April 1, 1930. S. W. NICHOLSON 1,752,688

WINDOW REGULATOR

Filed Feb. 23, 1926

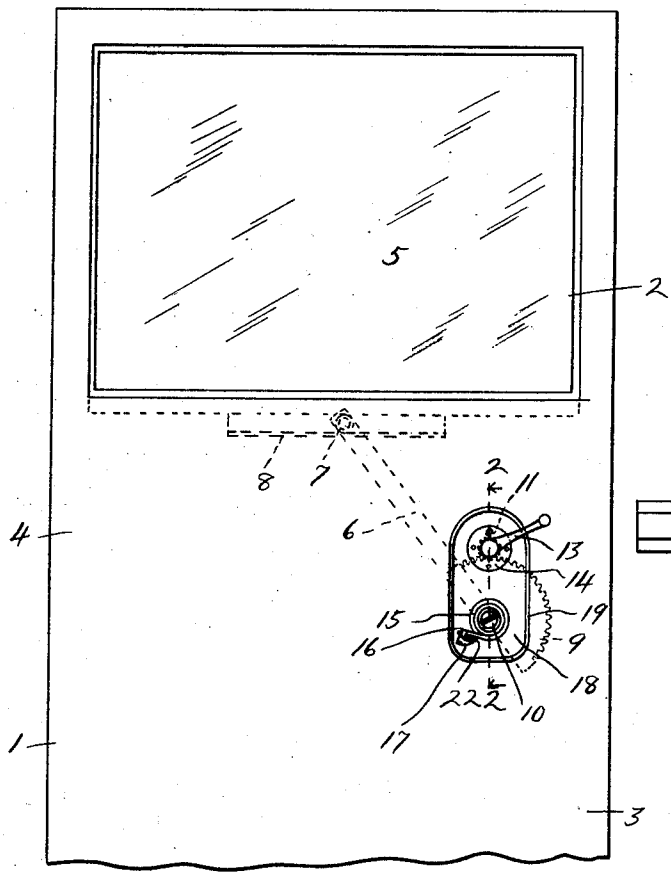


Fig. 1.

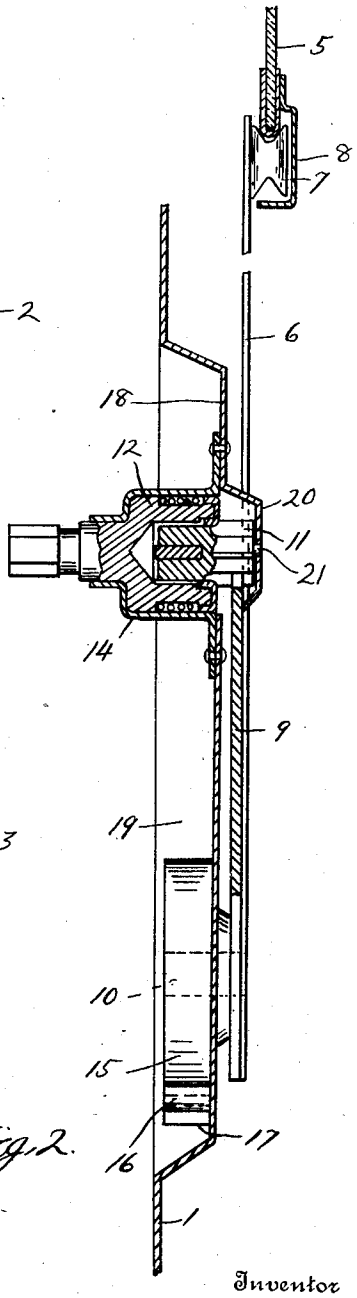


Fig. 2.

Inventor

Stanley W. Nicholson

By Whittemore Hubbard & Whittemore & Belknap.

Attorneys

Patented Apr. 1, 1930 1,752,688

UNITED STATES PATENT OFFICE

STANLEY W. NICHOLSON, OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DURA COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

WINDOW REGULATOR

Application filed February 23, 1926. Serial No. 90,106.

The invention relates to window regulators and has for its main object the provision of a unitary structure in which the window regulator is built into the panel forming a wall of the chamber into which the closure is adapted to be moved. Another object is to form the panel in a manner to guide the control arm of the window regulator and to also receive the irreversible drive mechanism for the control arm and the closure counterbalancing spring. Further objects of the invention reside in the novel features of construction and combinations and arrangements of parts as more fully hereinafter set forth.

In the drawings:—

Figure 1 is an interior side elevation of a vehicle door embodying my invention;

Figure 2 is a cross section on the line 2—2 of Figure 1.

It has been the customary practice heretofore to form the window regulator as an independent unit of the frame in which the window is slidably mounted and also to independently form the inner panel of the frame which forms a wall of the frame chamber.

With my invention the panel and window regulator are designed in conjunction with each other so that the panel forms a part of the window regulator and the latter might be said to be built into the panel. As specifically shown, my invention is applied to an all-steel vehicle door 1 having an opening 2 in its upper portion and a chamber 3 in its lower portion, the inner wall of this chamber being formed by the sheet steel panel 4. 5 is the window or closure for the opening 2 slidably mounted in suitable guideways in the door frame from a closed position into the chamber.

For raising and lowering the closure I have provided the control or lifter arm 6 suitably connected at its outer or free end to the closure as by means of the roller 7 and the channel 8. The inner end of this arm is pivotally mounted upon the panel 4 and in the present instance is rigidly secured to the gear segment 9. This gear segment is fixed upon the shaft 10, which is journaled in the panel and extends transversely thereof. 11 is a pinion meshing with the gear segment and driven by suitable irreversible drive mechanism 12 from the handle shaft 13, the inner end of which has a suitable handle secured thereto. 14 is a cupped casing for enclosing the irreversible drive mechanism and also forming a bearing in which the handle shaft is journaled.

For counterbalancing the weight of the closure 5, I have provided the convolute spring 15 which has its inner end rigidly secured to the shaft 10 and its outer end provided with a hook 16 for engaging an anchor 17 upon the panel.

To properly position and also guide the control or lifter arm 6 and also to secure the minimum thickness of door the panel 4 is outwardly depressed to form the laterally offset wall 18 and the depression 19 at the inner side of this laterally offset wall. The pivot 10 is journaled in this laterally offset wall and the gear segment 9 and control or lifter arm 6 are located adjacent to the outer side of this wall. Furthermore, this laterally offset wall is provided with the struck out tongue 20 which is engageable with the outer side of the gear segment to assist in guiding the same. This tongue 20 additionally forms a bearing in which is journaled the shaft 21 upon which the pinion 11 is formed. The depression 19 formed in the panel receives the irreversible drive mechanism 12 and its enclosing casing 14 and also receives the closure counterbalancing spring 15 as well as the anchor 17 which is specifically formed by means of the tongue 22 struck out from the laterally offset wall 19.

What I claim as my invention is:

1. The combination of a frame having an opening and a chamber adjacent said opening, a metallic panel forming one wall of said chamber and having a depressed portion with a laterally offset wall, a movable closure for the opening, an arm connected to said closure and located adjacent one side of said wall, and a drive mechanism connected to said arm and located in said depressed portion at the opposite side of said wall.

2. The combination of a frame having an opening and a chamber adjacent said opening, a metallic panel forming one wall of said

chamber and having a depressed portion with a laterally offset wall, a tongue struck out from said laterally offset wall and extending into the depression, control mechanism for said closure including an arm operatively connected to said closure, irreversible drive mechanism for said arm and a counterbalancing spring for said closure operatively connected to said arm, said arm being adjacent to one side of said laterally offset wall and said irreversible drive mechanism and counterbalancing spring being adjacent to the other side and located in the depression, said counterbalancing spring being anchored to said tongue.

3. The combination of a frame having an opening and a chamber adjacent said opening, a metallic panel forming one wall of said chamber and having a depressed portion with a laterally offset wall, said laterally offset wall being provided with a pair of tongues struck out therefrom, control mechanism for said closure including a pivotal arm operatively connected to said closure, a gear segment secured to said arm and guided by one of said tongues, a pinion meshing with said gear segment, and a convolute counterbalancing spring for said closure operatively connected to said arm, said arm and gear segment being adjacent to one side of said laterally offset wall and said counterbalancing spring being adjacent to the opposite side and located in the depression and having one end anchored to the other of said tongues.

In testimony whereof I affix my signature.

STANLEY W. NICHOLSON.