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E. A. MADER

2,299,832

LOUVER CONSTRUCTION

Filed May 2, 1939

2 Sheets-Sheet 1

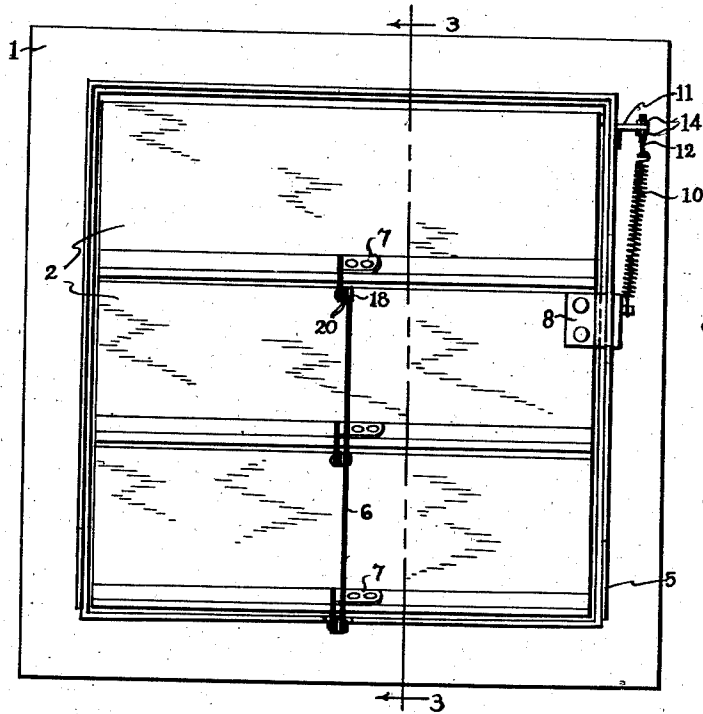


Fig. 1

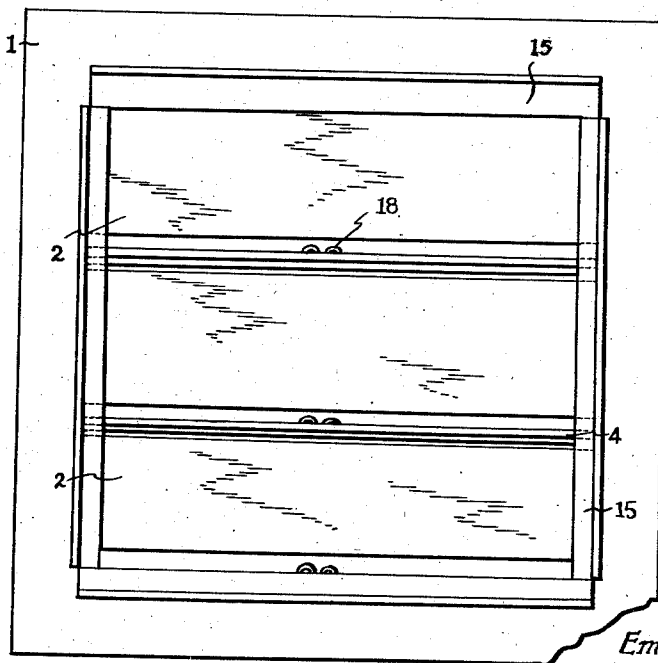


Fig. 2

Inventor
Emil A. Mader

J. S. Murray
Attorney

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Fig. 3

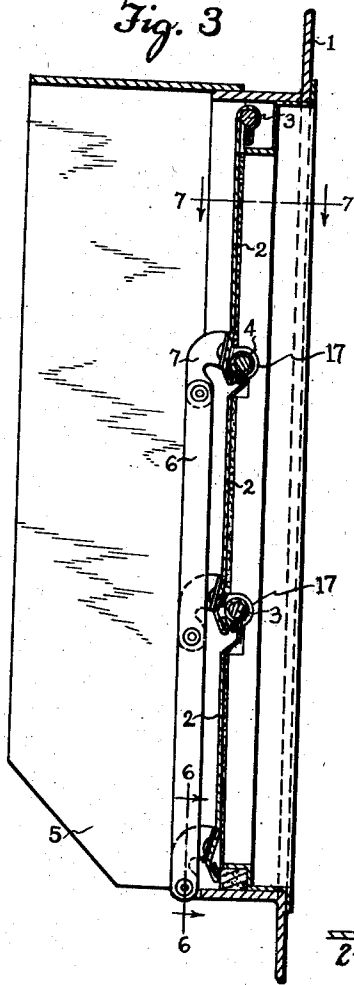


Fig. 4

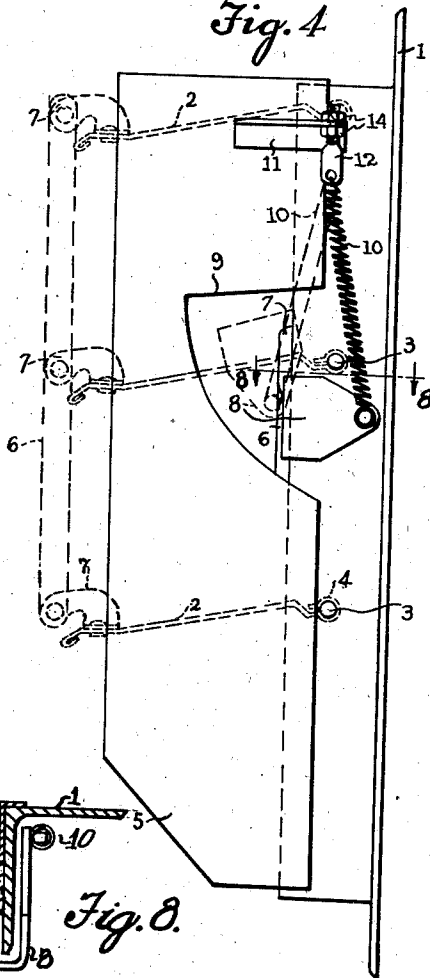


Fig. 8

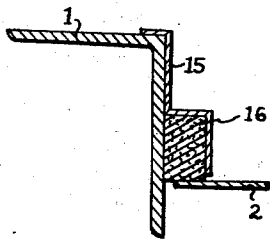
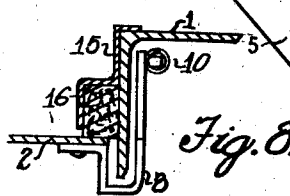


Fig. 7

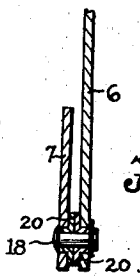


Fig. 6

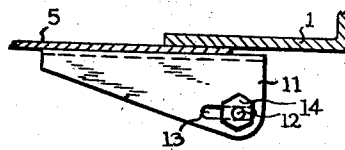


Fig. 5

Inventor
Emil A. Mader

J. S. Murray
Attorney

UNITED STATES PATENT OFFICE

2,299,832

LOUVER CONSTRUCTION

Emil A. Mader, Detroit, Mich., assignor of one-half to John Spargo, Detroit, Mich.

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10 Claims. (Cl. 98—116)

This invention relates to louvers and particularly to louvers adapted to automatically open or close responsive to starting or stopping of an air flow to the louver-controlled opening.

An object of the invention is to subject a set of pivoted louvers to a spring, acting in the absence of air flow, to yieldably hold the louvers closed and to resist their rattling or vibration, and further adapted, upon a slight initial opening of the louvers, to assist their full opening actuation, so that they may be opened and held open by a considerably less air pressure than would otherwise be required.

Another object is to provide for regulating the effect of such a spring on the louvers.

Another object is to install said spring exteriorly upon a frame wherein the louvers are mounted, and to provide an improved and simplified connection through which the spring takes effect on the louvers.

A further object is to provide an improved weather sealing means coacting very effectively with the louvers, when closed, to eliminate any flow of air or moisture.

A still further object is to provide an improved means for pivotally attaching to the louvers a link interconnecting them for unitary movement.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Fig. 1 is a view of the outlet side of the construction with the louvers closed.

Fig. 2 is a similar view of the inlet side.

Fig. 3 is a vertical sectional view of the same, taken upon the line 3—3 of Fig. 1.

Fig. 4 is a side view of the same, particularly showing a spring acting on the louvers, and indicating in dash lines the open position of the louvers and corresponding position of the spring.

Fig. 5 is a top view of an anchorage bracket for said spring.

Fig. 6 is a sectional detail of the pivotal connections between the louvers and a link adapting them for actuation in unison, the section being taken on the line 6—6 of Fig. 3.

Fig. 7 is a sectional detail view of a weather strip against which the closed louvers are sealed, the section being taken on the line 7—7 of Fig. 3.

In these views, the reference character 1 designates a frame, of angle bar construction, forming a rectangular opening within which a set of horizontally elongated louvers 2 are pivoted, one above another. Said louvers are mounted on cylindrical pivot rods 3, terminally journaled in the

uprights of said frame, the upper marginal portion of each louver being rolled to form a sleeve 4 snugly receiving the corresponding pivot rod. When the louvers are in their closed or substantially vertical positions, the lower portion of each louver, excepting the lowermost, overlaps and seats against the top portion of the adjoining underlying louver. To protect the louvers, when open, and to minimize access thereto of wind, rain or snow in any position thereof, it is preferred to rigidly mount a sheet metal shroud 5 of inverted U shape on the top and side members of the frame 1, said shroud projecting outwardly, or in the direction of normal air flow.

To assure their opening or closing movement in unison, the louvers are interconnected by a link bar 6, pivotally engaging brackets 7, riveted or otherwise attached to the outer faces of the louvers near their lower or free edges.

Exteriorly rigidly mounted on one of the louvers, near an end thereof, is a bracket 8, arched to straddle the adjacent flange of the frame 1 and to project inwardly beyond the plane established by the rods 3, when the louvers are closed. The shroud 5 is formed with an aperture 9, accommodating the bracket 8 and affording it the angular travel incident to swinging of the louvers. Opening travel of the louvers is limited by engagement of said bracket with the frame 1, as appears in dash lines in Fig. 4. Attached to the inner end of said bracket is a coiled spring 10, upwardly extending and anchored at its upper end to an angle bracket 11 exteriorly mounted on the shroud. Fig. 4 discloses that the upper end of said spring is anchored substantially in the plane of the pivot rods 3, so that the spring may urge the louvers either to closed or opened position, accordingly as its lower end is shifted inwardly or outwardly past said plane. Preferably connection of the spring 10 to the bracket 11 is effected by attaching it to a bolt 12 engaged in a slot 13 extending in said bracket transversely to the plane of the rods 3, and adapted to be clamped by nuts 14 at any point along said slot. Thus the point of anchorage of the upper end of the spring may be shifted somewhat to vary the extent of opening or closing angular travel of the louvers requisite to reverse the spring action. Also the bolt may be vertically adjusted by means of said nuts to permit the spring tension to be regulated.

Welded or otherwise rigidly secured to the frame 1 within the opening thereof is a sheet metal weather strip element 15, extending entirely around said opening, as best appears in Fig. 2, so as to seal all clearance gaps between the frame

and louvers, when the latter are closed. Said element is bent to form, jointly with the frame, a trough or channel snugly receiving a strip of felt or the like 16 for engaging or closely approaching the closed louvers. By employing this type of weather strip, the seal is extended a sufficient distance from the frame into the opening thereof to very effectively resist any fluid flow. In order that the sleeves 4, which form projections from the inner faces of the louvers, may not hinder location of said weather strip in close proximity to said faces, the elements 15 and 16 forming the weather strip are preferably transversely grooved, as indicated at 17, to snugly accommodate said sleeves.

The joints whereby the link bar 6 pivotally engages the brackets 7 are of a type deriving special advantages. Thus each such joint comprises a rivet 18 rotatively passing through two bushings 19, respectively set into aligned openings of the bar 6 and bracket 7, as detailed in Fig. 6.

These bushings are flanged, at adjacent ends thereof, the flanges 20 jointly forming a spacer for the bar and bracket, whereby they clear each other when swinging relatively. Furthermore the bushings transmit thrust to and from the rivet and receive the resultant wear. By forming the bushings of steel or other hard metal, such wear may be negligible. If the rivet directly connected the link bar and brackets, wear on the latter would, in most installations soon be considerable, since it is preferred, for the sake of lightness, to form said parts of aluminum. Prevention of wear at these joints is essential, as undue wear will result in rattling and resultant annoyance. A further advantage of the described joint lies in the fact that it permits providing oversized rivet holes in the link bar and brackets, which holes are readily reduced to accurate rivet size by mechanical insertion of the rivets. This materially expedites assembly, as compared to accurately forming holes to fit the rivets.

Ordinarily the described louver construction will be associated with a ventilating fan (not shown), setting up sufficient air pressure against the louvers to open same, upon starting the fan. When the fan is stopped, the weight of the louvers swings them to closed position. Provision of the described spring assures a full opening travel of the louvers under considerably less air pressure than would otherwise be required and further assures their firm closing.

In case the louvers are thrown violently open by any abnormal force, adaptation of the bracket 8 to limit such movement, tends to safeguard the louvers from resultant damage.

Mounting of the spring 10 in an exterior location on the frame 1 and hence out of the air discharged through said frame, protects said spring from accumulations of dust and grease, such as might eventually interfere with its functioning.

The invention is presented as including all such modifications and changes as come within the scope of the following claims.

What I claim is:

1. In a louver construction, the combination with a frame having an opening for air flow, a set of louvers pivoted on the frame within said opening, and means connecting said louvers for opening and closing travel in unison, of a spring biasing the louvers, and a member rigidly mounted on one of the louvers in proximity to the frame attaching such spring to such louver and overlap-

ping the frame to limit opening travel of the louvers by engagement with the frame.

2. In a louver construction, the combination with a frame having an opening for air flow, a set of louvers pivoted on the frame within said opening and jointly forming a closure for the opening, and a connection between the louvers compelling their opening and closing travel in unison, the pivotal axes of the louvers occupying substantially the same plane, of a bracket attached to the outer face of one of the louvers and arched to straddle the frame and having a leg exteriorly of the frame projecting toward and beyond said plane, when the louvers are closed, and a spring exteriorly mounted on the frame and effective on the free end portion of the exterior leg to urge the bracket substantially toward the pivotal axis of the louver carrying the bracket, whereby said spring acts to hold the louvers closed, and biases the louvers toward their open positions, upon an initial opening travel thereof.

3. In a louver construction as set forth in claim 2, a sheet metal shroud carried by the frame and apertured to accommodate said bracket and to afford it such travel as is incident to opening and closing travel of the louver carrying said bracket.

4. In a louver construction, the combination with a frame having an opening for air flow, a set of louvers pivoted on the frame within said opening and jointly forming a closure for the opening, and a connection between the louvers compelling their opening and closing travel in unison, the pivotal axes of the louvers occupying substantially the same plane, of a bracket attached to the outer face of one of the louvers and arched to straddle the frame and having a leg exteriorly of the frame projecting toward and beyond said plane, when the louvers are closed, a coiled spring attached at one end to the free end portion of said exterior leg and extending approximately toward and beyond the pivot axis of the louver carrying said bracket, and an anchorage for the other end of said spring exteriorly carried by the frame in approximately the plane of the pivot axes of the louvers.

5. In a louver construction, the combination with a set of pivotal louvers, of a link bar connecting said louvers, and brackets on the louvers for mounting said link bar, of a fastener connecting the link bar to each bracket, and bushings set into the brackets and the link bar to accommodate said rivets, said bushings being flanged between the bar and each bracket to jointly form a spacer for the bar and bracket.

6. In a louver construction, the combination with a set of pivotal louvers, and means connecting said louvers for opening and closing travel in unison, of an elongated coil spring effective on said louvers to yieldably hold them closed and biasing them toward their open positions, upon their initial actuation toward such positions, and means for adjusting one end of said spring transversely to the spring length to vary the extent of opening actuation of the louvers requisite to reverse the spring effect.

7. In a louver construction, the combination with a frame having an opening for air flow, a set of louvers pivoted on the frame within said opening and jointly forming a closure for the opening, and a connection between the louvers

compelling their opening and closing travel in unison, of a spring mounted on the frame and effective on the louvers to yieldably hold them closed, and biasing them toward their open positions upon their initial actuation toward such positions, and a member rigidly mounted on one of the louvers in proximity to the frame attaching the spring to such louver and overlapping the frame to limit opening travel of the louvers by engagement with the frame.

8. In a louver construction, the combination with a frame having an opening for air flow, a set of louvers pivoted on the frame within said opening and jointly forming a closure for such opening, means connecting the louvers to effect their opening and closing travel in unison, a bracket secured to an end of one of the louvers and projecting beyond said end and having an end portion bent in the direction of closing travel of the louvers to extend exteriorly adjacent to the frame when the louvers are closed, and a coiled spring extending from the frame to said bracket end portion for biasing the louvers to

a limiting position thereof, said bracket being engageable with the frame in the limiting open position of the louvers and thus serving to establish that position.

9. A louver construction as set forth in claim 8, said bracket being arched to straddle the frame in the limiting closed position of the louvers.

10. In a louver construction, the combination with a frame, a set of pivotal louvers in said frame, and means interconnecting said louvers for opening and closing travel in unison, of an elongated coil spring effective at one end on said louvers to yieldably hold them closed and biasing them toward their open positions, upon their initial actuation toward such positions, a bracket mounted on the frame, and slotted in a direction substantially transverse to said spring, and an anchorage for the other end of the spring mounted on the bracket, and adjustable in said slot to vary the extent of opening actuation of the louvers requisite to reverse the spring effect.

EMIL A. MADER.