

Nov. 8, 1949

G. J. BELTER

2,487,294

AIR MOVING DEVICE

Filed Nov. 7, 1947

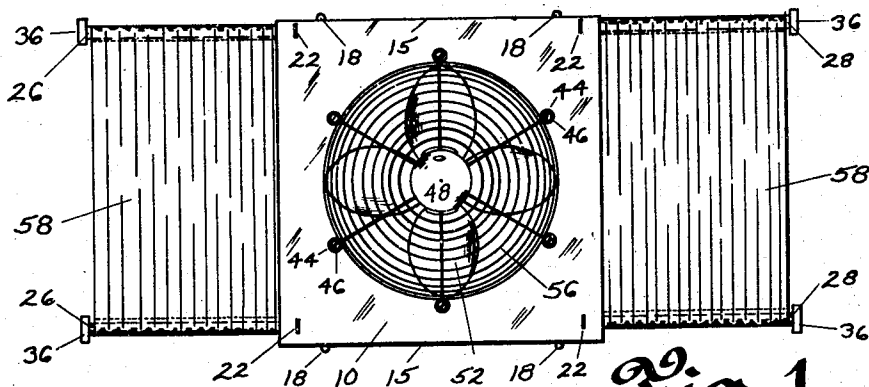


Fig. 1

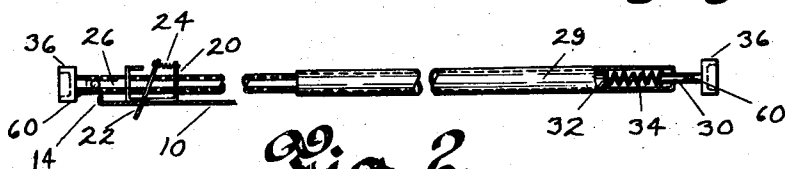


Fig. 2

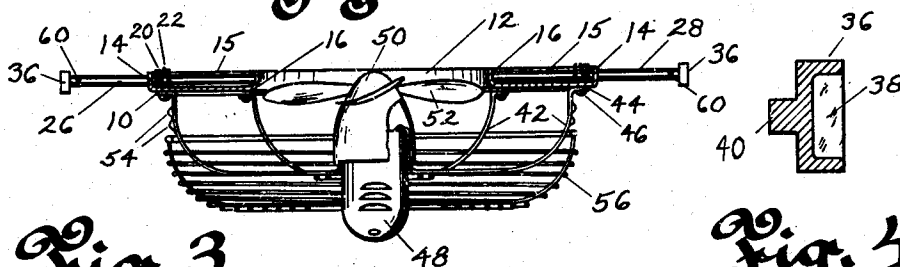


Fig. 3

Fig. 4

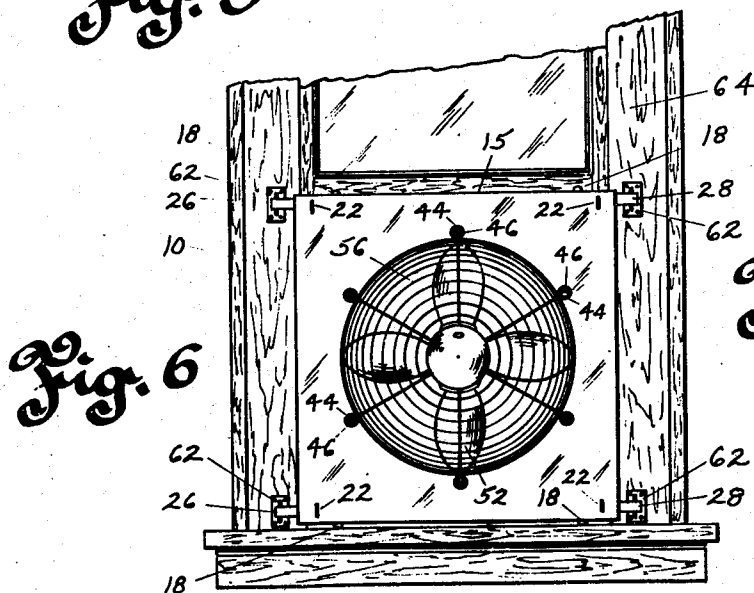


Fig. 6

Fig. 5

INVENTOR
George J. Belter

BY
Ray Eilers
ATTORNEY

UNITED STATES PATENT OFFICE

2,487,294

AIR MOVING DEVICE

George J. Belter, St. Louis, Mo.

Application November 7, 1947, Serial No. 784,678

8 Claims. (Cl. 98-94)

1

2

This invention relates to improvements in air-moving devices. More particularly, this invention relates to an improved air-moving device that can be positioned and operated in a window or other opening of a building.

It is, therefore, an object of the present invention to provide an improved air-moving device which can be positioned and operated in a window or other opening of a building.

Air-moving devices which are intended to be positioned and operated in the windows or other openings of a building are customarily provided with baffles that have central openings to receive a motor-driven fan; and the edges of the baffles extend to the sides and sills of the window frames and to the lower edges of the window sashes. The baffles thus permit air from the fan to pass through the windows or other openings of the buildings, while keeping that air from leaking back to the area it originally occupied. In those instances where the air-moving devices are designed for use in certain windows or certain openings of particular buildings, it is possible to dimension the baffles to just fit those openings or windows. However, it is not customary to select certain windows or openings in particular buildings and make the baffles to fit those windows or openings, for such a practice would be excessively expensive; instead, it is customary to make the baffles adjustable so they can fit into windows or openings of varying width.

Various types of adjustable baffles have been proposed for air-moving devices that are to be positioned and operated in windows or other openings in buildings; and one such baffle has an apertured central panel and two extensible wings. The aperture in the central panel permits air to pass through the window or other opening of the building, and the wings extend outwardly from the sides of the central panel to engage the sides of the window frame. The central panel and the wings are of thin sheet metal; the wings normally being positioned behind the portions of the central panel that are between the aperture and the edges of that panel, but being extensible outwardly to press against the sides of the window frame. These wings will keep air, moved by the fan, from leaking back to the area it originally occupied; and they will keep rain, dust and dirt from entering the window or other opening in which the air-moving device is operated. However, the thin, sheet metal wings tend to vibrate and to flap when gusts of wind strike the air-moving device; and this vibration and flapping makes the operation

of such air-moving device quite noisy. In addition, the fact that the sheet metal wings lie behind those portions of the central panel which are between the aperture and the edges of that panel means that the metal wings can be no wider than those portions of the central panel; else the metal wings would project into the aperture or out beyond the edges of the central panel when they are in telescoped position. Because the metal wings are no wider than the portions of the central panel between the aperture and edges of that panel, the amount of adjustment cannot be more than twice the distance between the aperture and edge of the central panel. Moreover, the metal wings must be quite thin to avoid undue weight and cost; and as a result they are easily bent and damaged. For these various reasons air-moving devices, which are provided with an apertured central panel that has thin metal wings, are objectionable. The present invention obviates these objections by providing an air-moving device which has telescoping tubes at the top and bottom of the central panel that are adjustable and that support collapsible, non-metallic, air-impervious wings. These telescoping tubes possess considerable strength while being capable of spanning a window or other opening which is approximately twice as wide as the central panel. The collapsible, non-metallic wings are free from flapping and they make no noise, and they can be used with central panels which have narrow portions between the apertures and edges thereof. It is therefore an object of the present invention to provide an air-moving device with telescoping tubes at the top and bottom of the central panel that are adjustable and that support collapsible, non-metallic, air-impervious wings.

Another adjustable baffle that has been used with air-moving devices included accordion-type pleated wings which extended outwardly from the edges of the central panel. The pleated wings could be folded to accommodate a narrow window and could be extended to accommodate a large window. While the pleated wings occupied less room than the sheet metal wings, they were more expensive to make and they were not sturdy. As a result they could easily be damaged. The present invention obviates any such damage by using telescoping tubes to support collapsible wings; the tubes acting to provide solidity and strength for the wings.

In still another air-moving device, a baffle was provided which had a central panel of wood

and an outer portion of cloth. The central panel was set solidly in the window or other opening of the building, and the cloth extended between the central panel and the window frame. Such a baffle is usable in installations of a generally permanent nature, but it will not permit the air-moving device to be used interchangeably in windows or other openings of different sizes. Consequently, a baffle of this type is far less desirable than the baffle provided by the present invention.

In the air-moving device provided by the present invention, a guard is provided around the moving parts. That guard is readily removable to facilitate cleaning of the moving parts and to permit oiling of the motor. By having this construction, the present invention makes it possible to place the air-moving device in a window or other opening of a building, to operate that air-moving device for considerable periods of time, and to remove the guard for cleaning and oiling the device without necessitating removal of the device from the window. Such a construction is far more satisfactory than prior constructions which failed to guard the moving parts or which had to be removed from the window for cleaning. It is therefore an object of the present invention to provide an air-moving device with a removable guard.

In those prior air-moving devices which had adjustable wings to accommodate windows of different widths, it was customary to provide wing nuts which could be loosened to permit setting of the wings and which could be tightened to hold the wings in position. Such wing nuts are usable, but they tend to be rather unhandy. The present invention obviates the use of wing nuts by providing automatic spring locks which operate to permit ready extension of the telescoping tubes but automatically set themselves to prevent accidental telescoping of the tubes. When the user of the air-moving device of the present invention is setting that device in the window or other opening of a building, all he need do is to pull on the tubes; and those tubes will easily move into holding position. While in that position they cannot be retracted without releasing the locking devices. Releasing of the locking devices permits ready telescoping of the tubes. It is therefore an object of the present invention to provide automatic locking devices for holding the telescoping tubes of an air-moving device in extended position.

In the air-moving device of the present invention, a tensioning device is provided which maintains tension in the telescoping tubes. With such a device it is possible to attain a considerable amount of tension between the telescoping tubes and the frame of the window or other opening in the building. That tension prevents skidding, slipping, or rattling of the tubes relative to the frame of the window or other opening in the building. As a result, an unusually quiet and sturdy construction is provided.

With the air-moving device of the present invention, no tools of any kind are needed to install the device. The installation merely requires that the air-moving device be set in the window, the tubes be extended until they touch the grooves which guide the sash of the window, and the collapsible, non-metallic wings be slipped and spaced along the extended ends of the tubes. It is therefore an object of the present invention to provide an air-moving device that can be

installed in a window or other opening without the use of tools.

The wings in the air-moving device of the present invention are preferably weatherproof, acid proof, non-inflammable, and translucent. Where this is the case, the wings safely protect the interior of the building against weather, they provide an attractive appearance for the air-moving device, and they permit light to pass through the window. It is therefore an object of the present invention to provide an air-moving device with translucent, weather proof, acid proof, and non-inflammable wings.

Where desired, a number of the air-moving devices of the present invention can be used in juxtaposition to fill the opening or window of a building. This is easily accomplished by having the ends of the tubes of one air-moving device telescope over the ends of the tubes of an adjacent air-moving device. As a result, a succession of the air-moving devices can be set in juxtaposition and used to fill almost any size or width of window or other opening in a building. It is therefore an object of the present invention to provide air-moving devices with frames that can telescope into each other so the devices can be operated in juxtaposition.

Other and further objects and advantages of the present invention should become apparent from an examination of the drawing and accompanying description.

In the drawing and accompanying description two preferred embodiments of the present invention are shown and described but it is to be understood that the drawing and accompanying description are for the purposes of illustration only and do not limit the invention and that the invention will be defined by the appended claims.

In the drawing, Fig. 1 is a front elevational view of an air-moving device that is made in accordance with the principles and teachings of the present invention, and it shows the telescoping tubes of that device as they are extended outwardly from the center panel of the device.

Fig. 2 is a partially sectioned plan view of another form of air-moving device that is made in accordance with the principles and teachings of the present invention.

Fig. 3 is a partially sectioned plan view of the air-moving device of Fig. 1, and it emphasizes the manner of supporting the fan motor and guard of that device.

Fig. 4 is a cross sectional view of the resilient bearing element used in the air-moving device of Figs. 1 and 2.

Fig. 5 is an end elevational view of the resilient bearing device of Fig. 4, and

Fig. 6 is a front elevational view of the air-moving device of Fig. 1 as that device is hung in proximity to a very narrow window.

Referring to the drawing in detail, the numeral 10 denotes the central panel of an air-moving device. That central panel is shown as being approximately square, but obviously it could be made so one dimension thereof was longer than the other dimension. The panel 10 is provided with a centrally disposed aperture 12, and that aperture is spaced only a short distance inwardly from the edges of the central panel 10. The side edges 14 of the central panel 10 are folded to provide a stiffening of the central panel 10, and the top and bottom edges 15 of the central panel are also folded to assist in

5

stiffening the central panel. The portion 16, of the central panel 10, which forms the aperture 12 is folded to form an annulus. This annulus not only assists in stiffening the central panel 10 but it also tends to form a venturi for the air-moving device.

The top and bottom edges 15 of the central panel 10 are provided with buttons 18 of rubber or other resilient material; and those buttons are intended to press against the window sill and against the bottom of the movable sash of the window. The buttons 18 permit the air-moving device to rest on the sill of the window and to have the window sash rest on the top of the panel 10 without transmitting vibrations from the air-moving device to the window frame or to the window sash.

The rear face of the central panel 10 supports four generally C-shaped guide clamps 20, and those guide clamps are provided with latch members 22. The latch members 22 extend through openings in the front faces of the guide clamps 20 and extend through openings in the central panel 10. The latch members 22 and the opposed walls of each of the guide clamps 20 have openings therethrough that are in register with each other and that can receive telescoping tubes 26 and 28. These tubes have a circular cross section, and one of the tubes telescopes within the other. However, the circular cross section is not necessary since tubes with rectangular, triangular, C-shaped, and many other cross sections can be used. A desirable cross section of tube is one that enables the outer tube to confine and support the end of the inner tube; but such a cross section is not absolutely necessary since it is possible to have the guide clamps 20, at the opposite sides of central panel 10, displaced relative to each other and to have those clamps act as the sole support and guide for the tubes. In such a case, the tubes may have any suitable configuration, and they may be solid or hollow. The primary requirements of the tubes 26 and 28 are that they be sturdy and that they be extensible and retractible relative to the central panel 10.

The openings in the opposed walls of the guide clamps 20 are larger than the outer diameters of the tubes 26 and 28, and the tubes 26 and 28 can easily move relative to the guide clamps 20. The openings in the latch members 22 also are larger than the diameters of the tubes 26 and 28; and the tubes 26 and 28 can easily move relative to the latch members 22 when the latch members 22 are perpendicularly disposed of said tubes. When, however, the latch members 22 are inclined in the direction of movement of the tubes 26 and 28, the latch members 22 will resist movement of those tubes. Springs 24 normally hold the latch members 22 inclined to the tubes 26 and 28 in such a manner that those tubes cannot be retracted. However, a light pressure on those ends of the latch members 22, which project through openings in the central panel 10, will overcome the force of the springs 24, thus freeing the tubes 26 and 28 for retracting movement. While the springs 24 enable the latch members 22 to resist retraction of the tubes 26 and 28, those springs permit ready extension of those tubes. More specifically, the springs 24 permit the tubes 26 and 28 to move the latch members 22 toward the perpendicular as the tubes are being extended, thus freeing the tubes for such movement. Once that movement is completed, the springs 24 hold the latch mem-

6

bers 22 at an inclination to the tubes 26 and 28 and prevent retraction of those tubes. An inwardly projecting end is provided on each guide clamp 20, and those ends keep the latch members 22 from moving too far while the tubes 26 and 28 are being extended. In the absence of those ends on the guide clamps, the latching members 22 could become inclined to the tubes 26 and 28 and prevent ready extension of those tubes. With the ends dimensioned as shown in the drawing, the guide clamps 20 hold the latch members 22 against movement from one inclined position through the perpendicular to an inclined position on the far side.

The tubes 26 and 28 are hollow, and the tube 26 telescopes into the tube 28. The telescoping tubes 26 and 28 cooperate with each other to form a sturdy extensible structure, and this structure is solidly secured to the central panel 10 by means of guide clamps 20. The guide clamps 20 at the right hand side of the central panel 10 are similar to those at the left hand side of that panel, but they are set so the spring 24 is at the left side thereof and so the inwardly projecting end is at the right side thereof. With this arrangement, extension of the tubes 26 and 28 can occur easily because the outward movement of those tubes tends to move the latch members 22 toward the perpendicular and free the tubes 26 and 28 for unimpeded movement. The minute the tubes 26 and 28 are permitted to stop, the springs 24 will pull the latching members 22 into latching position, thus preventing retracting movement of the tubes 26 and 28. It is thus possible to set the central panel 10 in a window in a structure, grasp the projecting ends of the telescoping tubes 26 and 28, move those tubes until their ends engage the grooves which guide the sash of the window, and then release the tubes. Immediately, the springs 24 will pull the latch members 22 into locking engagement with tubes 26 and 28, thus preventing telescoping movement of the tubes 26 and 28. In this simple and automatic manner, the tubes 26 and 28 can be extended and then automatically held against accidental telescoping movement. Purposeful telescoping movement, as required to remove the air-moving device from the window or other opening in the structure, can easily be accomplished by pressing the inner ends of latch members 22 toward the center of the panel 10. Such action moves the latching members 22 until they are parallel to the side walls of the guide clamps 20, whereupon the telescoping tubes 26 and 28 can easily be telescoped.

The hollow telescoping tubes may have constant diameters throughout, as shown in Fig. 1; or one of the tubes may have a constant diameter throughout the greater portion of its length, and then have the right hand end thereof provided with an opening which is narrower than the rest of the tube, as shown in Fig. 2. The tube is denoted by the number 29, and it carries a secondary tube 30 which has its outer end projecting outwardly beyond the right hand end of tube 29. The secondary tube 30, with its outwardly flared inner end, is positioned within the right hand end of the tube 29; the flare on the inner end of the tube 30 being larger than the reduced-diameter opening of the telescoping tube 29. The secondary tube 30 and the telescoping tube 29 are assembled before the diameter of the right hand end of tube 29 is reduced; and the reduction in the diameter of that end will maintain tubes 29 and 30 in assembled relation. A stop 32 is pro-

7

vided within the tube 29 and that stop is spaced inwardly from the flared end of the secondary tube 30. Stop 32 supports a helical compression spring 34, and that spring bears against the flared end of tube 30 to bias that tube outwardly of the telescoping tube 29. This construction makes it possible to compress spring 34 and thus create a tension in the secondary tube 30 and the telescoping tube 29. Such tension is very helpful in holding the central panel 10 against vibration, shifting or skidding when the air-moving device is positioned in a window or other opening in a building.

The air-moving device is also held against vibration, skidding, or slipping by the resilient bearing members 36. These bearing members are preferably of rectangular configuration, and they are preferably provided with cavities 38 in the bearing faces thereof. The cavities 38 render the walls of the resilient bearing members 36 quite thin, thus making the bearing faces of members 36 quite resilient. The bearing members 36 may be made of rubber, synthetic rubber, polyvinyl acetate, or other resilient material. Projections 40 are provided on the rear faces of the bearing members 36, and those projections extend into the open ends of the hollow tubes 26, 28, and 30, thus securing the bearing members 36 to those tubes.

With this arrangement movement of the tubes 26 and 28, or movement of the tubes 26, 29, and 30, against the frame of a window or other opening in a structure will create a compressive force in the resilient elements 36; and, in the case of tubes 26, 29 and 30, such movement will also create a compressive force in the helical spring 34. These forces will cooperate with the anti-frictional surfaces of elements 36 to hold the tubes 26 and 28, or the tubes 26, 29 and 30, against skidding, slipping or vibration. The compressibility of the bearing members 36 and the springs 34 will enable the tubes 26 and 28, or the tubes 26, 29 and 30, to be extended so far that the bearing members 36 and springs 34 occupy less space than normal; and their resilience will maintain a constant pressure on the frame of the window or other opening in the structure.

A frame 42 of bowl-shaped configuration is provided for the air-moving device, and that frame has a number of loops 44 at the edge thereof. Rubber grommets fit within the loops 44; and those grommets receive screws or bolts 46 which seat in the central panel 10 or pass through the central panel 10 and seat in nuts which are positioned behind the central panel 10. The rubber grommets absorb much of the vibration which is transmitted to the frame 42 by the fan, and the grommets tend to keep that vibration from being transmitted to the central panel 10. The grommets are not prominently shown in the drawing since the heads of the screws 46 overlie the grommets. The frame 42 has axially directed fingers that engage and confine the motor housing 48 of the air-moving device. These fingers are bolted to the motor housing 48; and thus the frame 42 directly supports the motor housing. While the motor housing 48 is directly secured to the frame 42, and while the frame 42 is directly secured to central panel 10, the rubber grommets prevent undesired vibration of the central panel 10.

A streamlined fan hub 50, which has an internal diameter that is larger than the housing 48, telescopes over the inner end of motor housing 48 and the axially-extending fingers of frame 42. This hub cooperates with the motor housing 48 to provide a smooth streamlined appearance for the

8

motor of the air-moving device. Fan blades 52 are secured to the streamlined fan hub 50, and those blades direct air through the aperture 12 in the central panel 10. The venturi form of the aperture 12 assists the fan blades 52 in directing the air.

The frame 42 is provided with spaced lugs 54, and those lugs are positioned adjacent the central panel 10. These spaced lugs are intended to facilitate the securement of a replaceable guard 56 to the frame 42. The guard 56 has an outer band or ring which can snap into the space between the lugs 54 on the frame 42. Once in the spaces between the lugs 54, the ring of the guard 56 will remain there and will resist accidental dislodgment. However, that ring of guard 56 can be momentarily bent and disturbed to ease successive portions of the periphery of the ring from the space between the lugs 54. This makes it possible to mount the guard 56 on the frame 42, thus protecting the fingers of passersby from the moving parts of the device; and yet makes it unnecessary to remove the air-moving device from the window or other opening in the building to clean the fan blades, oil the fan motor, or clean the guard. With this construction, it is only necessary to snap the inner ring of the guard 56 out of the space between the lugs 54, perform the various cleaning and oiling operations, and then snap the guard 56 back into assembled relation with frame 42.

The tubes 26 and 28, or tubes 26, 29 and 30, are normally telescoped together; and when so telescoped, the ends of those tubes are immediately adjacent the side edges of the central panel 10. In that position the tubes can engage the grooves, which guide the sash of a narrow window, and thus hold the air-moving device in position. Those same tubes can also hold the air-moving device in position in a wider window; and in such a case it is only necessary to extend the telescoping tubes 26 and 28, or tubes 26, 29 and 30, outwardly until the bearing members 36 thereon engage the grooves which guide the sash of the window. Where the window was narrow, the central panel 10 was substantially coextensive with the window and no air could bypass the fan. Where, however, the window was wider, the central panel 10 was spaced from each of the side edges of the window frame. To keep air from passing through the space between the edges of the central panel 10 and the side edges of the window frame, wings 58 of flexible material are provided. These wings have headings, which are passages formed by folding the upper and lower edges of the material of the wings 58 and securing those folded edges to the body of the wings along lines spaced inwardly from the folds, and which fit over the ends of the telescoping tubes 26 and 28, or tubes 26, 29 and 30, to secure the wings 58 to those tubes. The wings are preferably made of a flexible but closely woven fabric, or an air-impervious but flexible plastic. One very good material which is usable in making the wings 58 is Velon. The material is made by the Firestone Industrial Products Company of Akron, Ohio, and it is weatherproof, flexible, acid proof, translucent, and substantially non-inflammable. While it is preferred that the wings 58 possess each of these features, it is only necessary that those wings have flexibility and substantial imperviousness to air.

The wings 58 are held in position and solidly supported by the tubes 26 and 28 or the tubes 26, 29 and 30, and thus the wings 58 need not have any particular strength. The wings 58 are quite flexible, and they can be compressed together or

extended outwardly in the same manner that the housewife spaces the folds of a curtain for a window. Consequently, it is easy for even inexperienced users to quickly grasp the purpose of the wings 58 and to adjust them so they have a smooth and attractive appearance.

By having the tubes 26 and 28 capable of being telescoped into each other and by having the wings 58 of compressible material, it is possible to have the air-moving device fit windows of greatly varying widths. In one construction where a sixteen (16) inch fan was to be supported, the central panel 10 was made twenty-two (22) inches square and each telescoping tube was made about twenty-two (22) inches long. That air-moving device was installed and operated in windows as narrow as twenty-three (23) inches wide and was installed and operated in windows as wide as forty-two (42) inches. Thus, that device could accommodate an amazing range of window widths. This is quite novel since air-moving devices which are provided with sixteen (16) inch fans and are provided with sheet metal wings, and are intended to accommodate windows forty-two (42) inches in width, must have central panels that are about twenty-nine (29) or thirty (30) inches wide. Such a device cannot fit the narrow windows which the air-moving device of the present invention fits so nicely. The large amount of adjustment possible with the air-moving device of the present invention is due to the fact that the tubes 26 and 28, or tubes 26, 29, and 30, do not interfere with or overlie the aperture 12 of the central panel 10. Consequently, the adjustment of tubes and the wings will not interfere with the operation of the air-moving device. Moreover, the solid support which the tubes give to the wings makes this large adjustment possible without any decrease in strength or rigidity.

Not only can the air-moving device of the present invention be set in windows which are slightly wider than that device, but it also can be used with windows which are narrower than it is. This desirable result is accomplished by providing the tubes 26, 28, and 30 with vertically disposed holes 60 immediately adjacent the outer ends of those tubes. The holes 60 will fit down over the vertically disposed pins of pin plates 62 which can be secured either to the front or sides of the window frame 64. The tubes 26 and 28 are shown in Fig. 6 as being secured to pin plates 62 on the front of the window frame 64, but those pin plates could just as well be mounted on the inner edges of frame 64. Since the pin plates 62 can be secured either to the front or side edges of the window frames, it is possible for the air-moving device of the present invention to accommodate windows which have recessed frames as well as the more usual type of frame.

The rubber bearing members 36 will usually fit into the grooves, which receive and guide the window sashes. Those grooves will cooperate with the side walls of the bearing members 36 to prevent shifting or slipping of the tubes 26, 28, 29 and 30. The members 36 are preferably rectangular in configuration and preferably have one edge longer than the other. Where this is done, the members 36 can be set vertically to accommodate narrow grooves in the window frame, or they can be set horizontally to accommodate wide grooves in the window frame. This further assures prevention of vibration or shifting of the air-moving device.

The upper telescoping tubes 26 and 28 are located immediately adjacent the folded edges 15

at the top of the central panel 10, but the lower telescoping tubes 26 and 28 are spaced above the folded edge 15 at the bottom of the central panel 10. This is done to avoid pinching of the user's fingers when the buttons 18 on the lower edge 15 of the central panel 10 are set down into the groove which normally receives the bottom of the movable sash of the window. In the absence of this upward displacement of the tubes 26 and 28, those tubes would be partially or completely within the groove in the bottom of the window frame, thus making it difficult for the user to grasp the lower headings on the wings 58 when spacing those wings along the lengths of the tubes 26 and 28.

Where desired, a number of the air-moving devices of the present invention can be placed in tandem to fill a large window or other opening in a building. This is easily done by removing the rubber bearing members 36 at the adjacent ends of two air-moving devices and then telescoping the tubes of one of those devices into the tubes of the other of those devices. The tubes 26 of each air-moving device are uniformly smaller than the tubes 28 since they telescope into them, and thus the tubes 26 of one air-moving device can easily telescope into the tubes 28 of an adjacent air-moving device. This permits a number of the air-moving devices to fit together and form a united structure that is resistant to slipping, shifting or moving.

Whereas two preferred embodiments of the present invention have been shown and described in the drawing and accompanying description it should be obvious to those skilled in the art that various changes may be made in the form of the invention without affecting the scope thereof.

What I claim is:

1. An air-moving device that comprises a fan-carrying central panel with an aperture therein, a motor, a plurality of rigid telescoping tubes slidably carried at the top and bottom of said central panel between the aperture and the upper and lower edges of said panel, said tubes being movable to engage the side edges of a window frame, wings supported by said tubes and extending between the same, said wings being of flexible, relatively air-impervious material and having the form of curtains that can be collapsed into a multiplicity of folds of varying length or can be extended, bearing elements carried by the ends of said tubes, said bearing elements having one dimension longer than the other and being insertable in narrow and wide grooves in said window frame, a frame that supports the motor of the air-moving device, a guard releasably secured to said motor-supporting frame, said lower tubes being spaced upwardly above the lower edge of said central panel, and a secondary tube that is carried by one of said telescoping tubes and is biased outwardly of said tube.

2. An air-moving device that comprises a central panel with an aperture therein, a plurality of telescoping tubes at the top and bottom of said central panel, said tubes being movable to engage the side edges of the frame of a window or other opening in a building, wings supported by said tubes, said wings being of flexible, relatively air-impervious material and having the form of curtains, and resilient bearing elements carried by the ends of said tubes, said bearing elements having one dimension longer than the other and being insertable in narrow and wide grooves in said frame.

3. An air-moving device that comprises a fan-

carrying panel with an aperture therein, wing-supporting means having upper and lower arm-like elements slidably carried by said panel adjacent the upper and lower edges of the panel for extension outwardly beyond the edges of said panel, said wing-supporting means being movable to engage the side edge of the frame of a window or other opening in a building, and a wing supported along its length by said arm-like elements and extending between the same, said wing being of flexible, relatively air-impervious material that can be collapsed into a multiplicity of folds of varying lengths or can be extended.

4. An air-moving device that comprises a central panel with an aperture therein, a plurality of telescoping tubes at two spaced points on said central panel, said tubes being individually movable to engage the side edges of the frame of a window or other opening in a building, wings supported by said tubes, said wings being of flexible, relatively air-impervious material, and resilient bearing elements carried by the ends of said tubes, said bearing elements having one dimension longer than the other whereby said bearing elements can fit within grooves of varying width in said frame.

5. An air-moving device that comprises a central fan-carrying panel with an aperture therein, upper and lower rigid arm-like elements slidably carried by said central panel between the aperture and the upper and lower edges of the panel for extension outwardly beyond the edges of said central panel, said arm-like elements being adapted to engage the side edges of the frame of a window or other opening in a building, wings supported along their length by said arm-like elements and extending therebetween, said wings being of flexible, relatively air-impervious material that can be collapsed into a multiplicity of folds of varying length or can be extended, and openings in said arm-like elements that facilitate the hanging of said air-moving device adjacent said window or other opening.

6. An air-moving device that comprises a central fan-carrying panel with an aperture therein, upper and lower rigid arm-like elements slidably carried by said central panel between the aperture and the upper and lower edges of the panel for extension outwardly beyond the edges of said central panel, wings supported by said elements, said wings being collapsible into a multiplicity of folds of varying length and extensible, and openings in said elements that facilitate the hanging of said air-moving device adjacent a window or other opening.

7. An air-moving device that comprises a panel with an aperture therein, a plurality of arm-like elements that are extensible outwardly beyond an edge of said panel, holding means on said panel adjacent said arm-like elements that are releasably engageable with said arm-like elements to hold them in extended or retracted position, and a collapsible wing that is supported along its length by said arm-like elements, said ele-

ments being individually movable relative to said panel, said holding means being individually releasable to permit individual setting of said arm-like elements relative to said panel, said arm-like elements projecting outwardly beyond said edge as cantilevers, said wing having headings at the top and bottom thereof which telescope over and are slidable along said arm-like elements.

8. An air-moving device comprising a fan-carrying panel with an aperture therein, a wing adapted to extend outwardly beyond one edge of said fan-carrying panel toward the side edge of the frame of a window or other opening of a building, and a support for said wing, said support including upper and lower rigid arm-like elements, means for adjustably supporting said elements on said panel adjacent the upper and lower edges of said panel, said support being movable relative to said panel and being movable adjacent the side edge of the frame of said window or other opening, said wing being adapted to substantially fill the space between said upper and lower arm-like elements and said one edge of said fan-carrying panel and said side edge of said frame of said window or other opening, said wing being of flexible, relatively air-impervious material that can be collapsed into a multiplicity of folds of varying length or can be extended, said wing being supported along its length by said arm-like elements and extending between said arm-like elements.

GEORGE J. BELTER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
230,487	Miller	July 27, 1880
950,505	Baker et al.	Mar. 1, 1910
1,241,660	Roberts	Oct. 2, 1917
1,306,845	Andrews	June 17, 1919
1,409,050	Jurisch	Mar. 7, 1922
1,470,606	George	Oct. 16, 1923
1,681,206	Witter	Aug. 21, 1928
1,698,328	Duffie	Jan. 8, 1929
1,699,751	Pukerud	Jan. 22, 1929
1,769,922	Harris	July 8, 1930
1,777,087	Holden	Sept. 30, 1930
1,784,234	Hueglin	Dec. 9, 1930
1,868,980	Hueglin	July 26, 1932
1,917,327	Preston	July 11, 1933
1,988,810	Ross	Jan. 22, 1935
2,015,848	Hamm	Oct. 1, 1935
2,052,453	Dollinger	Aug. 25, 1936
2,279,271	Williams	Apr. 7, 1942
2,296,635	Foehrenbach et al.	Sept. 22, 1942
2,436,344	Winogron	Feb. 17, 1948

FOREIGN PATENTS

Number	Country	Date
182,358	Great Britain	July 6, 1922