Aug. 1, 1967 W. TISCHUK 3,333,525

FIXED-TYPE LOUVER ASSEMBLIES

Filed Feb. 9, 1966

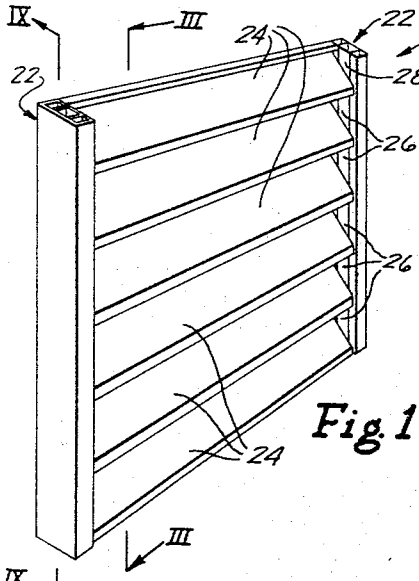


Fig. 1

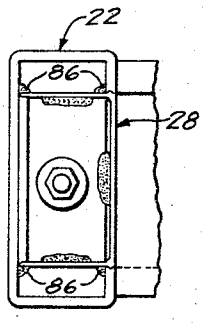


Fig. 10

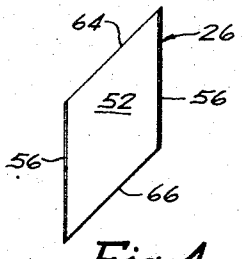


Fig. 4

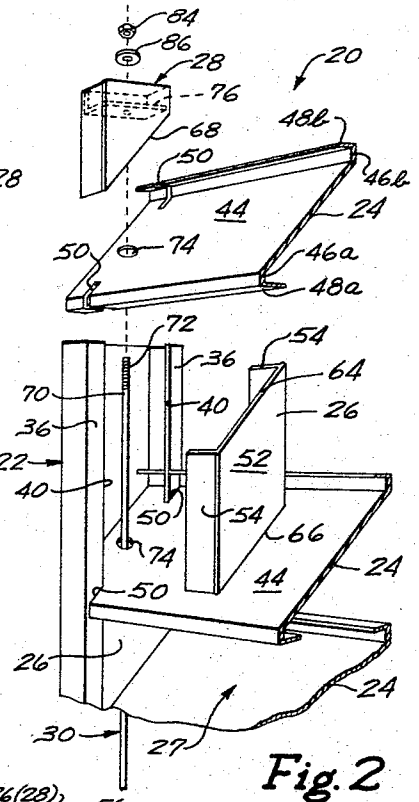


Fig. 2

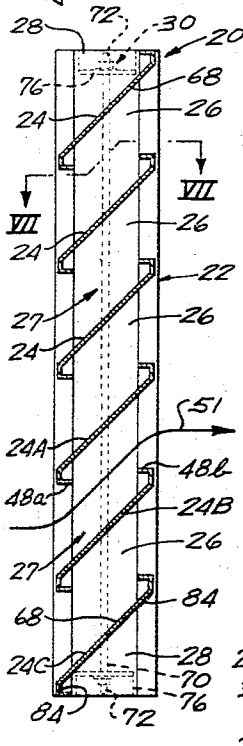


Fig. 3

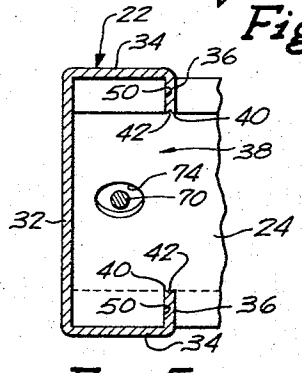


Fig. 5

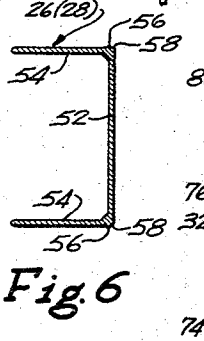


Fig. 6

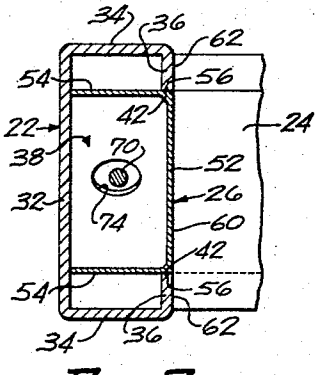


Fig. 7

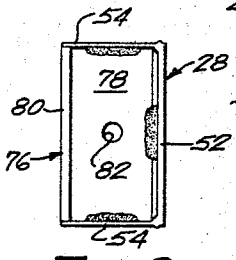


Fig. 8

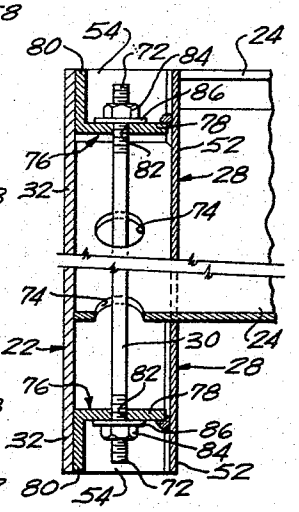


Fig. 9

INVENTOR.
WALTER TISCHUK
BY
Harry B. Keck
ATTORNEY

United States Patent Office 3,333,525 Patented Aug. 1, 1967

3,333,525

FIXED-TYPE LOUVER ASSEMBLIES

Walter Tischuk, Richmond, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Feb. 9, 1966, Ser. No. 526,296
7 Claims. (Cl. 98—121)

This invention relates to louver assemblies of the type having fixed louver blades, and more particularly to improvements in the construction of such louver assemblies.

Fixed-type louver assemblies are frequently employed to admit fresh air into the interior of a building. Louver assemblies are used frequently in conjunction with air conditioning apparatus and the like, as air intakes and/or exhausts. Conventionally, fixed-type louver assemblies comprise a rectangular frame consisting of vertical jambs and horizontal head and sill members. A plurality of louver blades extend between the vertical jambs and are rigidly secured thereto in vertically spaced relation so as to provide a plurality of horizontal slot-like gas passageways. The louver blades are inclined and overlapped so that no direct or straight-line path is provided between the blades into the interior of the building. Consequently, debris, rain, snow and the like are effectively prevented from entering the building or the air conditioning apparatus.

In certain louver assemblies of the prior art, the ends of the louver blades are secured to the vertical jambs at preselected locations thereon, for example, by means of welding, brazing, individual fasteners and the like. These methods of fabricating the louver assemblies are time consuming. The resulting louver assembly with its multitude of parts, is accordingly expensive.

In other louver assemblies of the prior art, a rectangular frame is provided wherein the vertical jambs consist of U-shaped channel members. In order to maintain the desired spacing of the louver blades and in order to eliminate some of the fasteners, a spacer element is interposed between each adjacent pair of the louver blades. Although this type of construction eliminated fasteners, the louver blades, in time, become loose and tend to rattle inasmuch as no means is provided for rigidfying the louver blade assembly.

Accordingly, as an overall object, the present invention seeks to provide a fixed-type louver assembly of improved construction.

Another object of the invention is to provide a fixed-type louver assembly wherein the louver blades are rigidly affixed to the vertical jambs without requiring a plurality of fasteners as in the prior art louver assemblies.

Still another object of the invention is to provide a fixed-type louver assembly having an aesthetically pleasing appearance.

A further object of the invention is to provide a fixed-type louver assembly of improved construction whereby said assembly is fabricated in less time, with fewer components and at a relatively low cost.

In accordance with the present invention, a louver assembly of the fixed-type, is provided which comprises a pair of spaced, substantially parallel vertical jambs each having an elongated recess therein which open toward the other of the jambs. A plurality of spacer elements is fitted into the recess of each of the vertical jambs. Each spacer member is constructed so that it must be snapped into place and is thereby detachably retained on the vertical jamb. A plurality of louver elements extend between the vertical jambs and have slotted ends fitted into the longitudinal recesses. Each end of each louver element resides between and is supported by adjacent ones of the spacer elements whereby the louver elements are maintained in

spaced-apart relation to provide a plurality of horizontal slot-like gas passageways.

The present invention provides tying means, one associated with each of the vertical jambs for tying together the louver elements and the spacer elements engaged with each of the vertical jambs. In order to connect the louver elements and the spacer elements to the vertical jambs, each of the vertical jambs is secured to one of the elements (louver or spacer) engaged therewith, preferably by means of welding. The secured element thus provides an anchor site to which the remaining louver elements and spacer elements may be tied. Each of the tying means subjects the louver elements and the spacer elements to a compressive restraint which rigidly clamps them one to the other and to the vertical jamb.

The above and other objects and advantages of the present invention will become apparent from the following detailed description by reference to the accompanying drawings, in which:

FIGURE 1 is a perspective view of the present fixed-type louver assembly;

FIG. 2 is a fragmentary perspective view, partially in exploded form, illustrating the configuration and relative positions of assembly, of the various components of the present louver assembly;

FIG. 3 is a cross-sectional view, taken along the line III—III of FIG. 1;

FIG. 4 is a side view of an intermediate spacer element;

FIG. 5 is a cross-sectional view illustrating the junction of a channel member and a louver element;

FIG. 6 is a cross-sectional view taken transversely through a spacer element and illustrating its configuration;

FIG. 7 is a cross-sectional view taken along the line VII—VII of FIG. 3;

FIG. 8 is a plan view of a typical end spacer element in a preferred embodiment of the invention;

FIG. 9 is a cross-sectional view, taken along the line IX—IX of FIG. 1, illustrating tying means of the invention; and

FIG. 10 is a plan view of a vertical jamb member illustrating an alternative arrangement.

General description

Referring now to FIGS. 1, 2 and 3, there is illustrated a fixed-type louver assembly **20** constructed in accordance with the present invention. The louver assembly **20** includes, in general, a pair of spaced, substantially parallel vertical jambs **22** each receiving the ends of a plurality of louver elements **24**. Interposed between the ends of adjacent ones of the louver elements is an intermediate spacer element **26** which maintains the louver elements **24** spaced apart so as to provide a plurality of horizontal, slot-like gas passageways **27**. An end spacer element **28** is received at each end of the vertical jambs **22**.

The louver assembly **20** further includes tying means **30**, one in each of the vertical jambs **22**, for tying the louver elements **24** and the spacer elements **26**, **28** together and securing them to the jambs **22**. As will be more fully described, each of the vertical jambs **22** has one element (spacer or louver) rigidly secured thereto so as to provide a "secured element" to which the remaining louver elements **24** and spacer elements **26**, **28** are tied. The overall arrangement is such that the jambs **22**, the louver elements **24** and the spacer elements **26**, **28** are secured together as a rigid unit. The tying means **30** is such that the louver assembly **20** may be easily dismantled in the event it becomes necessary to replace, for example, a damaged louver element **24**.

In accordance with the invention, the vertical jambs **22**, the louver elements **24** and the spacer elements **26**, **28**, are extruded products, that is, they are formed by an extrusion process. They may be made in any desired

length so that substantially any size louver assembly may be assembled. Furthermore, the extrusion fabricating techniques permit close dimensional tolerances to be maintained. Consequently, precise assembly of the preset louver components is accomplished.

Vertical jambs 22

Referring now to FIG. 5, the vertical jamb **22** comprises a generally C-shaped channel member including a central longitudinal web **32** and spaced longitudinal legs **34** each terminating in an inturned flange **36**. The web **32**, the legs **34** and the flanges **36** cooperate to define a longitudinal recess **38**. The inturned flanges **36** have opposed inner surface portions **40** in which there is formed longitudinally extending grooves **42**. As will be more fully described, the grooves **42** cooperate with beads provided on the spacer elements **26**, **28** for detachably connecting the spacer elements **26**, **28** to the vertical jambs **22**.

Louver elements 24

Referring now to FIG. 2, each of the louver elements **24** includes a central inclined portion **44** which terminates along each of its longitudinal edges in vertical segments **46***a*, **46***b* and horizontal segments **48***a*, **48***b*. Spaced inwardly from each end of the louver elements **24** is a pair of transverse slots **50** which extend through the vertical and horizontal segments **46**, **48** and into the central inclined portion **44**. The slots **50** are arranged such that when the end of a louver element **24** is fitted into the longitudinal recess **38**, the inturned flanges **36** extend through the slots **50** and retain the louver element **24** in fixed relation to the vertical jamb **22**. Further, the slots **50** penetrate into the central inclined portion **44** through a distance such that when the central inclined portion **44** engages the inner surface portions **40** of the inturned flanges **36**, the central inclined portion **44** is automatically inclined at an angle of approximately 45° with the longitudinal axis of the vertical jambs **22**.

As best shown in FIG. 3, the relative position of adjacent ones of louver elements, for example, the louver elements **24A** and **24B**, is such that the horizontal segment **48***a* of the louver element **24A** is below the level of the horizontal segment **48***b* of the louver element **24B**. Consequently, air passing through the passageway **27** provided by the louver elements **24A**, **24B**, is forced to travel along a curved flow path indicated schematically by the arrow **51**. The curved flow path **51**, of course, prevents the ingress of rain, snow, debris and the like, into the interior of a building.

Spacer elements 26, 28

The spacer elements **26**, **28** are cut from the same extrusion element and have the cross-sectional configuration illustrated in FIG. 6. The spacer element **26** (**28**) has a C-shaped configuration including a central web portion **52** and spaced leg portions **54**. Beads **56** are provided on opposite outer surface portions **58** of the spaced leg portions **54**. The beads **56** extend longitudinally along the spacer element **26** (**28**) and are shaped to correspond to the shape of the grooves **42** (FIG. 5) in the inturned flanges **36**. Furthermore, the overall width of the spacer element **26** (**28**), that is the distance between the opposite outer surface portions **58**, is substantially equal to the distance between the opposed inner surface portions **40** (FIG. 5) of the inturned flanges **36**.

The overall arrangement is such that the spacer element **26** (**28**) is snapped into place and is detachably connected to the vertical jambs **22** by engagement of the beads **56** in the grooves **42**. As shown in FIG. 7, the intermediate spacer element **26**, for example, is installed with the spaced leg portions **54** projecting into the longitudinal recess **38**. Thereafter, the spacer element **26** is forced further into the longitudinal recess **38** until the beads **56** engage the grooves **42**. It should be noted that the depth of the leg portions **54** and the position of the beads **56** is such that the outer surface **60** of the spacer element **26** is substantially coplanar with the outer surfaces **62** of the inturned flanges **36**. Consequently, the spacer elements **26**, **28** serve not only to support the louver elements **24** in the desired spaced-apart relation but also serve to cover the longitudinal recess **38** in the regions between the louver elements **24** and give the vertical jambs **22** a finished appearance.

Referring now to FIGS. 2 and 4, the central web portion **52** of the intermediate spacer elements **26** has a parallelogram configuration and provides upper and lower inclined surfaces **64**, **66**. When the intermediate spacer elements **26** are installed in the vertical jambs **22**, the upper and lower inclined surfaces **64**, **66** will engage the lower and upper surfaces, respectively, of adjacent ones of the louver elements **24**.

Referring now to FIGS. 2 and 3, the end spacer elements **28** have one end cut on a bias so as to provide an inclined surface **68** which is adapted to engage a surface of a louver element **24**. It is to be understood at this time that the end spacer elements are identical in shape and construction and that they differ only in their orientation when installed at the opposite ends of the vertical jambs **22**. This relation is clearly illustrated in FIG. 3.

Tying means 30

Referring now to FIGS. 2, 3, 8 and 9, the tying means **30** comprises slender rods **70** having threaded ends **72**. Each of the rods **70** extends through one of the longitudinal recesses **38** and through openings **74** provided in each of the louver elements **24**. An angle member **76** is provided in each of the end spacer elements **28** and includes a first plate member **78** secured, as by welding, to the central web portion **52** and the spaced leg portions **54**, and a second plate member **80** which is perpendicular to the first plate member **78**. The second plate member **80** is disposed in surface engagement with the central longitudinal web **32** of the vertical jamb **22**. The first plate members **78** each have an aperture **82** which receives the threaded end **72** of the rod **70**.

As best illustrated in FIG. 9, each of the threaded ends **72** receives a nut **84** and a washer **86**. It should be evident that when the nuts **84** are rotated in the proper direction, compressive restraint is applied to the first plate members **78**. This compressive restraint is transferred to the end spacer elements **28** and, in turn, to the louver elements **24** and the intermediate spacer elements **26** disposed therebetween. The overall arrangement is such that the spacer elements **26**, **28** and the louver elements **24** are compressed together into a rigid structure.

Inasmuch as the rods **70** are spaced apart from the central web portions **52** of the end spacer elements **28**, the compressive restraint create moments which tend to twist the upper and lower end spacer elements **28** out of engagement with the vertical jambs **22**. However, the second plate members **80** are engaged with the vertical jambs to resist the moments and avoid deformation.

Secured element

As stated above, each of the vertical jambs **22** has one of the aforementioned elements (louver or spacer) rigidly secured thereto so as to provide a "secured element" to which the remaining louver elements and spacer elements are tied.

In the preferred arrangement of the louver assembly **20**, the "secured element" comprises one of the louver elements **24**. More particularly and as shown in FIG. 3, the lowermost louver element **24C** has its ends secured to the vertical jambs **22** preferably by means of welds **84**. When the tying means **30** is tightened, the spacer elements **26**, **28** and the remaining ones of the louver elements **24** are forcibly compressed together and tied to the lower louver element **24C** and, hence, to the vertical jamb **22**. The result is a rigid unitary structure.

Alternatively, as illustrated in FIG. 10, the "secured element" may comprise one of the end spacer elements **28**

associated with each of the vertical jambs **22**. More particularly, the lowermost end spacer elements **28** are secured to the vertical jambs **22** by means of welds **86**.

Several distinct advantages arise from the mode of construction of the present fixed-type louver assembly **20**. For example, the louver assembly **20** does not require independent fasteners for each component of its assembly. Hence, fabrication operations are relatively simple. The cost of plural fasteners is avoided. Further, the louver elements **24** and the spacer elements **26, 28** are forcibly compressed together thereby eliminating loose, rattling performance. Still further, the louver elements **24** and the spacer elements **26, 28** are installed on the vertical jambs **22** in such a manner that the completed assembly has a finished, aesthetically pleasing appearance. Further still, the tying means **30** is such that the louver assembly **20** may be dismantled in the event it is necessary to replace a damaged louver element or spacer element.

Versatility

The present fixed-type louver assembly is fabricated from three principal extrusions which are the louver elements **24**, the jamb elements **22** and the spacer elements **26, 28**. A variety of louver constructions can be developed by providing different louver blade extrusions. The louver blade **24** as seen in FIG. 3 is designed to present an angle approximately 45° with respect to the vertical axis of the jamb **22**. If a different louver blade angle is desired, a different louver blade extrusion can be obtained which will present its vertical segments **46** and horizontal segments **48** in the intended disposition. However, the identical jamb element extrusions and spacer extrusions can be utilized by providing a suitable bias cut for the individual spacer elements **26** as seen in FIG. 4.

I claim as my invention:

1. A louver assembly comprising in combination:

a pair of spaced, substantially parallel channel members each including a central longitudinal web, spaced longitudinal legs each terminating in an inturned flange, the web, the legs and the inturned flanges of each of said channel members defining a longitudinal recess opening toward the other of said channel members;

a plurality of spacer elements fitted into said longitudinal recess of each of said channel members;

a plurality of louver elements extending between said channel members and having ends fitted into said longitudinal recesses, each end of said louver elements residing between and in contact with adjacent ones of said spacer elements whereby said louver elements are maintained in fixed spaced-apart relation to provide a plurality of gas passageways;

means for fastening each of said channel members to a secured element engaged therewith; and

tying means, one extending through each of said longitudinal recesses for tying the remaining ones of the louver elements and the spacer elements to said secured element and hence to each of said channel members, whereby said louver elements, said spacer elements and said channel members are secured together as a unit.

2. The louver assembly as defined in claim **1** wherein each of said spacer elements has a pair of outer surface portions, said internal flanges having inner surface portions engaged with said pair of outer surface portions, and including means for detachably connecting said spacer elements to said channel members comprising a bead on each said outer surface portion and a groove on each said inner surface portion, whereby each of said spacer elements is snapped in place with the said bead engaged in the said groove.

3. The louver assembly as defined in claim **1** wherein each of said spacer elements comprises U-shaped channel segments having a central web portion and spaced leg portions extending into said longitudinal recess between said inturned flanges, the outer surface of said central web portion being substantially coplanar with outer surfaces of said inturned flanges, whereby each of said channel members cooperates with the spacer elements engaged therewith to provide a closed vertical support on each side of said louver assembly.

4. The louver assembly as defined in claim **1** wherein said louver element has a pair of transversely extending slots spaced inwardly of each of its ends, said inturned flanges of said channel members residing in said slots and connecting said louver element to said channel members.

5. The louver assembly as defined in claim **1** wherein one of said louver elements has its ends fastened to said channel members, said one of said louver elements comprising the said secured element to which the remaining ones of the louver elements and the spacer elements are connected.

6. The louver assembly as defined in claim **1** wherein each of said channel members has one of said spacer elements fastened thereto, said one of said spacer elements comprising the said secured element to which the remaining ones of the louver elements and spacer elements are connected.

7. The louver assembly as defined in claim **1** wherein each of said tying means includes a rod and plate members, one each secured to the end ones of said spacer elements and each having an opening for receiving an end of said rod; and means on the ends of said rods for applying compressive restraint to said plate members whereby said spaced elements and said louver elements are compressed together.

References Cited

UNITED STATES PATENTS

2,382,075	8/1945	Leslie	98—121 X
2,626,556	1/1953	Davies	98—110 X
2,752,844	7/1956	Simblest	98—121
3,120,036	2/1964	Minds	98—121 X

FOREIGN PATENTS

755,038	8/1956	Great Britain.

ROBERT A. O'LEARY, *Primary Examiner.*

M. A. ANTONAKAS, *Assistant Examiner.*