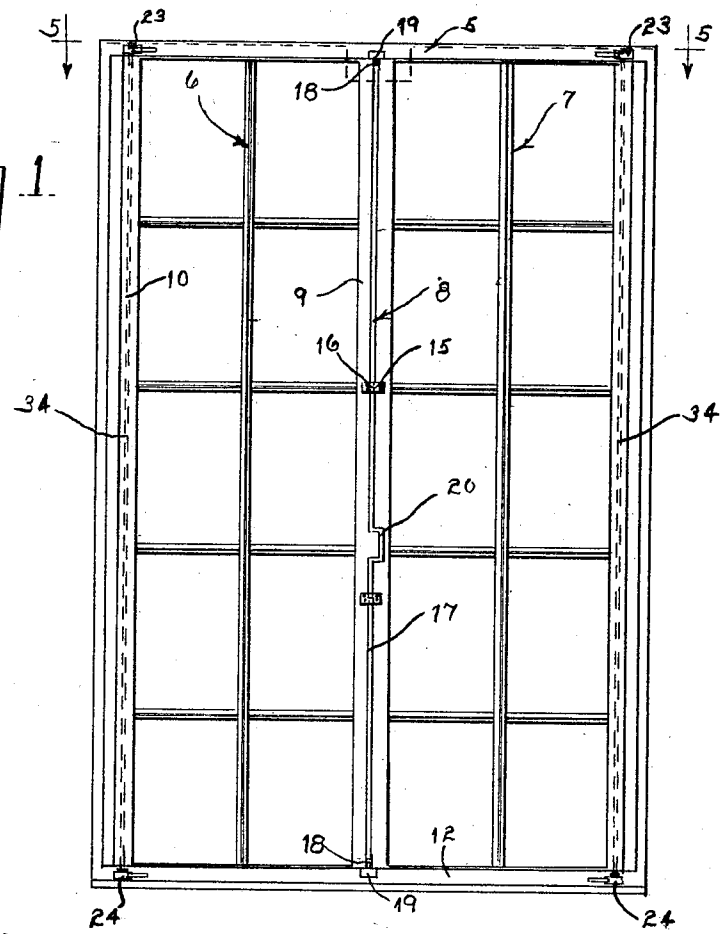
April 12, 1932. C. F. WARRICK 1,853,389

WINDOW CONSTRUCTION

Filed Sept. 22, 1930 3 Sheets-Sheet 1

Fig. 1.



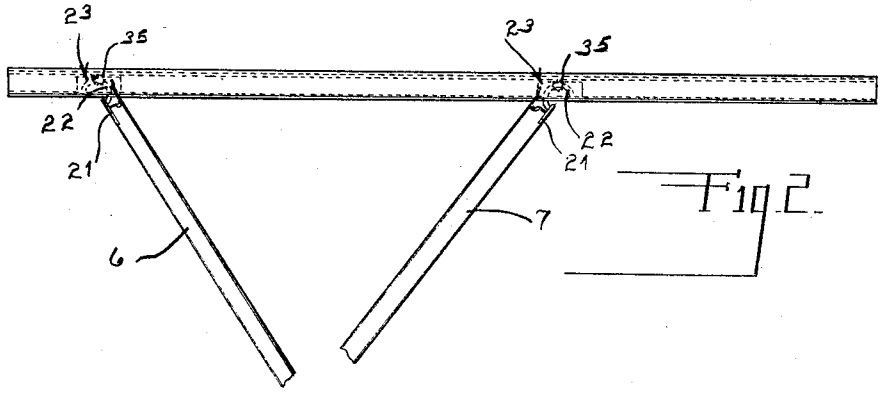


Fig. 2.

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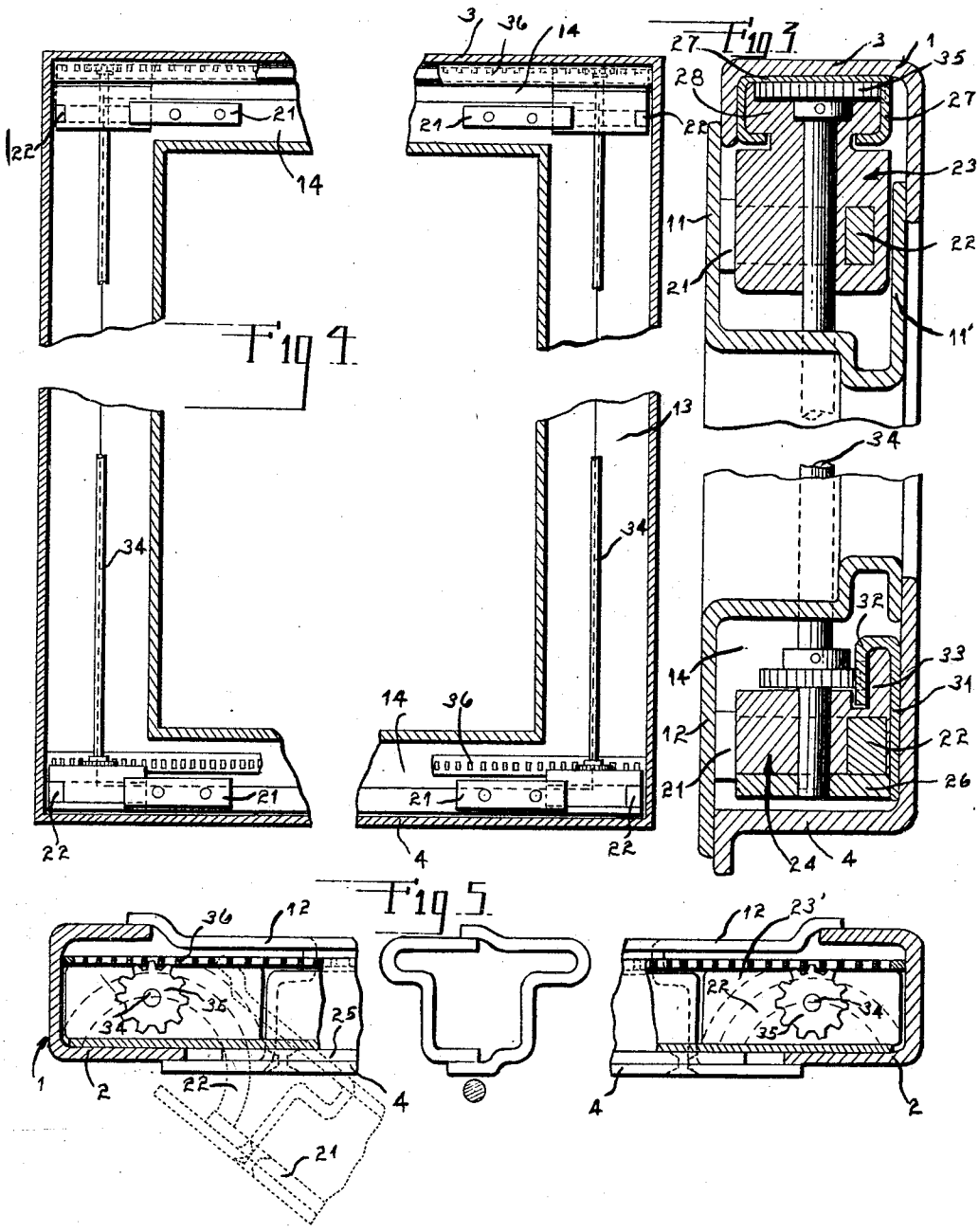
Filed Sept. 22, 1930 3 Sheets-Sheet 2



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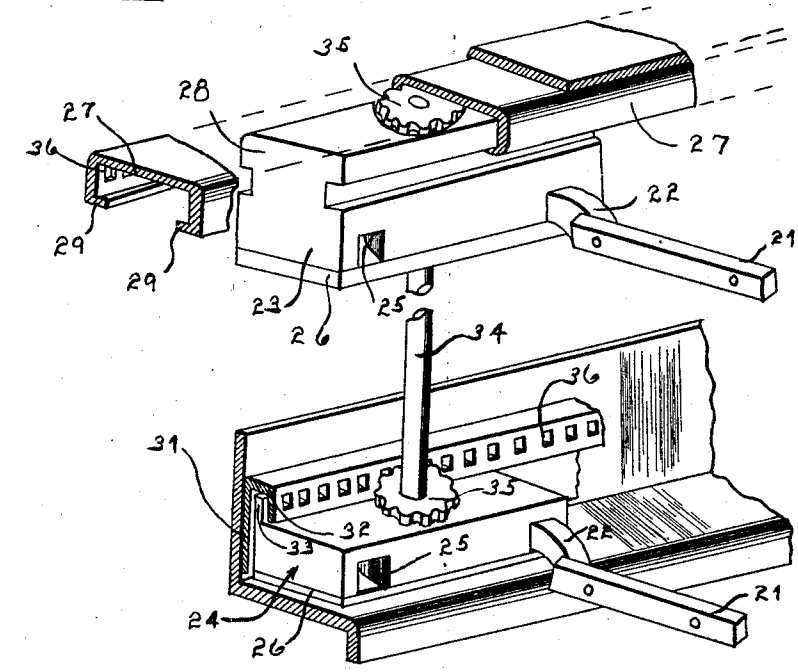
Filed Sept. 22, 1930 3 Sheets-Sheet 3

Fig. 6.



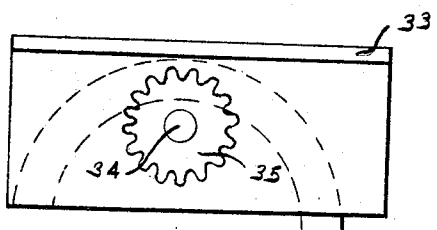


Fig. 8.

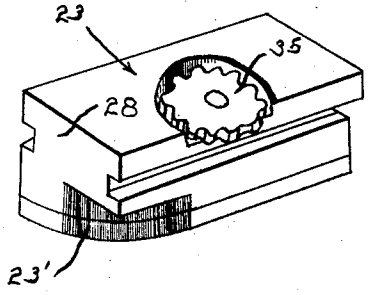
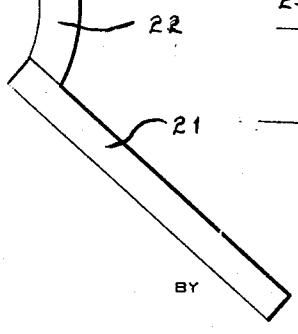


Fig. 7.



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UNITED STATES PATENT OFFICE

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WINDOW CONSTRUCTION

Application filed September 22, 1930. Serial No. 483,599.

This invention relates to windows and more particularly to a metallic window construction.

An object of the invention is to provide a window construction in which the means for mounting or supporting the movable window or ventilator upon the stationary window frame is completely housed and concealed when the ventilator is in closed position.

Another object of the invention is to provide means for so mounting the movable window upon its frame as to prevent warping and sagging of the window and consequent binding of the same.

A further object of the invention is to provide a metal window which is so constructed and arranged that the parts thereof may be made of relatively thin gauge metal at a comparatively low production cost.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the drawings:

Figure 1 is an inside elevation of a window embodying my invention;

Figure 2 is a top plan view showing the movable ventilator or window sections in different positions of adjustment;

Figure 3 is a vertical longitudinal sectional view through the construction illustrated in Figure 1;

Figure 4 is a vertical sectional view through the construction illustrated in Figure 1 and taken at right angles to Figure 3;

Figure 5 is a horizontal sectional view on the line 5—5 of Figure 1;

Figure 6 is a fragmentary perspective of a portion of the means for mounting the movable ventilator upon the stationary window frame;

Figure 7 is a perspective view of one of the upper slide members forming part of the mounting means;

Figure 8 is a top plan view of one of the lower slide members with a hinge member engaged therewith.

In the illustrated embodiment, the numeral 1 generally designates a stationary frame having spaced channel shaped jambs 2 and head and sill cross-members 3 and 4 respectively extending between the jambs.

A movable ventilator or window 5 is mounted for horizontal sliding and swinging movement upon the stationary frame and comprises sashes or sections 6 and 7 hingedly connected at their inner longitudinal edges for inward swinging movement by a hinge mechanism 8. Each sash has inner and outer channel shaped stiles 9 and 10 and upper and lower cross rails 11 and 12 respectively. As shown particularly in Figures 3 and 5, when the ventilator is in closed position, the inner stiles 9 inter-fit, the outer stiles 10 embrace and snugly engage the channel-shaped jambs 2 of the stationary frame, and the cross rails of the ventilator sashes overlap the head and sill cross members of the stationary frame. Thus, a tight weather-proof joint is provided at the meeting edges of the ventilator sections and throughout the marginal engaging portions of the ventilator and stationary frame. Also, when the ventilator occupies a closed position, the channel-shaped stiles 10 and the cross rails 11 and 12 thereof cooperate with the channel-shaped jambs 2 and the head and sill cross members 3 and 4 of the frame to provide vertically and horizontally extending chambers 13 and 14 respectively.

The hinge mechanism 8 comprises a series of hinge parts 15 rigidly secured to the longitudinal edge of each inner stile 9 and having overlapping aligned apertured barrel portions 16 through which a rod 17 extends to form a pintle. The rod 17 is rotatable and has its opposite ends provided with arcuate portions 18 which are adapted to be positioned behind and in engagement with keeper members, such as studs 19 carried by the cross members 3 and 4 of the stationary frame for securing the ventilator 5 in closed position. The rod 17 is provided at a point intermediate its ends with a handle portion 20 by means of which the rod may be conveniently rotated for moving the arcuate portions 18 into or out of latching position. The handle portion 20 of the rod may also be grasped by the operator when it is desired to effect adjustment of the ventilator sections 6 and 7.

The mechanism for mounting the ventila-

tor 5 upon the stationary frame will now be described, particular attention being directed to Figures 6, 7 and 8. Broadly, it comprehends means to provide sliding and swinging or pivotal movement of the ventilator with respect to the frame. To this end the ventilator has secured thereto adjacent its four corners hinge members 21 having curved portions 22. The hinge members 21 are pivotally connected to upper and lower pairs of slides 23 and 24 respectively by having their curved portions positioned in correspondingly curved grooves 25 formed in the lower faces of the slides, the lower sides of the grooves being closed by cover plates 26 after the insertion of the curved portions 22. The inner forward corner of each slide 23 is cut away as indicated at 23′ to permit the outer legs or sides 11′ of the channel-shaped cross members 11 of the ventilator sections to pass the slides when the ventilator is moved toward open or closed position.

For supporting the upper slides 23 for sliding movement longitudinally of the cross member 3 of the stationary frame, a channel-shaped track 27 coincident in length with the cross member is rigidly secured thereto and adapted to receive reduced portions 28 of the slides and has its leg portions provided with inwardly directed flanges 29 extending into longitudinal grooves 30 formed in the opposite faces of the slides.

The lower slides 24 are guided in their movement by means of a track 31 secured to the cross member 4 of the stationary frame and having a downwardly opening channel-shaped portion 32 into which upwardly extending flanges 33 on the slides 24 extend.

For the purpose of insuring uniform and equal movement of the upper and lower slides 23 and 24 at the opposite longitudinal edges of the ventilator, the same are connected by separate vertical rotatable shafts 34 journalled in the slides and having pinions 35 fixed thereto and engaging gear racks 36 formed in the tracks 27 and 31. The gear racks extend for substantially the full length of the tracks 27 and 31 as particularly shown in Figures 4 and 5.

At this point, it is desired to state that the upper track 27 carries substantially the entire weight or load of the movable ventilator 5 so that the pinions 35 are not forced into binding engagement with the racks 36 but are free to move thereover.

From the foregoing, it will be apparent that the mounting or supporting means for the ventilator 5 including the hinge members 21, slides 23 and 24, tracks 27 and 31, shafts 34 and pinions 35 are completely enclosed and concealed within the chambers 13 and 14 when the ventilator is in closed position. This not only protects the parts against corrosion due to exposure to the weather, but also greatly enhances the appearance of the window. Furthermore, by supporting the sashes 6 and 7 at their four corners by means of the hinge connection 8 and the hinges 21, the same are effectively prevented from sagging or warping and consequent binding in the stationary frame. Also, by thus supporting the sash members, the same may be constructed of relatively thin gauge metal at an extremely low production cost and the sashes have low thermal conductivity due to the thinness of the metal so that the possibility of inside frosting of the window glass is practically avoided.

The operation of the window may be briefly summarized as follows: Assuming the ventilator to be secured in closed position and it is desired to open the same, the operator may grasp the handle portion 20 of the rod 17 and rotate the rod sufficiently for the arcuate portions 18 thereof to clear the stud members 19, whereupon an inward pull on the handle will result in horizontal sliding and swinging movement of the sashes 6 and 7 on the stationary frame. This sliding and swinging action is afforded by the slides 23 and 24, which move longitudinally of the cross members 3 and 4 and the pivotal movement of the hinge members 21 with respect to the slides. The sashes may be adjusted to various positions between the sides of the frame opening or to a position adjacent one side or the other. Also, the sashes may be adjusted to assume the same relative positions with respect to the stationary frame, or may be variably adjusted to assume different positions with respect to the frame to bring about the desired ventilation.

What I claim as my invention is:

1. In a window structure, a stationary frame, a ventilator, and means for slidably and swingably mounting said ventilator upon said frame comprising members slidably associated with said frame and having curved guide portions, and hinge members carried by said ventilator and having curved portions rotatably engaging said curved guide portions.

2. In a window construction, a frame, a ventilator, said ventilator comprising a pair of hingedly connected sections, and means for slidably and swingably mounting said ventilator sections upon said frame, said mounting means providing for independent or unitary adjustment of said ventilator sections.

3. In a window construction, a frame having head and sill cross members, a ventilator comprising a pair of sash sections having their inner longitudinal edges hingedly connected, tracks secured respectively to said head and sill cross members and provided with longitudinally extending gear racks, a pair of slides associated with each of said tracks and arranged adjacent the outer longitudinal edges of said sash sections, shafts extending between the upper and lower slides, pinions carried by said shafts and engaging

said racks, and hinge members carried by said ventilator sections adjacent the outer longitudinal edges thereof and rotatably connected to said slides.

4. In a window construction, a frame having jambs and head and sill cross members between said jambs, a ventilator comprising a pair of sash members, each of which has an outwardly opening channel-shape stile adapted to receive and embrace the adjacent jamb, said sash members also having upper and lower channel-shaped cross rails connecting said stiles so that the sides of the channels abut and overlap spaced portions of said head and sill cross members, means for hingedly connecting the inner stiles of said sash members, and means for slidably and swingably mounting said ventilator upon said frame.

5. In a window construction, a frame having head and sill cross members, a ventilator having a pair of sash sections with their inner longitudinal edges hingedly connected, tracks secured respectively to said head and sill cross members, a pair of slides associated with each of said tracks and arranged adjacent the outer longitudinal edges of said sash sections, shafts extending between the upper and lower slides, and hinge members carried by said ventilator sections adjacent the outer longitudinal edges thereof and adjustably connected to said slides.

6. In a window construction, a frame, tracks extending longitudinally of the upper and lower cross bars of the frame, slides movable longitudinally of said tracks, a closure for the frame having two sections pivotally connected to said slides, a rod hingedly connecting said sections at their inner longitudinal edges, and shafts extending longitudinally of said sections and having opposite ends thereof engaging said slides.

7. In a window construction, a frame having upper and lower cross bars, tracks extending longitudinally of said cross bars, slides movable longitudinally of said tracks, a closure for the frame having two sections, a connection between said sections, and connections between said sections and said slides including shafts extending longitudinally of said sections at the outer longitudinal edges thereof.

8. In a window construction, a frame having upper and lower cross bars, tracks extending longitudinally of said cross bars, racks extending longitudinally of said tracks, slides movable longitudinally of said tracks, a closure for the frame having two sections, a connection between said sections permitting movement of one relative to the other, a connection between said sections and slides including shafts extending longitudinally of said sections and journaled in said slides, and means insuring uniform movement of the upper and lower slides, including pinions rigid with said shafts and engaging said racks.

9. In a window construction, a frame having upper and lower cross bars, a closure for the frame having two sections, a connection between said sections including a rod extending longitudinally thereof at their adjacent inner upright edges, shafts extending longitudinally of said sections at their outer upright edges, tracks extending longitudinally of the upper and lower cross bars of the frame, slides mounted on said shafts at opposite ends thereof and engaging said tracks, and hinge members carried by said sections and adjustable in said slides.

In testimony whereof I affix my signature.

CHARLES F. WARRICK.