June 18, 1963 E. F. O'BRIEN, JR., ETAL 3,094,058

VENTILATOR

Filed Aug. 28, 1961 4 Sheets-Sheet 1

FIG. 1

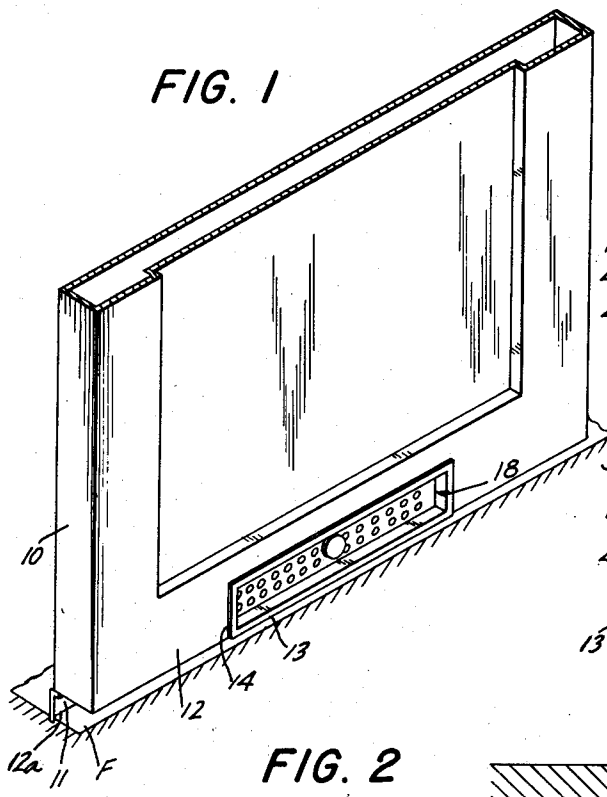


FIG. 3

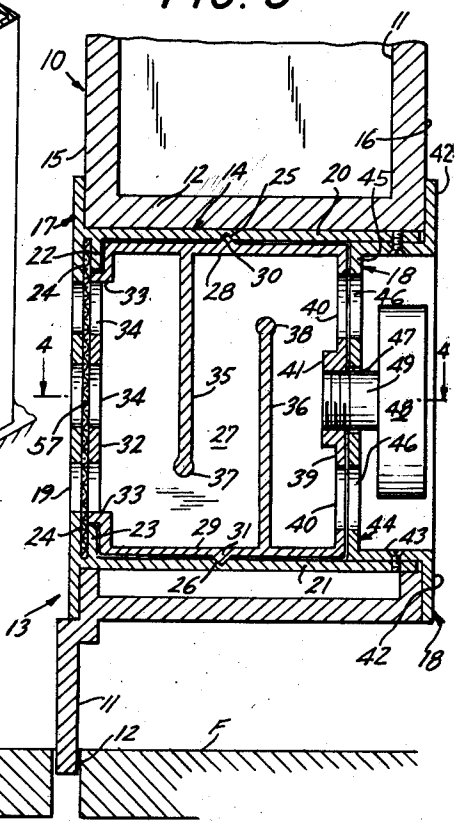
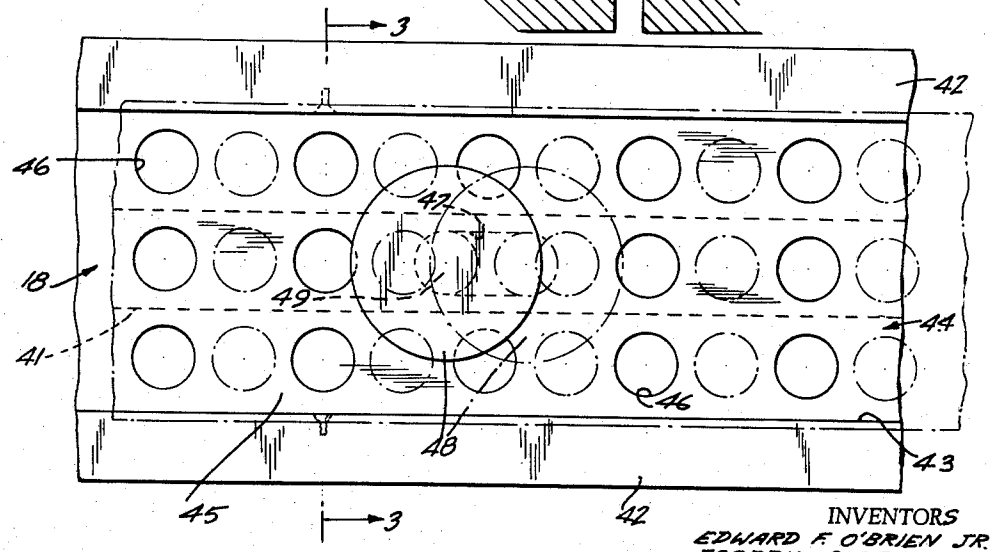


FIG. 2



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VENTILATOR

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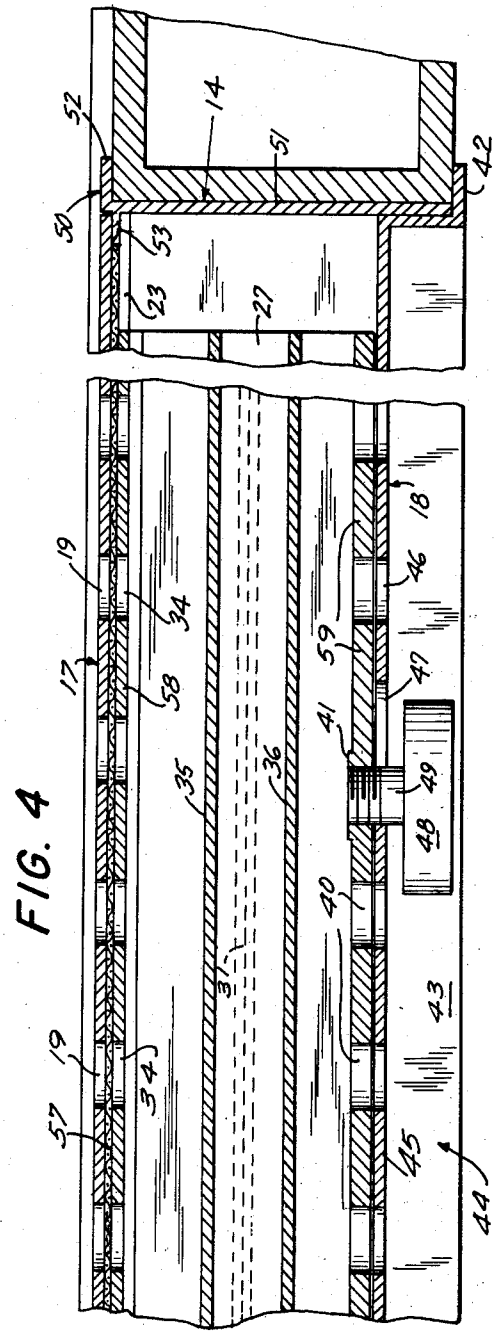


FIG. 4

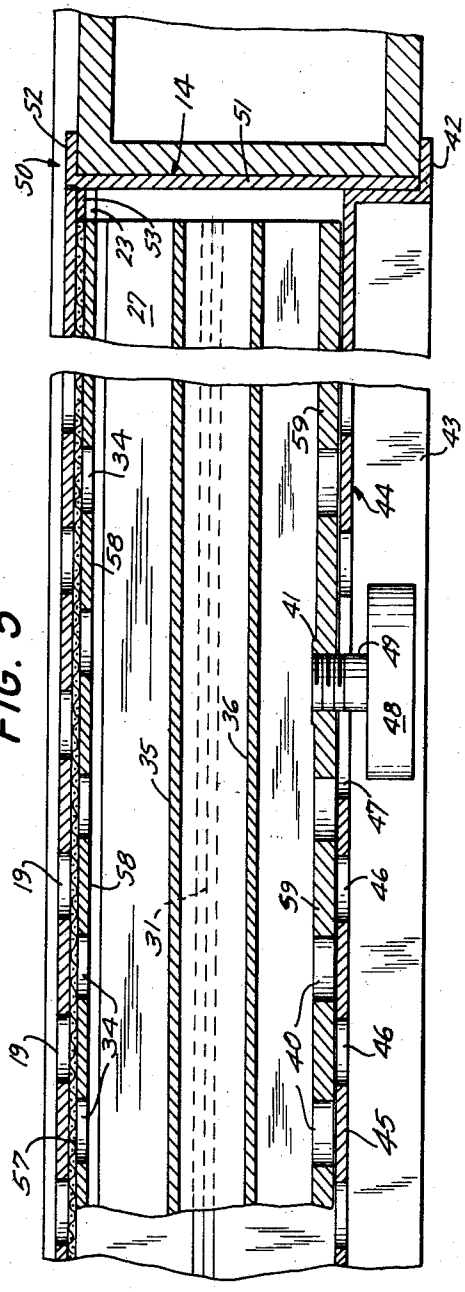


FIG. 5

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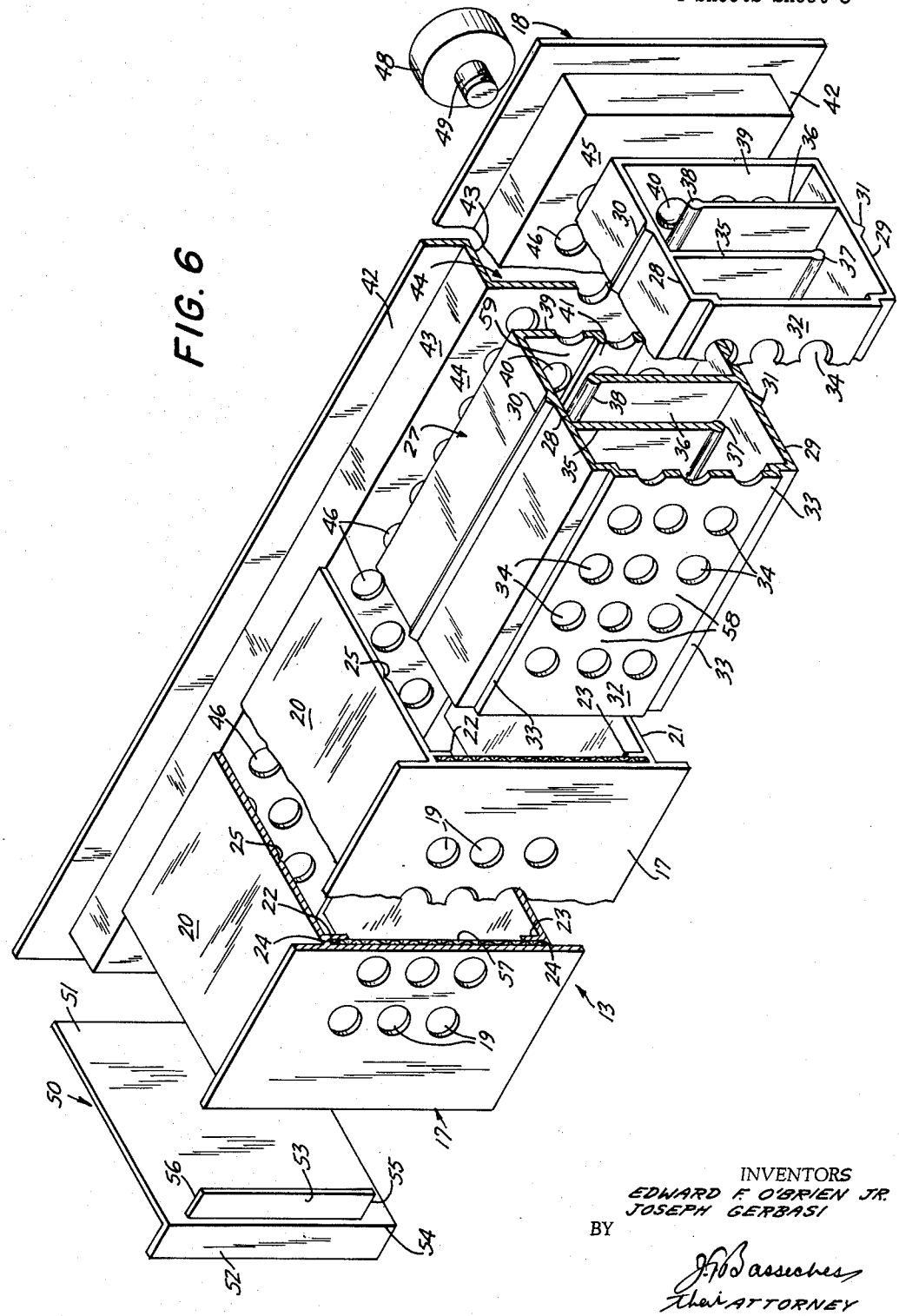
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FIG. 6



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VENTILATOR

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FIG. 7

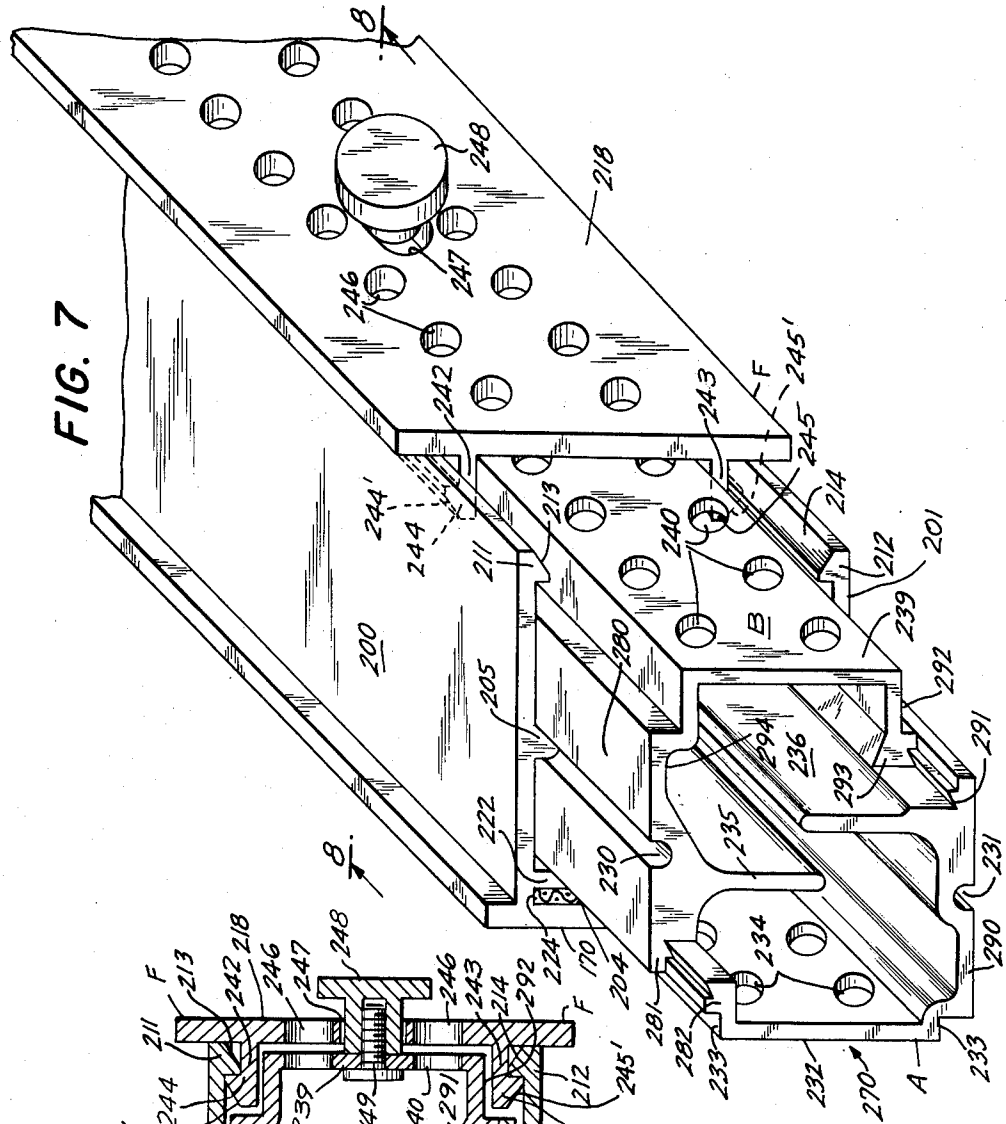
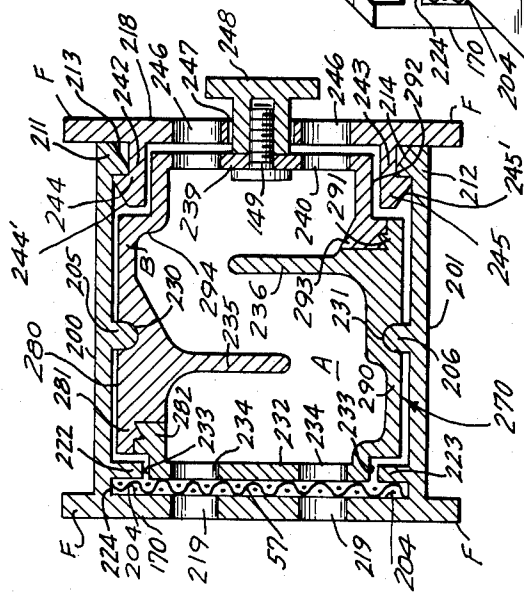


FIG. 8



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United States Patent Office 3,094,058 Patented June 18, 1963

3,094,058

VENTILATOR

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Filed Aug. 28, 1961, Ser. No. 136,144
3 Claims. (Cl. 98—97)

This invention relates to ventilators, more particularly to ventilators for rolling doors, partition panels, sliding windows and like members.

Still more particularly, this invention has for its object to provide ventilating means in flush planar members, such as in walls, doors, windows which are of a rolling or sliding type, and partitional members, whether hinged or of the sliding type, where bodily shifting movement of the doors, windows, panels, because of the extensiveness of the gap these members cover, makes it undesirable to move these members bodily for their entire height or width in attempting to effect ventilation.

More particularly it is an object of this invention to provide a ventilator which likewise should be free from any projection in the plane of the members, when they slide or roll relatively to each other.

Still more particularly, this invention has for its object to provide a ventilator installable in the frame portion of a sliding door, window, partition panel, to control the ingress and egress of air directed therethrough so as to flow circuitously, and eliminate drafts by controlling the path of the air flow, which may be very simply and readily installed in either wood or metal members.

Still more particularly, it is an object of this invention to provide ventilator means installable in flush or planar members, such as sliding doors, sliding windows, panels of partitions, in a manner to assure a minimum of undesirable projecting influence, and made from components which permit interfitting and assembly with minimum labor or the provision of custom-made parts, while assuring privacy, indirect diffusion of the flow of air, and providing means for complete or measured cut-off of the flow of air, when such control is found desirable.

Still more particularly, it is an object of this invention to provide a ventilator construction for the planar portions of doors, particularly sliding doors, windows, panels, in which extensive lengths of the member components may be stocked, to be cut to the desired sizes for assembly, and thereby effect large economies in labor and materials. Thus, it is contemplated by the invention that by making the main components of the ventilator in such lengths, of extrusions in standard forms from aluminum, plastic, or even stainless steel and other formable material, to store such parts in readiness for sectioning to desired sizes, reducing expensive inventories to the minimum, thereby to effect further economies in storage space, dies and tools for the installation of the ventilator assemblies.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which:

FIGURE 1 is a fragmentary perspective view illustrating a sliding door, the rail of which incorporates a ventilator in accordance with this invention, looking at the interior face of the same;

FIGURE 2 is a magnified fragmentary elevational view from the interior face of the door;

FIGURE 3 is a section taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a partial section taken on the line 4—4 of FIGURE 3, with the ventilator control in the fully open position;

FIGURE 5 is a sectional view similar to FIGURE 4 with the ventilator control in the fully closed position;

FIGURE 6 is an exploded perspective view of the member components;

FIGURE 7 is a perspective view of another embodiment of the invention;

FIGURE 8 is a section on the line 8—8 of FIGURE 7.

Reference is now made to the drawings wherein there is shown a fragment of a panel **10** arranged to be slidably guided at its lower portion **11** in a track **12***a* on the floor F. The panel is merely illustrative, and the invention has utility in connection with a sliding type window, a sliding or rolling door of a partition assembly or any other planar member which is so extensive that it would be inexpedient to slide it bodily for ventilation, without loss of the privacy visually and orally intended by the use of the member.

It is contemplated by the invention to incorporate a ventilator assembly **13** into an oblong slot **14** cut or otherwise formed in the lower rail **12** of the panel **10**, to lie flush with the exterior surface **15** and the interior surface **16** of the panel, so as to minimize obstructing projections.

The ventilator assembly **13** includes a front or exterior cover plate **17** and a rear or interior cover plate **18**. The front cover plate **17** dimensionally extends to overlap the rail. The slot **14** is intended to lie flush with the exterior surface **15** of the panel **10** and is formed with predeterminedly spaced venting holes **19**.

Extending from the interior face of the cover plate **17** are spaced guide plates **20** and **21**. These guide plates are spaced from each other for a distance providing a close fit within the rail outlined slot **14**, and to extend for a depth approximating the thickness of the rail **12**.

Spaced from the inner face of the cover plate **17** there is provided normal to the guide plates **20** and **21** upstanding flanges **22** and **23**, defining longitudinal slots **24**, **24** along the length of the guide plates **20** and **21**, respectively. At an intermediate portion of the guide plates **20** and **21** are formed oppositely directed guides **25**, **26**, respectively.

The components comprising the front cover plate, guide plates and flanges thus described are preferably made in the form of strips of an extrusion of aluminum, to secure components of intermediate length, although it will be understood that these lengths of members may likewise be formed from extrudable plastics, stainless steel or like moldable materials.

The second component of the ventilator assembly constitutes a tubular baffle member **27** having an upper wall **28** and a lower wall **29**, each having a guide lug or rib **30**, **31**, respectively, on the exterior surface of the walls **28** and **29**, arranged slidably to be received in the guides **25** and **26**, respectively. In other respects, the upper and lower walls conform to the spacing between the guide plates **20** and **21**, for slidable movement.

The tubular baffle member **27** has its exterior wall **32** formed with an offset **33**, interfitting the edges of the flanges **22**, **23**. The exterior wall **32** is formed with vent holes **34** which are positioned congruently in overlapped position with the vent holes **19** of the front cover plate.

Rearwardly, the tubular baffle member is provided with downwardly and upwardly extending baffles **35** and **36** at staggered positions so that the terminal edges **37** and **38** overlap each other. The terminal portions may be formed with curvilinear beads for the entire length to avoid knife edges and aero-dynamically improve the flow of air therethrough, as well as rigidify these unsupported terminal edges.

The tubular baffle member has a rear wall **39** formed with venting holes **40** which need not be congruent with the venting holes **19** and **34**. An upstanding boss **41** runs along the length of the wall **39**. The tubular baffle also may be extruded, in indeterminate lengths, to be cut to size as required, since it is used open-ended.

Another component member of the assembly comprises the cover **18**, previously described, which consists of a formed, die-drawn sheeting or cast plate having peripheral flanges **42** arranged to overlap the slot **14** on the interior face of the rail **12**, with a centrally disposed dished-in section **43** which merges into the wall **44** to provide an interior venting wall **45**, by the provision of venting holes **46**, likewise arranged in size, number and position to be congruent with the venting holes **40**, if aligned. There is also provided one elongated slot **47** arranged to receive the control knob **48** whose shank **49** is screw-threaded to be received in the boss **41** of the tubular baffle member, tapped to screw-threadedly receive the shank **49**.

There are also provided end closure strips **50**, each of which has a web **51** and an L-shaped flange **52** dimensionally simulating the front or exterior cover plate overhang **17** previously described, the web **51** extending for the thickness of the rail and for a width corresponding to the spacing between the guide plates **20, 21**. An upstanding rib **53** is spaced from the corner edge **54** (FIGURE 6) to bring the flange **52** into alignment with the cover plate **17** and to position the rib **53** in alignment with the flanges **22, 23** extending from the guide plates **20** and **21**.

The end closure strip **50** for each end of the assembly may likewise be made into continuous strips by extruding aluminum, plastic and other materials, as previously described for making the front or exterior plate **17**, to be cut or finished to the width of the slot **14** formed in the rail of the device into which the ventilator is incorporated.

For this purpose, the rib **53** is trimmed at the edges **55, 56** to bring these ends into alignment with the guide plates **20, 21** at their upper and lower edges **55** and **56**.

With the parts thus provided, assembly may now be effected. This objective is accomplished by first fitting a filter screen **57** into the slots **24, 24** to cover the venting holes **19**. Thereupon the tubular baffle member **27** is slid into position between the guide plates **20, 21**, to interfit the guide lugs **30** and **31** into the guides **25, 26**, respectively, and also interfit the offsets **33, 33** between the flanges **22** and **23**, respectively. Thereupon, the end pieces are assembled to each side of the front cover plate **17**, which strip for making the cover plate has previously been cut from a strip to the proper length of the slot **14** and formed with venting holes **19**, previously described. Other means of uncovering the venting holes **19** may likewise be employed, as will be readily understood.

With the assembly thus made comprising the front plate **17**, the end members **50** and the tubular baffle **27** holding the screen **57** in position, the box-like assembly is fitted into the slot **14** in the rail **12** from the front face of the panel **10**, and clipped or screwed to the slot walls, depending upon whether a metal or wood frame is employed in the material of the rail, as will be readily understood. Thereupon, the rear or interior cover is interfitted, preferably with a friction fit, between the ends of the guide plates **20, 21** and the shank of the control knob **28** extended into the slot **47**, into the threaded boss **41** of the tubular baffle member **27**.

The length of the tubular baffle member is such that in one position within the limits of the slot **47**, it will align the tubular baffle member **27** so that the venting holes **19, 34, 40** and **46** are in alignment, and in another extreme position with relation to the slot **47**, will bring the lands **58, 59** of the tubular baffle member **27** in the front and rear walls thereof into covering position of the vent holes **19** and **46**, it being understood that relative sliding movement will permit partial or complete covering or uncovering of the venting holes **19, 34, 40** and **46**.

It will be observed that by the construction as provided, a venting assembly is achieved which may be made from continuous strips for the principal parts, cut to length as the slot in the various panels may dictate, and supply a flush fit in substantial planar relationship to these moving parts, whether they be rolling doors, windows, sashes, panels of sliding partitions or the like, to avoid any projection and at the same time provide ventilation without requirement for opening the entire height of these members, and without sacrificing privacy.

Sufficient diffusion of the air draft or flow is secured to muffle the sounds and secure oral privacy.

The ventilator likewise has the features of ease of installation and minimum tooling to secure the flush or substantially planar fit on both faces.

In another embodiment of the invention disclosed in FIGURES 7 and 8, features are shown permitting a further simplification of the component parts to be made in the form of extrusions from aluminum and/or plastics in indeterminate lengths, from which sections in accordance with desired lengths may be cut, and also providing for assembly with considerable ease, without special tools.

In this embodiment, the strip to form the exterior cover plate **170** is provided with guide plates **200** and **201**, having inwardly directed guide ribs **205, 106** in the upper and lower guide plates, respectively. The guide plates terminate at their ends with latching ends **211, 212**, with cam faces **213, 214** adjacent the terminal ends of the guide plates. These latter ends are of a depth conforming to the rail thikness of the door panel, window or like panel member in which the installation is to be made.

As in the prior embodiment, the cover plate **170** has vent holes **219** therein. Locking flanges **222, 223** for end plate engagement are integrally extended from the guide plates **200, 201**, to define retaining slots **204**, as well as to serve as slots to hold the screen **57**.

A rear or interior outlining strip **218** for the rear cover plate, instead of being dished, is flat in shape and is extruded lengthwise, being provided with vent holes **246** and an elongated, horizontally extended guide slot **247**. The strip is provided with a pair of coupling flanges or lugs **242, 243**, formed with latch defining ends **244, 245** and camming faces **244', 245'**, respectively, at their leading ends. These flanges are spaced apart to match in relative positions with the spacing of the cams **213, 214** of the guide plates **200, 201**.

The tubular baffle **270**, to serve as a correlated member corresponding in the main to the baffle **27**, is made from a strip A having a front wall **232**, offset forwardly by extensions **233** arranged slidingly to fit between the flanges **222, 223**. The front wall is provided with venting holes **234** which may be congruent with venting holes **219** in the front cover **170** in one position of these parts to each other, as will be readily understood from the prior embodiment.

Rearwardly of the front wall **232**, the strip **270** extends into a lower wall **290** having an upstanding baffle plate **236** on its interior face, and a guiding groove **231** on its exterior face, corresponding in spacing to the distance to the strip extension **233**. The lower wall **290** terminates in a coupling component ledge **291** which may be roughly described as the female section of a dove-tail joint.

The coordinating rear portion of the tubular baffle **270** is a strip having a rear main wall **239** arranged to be faced on the interior of the panel, which is provided with venting holes **240** congruently positioned to the venting holes **246** in the rear wall **218**. It is provided with a lateral extension **292**, terminating in the male section **293** of a dovetail joint. For convenience this joint will be referred to as an interlocking joint, as it is clear that other joints to resist tension and compression will suggest themselves, the object being to outline the joint having this ready coupling and to permit ready extrusion in lengths of smaller sections than the tubular baffle **27**. Details of the stepped shoulders and abutting faces for a

design furnishing resistance to tension and compression while permitting coupling, preferably by a sliding fit or snap to avoid the need for fastening means, such as screws, welds, bolts are the primary objective, in the interest of economy.

The wall **239**, at its upper wall portion **294**, has a downwardly extending baffle **235** which is staggered in position to the position of the baffle **236**, as described in connection with the first embodiment, FIGURE 3.

On the outer surface, the wall section **280** is provided with a groove **230**, longitudinally, slidably to conform to the guide rib **205** on the wall **200**. The wall section **280** terminates in a joint section **281** for coupling slidably with the extension **282** on the wall section **232**, providing an interlocking joint complementally positioned at the opposite corner of the tubular baffle **270**.

For assembly of the tubular baffle, the strips A and B are cut for a length to fit within the slot **14** less the width of the slot **247**. The rear strip B is fitted with a stud or threaded shank **149** off-center with respect to the full dimension of the slot **14** to allow for the movement to the covering and uncovering positions of the venting holes. The strips are then coupled by sliding the joint portions **281, 282** and **291, 292** into coupling engagement.

Formation of the enclosure portions is then effected, cutting a length of strip **170** and **218** for the front and rear cover plates. If end plates **51** are employed, as is desirable, the front cover plate strip **170** is just slightly shorter than the slot **14** of the panel and the strip **218** for the rear cover plate is longer. This latter is cut away at the ends of the lugs **242, 243** only on opposite ends of the strip for a length to overlap on the rear face of the panel. If no end plates are employed, the strips may be of about equal length to the slot **14**. If end flange overlap is desired with no end plates, the opposite ends of the guide plates **200, 201**, as well as the opposite ends of the lugs **242, 243** may be cut away to provide a peripheral flange F overlapping the slot **14**, an operation which is very simple with some plastics such as polyethylene from which the strips may be extruded, at both the ends and the side edges of the strips.

After fitting the strips A and B to the length of the slot **14**, the tubular baffle **270** is slid into position edgewise, to enclose the same between the guide plates **200, 201** and slidingly engage the ribs **205, 206** in the guiding grooves **230, 231**, respectively. Thereupon the assembly of the front or exterior cover plate **170** and the tubular baffle **270** is ready to be inserted into the slot **14**, if no end plates **51** are employed. If end plates are employed, they are affixed in position first, as in the first embodiment.

Thereupon the rear strip **218** is moved into position to have the shank **149** enter the slot **247**, to project the shank therethrough and the coupling flanges **242, 243** are latched with the ends **211, 212** on the ends of the guide plates **200, 201**, respectively.

This operation firmly fixes the ventilator in position without tools and is intended to be irremovably positioned only by distortion of portions of the flanges. For removal or access, set-screw covered apertures (not shown) adjacent the latching faces **213, 214** through the flange F may be provided for prying the coupling apart.

After coupling to opposite sides of the slot in the rail or stile **12** of the door or window panel **10**, the knob **248** is threaded upon the shank **149** to provide the operation of the tubular baffle for aligning or overlapping the venting holes previously described.

In this embodiment not only are the full features achieved as described in connection with the first embodiment but each of the components may be readily extruded and more readily aerodynamically altered to secure a silent flow, with minimum internal turbulence losses, within a very limited aperture in the door or panel in which the ventilator is mounted, making the same adaptable to aluminum or metal windows with narrow rails or stiles.

Having thus described the invention and illustrated its use, what is claimed as new and is desired to be secured by Letters Patent is:

1. A ventilator arranged to be positioned in substantially planar relationship with the rail of a door, window or the like, with a slot formed therethrough, to be mounted within substantially the thickness of the rail, comprising a front cover plate having a pair of parallel guide plate means spaced apart substantially the height of the slot on one face thereof arranged to project into said slot of said rail, a tubular baffle member having upper and lower walls having engagement with said guide plate means and slidable within the limits of the ends of said slot between said guide plate means, said baffle having forward and rearward walls, a rear cover plate member coupled to said guide plate means, said front cover plate and rear cover plate having aligned ventilating holes and said forward and rearward walls of said baffle having aligned ventilating holes separated by lands, the holes of said baffle and said cover plates being aligned in one slidable position of said tubular baffle member, the lands of said baffle obscuring said ventilating holes in said front and rear cover plates in another position of said baffle member, end closure members for the opposite ends of said front cover plate, said guide plate means and end closure members each having outstanding ribs arranged to be co-planar and forming, with the front cover plate, a screen retaining slot along the edges of said plate and end members.

2. A ventilator arranged to be positioned in substantially planar relationship with the rail of a door, window or the like, with a slot formed therethrough, to be mounted within substantially the thickness of the rail, comprising a front cover plate having a pair of parallel guide plate means spaced apart substantially the height of the slot on one face thereof arranged to project into said slot of said rail, a tubular baffle member having upper and lower walls having engagement with said guide plate means and slidable within the limits of the ends of said slot between said guide plate means, said baffle having forward and rearward walls, a rear cover plate member coupled to said guide plate means, said front cover plate and rear cover plate having aligned ventilating holes and said forward and rearward walls of said baffle having aligned ventilating holes separated by lands, the holes of said baffle and said cover plates being aligned in one slidable position of said tubular baffle member, the lands of said baffle obscuring said ventilating holes in said front and rear cover plates in another position of said baffle member, end closure members for the opposite ends of said front cover plate, said guide plate means and end closure members each having outstanding ribs arranged to be co-planar and forming, with the front cover plate, a screen retaining slot along the edges of said plate and end members, said rear cover member having a centrally dished wall portion between said guide plate means, said dished wall portion defining a limit slot and control knob means within said dished portion and having a shank extending through said limit slot and coupled to said tubular baffle member.

3. A ventilator arranged to be positioned in a substantially planar relationship with the rails of doors, windows or the like having a ventilator receiving slot formed therethrough, comprising a front cover plate having a pair of spaced, integral, outwardly deflectible, rearwardly extending guide plates on one face thereof, a tubular baffle having front and rear faces and upper and lower walls, said walls, respectively, slidingly engaging said guide plates, latching ledges formed adjacent the rearmost ends of said guide plates, said ledges including cam surface portions, a rear cover plate member having latching means including cam portions and holding shoulders, said latching ledges of said guide plates and said latching means of said rear cover member being shiftable into interfitting relationship by movement of said rear plate toward said

front plate, the cam surfaces of said plates and said rear cover plate being positioned to deflect said plates outwardly in the course of said movement of said rear plate, a slot defined by said rear plate, a control knob having a shank slidably extending through said slot and having an inner end coupled to said baffle, said front and rear cover plates having aligned ventilating apertures and said baffle having ventilating apertures selectively shiftable into alignment with and out of registry with said apertures of said front and rear cover plates.

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