

June 13, 1961

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2,987,985

LOUVER

Filed Sept. 22, 1958

3 Sheets-Sheet 1

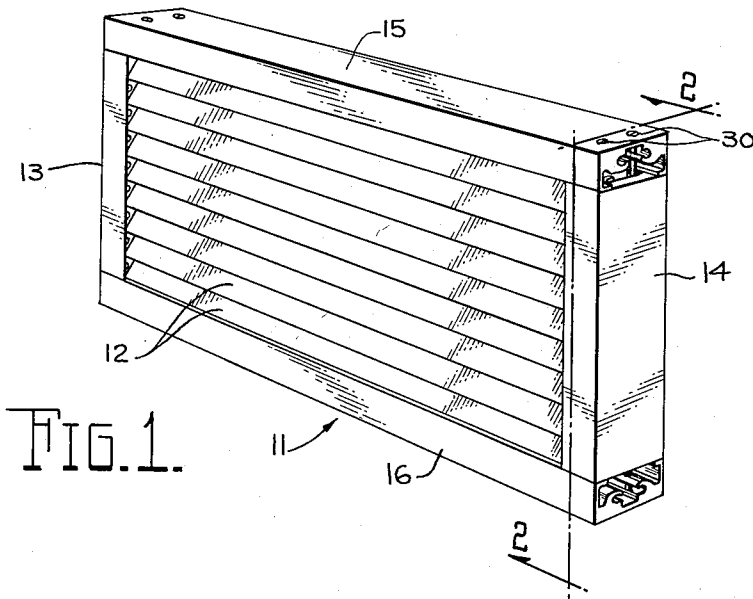


FIG. 1.

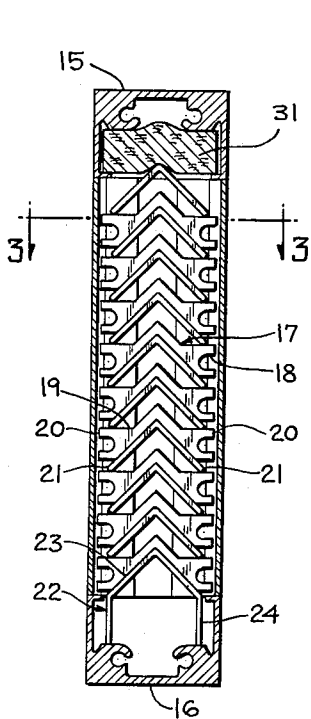


FIG. 2.

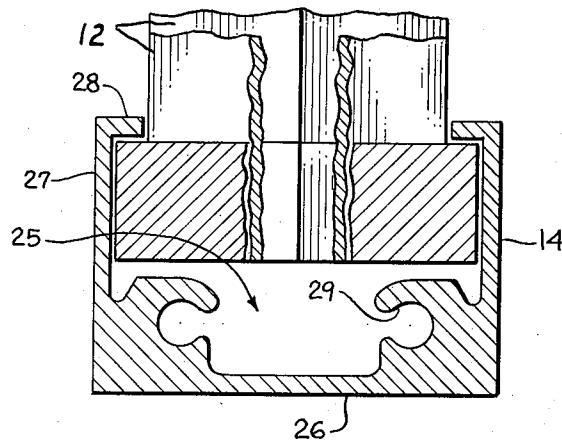


FIG. 3.

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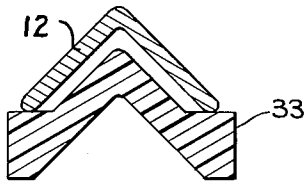


FIG. 5.

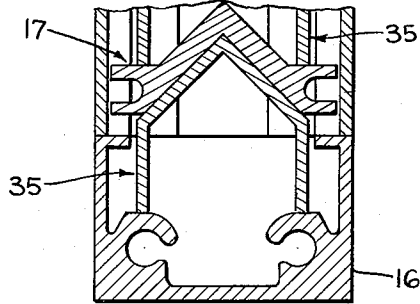
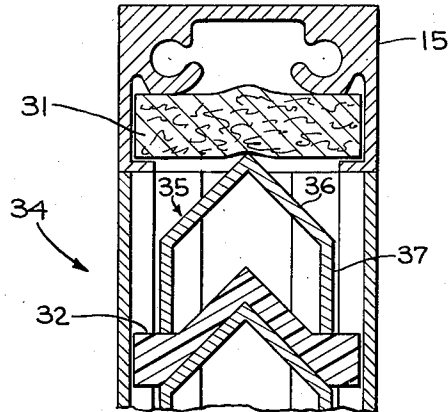


FIG. 6.

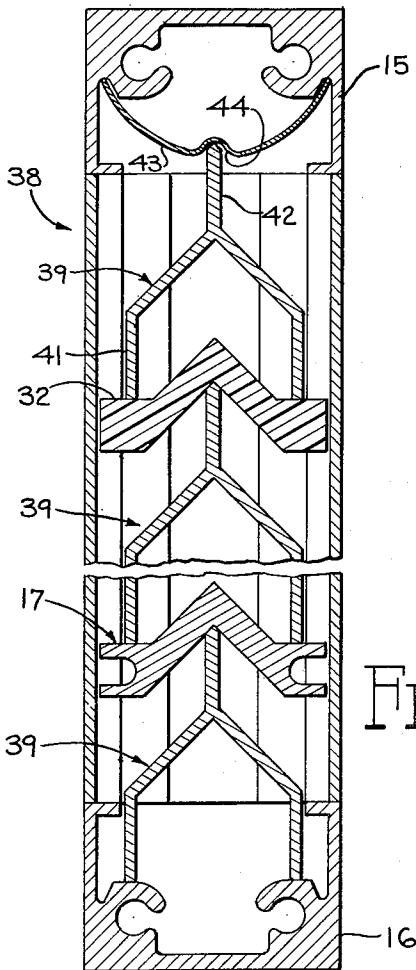
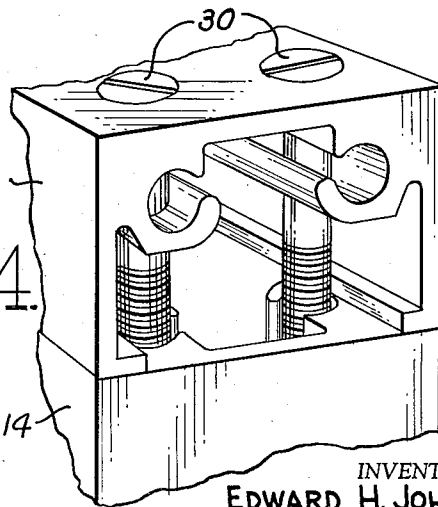


FIG. 4.

FIG. 7.



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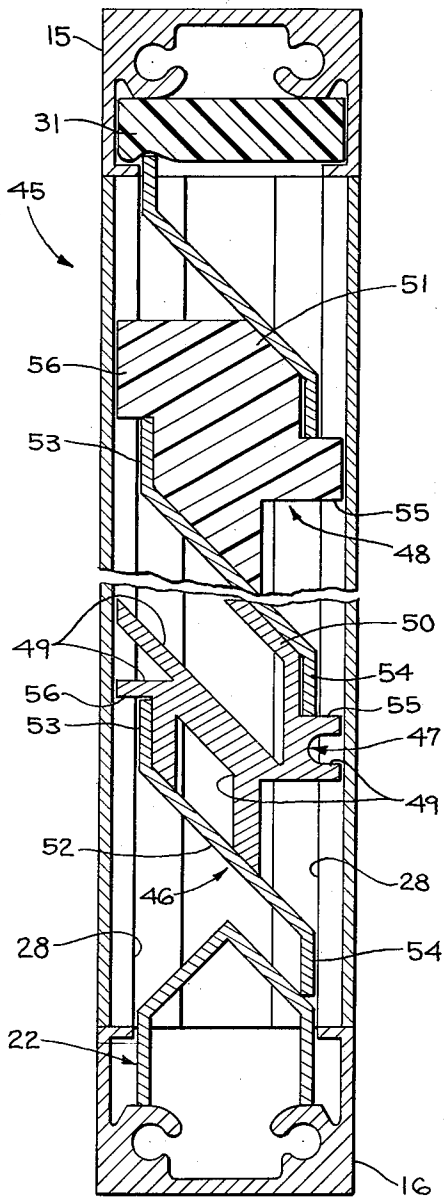


FIG. 8.

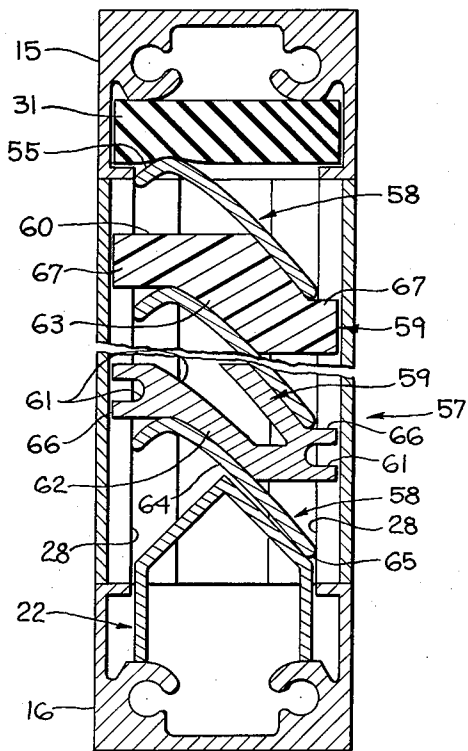


FIG. 9.

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3 Claims. (Cl. 98—121)

This invention relates to a louver and more particularly to a louver in which louver blades are held in spaced relationship by means of separate spacers located in vertical alignment between the blades.

The majority of known louvers have louver blades welded or otherwise fixed to a frame by means of flanges which are an integral part of the ends of the blades. Such louvers tend to be unduly expensive primarily because of the cost of fabrication. Also, such louvers must be tailor-made for any particular size because the flanges of the blades must be in proper spaced relationship with respect to the frame to which they are welded. Other known louvers have blades extending through slots in the frame which is disadvantageous because the blades are not maintained snugly in the slots, with the result that the blades rattle when subjected to wind or vibration. Still other known louvers are made with blades which have flanges integral with the ends thereof, which flanges contact an adjacent louver blade to maintain the blades in spaced relationship. Such louver blades must be tailor-made to fit any given size louver and there are no provisions for maintaining the flanges of one louver blade snugly with respect to adjacent louvers with result that rattle also occurs.

Another known louver has blades maintained in spaced relationship by separate spacers but has no means for preventing lateral movement of the spacers and no means for maintaining the louvers and spacers in snug-fitting relationship. Still another known louver has blades similarly maintained in spaced relationship by separate spacers which are prevented from lateral movement by partially extending through slots in the blades. Thus, the blades have to be specially made for varying sized louvers so as to properly fit the spacers which are located near the ends of the blades. Neither of these louvers have means for maintaining the blades and spacers in a snug-fitting relationship.

The present invention provides an improved louver having none of the above disadvantages. The new louver includes blades spaced apart by separate spacers which are maintained in vertical alignment by means of side frame members having troughs in which the spacers are located. Further, means are provided at the upper or lower end of each row of spacers to maintain a compressive force on the spacers and blades and thereby hold the spacers and blades in a snug relationship with respect to each other and with respect to the troughs of the frame members. In this manner, no rattle or vibration can occur between the louver blades and spacers. Further, the blades are uniform in cross section throughout their lengths because there are no flanges, slots, or any fastenings at any portions of the blades. This enables the new louvers to be easily made in any size simply by cutting the blades and frame members to proper length and assembling them.

It is, therefore, a principal object of the invention to provide an improved louver.

Another object of the invention is to provide a louver which can be easily made in a wide variety of sizes from standard components.

A further object of the invention is to provide a louver which can be more easily fabricated.

Still another object of the invention is to provide a less

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expensive louver because of the decreased cost of assembly.

Other objects of the invention will be apparent from the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawing, in which:

FIG. 1 is a view in perspective of an improved louver according to the invention;

FIG. 2 is a view in cross section taken along the line 2—2 of FIG. 1 showing louver blades spaced apart by separate spacers located in a side frame member;

FIG. 3 is a view in horizontal cross section taken along the line 3—3 of FIG. 2;

FIG. 4 is a detailed, fragmentary view in perspective of a portion of the louver shown in FIG. 1;

FIG. 5 is a view of a louver blade and a modified spacer;

FIGS. 6 and 7 are views in cross section, similar to FIG. 2, but showing modified louver blades employed with the spacers shown in FIGS. 2 and 4; and

FIGS. 8 and 9 are views in cross section, similar to FIGS. 5 and 6, but showing other modified blades and modified spacers therefor.

A specific form of the invention is shown in FIG. 1, in which a louver 11 comprises a plurality of inverted V-shaped louver blades, 12, side frame members 13 and 14, and upper and lower frame members 15 and 16. The blades 12 are held in spaced relationship by separate spacers 17 (FIG. 2) which can be made of any suitable material, such as metal, plastic, or rubber. When the spacers 17 are made of metal, they preferably have portions 18 removed to save material and reduce the overall weight of the louver 11. Each of the spacers 17 has an intermediate portion 19 which contacts the blades 12 and end portions 20, the purpose of which will be subsequently discussed. The intermediate portion 19 contacts an upper louver blade 12 at two points, along edges 21 thereof, and contacts the upper surface of an adjacent, lower louver blade with a V-shaped part of the intermediate portion 19. The peak of a lower blade extends above the edges 21 of an adjacent, upper blade to prevent one from seeing through the louver and yet permit the passage of air therethrough. The lowest spacer 17 is held on a supporting blade 22 which has an upper portion 23 similar to the blades 12 but also has legs 24 which rests on the lower frame member 16, and maintain the upper portion 23 above the edge of the member 16. In this manner, the blade 22 appears the same as the louver blades 12.

The spacers 17 are held in vertical alignment and against lateral displacement by a trough 25 (FIG. 3) in each of the side frame members 13 and 14, which trough is defined by a back 26, legs 27, and flanges 28. The trough 25 thereby prevents lateral movement of the spacers 17 with respect thereto, or movement having a lateral component. The back 26 of the member 14 has C-shaped appendages 29 which form recesses to receive screws 30 (Fig. 4) by means of which the upper and lower frame members 15 and 16 are connected to the side frame members 13 and 14. The screws 30 are preferably a sheet metal type so as to form their own threads in the recess formed by the C-shaped appendages 29.

For convenience, the top and bottom frame members 15 and 16 are identical to the side frame members 13 and 14 although the members 15 and 16 can be of any suitable shape which will clear the upper blade 12 yet abut the end of the side frame members 13 and 14.

A deformable means, such as material 31, is placed between the upper member 15 and the upper blade 12, preferably in alignment with the spacers 17. Although shown as cork, the material can be any suitable substance, such as rubber, felt, plastic, etc., as long as it is deform-

able so as to be capable of maintaining a compressive force. For this purpose, the material should also possess some degree of resiliency. The material 31 is of a sufficient size to hold the upper member 15 above the side members 13 and 14 when the material is in contact with both the upper member 15 and the upper blade 12. When the upper member 15 is brought into abutting relationship with the ends of the side members 13 and 14, the material 31 is then placed in compression and exerts a compressive force on the blades 12 and the spacers 17. This force maintains all of the blades 12 and the spacers 17 in a snug relationship to prevent any looseness and its concomitant disadvantages in the louver 11.

In assembling the louver 11, the side frame members 13 and 14 are first fastened to the lower frame member 16 by means of the screws 30 or other suitable fastening means to hold the members 13 and 14 in upright positions. The supporting blade 22 is then lowered through the troughs 25 of the side members 13 and 14 and positioned with the legs 24 resting on the appendages 29 or the back portion of the lower member 16 if another cross-sectional shape of the member 16 is used. With the blade 22 in this position, only the V-shaped upper portion 23 is exposed. Further, the legs 24 of the blade 22 are in close proximity to the flanges 28 or other edge portions of the member 16 to prevent or minimize the entrance of dust or dirt between the blade 22 and the member 16. With the supporting blade 22 in position, two of the spacers 17 are lowered through the troughs 25 of the side members 13 and 14 and positioned with the intermediate portions 19 in contact with the V-shaped upper portion 23 of the blades 22 and with the end portions 20 of the spacers 17 extending beyond the edges of the flange 28 near to the legs 27. In such position, the end portions 20 fit in the trough 25 to prevent substantially any lateral movement of the spacers 17. One of the blades 12 is then placed over the spacers 17 in the troughs of the side members 13 and 14 with the edges 21 of the blade in contact with the intermediate portions 19 of the spacers 17. The blades 12 are initially centered in the louver by means of the edges of the flanges 28 which are spaced apart slightly farther than the width of the blades 12. The blades 12 are then maintained in a centered position, preferably slightly spaced from the flanges 28, when another of the spacers 17 is lowered into position over the blade. The spacers 17 and the blades 12 are built up to a desired height by alternately placing them in the troughs 25. The upper blade 12 should at least slightly extend into the upper frame member 15 to prevent a gap from occurring therebetween. The degree of extension of the blade 12 into the member 15 is not critical, however. All that is necessary is that the amount of the material 31 be sufficient to apply a compressive force to the blades 12 and the spacers 17 when the upper frame member 15 is fastened to the side frame members 13 and 14 by means of the screws 30 or other suitable fastening means. After the upper frame member 15 is fastened to the side member 13 and 14, the louver 11 is completed.

The louver 11 can be assembled in an almost unlimited number of sizes. Any width of the louver can be obtained simply by cutting the blades 12 and the upper and lower members 15 and 16 to an appropriate width. The blades and frame members are of uniform cross section throughout their length as there are no flanges, holes, slots, etc., with which to contend. Further, the blades 12 need not be of an exact length because variation in the length will not affect the appearance or operation of the louver 11. The lengths of the blades 12 need only be less than the distance between the appendages 29 of the members 13 and 14 and greater than the minimum distance between the spacers 17. This variation in length is possible because there are no flanges or holes in the blade 12 that need be aligned and because the compressive force exerted by the material 31 prevents the blades 12 from sliding longitudinally by causing the spacers 17 to firmly engage

the blades. Because there is no close tolerance in the lengths, the size of the louver 11 can even be altered by the installer in order that the frame may properly fit a desired opening. This can be readily accomplished with a hack saw to cut the blades 12 and the frame members, and a drill to relocate the holes in the members 15 and 16 for the screws 30. The height of the louver 11 can be easily varied simply by changing the length of the side frame members 13 and 14 and changing the number of spacers 17 and the blades 12 that are used.

When the blades 12 are long, they can also be supported at intermediate portions by the spacers 17 which can be positioned in separate troughs extending up both sides of the louver blades 12. Such troughs can be affixed to intermediate portions of the upper and lower frame members 15 and 16.

FIG. 5 shows one of the blades 12 held by a plastic spacer 32 which is similar to the spacer 17 except that it is slightly heavier to compensate for the lower strength of the plastic material.

FIG. 6 shows a modified louver 34 similar to the louver 11 except that it has modified louver blades 35 which more closely resemble the supporting blade 22 of the louver 11. The blade 35, which has an upper inverted V-shaped portion 36 and legs 37, is held in spaced relationship by means of the spacers 17 or 32, one of each of which is shown purely for illustrative purposes. The spacers position the blades 35 so that the peak of the V-shaped portion 36 of one of the blades 35 extends upwardly beyond a horizontal plane extending through the lower edges of the legs 37 of the adjacent blade 34 disposed thereabove. In this manner, the louver 34 cannot be seen through but, nevertheless, air can pass there-through as is also true for the inverted V-shaped blades 12. The material 31, shown as felt, maintains a compressive force on the blades and spacers.

FIG. 7 shows a modified louver 38 having modified louver blades 39 which have inverted V-shaped portions 40, legs 41, and a central upwardly extending appendage 42, which blades are maintained in spaced relationship by the spacers 17 or 32, one of each of which is shown only for purposes of illustration. A compressive force is maintained on the blades 39 and spacers 17 or 32 by a deformable means shown as a generally U-shaped spring 43 having a centrally located recess 44 to receive the upper edge of the appendage 42. It will be understood, of course, that the material 31 can be used instead.

FIG. 8 shows a further modified louver 45 having blades 46 of a different style. The blades 46 are maintained in spaced relationship by means of spacers 47 and 48 which differ only in that the spacer 47 is preferably metal and has metal removed from portions 49 whereas the spacer 48 can be plastic, rubber, or the like and is solid. Both types of spacers are shown in the louver 45 only to illustrate both of them. The spacers 47 and 48 have intermediate portions 50 and 51, respectively, which contact slanted portions 52 and upper and lower edges 53 and 54 of the blades 46, and also have end portions 55 and 56 which extend past the flanges 28 of the side members 13 and 14 to prevent lateral movement of the spacers 47 and 48. The lower blade 46 rests on the supporting blade 22 and a compressive force is applied to the blades 46 and the spacers 47 and 48 by the material 31, shown as plastic.

FIG. 9 shows another modified louver 57 which includes louver blades 58 maintained in spaced relationship by means of spacers 59 and 60 which differ only in that the spacer 59 is preferably metal and has metal removed from portions 61 while the spacer 60 is rubber, plastic, or the like and is solid. These spacers have intermediate portions 62 and 63, respectively, which contact slanted portions 64 and edges 65 of the blades 58, and end portions 66 and 67, respectively, which extend beyond the edges of the flanges 28 to prevent lateral movement of the spacers. The lower blade 58 rests on the supporting

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blade 22 and a compressive force is applied to the blades and spacers by the material 31, shown as rubber.

It will be readily seen that a louver according to the invention basically comprises a plurality of louver blades which are maintained in spaced relationship by means of separate spacers between the blades and means are provided for maintaining the spacers in position.

Various modifications of the herein described invention will be apparent and such modifications can be made without departing from the scope of the invention if within the spirit of the appended claims.

I claim:

1. A louver comprising a frame having two side frame members and upper and lower frame members, said side frame members forming channels throughout their lengths, a plurality of louver blades of uniform cross section throughout their lengths extending into said channels, a plurality of spacers located between said blades and separate therefrom, said spacers being located wholly within said channels and held against any lateral movement by portions of said side frame members forming the channels, said upper and lower frame members extending the width of the louver and lying adjacent the ends of said side frame members, and means for fastening said upper and lower members to said side frame members and for drawing said upper and lower members toward one another and into abutting relationship with the ends of said side frame members.

2. A louver comprising a frame having two side frame members and upper and lower frame members, said side frame members having inwardly extending flanges partially forming channels over the length of said members, a plurality of louver blades having portions received in the channels of said side frame members, the horizontal,

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lateral extent of said blades being less than the distance between the flanges, a plurality of spacers between said blades and having end portions extending beyond said blades and fitting with the channels and flanges to prevent lateral movement of said spacers, and means for fastening said upper and lower frame members to said side frame members and for drawing said upper and lower frame members toward one another.

3. A louver comprising a frame having two side frame members and upper and lower frame members, a plurality of louver blades having portions received in said side frame members, a plurality of spacers between said louver blades, a lower supporting blade located below said louver blades, said side frame members and said upper and lower frame members being of substantially identical cross section and containing channels, with the channels of the side frame members receiving said spacers and preventing lateral movement thereof and also receiving ends of said louver blades, and with the channels of said lower frame member receiving the lower supporting blade, and means for fastening said upper and lower frame members to said side frame members.

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