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SELF-ADJUSTING VENTILATING WINDOW

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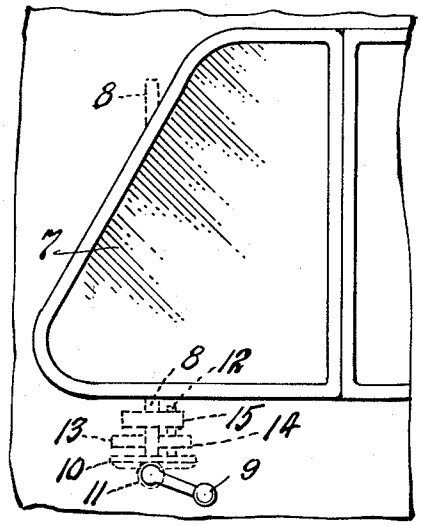


Fig. 1.

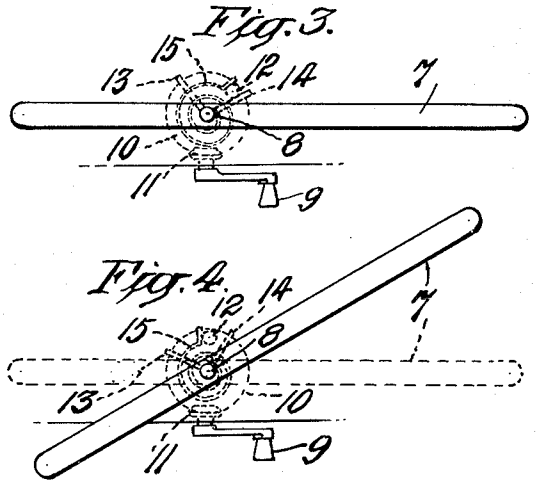


Fig. 3.

Fig. 4.

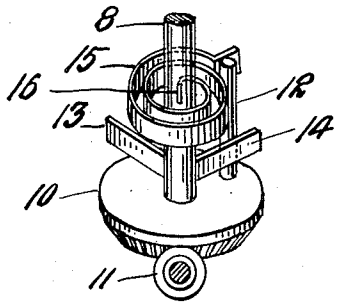


Fig. 2.

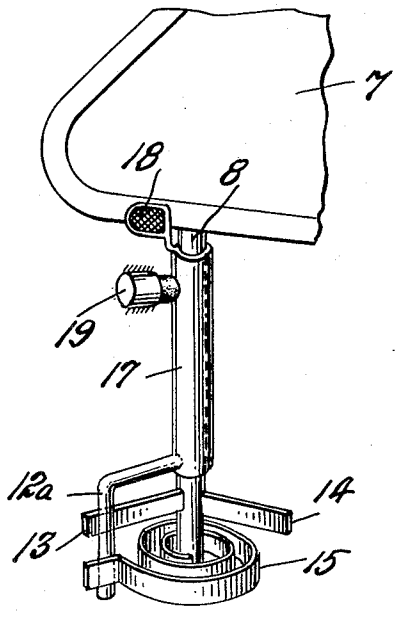


Fig. 5.

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SELF-ADJUSTING VENTILATING WINDOW

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5 Claims. (Cl. 268—117)

The invention here disclosed relates to ventilating windows in the nature of the quarter windows used in automobiles.

These windows can be adjusted to afford a desired degree of ventilation at a present sped of travel but as the speed varies the amount of ventilation may become too great or too small.

In the present invention the window is made to automatically adjust itself to effect substantially the same extent of ventilation in accordance with varying speed of travel.

Special objects of the invention are to provide such automatic self-adjustment which can be adapted and applied to existing window constructions and operating mechanism.

Particularly it is a purpose of the invention to provide the necessary mechanism in a small, compact, low cost form applicable to existing automobile body construction.

Other desirable objects attained by the invention and the novel features of construction through which the purposes of the invention are attained, will either appear or are definitely set forth in the following specification.

The drawing accompanying and forming part of the specification illustrates certain present practical embodiments of the invention. Structure, however, may be modified and changed as regards such illustration, all within the true intent and scope of the invention as herein defined and claimed.

Fig. 1 in the drawing is a broken and somewhat diagrammatic view illustrating a form of the invention as applied to a crank-operated quarter window;

Fig. 2 is an enlarged detail view illustrating cooperative action of the parts of the automatic self-adjusting mechanism and the positive opening and closing mechanism;

Figs. 3 and 4 are diagrammatic plan views showing how with the self-adjusting mechanism in control, the window will gradually close as speed of the vehicle increases and gradually open as speed is reduced, to effect in each instance generally the same amount of ventilation;

Fig. 5 is a perspective and somewhat diagrammatic view illustrating the invention applied to a push-operated form of ventilating window.

The ventilating window shown comprises a pane **7** carried by a shaft **8** mounted for rotation about a generally vertical axis.

These quarter windows usually are adjusted either by a hand crank or pushed by hand to a desired ventilating position. The present invention is applicable to both designs.

In Figs. 1 and 2 a hand crank **9** is provided for positively opening and positively closing the window and for setting it in intermediate positions where it will be self-adjusting, according to wind pressure.

This is accomplished by provision of a gear **10** journaled on a vertical axis concentric with the shaft **8**, operated by pinion **11** independently of the shaft, although for convenience of mounting it may be rotatably engaged over the lower end of the shaft, said gear carrying an upstanding pin **12** disposed between angularly related stops **13**, **14** on the shaft and engageable by the outer end of a spiral spring **15** whose inner end is attached to the shaft at **16**.

The stops **13**, **14** may be in the form of arms projecting radially from the shaft at approximately 90° to each other, and their purpose is to enable the pin **12**, by engagement with one or the other, to turn the shaft far enough to either fully close or fully open the window. The pin and angularly spaced stops thus provide a lost motion connection, enabling adjustment of the window to any intermediate or to either fully closed or fully open position, and to positively hold the window either fully closed or fully open.

The spring, through its engagement with the positioning or actuating pin, provides means for yieldingly opening and yieldingly holding the window in opened relation, with the extent of such opening dependent on pressure against that portion of the pane projecting into the air stream.

This relation and operation of parts will be clear from Figs. 3 and 4, which show how at higher speeds the pane will tend to wind the spiral spring to attain a more nearly closed position, while with reduced speed the spring will assert itself to swing the pane into more nearly open relation, to maintain a more or less approximately uniform ventilation.

This automatic self-adjustment also has the effect of keeping wind noises down to a desired level.

In the push-operated form of the invention illustrated in Fig. 5, the hand crank gearing is eliminated, normal adjustment being effected by simply pushing the pane one way or the other about the shaft center.

The actuator pin **12***a* in this case is carried by a tubular shaft **17** concentric with the supporting shaft **8**, which can be turned by a handle **18** and which is held in adjusted position by a friction device **19**.

The frictional holding member **19** is designed to hold the window open against all possible wind forces when the hand control is turned all the way to full open position. When the hand control **18** is placed in any other than full open or full closed position, the force of the air may operate through the spring tension to swing the window according to the pressure applied.

In both forms of the invention illustrated the actuator pin **12** or **12***a* operates to open the window through the tension of the spring **15** and leaves the window free to close more or less, according to pressure exerted on it by the closing stop. The window, however, may be positively shifted to fully open position by engagement of actuator pin against the opening stop **13**. To similar effect, the window may be positively closed all the way by engagement of the actuator pin against the closing stop **14**, as indicated in Fig. 3. Thus, the window may be positively opened and closed after taking up the free spring action and be positively held in either open or closed relation. In the free spring position, that is with no tension on the spring, the spring arm should bear lightly against the closing stop to prevent any free motion between the spring and window when the window is closed and locked.

What is claimed is:

1. A self-adjusting ventilating window comprising a rotatably adjustable shaft and a window pane carried thereby, an actuator pivoted to swing on an arc concentric with the axis of the shaft, a lost motion connection between said actuator and shaft for turning the shaft from the actuator far enough in opposite directions to fully close or to fully open the window pane and incorporating free motion permitting free turning of the shaft unrestricted by the actuator between the fully open and fully closed positions, and a spring connection between the shaft and actuator for yieldingly taking up the lost motion in said lost motion connection and arranged in partly opened positions of the pane to yieldingly hold the shaft positioned according to wind pressure against the pane.

2. A self-adjusting ventilating window comprising a rotatably adjustable shaft and a window pane carried thereby, an actuator pivoted to swing on an arc concentric with the axis of the shaft, a lost motion connection between said actuator and shaft for turning the shaft from the actuator far enough in opposite directions to fully close or to fully open the window pane and incorporating free motion permitting free turning of the shaft unrestricted by the actuator between the fully open and fully closed positions, and a spring connection between the shaft and actuator for yieldingly taking up the lost motion in said lost motion connection and arranged in

partly opened positions of the pane to yieldingly hold the shaft positioned according to wind pressure against the pane, said spring being a spiral spring attached at its inner end to the shaft and bearing against the actuator at its outer end.

3. A salf-adjusting ventilating window comprising a rotatably adjustable shaft and a window pane carried thereby, an actuator pivoted to swing on an arc concentric with the axis of the shaft, a lost motion connection between said actuator and shaft for turning the shaft from the actuator far enough in opposite directions to fully close or to fully open the window pane and incorporating free motion permitting free turning of the shaft unrestricted by the actuator between the fully open and fully closed positions, and a spring connection between the shaft and actuator for yieldingly taking up the lost motion in said lost motion connection and arranged in partly opened positions of the pane to yieldingly hold the shaft positioned according to wind pressure against the pane, said lost motion connection including angularly spaced stops attached to the shaft and an actuating pin disposed between and free for motion between said stops.

4. A self-adjusting ventilating window comprising a rotatably adjustable shaft and a window pane carried thereby, an actuator pivoted to swing on an arc concentric with the axis of the shaft, a lost motion connection between said actuator and shaft for turning the shaft from the actuator far enough in opposite directions to fully close or to fully open the window pane and incorporating free motion permitting free turning of the shaft unrestricted by the actuator between the fully open and fully closed positions, and a spring connection between the shaft and actuator for yieldingly taking up the lost motion in said lost motion connection and arranged in partly opened positions of the pane to yieldingly hold the shaft positioned according to wind pressure against the pane, said actuator including a pin on a gear driven disc and said lost motion connection including angularly spaced radial extensions on the shaft disposed at opposite sides of said pin.

5. A self-adjusting ventilating window comprising a rotatably adjustable shaft and a window pane carried thereby, an actuator pivoted to swing on an arc concentric with the axis of the shaft, a lost motion connection between said actuator and shaft for turning the shaft from the actuator far enough in opposite directions to fully close or to fully open the window pane and incorporating free motion permitting free turning of the shaft unrestricted by the actuator between the fully open and fully closed positions, and a spring connection between the shaft and actuator for yieldingly taking up the lost motion in said lost motion connection and arranged in partly opened positions of the pane to yieldingly hold the shaft positioned according to the wind pressure against the pane, said actuator including a pin carried by a tubular shaft concentrically related to said first shaft and adjustable angularly in respect to said first shaft, friction means for holding said tubular shaft in angularly adjusted relation and said lost motion connection including angularly spaced radial extensions on said first shaft disposed to opposite sides of said pin.

No references cited.