Dec. 6, 1960 L. L. MAGYAR 2,962,956

VENTILATING LOUVER ASSEMBLY

Filed Sept. 16, 1957

Fig. 1

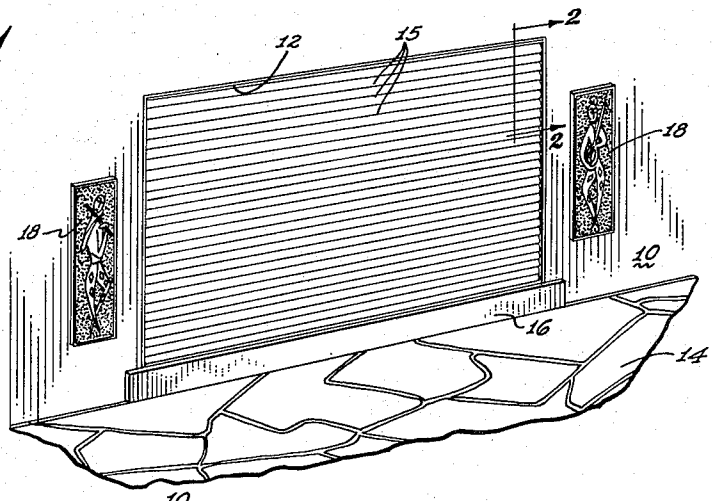



Fig. 2

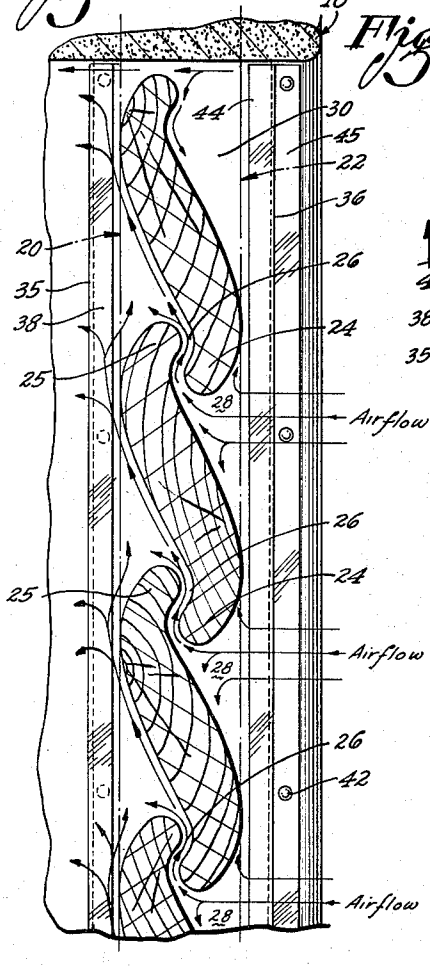



Fig. 3

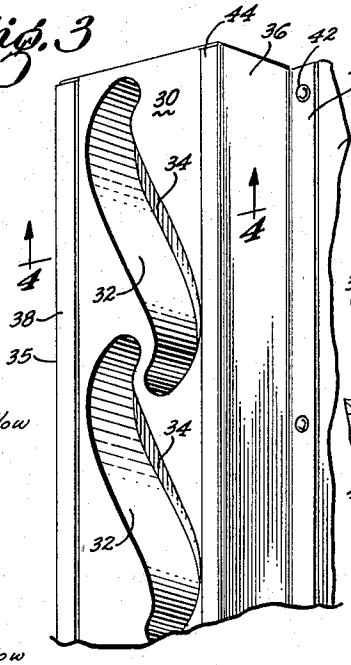



Fig. 4

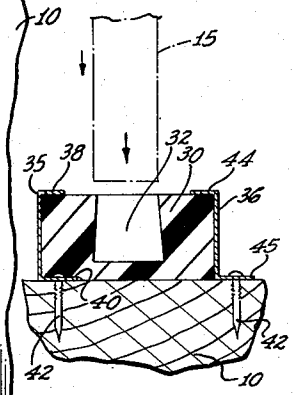
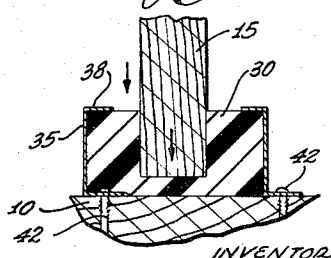



Fig. 5




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# VENTILATING LOUVER ASSEMBLY

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6 Claims. (Cl. 98—121)

This invention relates to a louver assembly for closing an opening in the exterior wall of a building, such as a window opening or a door opening. While various features of the invention may be incorporated in the construction of various louver assemblies for various specific purposes, the invention has special utility where permanent or constant direct ventilating communication with the outside of a building is desired without incurring the penalties of using a simple conventional ventilating opening.

One of these problems is to provide a wall opening for the passage of air therethrough that will prevent drafts even when the wall opening is subjected to wind pressure. Another problem, in many instances is to provide a ventilating opening through a wall where privacy for the occupants is required. It is also a problem to provide a ventilating opening in an exterior wall that will not only afford protection against inclement weather but will also function effectively as a barrier against wind-blown dirt particles. A further problem is to provide a ventilating opening without freely admitting outside noise. It is further desirable in some installations to provide a ventilating opening that has the appearance of solid wall structure and is of a pleasing appearance to serve as an ornamental addition to the wall.

The louver assembly of the present invention comprises a series of vertically spaced generally horizontal louvers forming horizontal ventilation passages. The louvers are constructed and arranged to provide a number of features which work together in various ways to meet the above mentioned requirements.

The free passage of air through the wall opening without creating drafts is provided, in part, by making the ventilation passages narrow with the passages directed upwardly towards the ceiling. In the preferred practice of the invention, the inner ends of the ventilation passages are more nearly vertical than horizontal. Avoidance of drafts is provided, in further part, by making the ventilation passages of a smoothly curved cross-sectional configuration that is conductive to laminar flow in the ventilation air streams. The upwardly directed laminar currents of air emerging from the louver assembly at the inner ends of the ventilation passages are rapidly dissipated in micro turbulence within an inch or two of the louver assembly.

Where privacy is a requisite, it is merely necessary to make the louvers opaque since the inclined ventilation passages are sufficiently tortuous to block lines of sight therethrough. It is to be noted, however, that the louvers may be made of light-transmitting material in instances where it is desirable for the louver assembly to serve as a window.

The inwardly and upwardly inclination of the ventilation passages affords protection against inclement weather. Since the ventilation passages are narrow in width, relatively long in the direction of air flow, and tortuous in configuration, even wind-driven rain cannot penetrated the louver assembly.



Protection against ingress of airborne dirt particles is afforded by the fact that exterior air currents directed against the louver assembly impinge on solid surfaces, there being no opening whatsoever through the louver assembly in the direction of approach of outdoor air currents. Air can pass through the louver assembly only by making an abrupt upward change in direction. Airborne particles that are heavier than air are decelerated by impact against the louvers and all such particles that have settling velocities greater than the velocity of upward airflow at the regions of impact will simply drop along the outer side of the assembly. Only an insignificant portion of the exceedingly light airborne particles can reach the inner side of the louver assembly.

Fortuitously, the described construction of the lower assembly has an inherent attenuating effect on sound waves. The tortuous configuration of the ventilation passages is one factor. The narrow dimensioning of the ventilation passages is another factor in the attenuating of sound. It is further helpful that all of the narrow vertical passages are directed upwardly at a steep angle towards the ceiling instead of being directed across the interior of the building. In the preferred practice of the invention, the deadening of sound is further favored by the use of relatively thick louvers of nonmetallic material and the use of resilient rubber-like material to support the louvers in a yielding manner.

Further features of the preferred practice of the invention relate to the simple economical structure of the louver assembly, the simplification of the installation procedure and the durability of the assembly for long service life. The ends of the louvers are seated in sockets formed in molded vertical support members of rubber-like material and simple flanged metal strips serve to anchor the vertical supports to the wall opening. The rubber-like material makes sealing contact with the wall structure and also makes sealing contact with the ends of the louvers.

A further and important advantage of the described construction is the flexibility of the louver assembly in that it may be adjusted to compensate for minor inaccuracies and dimensional variations. The rubber-like vertical supports readily conform to surface irregularities in the wall opening. The degree to which the ends of the louvers extend into the sockets in the rubber-like vertical supports may be varied as required in accord with minor variations in the width of the wall opening. It is to be further noted that since the louver assembly is, in effect, articulated at the junctures of the transverse louvers with the rubber-like vertical supports, one end of the louver assembly may be readily raised or lowered relative to the other end. By reason of these capabilities for adjustment, the louver assembly can compensate for minor dimensional inaccuracies and may be installed easily in a wall opening that is not accurately rectangular.

The various features and advantages of the invention will be apparent in the following detailed description considered with the accompanying drawing.

In the drawing, which is to be regarded as merely illustrative:

Figure 1 is a perspective view showing, by way of example, how the louver assembly of the invention may be employed in a relatively large wall opening near floor level for permanent ventilation of a room;

Figure 2 is an enlarged vertical section taken as indicated by the line 2—2 of Figure 1, this view showing the cross-sectional configurations of the individual louvers and the spatial relationships among the louvers;

Figure 3 is a fragmentary perspective view of a vertical rubber-like support member showing the sockets therein that seat the ends of louvers, the louvers not being shown. This view also shows how metal strips may be

used to anchor the vertical support members to the wall structure;

Figure 4 is a transverse section of the structure shown in Figure 3, taken as indicated by the line 4—4 of Figure 3; and

Figure 5 is a view similar to Figure 4 showing how the ends of the louvers seat in the sockets.

Figure 1, illustrating a selected practice of the invention, shows the exterior wall **10** of a building with a rectangular ventilation opening **12** in the wall near the level of the floor **14** of a room. The opening **12** is closed by a series of transverse louvers **15** that are closely spaced and give the appearance of a solid wa l panel. It is to be noted that the closely spaced louvers give the wall opening an ornamental effect that may be enhanced in various ways. In this instance, for example, the ornamental effect is enhanced by a base strip **16** and by two flanking pictorial ornaments **18**. Thus, permanent ventilation of the room space is achieved without detracting from the appearance of the wall.

The louvers **15** may be made of any suitable material but preferably are made of nonmetallic material such as wood or a suitable plastic. It is also to be noted that the louvers may be made of transparent or translucent material where the admission of light is desirable.

Each of the louvers **15** is relatively thick, being substantially thicker than a sheet metal louver. Preferably the edge portions of the louvers are somewhat reduced in thickness. Each of the louvers **15** is S-shaped or of sigmoid cross-sectional configuration with the upper edge portion of the louver turned outward towards the exterior of the building and the lower edge portion turned inward towards the interior of the building. All of the louvers **15** are inclined inwardly and upwardly with the upper portions of the louvers defining an interior vertical plane indicated by the broken line **20** in Figure 2, and the lower portions of the louvers defining an exterior vertical plane indicated by the broken lines **22**, the curvature of the louvers being tangential to these two planes.

In each pair of the successive louvers **15**, the lower edge portion **24** of the upper louver overlaps the upper edge portion **25** of the lower louver on the exterior side of the lower louver and at relatively small spacing from the lower louver. With this arrangement, the successive louvers **15** form upwardly inwardly directed ventilation passages **26**, which passages are relatively narrow in comparison to the thickness of the louvers. Preferably the inward curvature of the lower edge portion **24** of the louver that forms the forward wall of each ventilation passage **26** conforms to the curvature of the upper edge portion **25** of the louver on the interior side of the passage so that each of the ventilation passages is of substantially constant cross-sectional dimension throughout the major portion of its length. By virtue of this arrangement, each of the ventilation passages **26** is also of sigmoid cross-sectional configuration, the sigmoid curvature of the ventilation passages being reversed with respect to the sigmoid curvature of the louvers **15**. As may be seen in Figure 2, the individual ventilation passages **26** are tortuous to the extent that no line of sight may be drawn through the passage from one side of the louver assembly to the other side.

The mid-portions of louvers **15** are at least approximately four times as thick as the thickness of the ventilation passages **26**. By reason of the fact that the ventilation passages **26** are relatively narrow and the sigmoidal louvers **15** are relatively thick, there is a relatively wide and smoothly convergent entrance space **28** at the exterior end of each ventilation passage, these entrance spaces **28** converging inwardly in a gradual manner from the exterior plane **22**.

The arrows in Figure 2 indicate the general behavior of the air currents that are involved when the exterior side of the louver assembly is subjected to wind pressure. It will be noted that all of the air currents impinge on solid surfaces and are turned sharply thereby, so that solid particles that are heavier than air strike the solid surfaces and are thereby decelerated. The relatively heavy dirt particles strike the solid surfaces of the louver assembly in regions of air flow velocities that are relatively low in comparison to the velocities of the air streams in the ventilation passages **26**.

Wind blown particles of any substantial density are more likely than not to approach the louver assembly in a downwardly inclined direction and it is apparent that the overlapping of the louvers in the manner shown in Figure 2 effectively masks the ventilation passages from particles that approach in this manner. When the particles are stopped by the solid surfaces of the louver assembly, only exceedingly light particles with exceptionally slow settling rates are carried into the ventilation passages.

Rain water droplets impinge on solid surfaces in the same manner. It is apparent that rain water will drip from louver to louver across the entrance spaces **28**. Without encountering the air streams of relatively high velocity at the ventilation passages **26**.

As indicated by the arrows in Figure 2, the small narrow air streams that are discharged from the ventilation passages **26** are directed upwardly along the surfaces of the louvers on the interior or room side of the louvers. It has been found by tests with smoke that these air streams are dissipated by micro turbulence within a distance of one or two inches of the louver assembly.

Sound waves from the exterior of the building are attenuated by the louver construction in the manner heretofore described.

The louvers **15** may be supported in their assembled positions in any suitable manner. A feature of this particular practice of the invention is the use of vertical end supports **30** in the form of molded strips of rubber-like material having sockets **32** to seat the ends of the louvers **15**. As may be seen in Figure 3, the sockets **32**, which have inner end walls **34**, are of the same sigmoidal configuration as the louvers and, as may be seen in Figure 4, the sockets have narrowed entrances. The entrances to the sockets prior to the insertion of the louvers are narrower than the width of the louvers to create a desirable resilient gripping action.

Any suitable means may be employed to anchor each of the vertical supports **30** to the building wall **10**. In the practice of the invention illustrated by the drawing, a pair of angular metal strips **35** and **36** is employed for this purpose. The metal strip **35** which is used on the interior or room side of the louver assembly has an outer flange **38** to engage the vertical support **30** and has a base flange **40** for anchorage to the building wall **10** by nails **42** or other suitable fasteners. The base flange **40** extends behind the vertical support **30** and is concealed thereby when the louver assembly is installed. The second metal strip **36** has an outer flange **44** to engage the vertical support **30** and has a base flange **45** for anchorage by nails or the like **42**, this base being turned outward and exposed at the exterior of the building.

The previously mentioned advantages of the described louver assembly with respect to the compensation for dimensional inaccuracies are readily apparent. The louvers **15** may be bonded in the sockets **32** by suitable adhesive material when the louver assembly is installed or, if desired, the louvers may be bonded in the sockets prior to installation. The louver assembly may be completely fabricated and shipped in assembled state. One advantage of the construction in this regard is that the louver assembly is not likely to be damaged in shipment because the louvers are rugged and are yieldingly connected together by the rubber supports **30**. An important feature of the invention, however, is that the louver assembly may be shipped in dismantled state for assembly on the job, the dismantled louver assembly being exceptionally compact.

The use of the rubber-like supports **30** for the ends of the louvers **15** is especially advantageous for installations where the louver assembly is subject to vibration. Vibration is a consideration, for example, when the louver assembly is used on a vehicle.

My description in specific detail of the presently preferred practice of the invention will suggest various changes, substitutions and other departures from my disclosure within the spirit and scope of the appended claims.

1. A ventilating louver assembly for an opening in an exterior wall of a building, comprising: a series of louvers of sigmoid cross section positioned more nearly vertical than horizontal with their upper edge portions curved outwardly and their lower edge portions curved inwardly, said louvers being inclined with their upper portions defining an inner plane and their lower portions defining an outer plane at said opening, the lower edge portion of the upper louver of each pair of successive louvers overlapping the upper edge portion of the lower louver of the pair on the outer side of said lower louver, said louvers being spaced apart with said overlapping edge portions forming a plurality of vertically spaced inwardly upwardly directed transverse ventilation passages of tortuous configuration blocking all lines of sight, said louvers being substantially greater in thickness than said passages with each pair of the successive louvers forming a relatively wide convergent entrance extending inwardly from said outer plane to the corresponding ventilation passage, the cross-sectional curvature of the inwardly turned lower edge portion of the upper louver of each of said pairs of successive louvers conforming substantially to the cross-sectional curvature of the corresponding outwardly turned upper edge portion of the lower louver of the pair with each of said ventilation passages of substantially uniform width throughout a major portion of its length.

2. A ventilating louver assembly as set forth in claim 1 which includes vertical supports having vertically spaced sockets seating and completely surrounding the opposite ends of said louvers, the walls of said sockets being made of resilient rubber-like material for yielding support of the louvers.

3. A ventilating louver assembly as set forth in claim 2 in which said vertical supports are one-piece molded members of rubber-like material.

4. A ventilating louver assembly as set forth in claim 3 in which the entrances to said sockets are narrower than the width of the louvers whereby said vertical supports yieldingly grip the ends of the louvers.

5. A ventilating louver assembly for an opening in an exterior wall of a building comprising: a series of louvers of sigmoid cross section with their upper edge portions curved outwardly and their lower edge portions curved inwardly, said louvers being inclined with their upper portions defining an inner plane and their lower portions defining an outer plane at said opening, the lower edge portion of the upper louver of each pair of successive louvers overlapping the upper edge portion of the lower louver of the pair on the outer side of said lower louver, said louvers being spaced apart whereby said overlapping edge portions form a plurality of spaced inwardly upwardly directed transverse ventilation passages of tortuous configuration intermediate said planes; vertical members at the opposite ends of said series supporting and interconnecting said louvers, said vertical support members being made of rubber-like material and having sockets seating the ends of the louvers in a yielding manner, said sockets being of less depth than the thickness of the vertical support members to cushion and seal the ends of the louvers; and vertically elongated retaining means engaging each of said support members for anchorage of the support members in a wall opening.



6. A ventilating louver assembly for an opening in an exterior wall of a building, comprising: a series of louvers of sigmoid cross section positioned more nearly vertical than horizontal with their upper edge portions curved outwardly and their lower edge portions curved inwardly, said louvers being inclined with their upper portions defining an inner plane and their lower portions defining an outer plane at said opening, the lower edge portion of the upper louver of each pair of successive louvers overlapping the upper edge portion of the lower louver of the pair on the outer side of said lower louver, said louvers being spaced apart with said overlapping edge portions forming a plurality of vertically spaced inwardly upwardly directed transverse ventilation passages of tortuous configuration blocking all lines of sight, said ventilation passages being of sigmoid cross-sectional configuration with the curvature thereof opposite to the curvature of the sigmoid cross-sectional configuration of the louvers, said louvers being at least approximately four times as thick as the thickness of said passages with each pair of the successive louvers forming a relatively wide convergent entrance extending inwardly from said outer plane to the corresponding ventilation passage.

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