan. 15, 1952 A. PARQUETTE 2,582,558

OPENING AND CLOSING MECHANISM FOR WINDOWS

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Fig. 3



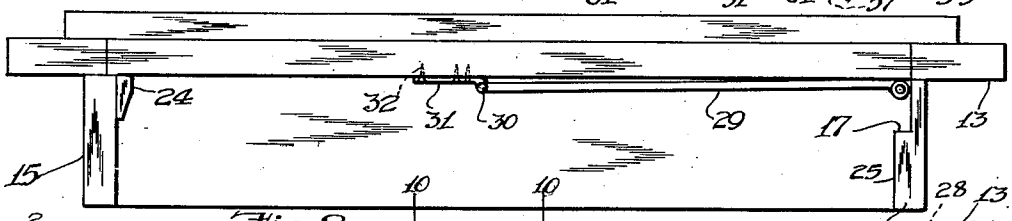


Fig. 2

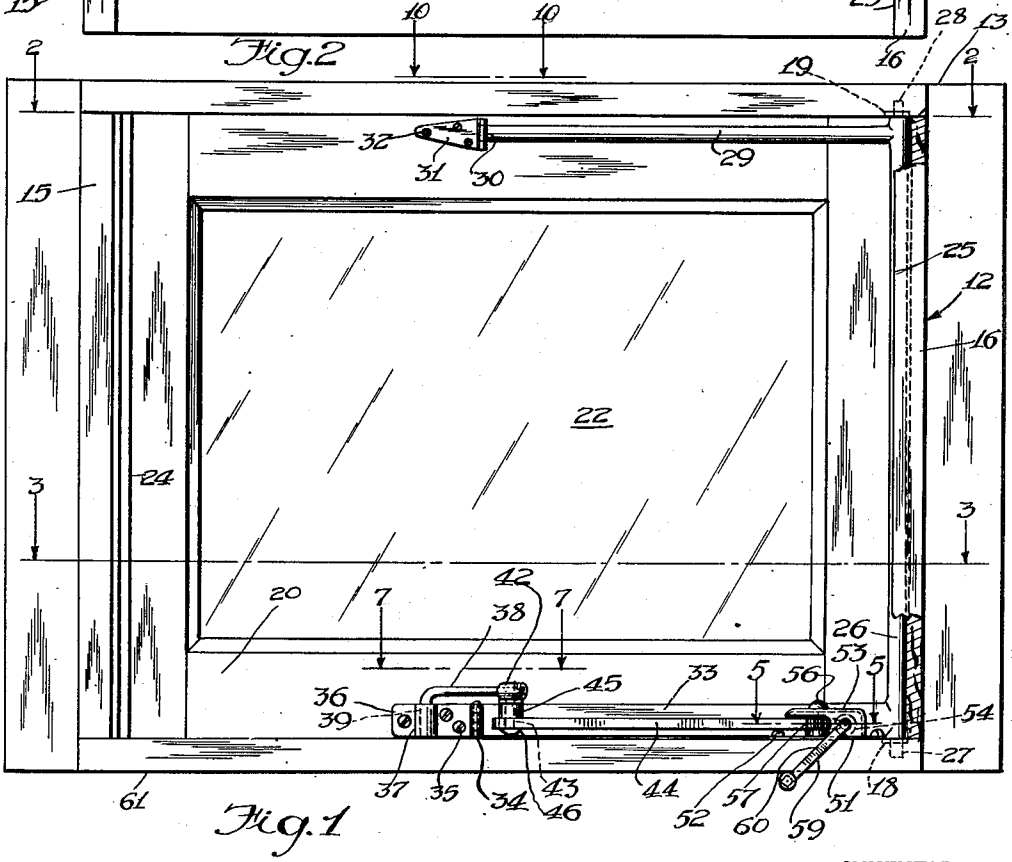


Fig. 1

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Fig. 6

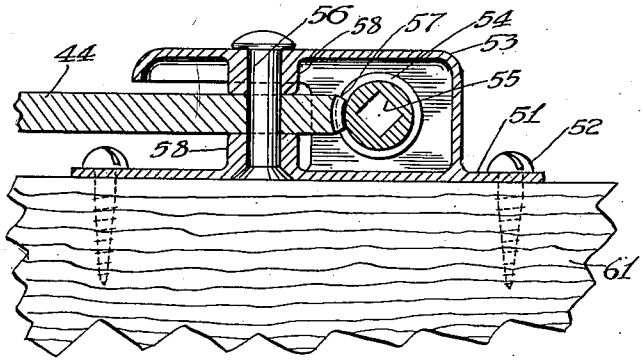


Fig. 5

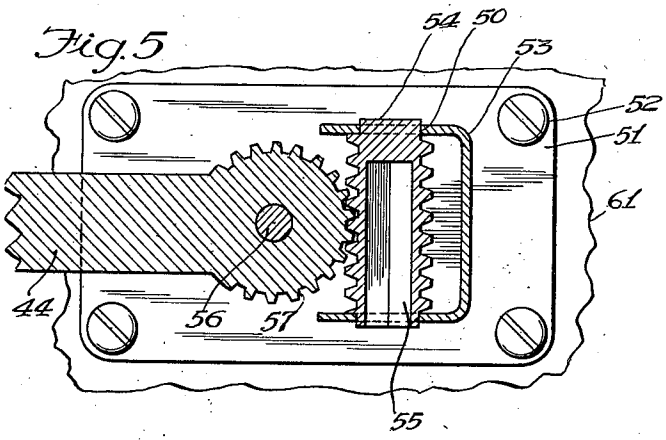


Fig. 4

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OPENING AND CLOSING MECHANISM FOR WINDOWS

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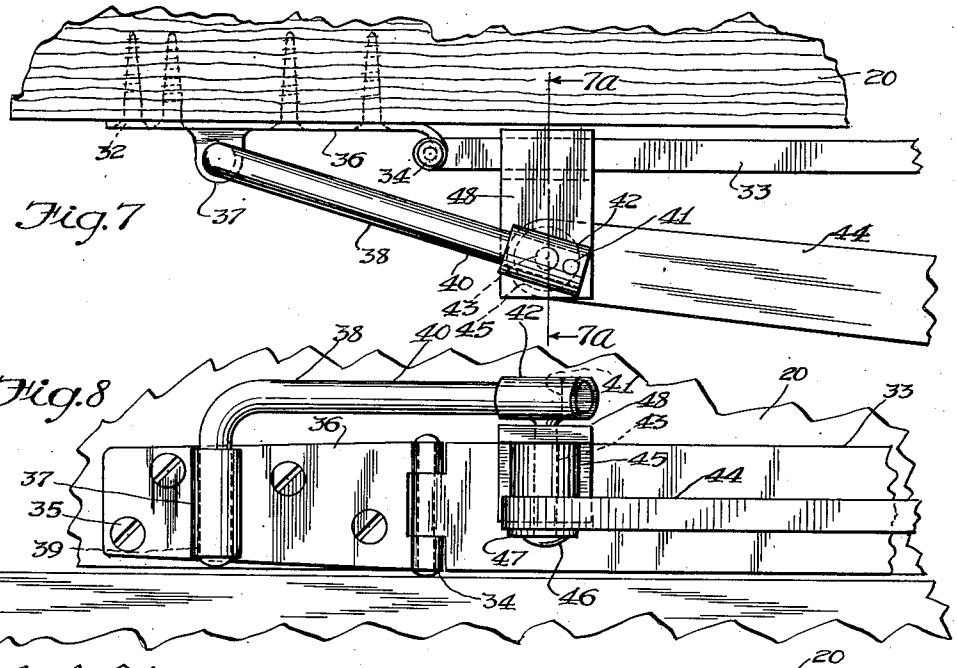


Fig. 7

Fig. 8

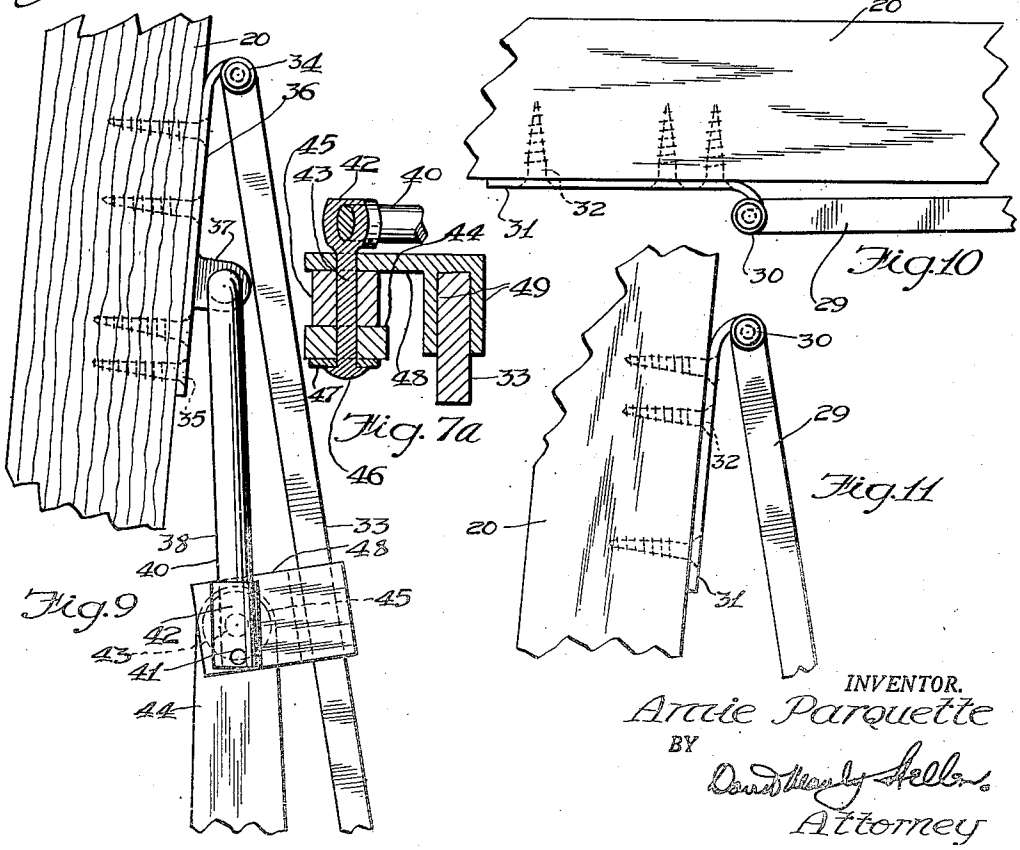


Fig. 9

Fig. 10

Fig. 11

Fig. 7a

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Patented Jan. 15, 1952

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UNITED STATES PATENT OFFICE

2,582,558

OPENING AND CLOSING MECHANISM FOR WINDOWS

Amie Parquette, Woodstock, Ill.

Application December 22, 1950, Serial No. 202,301

8 Claims. (Cl. 268—119)

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My invention relates to opening and closing mechanism for window structures particularly of the casement type.

An important object of my invention is to provide a mechanism of the aforementioned character which will open a casement window, or a French window, by motivating the said window outwardly at the same time bringing the outer surface of the window pane within accessible range from the interior of a building structure in order to facilitate cleaning the pane of glass from the inside.

Another object of my invention is to provide a mechanism of the aforementioned character consisting of crank handle means engaging a worm and gear mechanism which is connected by articulate linkage and lever means so as to bring or rotate the outer surface of the pane of glass for accessibility from within the interior confines of a building structure.

A further object of my invention is to provide a window frame to which a window is secured by means of an articulate pivot structure hingeably secured to the interior of the frame of the said window structure.

A still further object of my invention is to provide articulate and sliding engagement means interconnecting the worm structure mechanism to the articulate pivotal supporting means which is pivotally secured or positioned within the window frame structure.

Other objects and advantages inherent in my invention will become apparent from an examination of the accompanying drawings bearing further elucidation in the ensuing description, wherein like symbols are used to designate like parts, and in which;

Fig. 1 is a front view of my invention with certain portions broken away in order to more clearly indicate the operative mechanism thereof.

Fig. 2 is a top view of Fig. 1.

Fig. 3 is a cross-sectional view taken substantially on lines 3—3 of Fig. 1.

Fig. 4 is a cross-sectional view similar to Figure 3 showing the window mechanism in position holding the window frame open so as to afford accessibility to the outer surface of the glass window pane, to permit cleaning the same from the interior of a building structure.

Fig. 5 is a cross-sectional view taken substantially on line 5—5 of Figure 1.

Fig. 6 is a cross-sectional view taken substantially on lines 6—6 of Figure 3.

Fig. 7 is a view looking in the direction of arrows 7—7 on Figure 1.

Fig. 7*a* is a fragmentary cross-sectional view

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taken substantially on lines 7*a*—7*a* on Figure 7.

Fig. 8 is an enlarged front view of Figure 7.

Fig. 9 is a view similar to Figure 7 showing the window frame open in its extreme position within the range of movement of the same.

Fig. 10 is a view looking in the direction of arrows 10—10 on Figure 1.

Fig. 11 is a view similar to Figure 10 showing the relationship of the parts illustrated in Figure 10 when the window frame is open to its maximum position.

Referring to the various views, my invention is, generally, designated 12 and consists of a window frame designated 13 secured adjacent a ledge 14 in an opening provided therefor in a building structure. The said window frame 13 is provided with an interior enclosure consisting of elements 15 and 16 and an upper frame element not numerically designated and a lower element designated 61.

It will be noted that the side 16 of the interior frame enclosure is cut out as indicated at 17 in order to permit mounting a plate support 18 which is secured by screws or other similar fastenings. A similar plate 19 is secured to the top of the interior framework or enclosure. A pivotal support element consisting of U-shaped framework having a base 26, and legs 29 and 33, is secured articulately in the said support plates 18 and 19, as well as in properly bored openings in the window frame structure to accommodate pivoting trunnions 27 and 28. The arms or legs 29 and 33 are hingedly secured at 30 and 34, respectively, to hinge sections 31 and 36, said hinge sections being respectively secured to a casement window 20 by means of screws 32 and 35. The lower arm or leg 33 is preferably of flat construction as indicated in Figure 7*a*. The hinge element 36 is provided with a tubular bearing portion 37 in which a right angularly bent rod 38 is articulately secured by virtue of its shorter extension 39, its longer extension 40 being secured to a tubular pivotal element 42 by means of a pin 41. The tubular pivotal element 42 is provided with an extension 43 which operates in a bearing 45 and is firmly held in place by riveting or peening the head thereof as indicated at 46, a washer 47 being provided for smooth operation. On the extension 43 is articulately mounted a bracket element 48 having a bifurcated downwardly depending extension 49 which rides on the leg or arm 33 of the pivotal support element 26.

It will be noted that the hinge elements 32 and 36 are suitably offset in order to permit the maximum range of opening which is somewhat

substantially more than 90 degrees from the normal of those positions indicated in Figures 7, 9, 10 and 11.

The means for operating the window to open position or closed position from within is made possible by the worm gear mechanism which is clearly illustrated in Figures 5 and 6, wherein it will be noted that an arm 44 is articulately connected to the extension 43 heretofore mentioned, and has provided at its opposite end a sectional worm gear 57, the said arm 44 being also pivotally mounted on a fulcrum 56 supported by bearing portions 58 in a housing 53. The housing 53 is also provided with a flange extension 51 with holes for receiving screws 52 for attaching the same firmly in place. The housing 53 is provided with bores 50 in which a worm 54 is rotatably confined, the said worm 54 having a blind square central opening 55 which is adapted to be engaged by a crank handle 59, so that the same when motivated clockwise or counterclockwise will cause the lever or arm 44 to either open or close the window. The forward portion of the handle 59 is also square as indicated at 60 in order to engage the worm 54 and impart rotation thereto whenever the handle 59 is motivated.

Referring to the window structure, it is also to be noted that on element 15 I secure a cleat 24 so as to act as a finishing off for the interior of the extension of the window within a building and also to act as an abutment or stop for the casement window 20.

The casement window 20 has a window pane 22 therein having an interior surface 23 and an outer surface 21. The object of the mechanism provided is to permit motivating the window 20 so that the surface 21 will be accessible from the interior of the building as indicated in Figure 4. The frame 13 is provided with a recessed opening 62 therein to permit edges 63 of the window to abut thereagainst when the window is closed, the cleat 24 aiding in forming a weather seal with the window 20. The element 16 has an overlapping portion 25 by virtue of its being cut out at 17 so as to overlap the mechanism which imparts articulate motivation to the casement window.

It will be noted that the mechanism provided may be utilized to set the casement window 20 in any angular position within the maximum range of adjustment from the normal to the extreme open position. The important advantage of opening the window in the manner indicated is that it facilitates cleaning of the window pane 22 on both sides without it being necessary to clean the outer surface of the window from the outside of a building.

It goes without saying that the operation of the window mechanism is such as to permit the window to be placed in suitable positions to afford ideal ventilating conditions in the various positions of the window, the window acting partly as a baffle for the air currents circulating through the window opening in various ranges or positions within the range of adjustment, simultaneously affording different degrees of ventilation and passage of air currents into and out of a room in which the window is situated.

In actual operation or transition from the closed position shown in Figure 1 to the open position shown in Figure 4, when the handle 59 engages the worm 54, causing the lever 44 to be rotated outwardly simultaneously therewith, the lever 44 which is articulately secured through the tubular pivotal element 42 and the bent rod 38 to the extension 36, will cause the bracket element 48 to engage slidably by virtue of its bifurcation 49 the arm 33 and slide thereupon in order to permit the tubular pivotal element 42 to fold over inwardly, bend over, or overlap, as indicated in Figure 4. In like manner, as illustrated in Figures 10 and 11, the upper arm 29 will also simultaneously cause the hinge element 31 to overlap the same as indicated in Figure 11, when the window is open as shown in Figure 4, so as to maintain the window in rigid and fixed open arrangement. Because of the particular structural organization of the worm wheel and worm gear construction as well as the hinge structure and the articulate and sliding bracket element 48, the said functions are possible.

Although I have herein described rather succinctly the nature and use of my invention so that persons skilled in the art will have no difficulty apprising themselves of the teaching thereof and, inasmuch as the disclosure is susceptible of various alterations, modifications and improvements, I hereby reserve the right to all modifications, alterations and improvements falling within the scope and spirit of my invention, as well as any modifications that are embraced suggestively in the accompanying drawings, and any that may come within the purview of the foregoing description; my invention to be limited only by the appended claims.

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

1. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, and bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm.

2. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, and crank handle means removably engageable with the said worm gear means for opening and closing the said window.

3. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm

hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of said pivotal support means, and bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, the said worm gear means including a housing secured interiorly of the said window frame, a worm rotatably mounted in the said housing and a lever provided with a pivotal perimetral worm gear section in meshing engagement with the said worm, the said worm being provided with a bore of polygonal cross-section.

4. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, and crank handle means removably engageable with the said worm gear means for opening and closing the said window, the said worm gear means including a housing secured interiorly of the said window pane, a worm rotatably mounted in the said housing and a lever provided with a pivotal perimetral worm gear section in meshing engagement with the said worm, the said worm being provided with a bore of polygonal cross-section.

5. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, and bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, the said opening and closing mechanism when operated to open the said window causing the said window to open simultaneously positioning the said window affording access to the outer surface of the window pane therein from the interior of a building.

6. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of

the said pivotal support means, bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, and crank handle means removably engageable with the said worm gear means for opening and closing the said window, the said opening and closing mechanism when operated to open the said window causing the said window to open simultaneously positioning the said window affording access to the outer surface of the window pane therein from the interior of a building.

7. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, and bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, the said worm gear means including a housing secured interiorly of the said window frame, a worm rotatably mounted in the said housing and a lever provided with a pivotal perimetral worm gear section in meshing engagement with the said worm, the said worm being provided with a bore of polygonal cross-section, the said opening and closing mechanism when operated to open the said window causing the said window to open simultaneously positioning the said window affording access to the outer surface of the window pane therein from the interior of a building.

8. Window opening and closing mechanism including a window and a window frame, comprising worm gear means mounted on the said window frame and provided with a lever extension, pivotal support means provided with trunnions articulately secured adjacent one side of the said window frame and having an upper and a lower arm hingeably secured to the said window, tubular pivotal means secured to the free end of the said lever extension, angularly bent rod means connecting articulately the said tubular pivotal means to the hinge portion of the lower arm of the said pivotal support means, bracket means articulately mounted on the said tubular pivotal means and provided with a depending bifurcation slidably engaging the said lower arm, and crank handle means removably engageable with the said worm gear means for opening and closing the said window, the said worm gear means including a housing secured interiorly of the said window pane, a worm rotatably mounted in the said housing and a lever provided with a pivotal perimetral worm gear section in meshing engagement with the said worm, the said worm being provided with a bore of polygonal cross-section, the said opening and closing mechanism when operated to open the said window causing the said window to open simultaneously positioning the said window affording access to the outer surface of the window pane therein from the interior of a building.

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No references cited.