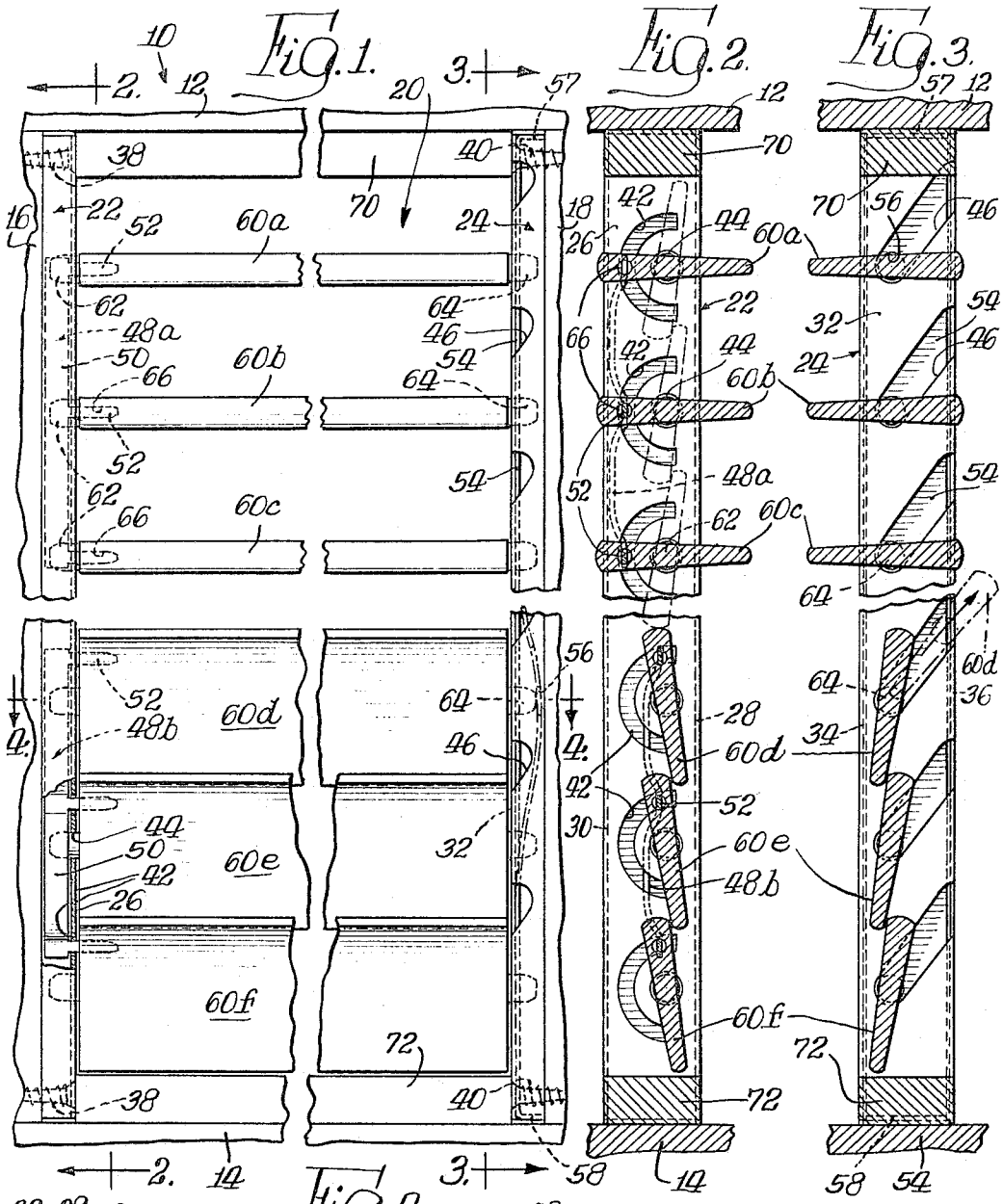
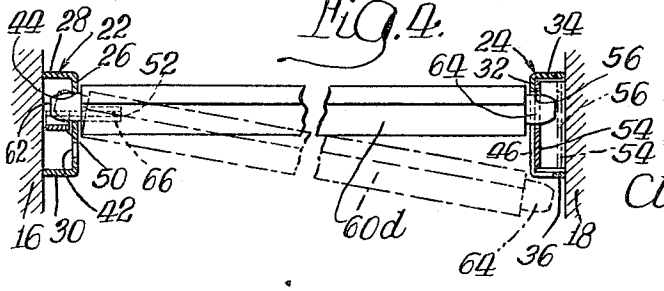
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LOUVERED STRUCTURE

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INVENTOR.
Clarence M. Shapiro,
BY Brown, Jackson, Boettcher & Dremmer
Attys

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LOUVERED STRUCTURE

Clarence M. Shapiro, 410 S. Michigan Ave., Chicago, Ill.

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My present invention relates generally to a louvered structure comprised of a plurality of elongated slats or louvers which are rotatable or tiltable between an open position and a closed position, and more particularly to a louvered structure adapted for use in connection with shutters, room dividers, window frames, lamp shades, and the like.

It is an object of my present invention to provide a louvered structure wherein a group of louvers thereof are operatively interconnected so that tilting of one louver will effect corresponding conjoint tilting of the other louvers of the interconnected group.

It is another object of my present invention to provide a louvered structure comprised of more than one group of louvers wherein the louvers of one group are tiltable independently of the louvers of another group.

It is another object of my present invention to provide a louvered structure wherein the tilt actuating means interconnecting a group of louvers is concealed.

It is a further object of my present invention to provide a louvered structure wherein the louvers thereof may be installed and removed individually.

It is a still further object of my present invention to provide a louvered structure wherein the louvers are mounted in side members which facilitate assembly of the structure within a support frame and which minimize the number of mounting holes that must be formed in the support frame.

Now in order to acquaint those skilled in the art with the manner of constructing and using louvered structures in accordance with the principles of my present invention, I shall describe in connection with the accompanying drawing a preferred embodiment of my invention.

In the drawing:

FIGURE 1 is a front elevational view of the louvered structure of my present invention incorporated in a support frame, with the louvered structure and frame being foreshortened both vertically and horizontally for the sake of illustration;

FIGURE 2 is a vertical sectional view, taken substantially along the line **2—2** in FIGURE 1, looking in the direction indicated by the arrows;

FIGURE 3 is a vertical sectional view, taken substantially along the line **3—3** in FIGURE 1, looking in the direction indicated by the arrows; and

FIGURE 4 is a horizontal sectional view, taken substantially along the line **4—4** in FIGURE 1, looking in the direction indicated by the arrows.

Referring now to FIGURE 1, there is indicated generally by the reference numeral **10** a vertical rectangular support frame, which has been foreshortened both vertically and horizontally for the sake of illustration, and which is comprised of a top frame element **12**, a bottom frame element **14**, and side frame elements **16** and **18**.

Mounted within the frame **10** is the louvered structure of my present invention indicated generally by the reference numeral **20**. The louvered structure **20** comprises a pair of laterally spaced vertical side support members **22** and **24** preferably in the form of generally U-shaped channel members. As shown in FIGURE 4, the channel member **22** has a bight or wall portion **26** and side flange portions **28** and **30**; correspondingly, the channel member **24** has a bight or wall portion **32** and side flange portions **34** and **36**. As illustrated in FIGURE 1, the channel members **22** and **24** are suitably secured, for

example adjacent their upper and lower ends by means of screws **38** and **40** respectively, to the inner faces of the side frame elements **16** and **18**, with the bight portions **26** and **32** of the channel members **22** and **24** being arranged in parallel facing relation.

As shown in FIGURE 2, a plurality of C-shaped arcuate slots **42** are formed in the bight portion **26** of the channel member **22** and are spaced lengthwise therealong. In addition, a plurality of apertures **44** are formed in the bight portion **26** of the channel member **22**, with the axes of the apertures **44** coinciding with the centers of the radius of curvature of the arcuate slots **42**.

As shown in FIGURE 3, a plurality of slots **46** are formed in the bight portion **32** of the channel member **24**. The slots **46** are spaced lengthwise along the channel member **24** and are inclined relative to the lengthwise axis of the latter. The lower ends of the inclined slots **46** are aligned substantially with the apertures **44** in the channel member **22**, and the upper ends of the inclined slots **46** extend into the adjacent side flange portion **36** of the channel member **24**.

Associated with the channel member **22**, as best shown in FIGURES 1 and 2, are a pair of tilt actuating members, indicated generally by the reference numerals **48***a* and **48***b*, arranged one above the other and each comprised of an elongated relatively thin body portion **50** disposed within the confines of the channel member **22** generally parallel to the side flange portions **28** and **30**. The tilt actuating members **48***a* and **48***b* also have finger portions **52**, which extend substantially perpendicularly from the edges of the body portions **50**, and which project through the arcuate slots **42** in the direction of the channel member **24**. For purposes to be explained more fully hereinafter, the body portions **50** of the tilt actuating members **48***a* and **48***b* preferably have a width substantially equal to the inner width of the side flange portions **28** and **30** of the channel member **22**, and the body portions **50** intermediate of the finger portions **52** preferably are offset from the plane of the trigger portions **52**.

Disposed within the confines of the channel member **24** is an elongated relatively thin resilient retaining member **54** which has a width substantially equal to the distance between the side flange portions **34** and **36** of the channel member **24**. Suitably formed in the retaining member **54** are a plurality of apertures **56** which are aligned substantially with the lower ends of the inclined slots **46** in the channel member **24**. The resilient retaining member **54** is normally held or biased against the inner face of the bight portion **32** of the channel member **24** by the bent over upper and lower ends **57** and **58** of the retaining member **54**.

Extending between and supported by the channel members **22** and **24** are a plurality of elongated louvers, six of which are shown by way of illustration and identified by reference numerals **60***a–f*. Each of the louvers **60***a–f* has pivot pins **62** and **64** projecting from the opposite ends thereof on a common axis. Also, each of the louvers **60***a–f* has an aperture **66** formed in the end thereof adjacent the pivot pin **62** and parallel to the axis of the latter. As illustrated in FIGURES 1 and 2, the pivot pins **62** at the one ends of the louvers **60***a–f* are normally disposed in the apertures **44** in the bight portion **26** of the channel member **22**, with the apertures **66** in the ends of the upper three louvers **60***a–c* receiving the finger portions **52** of the tilt actuating member **48***a*, and with the apertures **66** in the ends of the lower three louvers **60***d–f* receiving the finger portions **52** of the tilt actuating member **48***b*. The pivot pins **64** at the other ends of the slats **60***a–f* are normally received in the slots **46** of the channel member **24** and in the aperture **56** of the retaining member **54**.

By reason of the described arrangement, the upper group of louvers **60***a–c* are operatively interconnected by the tilt actuating member **48***a*, and the lower group of louvers **60***d–f* are operatively interconnected by the tilt actuating member **48***b*. Accordingly, when one of the louvers **60***a–c*, for example louver **60***a*, is manually grasped and tilted about the axis of its pivot pins **62** and **64**, the other louvers **60***b–c* are tilted about the axes of their pivot pins **62** and **64**. Similarly, when one of the louvers **60***d–f*, for example louver **60***d*, is manually grasped and tilted about the axis of its pivot pins **62** and **64**, the other louvers **60***e–f* are tilted about the axes of their pivot pins **62** and **64**. Each group of louvers **60***a–c* and **60***d–f* may thus be tilted between open and closed positions independently of the other group of louvers. In the drawing, the louvers **60***a–c* are shown in a horizontal open position and the louvers **60***d–f* are shown in a substantially vertical closed position. The vertical distance between the axes of tilting of the louvers **60***a–f* is so arranged that the adjacent horizontal edges of the lovers in closed position are disposed in overlapping relation. If desired, transverse spacer members **70** and **72** may be mounted against the inner faces of the top and bottom frame elements **12** and **14** respectively to fully close the frame **10** when the louvers **60***a–f* are in closed position.

My described louver structure also permits the louvers **60***a–f* to be removed individually for cleaning, repair or replacement. To remove one of the louvers **60***a–f*, for example louver **60***d*, the end of a pencil, rod or the like is inserted through the adjacent slot **46** in the channel member **24** and pressed against the retaining member **54** for urging the latter away from the bight portion **32** to the position shown in dot-dash lines in FIGURE 1, so as to effect disengagement between the pivot pin **64** of the louver **60***d* and the adjacent aperture **56**. The right end of the louver **60***d*, as viewed in FIGURE 1, is then grasped and pulled upwardly to withdraw the pivot pin **64** through the slot **46**, an intermediate position of withdrawal being shown in dot-dash lines in FIGURE 3. After the pivot pin **64** of the louver **60***d* has been fully withdrawn from the slot **46**, as shown in dot-dash lines in FIGURE 4, the louver **60***d* is moved to the right as viewed in FIGURE 4 thereby withdrawing the pivot pin **62** from the aperture **44** in the channel member **22** and effecting disengagement between the finger **52** of the tilt actuating member **48***b* and the aperture **66** in the end of the louver **60***d*. The louver **60***d* may be re-mounted in position by inserting the pivot pin **62** in the aperture **44** of the channel member **22** with the finger **52** of the tilt actuating member **48***b* being aligned with and disposed in the aperture **66** in the end of the louver **60***d*. Then the retaining member **54** is urged to the position shown in dot-dash lines in FIGURE 4 and the pivot pin **64** is moved into and through the slot **46** until snap interengagement is effected between the pin **64** and the aperture **56** of the retaining member **54**.

In the preferred embodiment of my invention disclosed herein, the body portions **50** of the tilt actuating members **48***a* and **48***b* have a width substantially equal to the inner width of the side flange portions **28** and **30** of the channel member **22** so as to minimize free movement of the actuating members within the channel member **22** when all of the louvers **60***a–f* have been removed and thereby prevent the finger portions **52** from slipping to an inaccessible position within the confines of the channel member **22**. The body portions **50** of the tilt actuating members **48***a* and **48***b* intermediate of the finger portions **52** are offset as shown in FIGURE 2, to accommodate the pivot pins **62** whenever the louvers **60***a–f* are tilted toward and approach the closed position whereby to permit full closure thereof.

Although I have shown the two groups of louvers **60***a–c* and **60***d–f* as being independently tiltable, it will be understood that the actuating members **48***a* and **48***b* may be formed as one continuous member should it be desired to actuate all of the louvers **60***a–f* conjointly. Conversely, the louver structure **20** may be arranged with more than two independently tiltable groups of louvers. It will be appreciated also that the number of louvers within each group may be varied to meet differing conditions of use. In any case, as will be observed from the drawing, the tilt actuating member or members interconnecting the louvers are concealed when the slats are in mounted position. In the fabrication of parts for my louver structure, various materials may be employed. By way of illustration, and not limitation, the channel members **22** and **24**, the actuating members **48***a* and **48***b*, and the retaining member **54** may be fabricated of metal, and the louvers **60***a–f* of wood. In addition, those skilled in the art will understand that other forms of biasing means, such as compression springs, rubber grommets, or the like, may be substituted for the bent-over ends **57** and **58** of the retaining member **54**, in which event the latter need not necessarily be resilient.

The above-described louver structure of my present invention has many different applications. For example, it may be incorporated in a window frame. In this application, if the lower section of the window is opened, the lower group of louvers may be tilted to open position to permit ingress of air while the upper group of louvers are maintained in a closed position to obstruct passage of light. My louver structure may also be incorporated with the frame of a shutter or a room divider, and additionally may be used to define one or more sides of a lamp shade. In the latter application, the light from the lamp, through suitable adjustment of the groups of louvers, may be directed and reflected in a varying number of paths thereby permitting individualized control of illumination. Still further, in any application louvers of one color may be interchanged at will for louvers of another color to gain differing aesthetic appearances. It is also to be noted that by mounting the pivot pins of the louvers in channel members, rather than directly in the side frame elements, assembly and alignment of the louver structure within a support frame is facilitated and the number of mounting holes that must be formed in the support frame is minimized. Finally, although the louver structure **20** and associated frame **10** have been shown and described in a vertical position, it is to be understood that they may be arranged in an inclined position or even in a horizontal position. Also, the louvers **60***a–f* may be arranged for rotation on vertical axes rather than horizontal axes as shown.

While I have shown and described what I believe to be preferred embodiment of my present invention, it will be understood by those skilled in the art that various rearrangements and modifications may be made therein without departing from the spirit and scope of my invention.

I claim:

1. A louver structure comprising a pair of support members, one of said support members having a plurality of apertures formed therein, the other of said support members having a plurality of slots formed therein, a retaining member disposed adjacent said other support member, said retaining member having apertures formed therein, a plurality of elongated louvers extending between said support members, each of said louvers having pivoting means at the one ends of said louvers being receivable in said apertures in said one support member, said pivoting means at the other ends of said louvers being receivable in salt slots in said other support member and in said apertures in said retaining member, and said retaining member being movable away from said other support member for disengaging at least one of the apertures therein from the adjacent pivoting means whereby the latter may be withdrawn through said slot in said other support member so as to permit removal of the associated louver from its mounted position between said members.

2. A louver structure comprising a pair of support members, one of said support members having a plurality of arcuate slots and a plurality of apertures formed therein, the other of said support members having a plurality of slots formed therein, a tilt actuating member disposed adjacent said one support member, said actuating member having finger portions projecting through said arcuate slots in the direction of said other support member, a retaining member disposed adjacent said other support member, said retaining member having apertures formed therein, a plurality of elongated louvers extending between said support members, each of said louvers having pivoting means at the opposite ends thereof and having an aperture in one end thereof, said pivoting means at the one ends of said louvers being receivable in said apertures in said one support member with said adjacent apertures in said one ends of said louvers receiving said finger portions of said actuating member whereby said louvers are operatively interconnected by the latter, said pivoting means at the other ends of said louvers being receivable in said slots in said other support member and in said apertures in said retaining member, said actuating member upon tilting of one of said louvers on its pivoting means serving to effect conjoint tilting of the other of said louvers on their pivoting means, and said retaining member being movable away from said other support member for disengaging at least one of the apertures therein from the adjacent pivoting means whereby the latter may be withdrawn through said slot in said other support member so as to permit removal of the associated louver from its mounted position between said support members.

3. A louver structure comprising a pair of laterally spaced support members having wall portions arranged in parallel facing relation, one of said support members having a plurality of lengthwise spaced slots formed in said wall portion thereof and inclined relative to the lengthwise axis of said one support member, a retaining member disposed adjacent said wall portion of said one support member, said retaining member having apertures formed therein which are aligned substantially with the lower ends of said inclined slots in said one support member, a plurality of elongated louvers extending between said support members, each of said louvers having pivot pins projecting from the opposite ends thereof on a common axis and having an aperture in one end thereof, said pivot pins at the one ends of said louvers being receivable in said other support member, said pivot pins at the other ends of said louvers being receivable in said slots in said one support member and in said apertures in said retaining member, and said retaining member being movable away from said wall portion of said one support member for disengaging at least one of the apertures therein from the adjacent pivot pin whereby the latter may be withdrawn upwardly through said slot in said wall portion of said one support member so as to permit removal of the associated louver from its normal mounted position between said support members.

4. A louver structure comprising a pair of laterally spaced support members having wall portions arranged in parallel facing relation, one of said support members having a plurality of arcuate slots formed in said wall portion thereof and spaced lengthwise therealong, said one support member having a plurality of apertures formed in said wall portion thereof with the axes of said apertures coinciding with the centers of the radius of curvature of said arcuate slots, the other of said support members having a plurality of lengthwise spaced slots formed in said wall portion thereof and inclined relative to the lengthwise axis of said other support member, the lower ends of said inclined slots being aligned substantially with said apertures in said one support member, a tilt actuating member having a body portion disposed adjacent said wall portion of said one support member, said

actuating member having finger portions extending from said body portion and projecting through said arcuate slots in the direction of said other support member, an elongated retaining member disposed adjacent said wall portion of said other support member, said retaining member having apertures formed therein which are aligned substantially with the lower ends of said inclined slots in said other support member, a plurality of elongated louvers extending between said support members, each of said louvers having pivot pins projecting from the opposite ends thereof on a common axis and having an aperture in one end thereof, said pivot pins at the one ends of said louvers being receivable in said apertures in said wall portion of said one support member with said adjacent apertures in said one ends of said louvers receiving said finger portions of said actuating member whereby said louvers are operatively interconnected by the latter, said pivot pins at the other ends of said louvers being receivable in said slots in said other support member and in said apertures in said retaining member, said actuating member upon tilting of one of said louvers on its pivot pins serving to effect corresponding conjoint tilting of the other of said louvers on their pivot pins, and said retaining member being movable away from said wall portion of said other support member for disengaging at least one of the apertures therein from the adjacent pivot pin whereby the latter may be withdrawn upwardly through said slot in said wall portion of said other support member so as to permit removal of the associated louver from its normal mounted position between said support members.

5. A louver structure comprising a pair of laterally spaced support members one of which is a generally U-shaped channel member having a bight portion and side flange portions, said channel member having a plurality of lengthwise spaced slots formed in said bight portion thereof and inclined relative to the lengthwise axis of said channel member, the upper ends of said inclined slots extending into the adjacent side flange portion of said channel member, a retaining member disposed within the confines of said channel member and extending width-wise between said side flange portions of said channel member, said retaining member having apertures formed therein which are aligned substantially with the lower ends of said inclined slots in said channel member, said retaining member normally lying closely adjacent said bight portion of said channel member, a plurality of elongated louvers extending between said support members, each of said louvers having pivot pins projecting from the opposite ends thereof on a common axis, said pivot pins at the one ends of said louvers being receivable in the other of said support members, said pivot pins at the other ends of said louvers being receivable in said slots in said channel member and in said apertures in said retaining member, and said retaining member being movable away from said bight portion of said channel member for disengaging at least one of the apertures therein from the adjacent pivot pin whereby the latter may be withdrawn upwardly through said slot in said bight portion of said channel member so as to permit removal of the associated louver from its normal mounted position between said support members.

6. A louver structure comprising a pair of laterally spaced generally U-shaped channel members, each of said channel members having a bight portion and side flange portions, said bight portions of said channel members being arranged in parallel facing relation, one of said channel members having a plurality of C-shaped arcuate slots formed in said bight portion thereof and spaced lengthwise therealong, said one channel member having a plurality of apertures formed in said bight portion thereof with the axes of said apertures coinciding with the centers of the radius of curvature of said arcuate slots, the other of said channel members having a plurality of lengthwise-spaced slots formed in said bight portion thereof and inclined relative to the lengthwise axis of said

other channel member, the lower ends of said inclined slots being aligned substantially with said apertures in said one channel member and the upper ends of said inclined slots extending into the adjacent side flange portion of said other channel member, a tilt actuating member having an elongated relatively thin body portion disposed within the confines of said one channel member generally parallel to said side flange portions, said actuating member having finger portions extending substantially perpendicularly from the edge of said body portion and projecting through said arcuate slots, an elongated relatively thin resilient retaining member disposed within the confines of said other channel member and extending width-wise between said side flange portions of said other channel member, said retaining member having apertures formed therein which are aligned substantially with the lower ends of said inclined slots in said other channel member, said retaining member normally lying closely adjacent said bight portion of said other channel member, a plurality of elongated louvers extending between said channel members, each of said louvers having pivot pins projecting from the opposite ends thereof on a common axis and having an aperture in one end thereof, said pivot pin at the one ends of said louvers being receivable in said apertures in said bight portion of said one channel member with said adjacent apertures in said one ends of said louvers receiving said finger portions of said actuating member whereby said louvers are operatively interconnected by the latter, said pivot pins at the other ends of said louvers being receivable in said slots in said other channel member and in said apertures in said retaining member, said actuating member upon tilting of one of said louvers on its pivot pins serving to effect corresponding conjoint tilting of the other of said louvers on their pivot pins, and said retaining member being movable away from said bight portion of said bight portion of said other channel member for disengaging at least one of the apertures therein from the adjacent pivot pin whereby the latter may be withdrawn upwardly through said slot in said bight portion of said other channel member so as to permit removal of the associated louver from its normal mounted position between said channel members.

7. The louver structure of claim 6 wherein said body portion of said actuating member has a width substantially equal to the inner width of said side flange portions of said one channel member.

8. The louver structure of claim 6 wherein said body portion of said actuating member intermediate of said finger portions is offset from the plane of said finger portion to accommodate said pivot pins whereby to permit full closure of said louvers.

9. The louver structure of claim 6 wherein said retaining member has a width substantially equal to the distance between said side flange portions of said other channel member.

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HARRISON R. MOSELEY, *Primary Examiner.*

P. C. KANNAN, *Assistant Examiner.*