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T. H. GRONLUND ET AL  
VEHICLE WINDOW AND SCREEN

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2 Sheets-Sheet 1

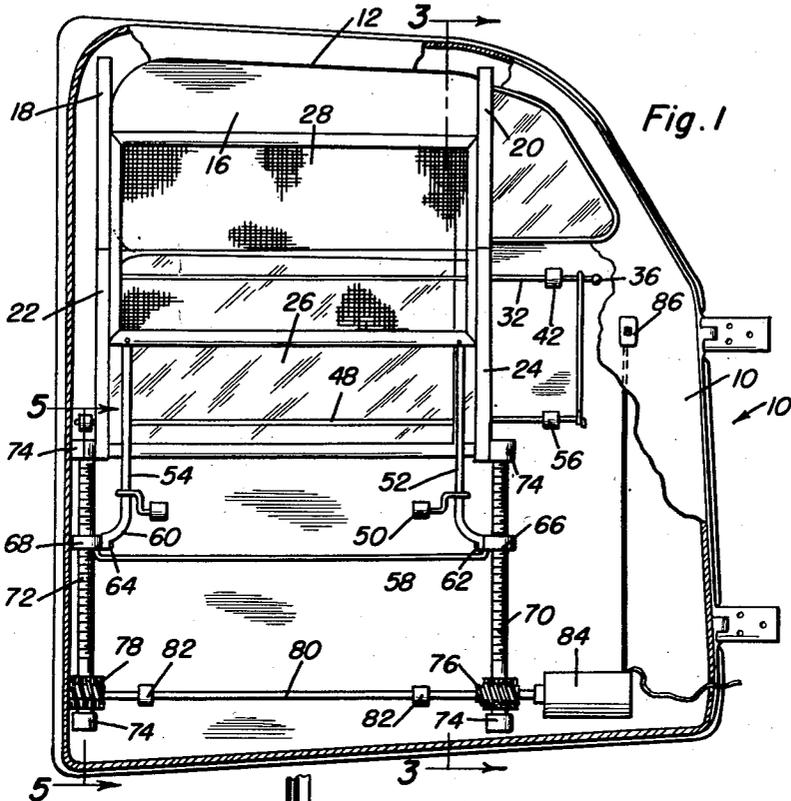


Fig. 1

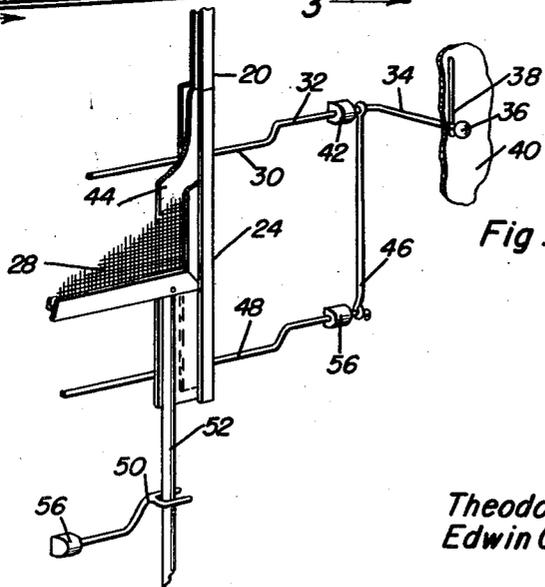


Fig. 2

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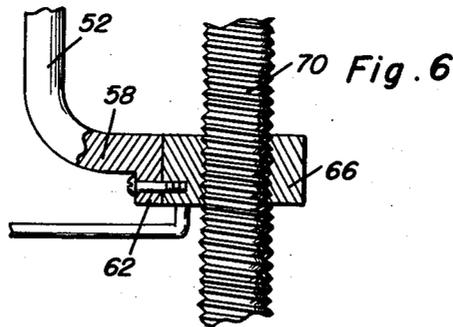
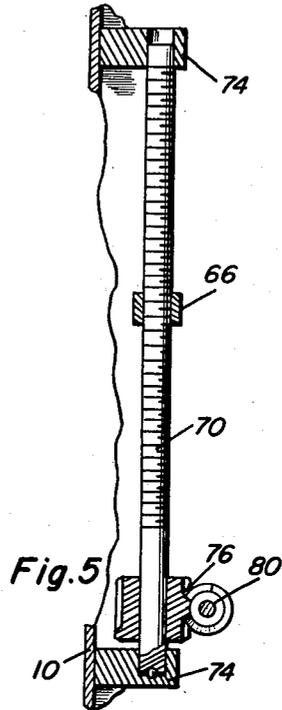
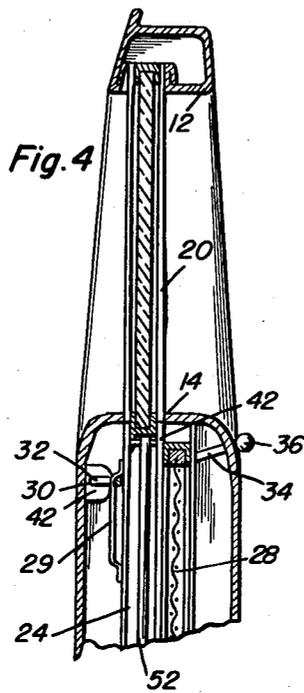
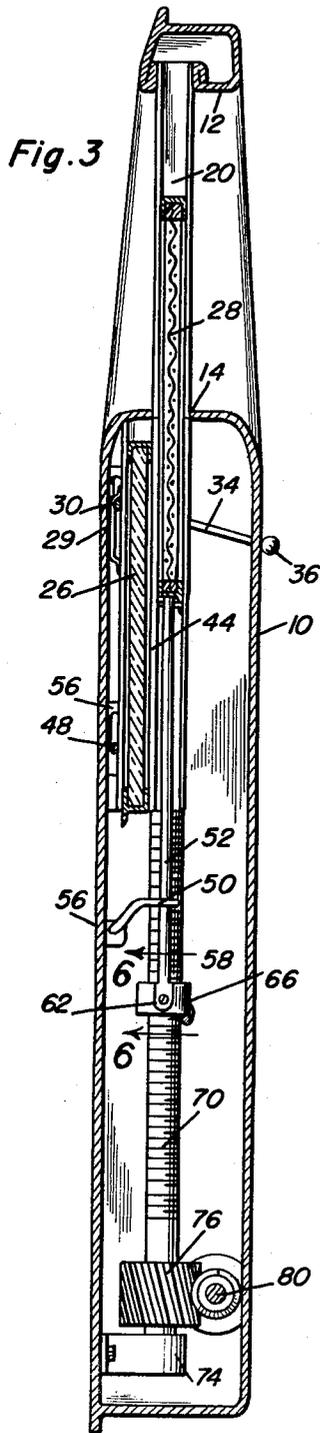
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1

2,710,058

**VEHICLE WINDOW AND SCREEN**

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8 Claims. (Cl. 160—103)

This invention relates to window construction especially adapted for use in vehicles and more particularly to means for actuating window sash and screen sash in a selective manner.

The primary object of the present invention resides in the provision of means for raising and lowering window sash or screen sash so as to close a window opening in a vehicle door or light portion of a vehicle having a window opening therein.

The construction of this invention especially features a pair of double channel members which are adapted to be floatingly swung into selective alignment with a pair of guide channels. Means are provided to raise and lower window or screen sash on the double channel members into the channel shaped guides so as to enable the window openings to be opened or closed by either the window sash or the screen sash.

A further object of this invention resides in the provision of power operated means for raising and lowering a screen sash or a window sash by means of a simple control mechanism.

Still further objects and features of this invention reside in the provision of a window and screen construction for vehicles that is strong and durable, simple in construction and manufacture, capable of being readily installed on various existing makes and models of automotive vehicles, and which is readily adaptable for initial installation in new models of vehicles, and which is relatively inexpensive to construct and produce, thereby permitting wide use and distribution.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this vehicle window and screen construction, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is an elevational view of the apparatus comprising the present invention, shown as installed in a door of a vehicle with major portions of the door being broken away to show the invention;

Figure 2 is a perspective view of the means for shifting the double channel members into alignment with the slot in the window frame and into alignment with the pair of channel guides;

Figure 3 is a vertical sectional view as taken along the plane of line 3—3 of Figure 1;

Figure 4 is a vertical sectional view, illustrating the window sash in a closed position;

Figure 5 is a sectional detailed view as taken along the plane of line 5—5 in Figure 1, illustrating the construction of the means provided for raising and lowering the screen sash and window sash; and

Figure 6 is an enlarged sectional detailed view as taken along the plane of line 6—6 in Figure 3, illustrating the connections between the lifting rods, lifting rings and lift screws comprising elements of the invention.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar

2

parts throughout the various views, reference numeral 10 generally designates a door or other similar portion of a vehicle which is provided with a window frame 12 having a slot as at 14 therein to permit the passage of suitable sash. Arranged in alignment with the opening 16, defined by the window frame 12 and adapted to guidably receive sash, are a pair of channel shaped guides 18 and 20.

Floatingly suspended below the channel shaped guides 18 and 20 are a pair of double channel members 22 and 24 which are adapted to house a window sash 26 and a screen sash 28. Attached to the channel members 22 and 24 are retainer members 29 which are of substantially U-shape. Guidingly and rotatably received within the confines of the retaining members 29 between the retaining members 29 and the double channel members 22 and 24 is an eccentric portion 30 of an operating shaft 32 to which an operating handle 34 is attached. The operating handle 34 may be provided with a knob 36 and the operating handle 34 extends through a slot 38 in the upholstery or inner panel 40 of the door or other panel or structure on which this invention is mounted.

Rotation of the operating handle 34 will rotate the shaft 32 to actuate the eccentric portion 30 of the shaft 32 to move the portion of the channel members 22 and 24 retaining the window sash 26 or that portion of the double channel members 22 and 24 retaining the screen sash 28 in alignment with the slot 14 and hence with the channel shaped guides 18 and 20. The shaft 32 is, of course, journaled in bearing brackets as at 42. The double channel members 22 and 24 are, of course, provided with stops (not shown) at their lowermost edges for retaining the window sash 26 and the screen sash 28 within the double channel members and the double channel members 22 and 24 are provided with enlarged central dividing partitions 44 separating the housing of the window sash 26 from the housing of the screen sash 28. Pivotaly attached to the shaft 32 is a supporting arm 46 for one end of a shaft 48. The shaft 48 is also journaled in a bearing bracket 56.

Guides 50 for lifting rods 52 and 54 are affixed to the door 10. The lifting rods 52 and 54 are provided with arcuate lower end portions 58 and 60 terminating in flanges 62 and 64 which are secured by suitable fasteners to lifting rings 66 and 68 which are internally threaded and threadedly received on lift screws 70 and 72. The upper and lower ends of the lift screws 70 and 72 are suitably journaled in bearing blocks 74 and are drivingly connected through gearing arrangements 76 and 78 to a drive shaft 80 journaled in bearing blocks 82 and driven by an electric motor 84 receiving electrical power from the battery or generator (not shown) of the vehicle on which this device is installed. A switch 86 is provided for controlling the operation of the motor 84.

The operation of this apparatus is quite simple. With the lift arms 52 and 54 in a lowered position and with both the screen sash 28 and window sash 26 in a lowered position, the operator of the vehicle can then select which sash he desires to raise, if any. Positioning the operating handle 34 in the lower position, will position the double channel members 22 and 24 so that the screen sash 28 is in alignment with the slot 14 and the channel shaped guides 18 and 20. Upward movement of the operating handle 34 will position the screen sash 26 in alignment with the slot 14 and the guides 18 and 20. Whichever sash is selected will be also placed in alignment with the upper ends of the lifting rods 52 and 54 since the lift screws 70 and 72 are also in alignment with the slot 14. Then, exciting the motor 84 by actuating the switch 86 will cause the shaft 80 to be rotated thus rotating the lift screws 70 and 72 and raising and

3

lowering the lift rings 66 and 68 to which the lift arms 52 and 54 are attached. This will cause the lift arms 52 and 54 to raise the selected sash 26 or 28. It is to be recognized that with the selected sash in a raised or partially raised position, it is impossible to actuate the operating handle 34 since the central dividing partitions 44 would then butt against the lift arms 52 and 54 which are guided by the guides 50.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides.

2. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said lifting means comprising a pair of lifting rods, threaded lift screws, drive means for rotating said lift screws, lift rings threadedly positioned on said lift screws, said lifting rods being attached to said lift rings.

3. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said selector means comprising a crank arm forming an operating handle attached to an operating shaft, said operating shaft having an eccentric portion, and retainer members slidably rotatably connecting said eccentric portion to said pair of opposed double channel members.

4. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage

4

of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said lifting means comprising a pair of lifting rods, threaded lift screws, drive means for rotating said lift screws, lift rings threadedly positioned on said lift screws, said lifting rods being attached to said lift rings, said drive means comprising a drive shaft, gearing connecting said drive shaft to said lift screws, and a motor driving said drive shaft.

5. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said lifting means comprising a pair of lifting rods, threaded lift screws, drive means for rotating said lift screws, lift rings threadedly positioned on said lift screws, said lifting rods being attached to said lift rings, said selector means comprising a crank arm forming an operating handle attached to an operating shaft, said operating shaft having an eccentric portion, and retainer members slidably rotatably connecting said eccentric portion to said pair of opposed double channel members.

6. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said lifting means comprising a pair of lifting rods, threaded lift screws, drive means for rotating said lift screws, lift rings threadedly positioned on said lift screws, said lifting rods being attached to said lift rings, said selector means comprising a crank arm forming an operating handle attached to an operating shaft, said operating shaft having an eccentric portion, and retainer members slidably rotatably connecting said eccentric portion to said pair of opposed double channel members, said drive means comprising a drive shaft, gearing connecting said drive shaft to said lift screws, and a motor driving said drive shaft.

7. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly

5

mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash when the window sash and the screen sash respectively are in alignment with said guides, said double channel members having enlarged central dividing strips for guiding said lifting rods.

8. A vehicle window and screen construction for use in combination with a frame defining a window opening, said frame having a slot therein for permitting passage of a window sash or a screen sash therethrough comprising a pair of opposed channel shaped sash receiving guides on said window opening and in alignment with said slot, a pair of opposed double channel members floatingly mounted below said guides, a window sash and a screen sash received in said double channel members, selector means for shifting said double channel members relative to said guides to selectively align said screen sash and said window sash with said guides, and lifting means for engaging and lifting the window sash and the screen sash

6

when the window sash and the screen sash respectively are in alignment with said guides, said lifting means comprising a pair of lifting rods, threaded lift screws, drive means for rotating said lift screws, lift rings threadedly positioned on said lift screws, said lifting rods being attached to said lift rings, said selector means comprising a crank arm forming an operating handle attached to an operating shaft, said operating shaft having an eccentric portion, and retainer members slidably rotatably connecting said eccentric portion to said pair of opposed double channel members, said drive means comprising a drive shaft, gearing connecting said drive shaft to said lift screws, and a motor driving said drive shaft, said double channel member having enlarged central dividing strips for guiding said lifting rods.

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