

Aug. 21, 1962

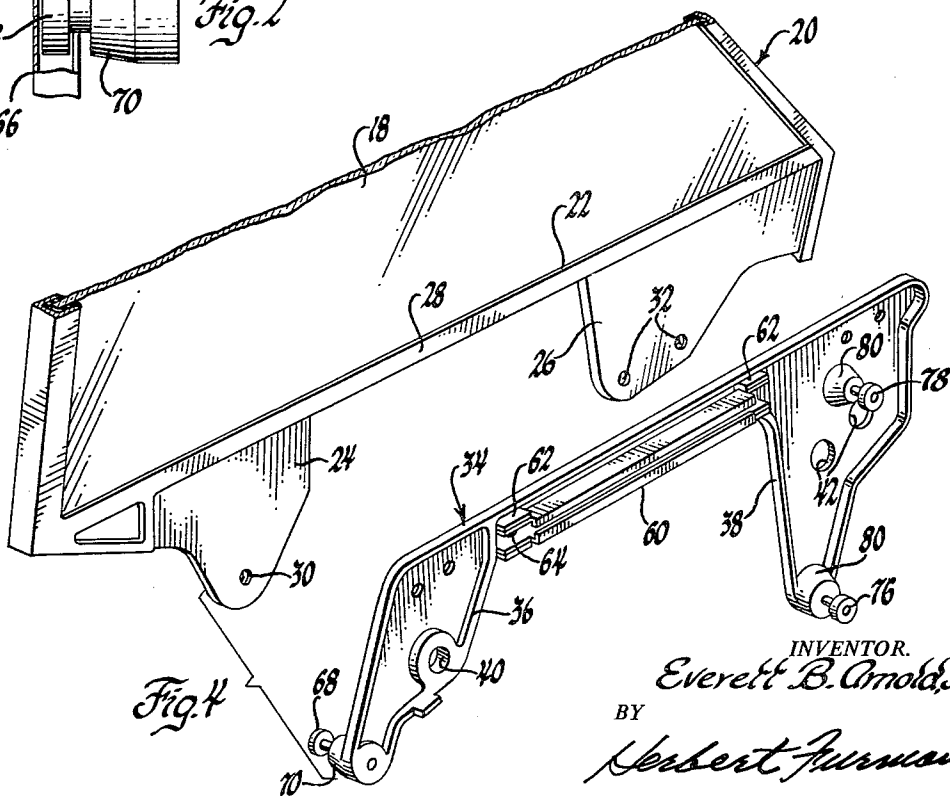
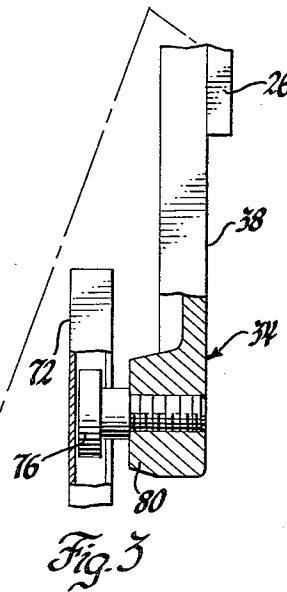
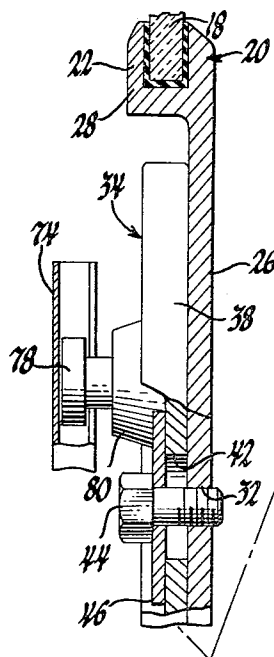
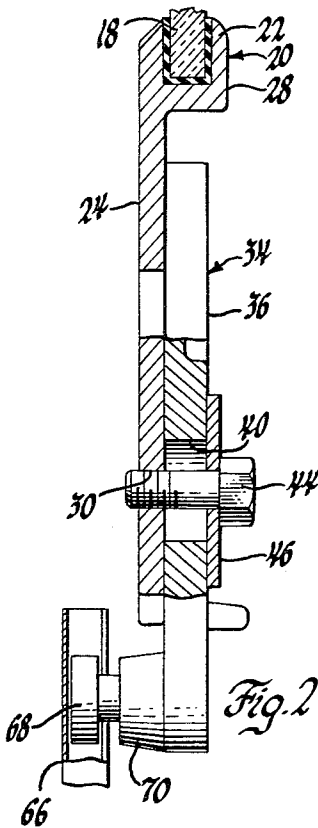
E. B. ARNOLD, JR

3,050,332

WINDOW AND WINDOW FRAME STRUCTURE

Filed March 18, 1960

2 Sheets-Sheet 1



INVENTOR.
Everett B. Arnold, Jr.
BY
Herbert Furman
ATTORNEY

Aug. 21, 1962

E. B. ARNOLD, JR

3,050,332

WINDOW AND WINDOW FRAME STRUCTURE

Filed March 18, 1960

2 Sheets-Sheet 2

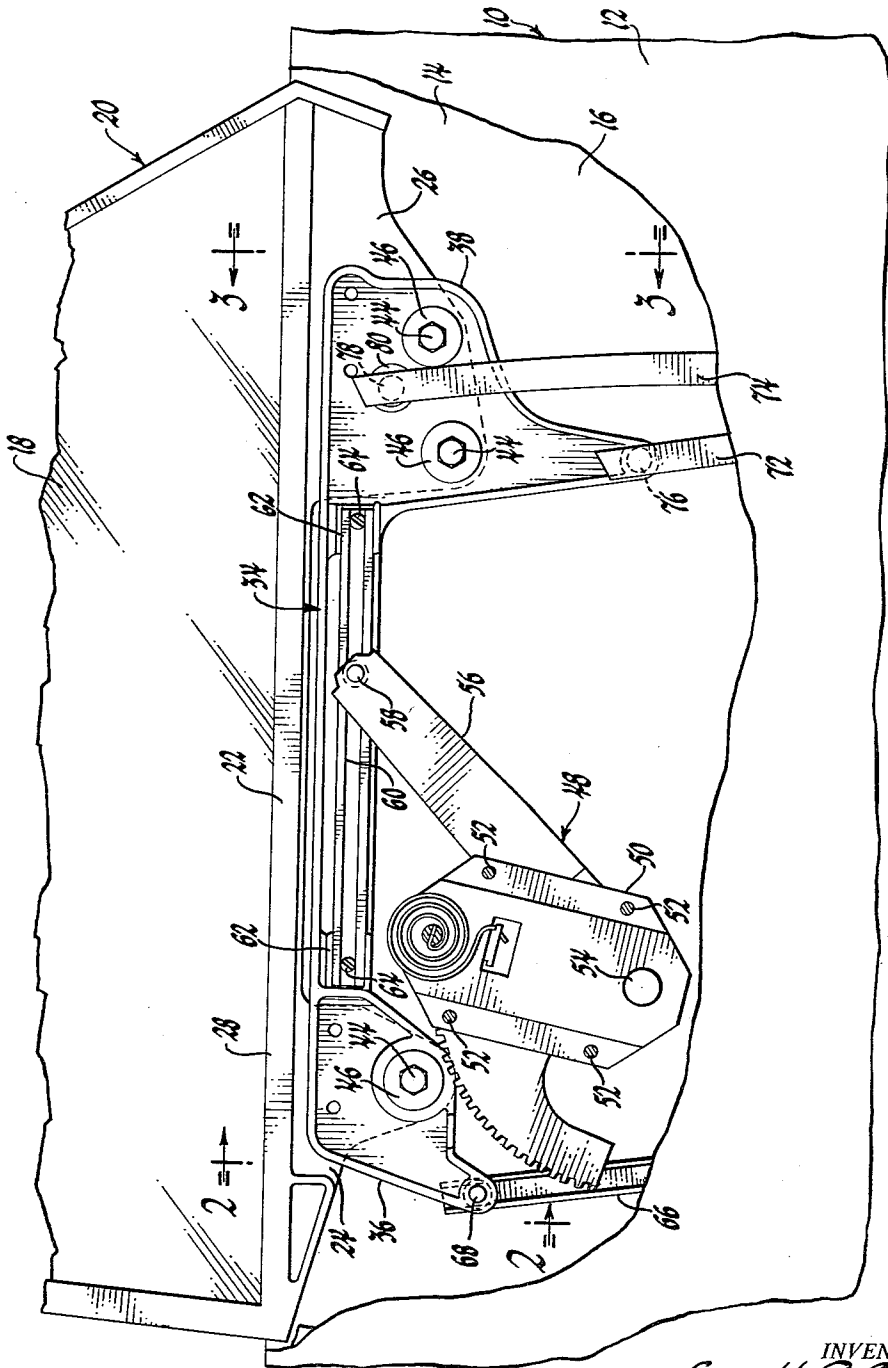


Fig. 1

INVENTOR.
Everett B. Arnold, Jr.
BY
Herbert Furman
ATTORNEY

1

2

3,050,332

WINDOW AND WINDOW FRAME STRUCTURE
Everett B. Arnold, Jr., Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Mar. 18, 1960, Ser. No. 16,021
3 Claims. (Cl. 296-44)

This invention relates generally to a window and window frame structure wherein the window frame structure is adapted to be operatively connected to a window regulator mechanism and a window guiding means and includes means for adjusting the window within a window opening simultaneously with respect to both the window regulator mechanism and the window guiding means without requiring any adjustment of the mechanism or of the guiding means with respect to the support therefor.

At the present time most of the commercially used window regulator mechanisms include a lift arm pivotally supported at one end thereof on a back plate, with the other end thereof being pivotally and slidably mounted in a cam channel on the window frame. Two or more guide channels are usually provided, with these guide channels receiving rollers or studs pivotally secured to the window frame so as to guide movement of the window between opened and closed positions.

In order to accurately locate the window within the window opening in the closed position thereof, elongated slots are provided in the back plate, cam channel and guide channels so as to adjust the back plate and guide channels with respect to the body and adjust the cam channel with respect to the window so that the window regulator mechanism and guiding means accurately locates the window in the closed position thereof. In certain window regulator mechanisms, such as those used in the rear door windows of four-door hardtops, as many as 15 or 16 separate adjustments are provided in order to accurately adjust the window with respect to the window opening.

The window and frame structure of this invention greatly reduces the number of adjustments required by providing a two-piece window frame arrangement. The main window frame member is secured to the lower edge of the window and includes spaced depending portions of large surface area. An auxiliary window frame member is provided with spaced portions of large surface area which pivotally and slidably seat against the portions of the main frame member. The portions of the auxiliary frame member are provided with enlarged circular apertures or holes and headed studs extend through these apertures into tapped holes in the portions of the main frame member so as to adjustably secure the frame members together. The auxiliary frame member mounts the cam channel for the window regulator lift arm and also mounts the studs which are pivotally and slidably received in the guide channels on the body. Whenever it is necessary to accurately locate the window within the window opening, all that need be done is to loosen the studs, adjust the entire window to whatever position desired, and thereafter tighten the studs. Thus, the entire window is simultaneously adjusted within the window opening with respect to both the window regulator mechanism and the guiding means without requiring any adjustment of the latter with respect to the body. The enlarged apertures provide substantially 360° of adjustment of the window within the window opening whereby the window can be adjusted in horizontal and vertical linear directions and can also be tilted in vertical directions within the plane of the window opening, if necessary.

The primary object of this invention is to provide a

new and improved window and window frame structure wherein the frame structure is adapted to be secured to a window regulator mechanism and to window guiding means and includes improved means permitting adjustment of the window within the window opening relative to both the mechanism and the guiding means without any adjustment whatsoever of the guiding means and mechanism with respect to their supporting means.

This and other objects of this invention will be readily apparent from the following specification and drawings wherein:

FIGURE 1 is a partially broken away side elevational view of a vehicle rear door window mounted within a vehicle door and including a frame structure according to this invention operatively connecting the window to a window regulator mechanism and to window guiding means;

FIGURE 2 is an enlarged sectional view taken generally along the plane indicated by line 2-2 of FIGURE 1;

FIGURE 3 is an enlarged sectional view taken generally along the plane indicated by line 3-3 of FIGURE 1; and

FIGURE 4 is an exploded perspective view of a window frame structure according to this invention.

Referring now particularly to FIGURE 1 of the drawings, a vehicle door 10 includes a door inner panel 12 and a door outer panel 14 located in spaced relationship to each other to define a window receiving well 16. A door window 18 has its upper, lower and side edges fixedly received within a channel of a main window frame member 20. As best shown in FIGURE 4 of the drawings, the lower frame member 22 of frame 20 includes a pair of spaced front and rear depending portions 24 and 26, respectively, which are of rather large surface area and which are recessed with respect to the inboard leg 28 of frame member 22. Portion 24 is provided with a tapped hole 30, and portion 26 is provided with a like pair of tapped holes 32.

The auxiliary frame member 34 includes front and rear portions 36 and 38, respectively, of rather large surface area which are adapted to pivotally and slidably seat against the portions 24 and 26, respectively of the main frame member 20. The portion 36 includes an enlarged circular aperture or hole 40 and the portion 38 includes a pair of like enlarged circular apertures or holes 42. In order to secure the frame member 34 to the main frame member 20, bolts 44 extend through the apertures 40 and 42 and are threaded into the tapped holes 30 and 32 of the main frame member, with circular washers 46 being provided between the heads of the bolts and the surface of the portions 36 and 38 adjacent the apertures 40 and 42 therein.

A window regulator mechanism 48 of known type includes a back plate 50 adapted to be bolted at 52 to the door inner panel 12 and pivotally supporting at 54 a lift arm or drive arm 56. The free end of the arm 56 mounts a roller 58 which is pivotally and slidably received within a cam channel 60. The ends of channel 60 are received within U-shaped lug portions 62 of the auxiliary frame member 34, with the cam channel being secured in place by bolts 64 which extend through the base of the cam channel into tapped openings in the bases of the U-shaped lug portions 62. Since the lift arm 56 is pivotally and slidably connected to the window, some means must be provided to longitudinally locate the window within the body window opening and the window well 16 in its respective closed and open positions, and to also guide movement of the window between its open and closed positions.

As best shown in FIGURES 1, 2 and 3 of the drawings, a front inwardly opening guide channel or guid-

3

ing means 66 is suitably mounted on the door outer panel 14 and pivotally and slidably receives a stud or guided means 68 threaded in a laterally outwardly extending tapped lug 70 located substantially at the lowermost end of the front portion 36 of frame member 34. A pair of outwardly opening rear guide channels or guiding means 72 and 74 are suitably mounted on the door inner panel 12 and receive studs or guided means 76 and 78 which are respectively threaded in laterally inwardly extending tapped lugs 80 of the rear portion 38 of the auxiliary frame member. As the lift arm 56 swings about its pivot 54 on the back plate to move the window 18 between opened and closed positions, the front guide channel 66 and stud 68, and the rear guide channels 72 and 74 and the studs 76 and 78 locate the window 18 longitudinally within the window well 16 and guide the window along a predetermined path of movement. It will be noted that the lugs 80 are vertically spaced and offset longitudinally of the window. This is done so that the rollers 76 and 78 and the guide channels 72 and 74 will act to stabilize the window against lateral tilting movement in its open and closed positions and also during movement of the window between these positions.

Whenever it is necessary to adjust the window 18 within the window opening of the body, all that need be done is to loosen the bolts 44 and then move the window 18 to its desired position within the window opening as the portions 24 and 26 of frame member 20 pivot and slide relative to the portions 36 and 38 of the auxiliary frame member 34. The bolts 44 are then tightened to again secure the auxiliary and main frame members together and operatively secure the window to the window regulator mechanism and the guiding means. Thus, the window can be very easily and quickly adjusted within the window opening with respect to both the window regulator mechanism and the guiding means without requiring any adjustment of the regulator mechanism and guiding means with respect to either the door inner panel or the door outer panel. The enlarged apertures 40 and 42 are sufficient to permit both horizontal and vertical linear adjustment of the window 18 within the window opening and to also permit any tilting movement of the window 18 within the vertical plane of the window opening without binding of the bolts 44 against the sides of the apertures. Thus, both linear and rotary movement of the window 18 are permitted by merely loosening the bolts 44 so as to allow the portions 24 and 26 of the main frame member to pivot and/or slide relative to the portions 36 and 38 of the auxiliary frame member.

Thus, this invention provides a new and improved window and window frame structure wherein the window frame structure includes means permitting the window to be adjusted within the window opening simultaneously with respect to both the window regulator mechanism and to the guiding means without requiring any adjustment whatsoever of the window regulator mechanism and guiding means with respect to their supporting members.

I claim:

1. In a vehicle body having a window opening, the combination comprising, a vehicle window, guiding means, a window regulator mechanism, a main frame member secured to said window and including a depending portion having at least a pair of large surface area portions, an auxiliary frame member having a pair of large surface area portions adapted to pivotally and slidably seat against said pair of portions of said main frame member, guided means mounted on said portions of said auxiliary frame member and operatively connected to said guiding means, means connecting said auxiliary frame member to said window regulator mechanism, said portions of one of said frame members including enlarged holes, and securing means extending through said holes and releasably secured to the portions of the other of said frame members to releasably secure said frame members to each other and thereby operatively secure said window to

4

said window regulator mechanism and to said guiding means, said holes being of greater extent than said securing means to permit simultaneous horizontal and vertical adjustment of said one frame member relative to said other frame member as said securing means move within said holes, said window being simultaneously adjustable in horizontal and vertical directions with respect both to said window regulator mechanism and to said guiding means by releasing said securing means and adjusting said window with respect thereto within said window opening to thereby permit said window to be accurately adjusted within said opening without adjustment of said window regulator mechanism and said guiding means.

2. In a vehicle body having a window opening, the combination comprising, a vehicle window, guiding means, a window regulator mechanism including a lift arm adapted to be operatively connected to said vehicle window, a main frame member secured to the lower edge of said window and including a pair of depending portions of large surface area, an auxiliary frame member having a pair of portions of large surface area adapted to pivotally and slidably seat against said pair of portions of said main frame member, guided means mounted on said portions of said auxiliary frame member and operatively connected to said guiding means, a cam channel mounted on said auxiliary frame member intermediate said portions and pivotally and slidably connected to said window regulator lift arm, said portions of one of frame members including enlarged holes, and securing means extending through said holes and releasably secured to the portions of the other of said frame members to releasably secure said frame members to each other and thereby operatively secure said window to said window regulator mechanism and to said guiding means, said holes being of greater extent than said securing means to permit simultaneous horizontal and vertical adjustment of said one frame member relative to said other frame member as said securing means move within said holes, said window being simultaneously adjustable in horizontal and vertical directions with respect both to said window regulator mechanism and said guiding means by releasing said securing means and adjusting said window with respect thereto within said window opening to thereby permit said window to be accurately adjusted within said opening without adjustment of said window regulator mechanism and said guiding means.

3. In a vehicle body having a window opening and a window receiving well below said opening, the combination comprising a vehicle window, guiding means within said well, a window regulator mechanism mounted within said well and including a lift arm adapted to be pivotally and slidably connected to said vehicle window, a main frame member secured to the lower edge of said window and including a pair of spaced depending portions of large surface area, an auxiliary frame member having a pair of spaced portions of large surface area adapted to pivotally and slidably seat against said portions of said main frame member, guided means fixedly mounted on said portions of said auxiliary frame member and operatively connected to said guiding means, a cam channel mounted on said auxiliary frame member between said spaced portions thereof and pivotally and slidably connected to said window regulator lift arm, said portions of one of said frame members including enlarged holes, and means extending through said holes and releasably secured to the portions of the other of said frame members to releasably secure said frame members to each other and thereby operatively secure said window to said window regulator mechanism and to said guiding means, said holes being of greater extent than said securing means to permit simultaneous horizontal and vertical adjustment of said one frame member relative to said other frame member as said securing means move within said holes, said window being simultaneously adjustable in

5

horizontal and vertical directions with respect both to said window regulator mechanism and said guiding means by releasing said securing means and adjusting said window with respect thereto within said window opening to thereby permit said window to be accurately adjusted within said opening without adjustment of said window regulator mechanism and said guiding means.

5

6

References Cited in the file of this patent

UNITED STATES PATENTS

2,429,156	Floraday	Oct. 14, 1947
2,447,990	Roethel	Aug. 24, 1948
2,494,040	Floraday	Jan. 10, 1950
2,876,003	Probst	Mar. 3, 1959