

Aug. 12, 1958

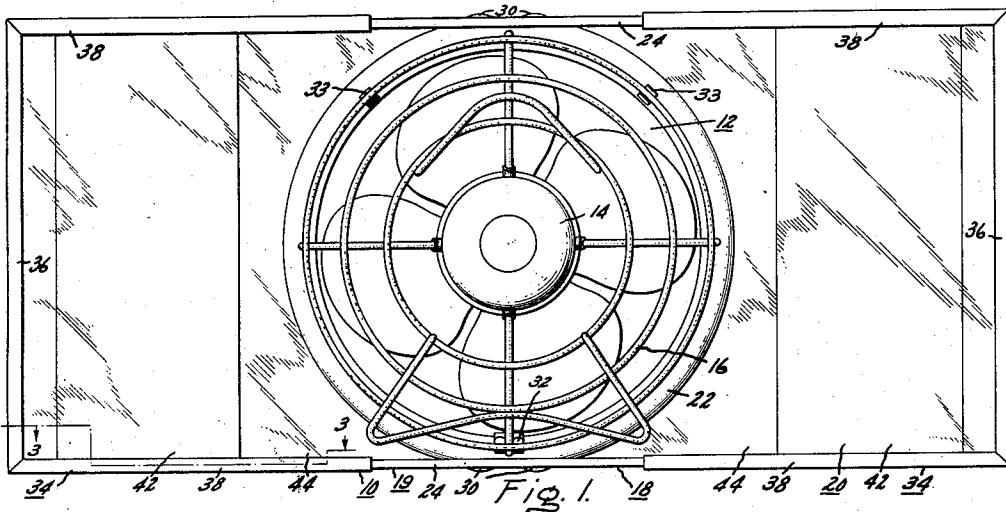
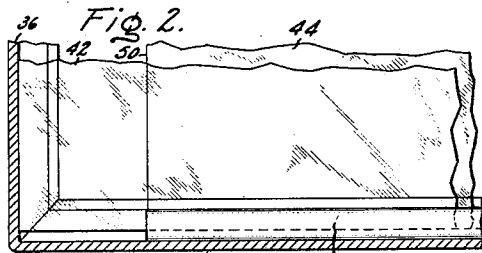
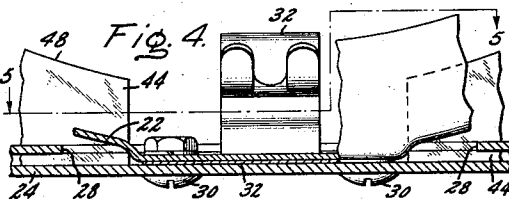
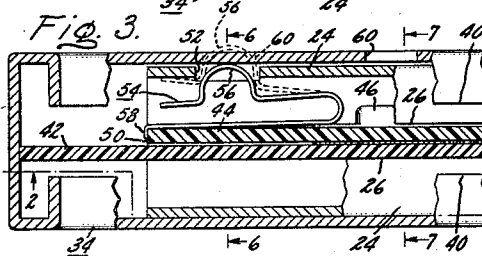
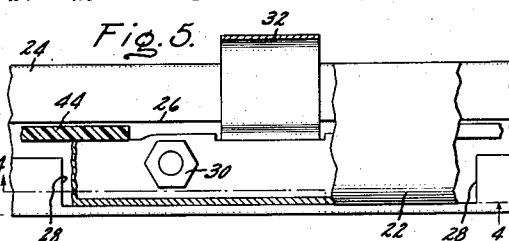
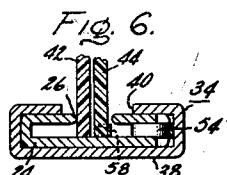
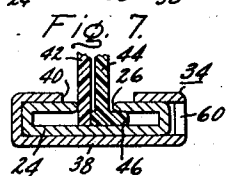
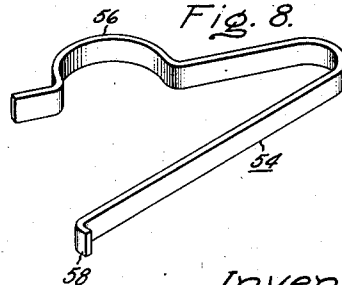
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2,846,936

WINDOW VENTILATOR CONSTRUCTION

Filed June 13, 1955

2 Sheets-Sheet 1



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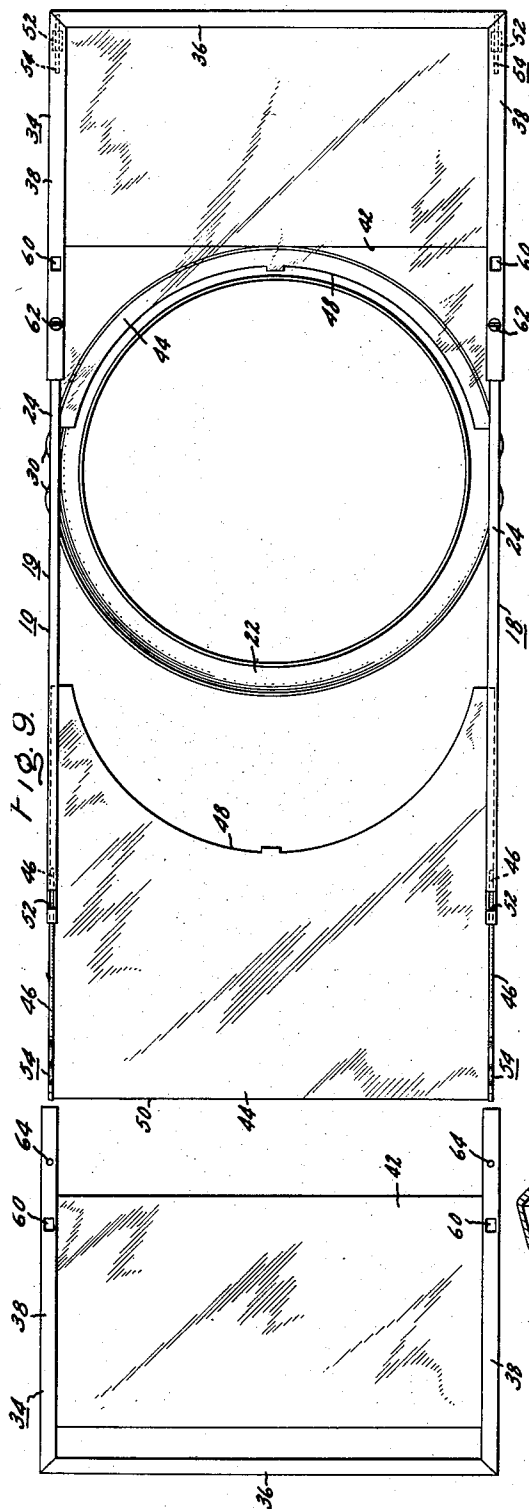
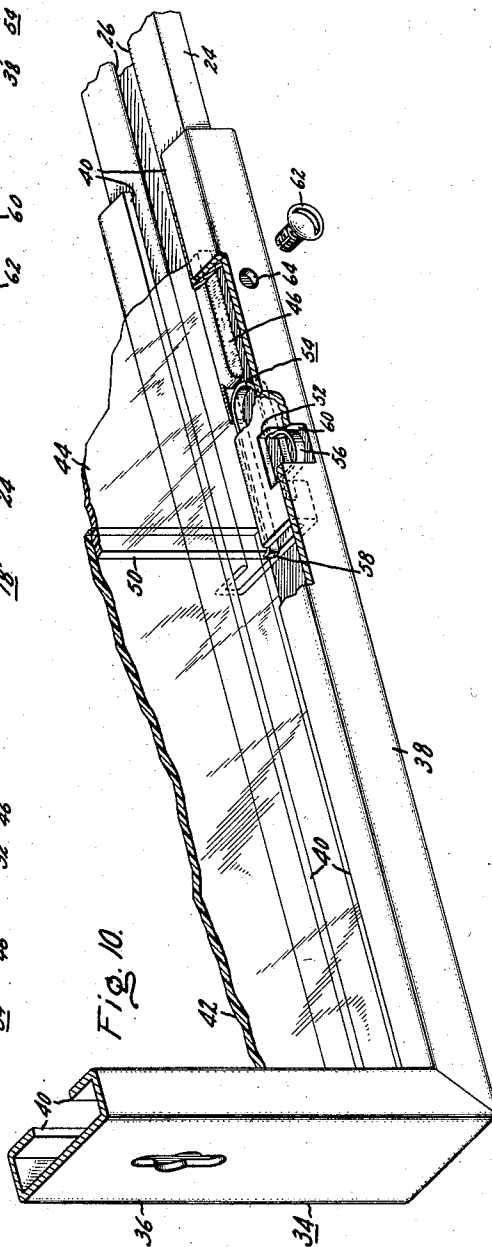
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WINDOW VENTILATOR CONSTRUCTION

Filed June 13, 1955

2 Sheets-Sheet 2



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1

2,846,936

WINDOW VENTILATOR CONSTRUCTION

William M. Copeland, Stratford, Conn., assignor to General Electric Company, a corporation of New York

Application June 13, 1955, Serial No. 515,014

7 Claims. (Cl. 98—94)

This invention relates to window ventilators and particularly to a fan assembly supporting structure which is adjustable to various window widths and includes substantial transparent portions.

In the window ventilator art two serious problems exist: first, that of providing window ventilators which are adjustable to fit the various window widths that occur in existing houses and apartments, and secondly, that of preventing the blocking out of outside light by the ventilator.

It is an object of this invention to provide an improved window ventilator which is readily adjustable to the width of the window frame in which it is to be mounted.

It is another object of the invention to provide an improved window ventilator which has substantial transparent portions and, therefore, does not block out an appreciable amount of outside light.

The objects of this invention are accomplished in one form by providing in a window ventilator, a fan mounting structure which is of adjustable width and which incorporates a substantial transparent panel.

Other objects and further details of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawings wherein:

Figure 1 is an elevation view of a window ventilator incorporating my invention.

Figure 2 is a sectional view taken substantially on line 2—2 of Figure 3.

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 1 after the ventilator has been extended slightly relative to the Figure 1 showing and on a larger scale.

Figure 4 is a sectional view taken substantially on line 4—4 of Figure 5.

Figure 5 is a sectional view taken substantially on line 5—5 of Figure 4.

Figure 6 is a sectional view taken on line 6—6 of Figure 3.

Figure 7 is a sectional view taken on line 7—7 of Figure 3.

Figure 8 is a perspective view of a mounting spring.

Figure 9 is an elevation view of the fan assembly mounting structure showing its details and those of its components.

Figure 10 is a perspective view of a portion of the window ventilator showing the manner in which a mounting spring cooperates with its associated structure to mount the transparent panel.

Referring to the drawings and particularly to Figure 1, it will be seen that the window ventilator essentially comprises two main parts: the mounting structure 10 and the fan assembly 12. The fan assembly 12 generally comprises a fan-motor unit 14 and an associated wire guard 16. The mounting structure generally comprises a frame 18, a panel 20 and an orifice ring 22. The fan assembly may be detachably mounted to the orifice ring. The details of the fan assembly and its connection to the

2

orifice ring are not included herein for the reason that they form no specific part of my invention. They are, however, disclosed and claimed in the copending application of Alfred W. Wakeman and myself, which is being filed concurrently with this application and is assigned to the assignee of the instant application.

The frame 18 comprises a central section 19 and a pair of end sections 34. Central section 19 is made of a pair of spaced, parallel, C-shaped rails 24 to which is secured the orifice ring 22. The rails 24 each have an opposed longitudinal slot 26. The central portion of one side of each of the rails 24 is cut away at 28 to permit a portion of the orifice ring 22 to lie adjacent to the base of the rails 24 and to be secured thereto by conventional securing means 30. This is shown in Figures 4 and 5 where a clip 32 is also illustrated as being secured to one of the rails 24 by the same means that secures the orifice ring to the rail. Clip 32 is part of the means for detachably supporting the fan assembly 12 which also includes hangers 33 (see Fig. 1) and which is covered in the referred-to application of Alfred W. Wakeman and myself and, therefore, will not be described. It should be clearly understood, however, that for the purposes of the instant invention, it is not necessary that the fan assembly be detachably mounted and, therefore, the clip 32 could be eliminated and the fan assembly could be rigidly secured to the orifice ring 22 in any conventional manner.

Secured to each side of the central section 19 is an end section 34. Each end section is U-shaped in general configuration, comprising a central portion 36, which as viewed in Figures 1 and 2, is vertically disposed and a pair of parallel upstanding portions 38, which as viewed in Figures 1 and 2 are horizontally disposed. As can be seen in Figures 3, 6 and 7, the end sections are generally C-shaped in cross-section. The opening in the C is formed by a slot 40 which extends completely throughout the inner sides of the end sections.

Each of the end sections 34 is secured to the central section 19 of the mounting structure by being slid on the rails 24 so as to telescope said rails within the portions 38 of the end sections. The cross-sectional area of the rails 24 is slightly less than the cross-sectional area of the space in the portions 38, hence, the end sections 34 may be moved relative to the central section 19 of the mounting structure to thereby vary the overall width of the ventilator. See Figure 9 wherein the left-hand end section has been completely removed from the central section.

The panel 20 enclosing the space between the frame and the orifice ring, may be transparent (glass or plastic) and comprises a plurality of sub-panels. Referring to the left-hand side of Figure 1, though both sides are correspondingly constructed, this portion of the frame supports end sub-panel 42 and central sub-panel 44. Both of the sub-panels have portions that extend through the slot 40 in the end section 34 and the slots 26 in the rails 24. In Figures 3, 7 and 10 it will be observed that the central sub-panel 44 has a perpendicular flange 46 formed at its lower edge (one is also formed at its upper edge). These flanges are positioned so as to extend interiorly of the rails 24 and thereby prevent disassembly of the sub-panels from the rails in the event the rails spread apart relative to each other.

As can best be seen in Figure 9, wherein it is partially removed from the central section 19, the central sub-panel 44 is straight on three of its sides and has a concave, arcuate fourth side 48. Arcuate side 48 is positioned adjacent to one side of the orifice ring 22. The straight side 50 of sub-panel 44, opposite to the arcuate side 48, extends away from the orifice ring substantially the same distance as the rails 24 (see Figs. 3 and 9). Near the

3

free ends of each of the rails 24 in one of their side walls are formed the openings 52. Disposed in each of the rails 24 adjacent to each of the openings 52 is a mounting spring 54, the details of which are shown in Fig. 8. The mounting springs have several functions, one of which is to retain the central sub-panel 44 securely in position within the rails 24 so as to remain relatively immovable regardless of movement of the end sections 34 or the sub-panels 42.

Mounting springs 54 are irregularly shaped, being generally hairpin shaped, but having in one of their legs an arcuate projecting bend 56, and having the other of their legs extending beyond the bent leg and terminating in a bent-over end 58. As can best be seen in Figs. 3 and 10, the springs 54 maintain the sub-panels 44 in position by virtue of their exerting pressure laterally against the sides of the sub-panels due to their being placed in compression when they are fully mounted. Note the difference between their unstressed condition (Fig. 8) and their stressed condition (Figs. 3 and 10). The springs are retained in position by virtue of having their bends 56 seated in openings 52 in the rails 24 and exerting force against the adjacent internal sides of end section portions 38. The bent ends 58 on the springs constitute limiting means for the sub-panels 44 by contacting and restraining the straight sides 50 of the sub-panels 44.

As can be clearly seen in Figs. 3 and 10, end sub-panels 42 overlap the sub-panels 44 to some extent and have portions which extend solely within the end sections 34. It should be understood that when one of the end sections 34 is moved relative to the central section 19 of the mounting structure, the sub-panel 42 is moved with it in order to maintain a complete panel within the overall frame of the window ventilator at all times. During such movement, the central sub-panel 44 is maintained in position by the mounting springs 54.

In order to avoid inadvertent, complete removal of the end sections from the central section, a stop arrangement is effected by providing an opening 60 in a side wall in each of the end section portions 38 which is adjacent the side walls of rails 24 that have openings 52 formed therein (see Fig. 9). As shown in dotted lines in Fig. 3 and perspective in Fig. 10, when an end section 36 is pulled to the point whereby the openings 60 overlie the openings 52, the bends 56 of the springs 54 spring into the openings 60 and lock the end sections to the rails. It should, therefore, be apparent that in addition to maintaining the sub-panels 44 in position relative to the orifice ring 22, the springs 54 comprise a safety stop and locking arrangement for preventing the inadvertent disassembly of the ventilator parts. If it is desired to intentionally disassemble the end sections from the central section, the exertion of a separating force will cause the bends 52 to retract from the openings 60 and permit complete separation.

In addition to the foregoing, the mounting springs 54 perform the function of maintaining both sub-panels 44 and 42 securely in adjusted position by forcing them against one side of slot 26, thereby permitting automatic retention in adjusted position and precluding any transverse wobbling of the sub-panels within the frame.

Whereas the left-hand portion of the window ventilator of Fig. 1 has been described in detail, it should be clearly understood that the right-hand portion corresponds, and also that while only one of the springs has been illustrated in Fig. 3 and its operation described, each of the rails 24 supports a spring 54 at each of its free ends, thereby providing four mounting springs for the entire ventilator mounting structure. See Fig. 9, which illustrates the frame with the right-hand side positioned so as to be of minimum length, and the left-hand side disassembled so as to show details of the parts.

In operation, in order to expand the frame of the mounting structure, it is simply necessary to pull the end

4

sections 34 away from the central section 19. Complete removal of the end sections is avoided by the safety stops provided by the bends 56 of the mounting springs 54 and the openings 60 in the portions 38. In order to reduce the width of the ventilator, it is simply necessary to force the end sections toward each other. The frame parts are normally maintained in adjusted position by the springs 54. If it is desired to effect a more rigid connection, means are provided for this purpose. This means is clearly shown in Figs. 9 and 10 in the form of set screws 62 provided in openings 64 formed in the positions 38; these elements permit the frame to be more rigidly retained in adjusted position than when retained solely by the tension of springs 54. This effect is accomplished by tightening the screws in their openings until they bite into the rails 24. The screws are normally not needed, but can be used when desired, as when the frame is mounted in a tall, narrow casement window. Regardless of the position of adjustment, due to the fact that the sub-panels are all transparent, no substantial blocking out of outside light occurs. If this feature is not desired, of course, the sub-panels may be other than transparent.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the example illustrated, and I contemplate that various and other modifications will occur to those skilled in the art. It is, therefore, my intention that the appended claims will cover such modifications and applications as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A fan assembly mounting structure comprising an adjustable frame and an adjustable panel, said frame comprising a central section and end sections, said sections being movable relative to each other to expand or contract said frame, said panel comprising a plurality of sub-panels mounted in said frame, some of said sub-panels being movably mounted with respect to the central and end sections of said frame so as to permit expansion or contraction of said panel when said frame is expanded or contracted, and a flange integrally formed at an edge of one of said sub-panels, one of said frame sections having a portion thereof partially surrounding and engaging said flange for preventing disassembly of said one of said sub-panels from the frame section in the event the frame section is spread apart.

2. A device as defined in claim 1 wherein said movable sub-panels overlap their adjacent sub-panels.

3. A device as defined in claim 1 wherein said central section comprises a pair of spaced rails having portions C-shaped in cross-section, said end sections are U-shaped in general configuration and have portions C-shaped in cross-section, and wherein one of the cross-sections is larger than the other to permit the portions having the smaller cross-section to be slidably received in the other portions.

4. A device as defined in claim 3 wherein the openings in said C-shaped portions form open sides in said rails and end sections which face inwardly, and said sub-panels are mounted in said open sides.

5. In a window ventilator, a frame section, said frame section comprising spaced generally parallel walls, a hole formed in one of said walls, a panel positioned between said spaced walls, a spring comprising two generally parallel legs self-urged away from each other, said spring being positioned in said frame section with one leg in contact with one wall and the other leg in contact with said panel to thereby resiliently restrain said panel from transverse movement between said side walls, an arcuate protruding bend formed in one leg of said spring, said bend extending into said hole to thereby restrict movement of said spring within said frame, and a transverse bend formed in the other leg of said spring, said transverse bend extending over said panel to thereby restrict

5

said panel from longitudinal movement in a plane generally parallel to said walls.

6. In a window ventilator, a first frame section, said frame section comprising spaced generally parallel walls, a hole formed in one of said walls, a spring comprising two generally parallel legs self-urged away from each other positioned between the walls of said first frame section, a protruding bend formed in one of the legs of said spring, said bend extending into said hole to thereby restrict movement of said spring within said frame, a second frame section, a wall formed on said second frame section slidably positioned with respect to said one of said walls of the first frame section, said wall formed on said second frame section being confined for movement in a plane generally parallel to the walls of said first frame section, and a hole formed in the wall of said second frame section for selectively receiving said protruding bend to thereby releasably lock said frame sections to each other.

7. A fan assembly mounting structure comprising an adjustable frame and an adjustable panel, said frame comprising a central section and end sections, said sections being movable relative to each other to expand or contract said frame, said panel comprising a plurality of sub-panels mounted in said frame, some of said sub-panels being movably mounted so as to permit expansion or contraction of said panel when said frame is expanded

6

or contracted, and a spring comprising two generally parallel legs self-urged away from each other, said spring being positioned in said frame with one leg in contact with said frame and the other leg in contact with one of said sub-panels to thereby resiliently restrain said one of said sub-panels from transverse movement within said frame, an arcuate protruding bend formed in one leg of said spring, a hole formed in one of said frame sections, said bend extending into said hole to thereby restrict movement of said spring within said one of said frame sections, and a transverse bend formed in the other leg of said spring, said transverse bend extending over said one of said sub-panels to thereby restrict said one of said sub-panels from longitudinal movement in a plane generally parallel to the plane of said frame.

References Cited in the file of this patent

UNITED STATES PATENTS

353,171	Skinner	Nov. 23, 1886
1,086,317	Forsyth	Feb. 3, 1914
1,234,925	Moss	July 31, 1917
1,784,234	Hueglin	Dec. 9, 1930
1,988,810	Ross	Jan. 22, 1935
2,021,684	Faber	Nov. 19, 1935
2,658,441	Johnson	Nov. 10, 1953
2,715,495	SeBastian	Aug. 16, 1955