

Nov. 10, 1953

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2,658,441

ROOM VENTILATING DEVICE

Filed Nov. 30, 1949

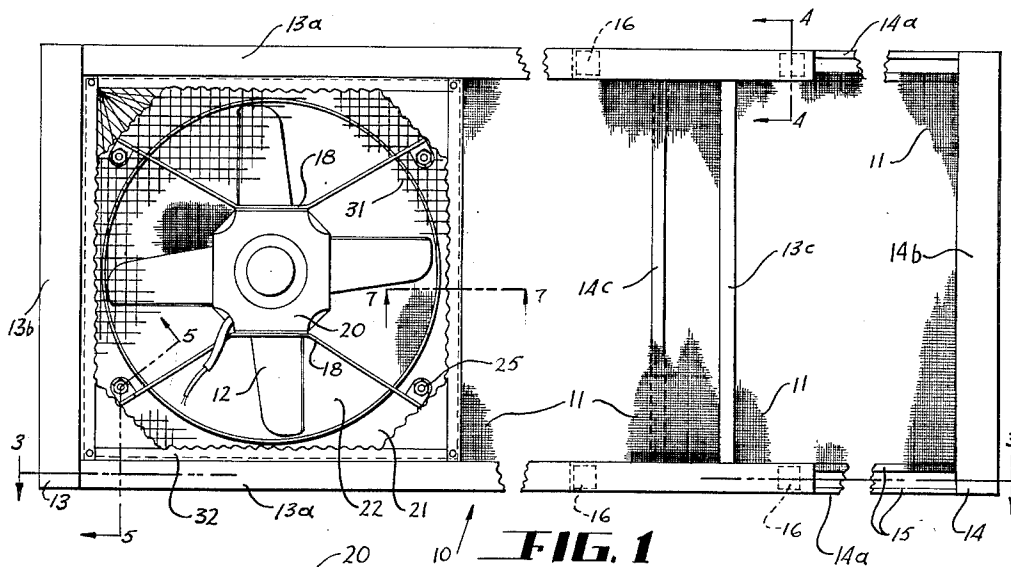


FIG. 1

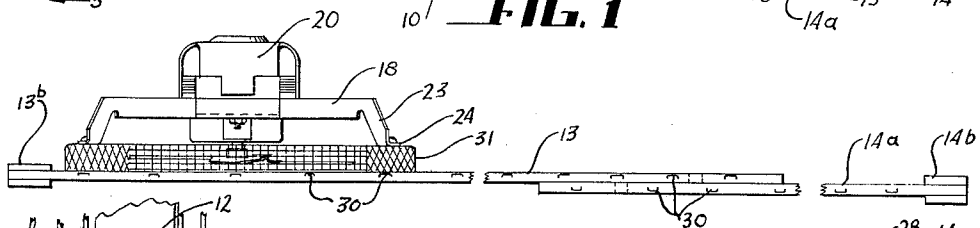


FIG. 2

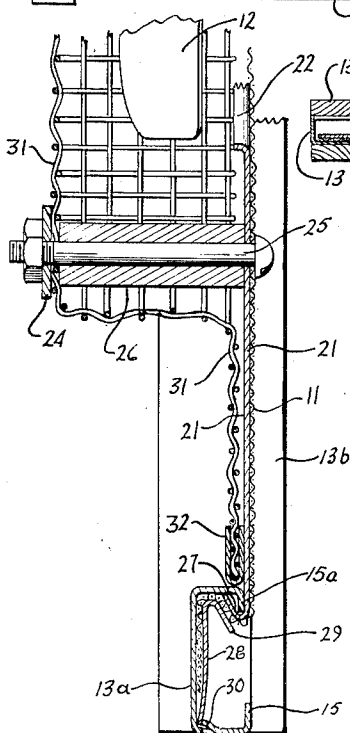


FIG. 3

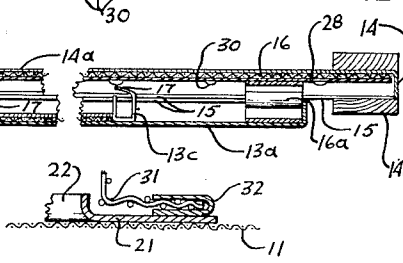


FIG. 4

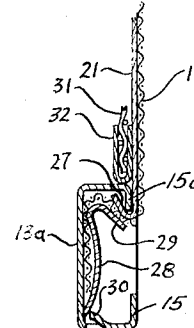


FIG. 5

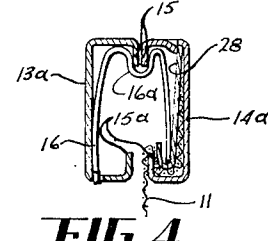


FIG. 6

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2,658,441

ROOM VENTILATING DEVICE

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Application November 30, 1949, Serial No. 130,252

8 Claims. (Cl. 98—94)

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This invention relates to a room ventilating device.

One object of the invention is to provide a ventilating device adapted to be removably mounted in a window and to circulate air through the window opening while maintaining that opening fully screened.

A further object of the invention is to provide a ventilating device which provides adequate circulation through the window without material obstruction of vision through the window.

A further object of the invention is to provide a ventilating device including an adjustable screen and a motor driven fan mounted on said screen.

A further object of the invention is to provide an adjustable screen with means for mounting a motor driven fan thereon without restricting the adjustment of the screen.

A further object of the invention is to provide a combined screen and motor driven fan of a simple construction which can be produced at a relatively low cost and which is of light weight.

Other objects of the invention may appear as the device is described in detail.

In the accompanying drawings, Fig. 1 is a front elevation, partly broken away, of a ventilating device embodying the invention, showing the same in an operative position; Fig. 2 is an edge view of the ventilating device, partly broken away; Fig. 3 is a longitudinal section taken on the line 3—3 on Fig. 1 through overlapping portions of one pair of the side bars of the screen frame; Fig. 4 is a cross section taken through overlapping portions of the side bars on the line 4—4 on Fig. 1; Fig. 5 is a section taken on the line 5—5 of Fig. 1; Fig. 6 is a section similar to Fig. 5 showing the clamping bar in its initial form; and Fig. 7 is a section taken on the line 7—7 of Fig. 1.

In these drawings I have illustrated a preferred embodiment of the invention, but it is to be understood that the device as a whole, as well as the several parts thereof, may take various forms without departing from the spirit of the invention.

The ventilating device comprises a main, or screen, frame 10 which is provided with screen material 11 and on which is mounted a motor driven fan 12 which is arranged to circulate air through a portion of the screen material. In the particular form here illustrated, the frame is rectangular in form and is adapted to be mounted in a window between the sill and the lower sash rail. Preferably the frame is formed in two sections, 13 and 14, which are slidably connected

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one with the other to enable them to be adjusted in accordance with the width of the window in which the screen is to be mounted. Each frame section comprises a longitudinal member, or coil, designated 13a and 14a respectively, an outer end member, 13b and 14b, and an inner end member, 13c and 14c, which is preferably spaced from the inner ends of the side members. Preferably the side members and the inner end member of the frame sections are formed of sheet metal and the outer end members are formed of wood and are here shown as having their ends slotted to receive the end portions of the respective side members. Thus the outer end members rigidly connect the side members of the respective frame sections one with the other, impart substantial rigidity to the frame as a whole and support the weight of the window sash which rests on the screen frame. The corresponding side members 13a and 14a of the two frame sections are supported one upon the other and are preferably in the nature of channel bars each having inwardly extending flanges 15 and 15a and arranged with their channels in opposed relation one to the other. The superposed channel bars may be slidably connected one with the other in any suitable manner and in the present instance, each channel bar of each frame section is provided adjacent the inner end thereof with a connecting, or slide, member 16 rigidly secured in the channel thereof and having a part extending into and slidable in the channel of the opposed channel bar of the other frame section. This slide member may be of any suitable character and may be connected with the opposed channel bars in any suitable manner. In the form here illustrated each slide member comprises a substantially U-shape piece of metal, the two parts, or legs, of which are substantially parallel one with the other and with the transverse walls of the respective channel bars, and are of a transverse length approximating the distance between the side walls of said channel bars. A clamping member, such as a bar, 20, is mounted in each channel bar of each frame section and extends for the full distance between the end members of that frame section and has adjacent the inner side wall of the channel bar an inward turned edge 21 forming a groove to receive the end of that leg of the slide member which moves in the channel of that bar. At its other, or outer, edge the clamping member is secured to the channel bar adjacent the outer side wall thereof, as by providing the outer side wall with inwardly pressed projections 30 which overlap the edge

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portion of the clamping member. Thus one of the parallel parts of each slide member is secured to the transverse wall of one channel bar and the other of said parallel parts has sliding engagement with the clamping member in the other channel bar, with its inner edge extending into the groove formed by the inturned edge 29 of that clamping member. Preferably the transverse part of the U-shape slide member is formed with a recess 16a which embraces the adjacent flanges 15 of the two channel bars to hold the same against relative transverse movement without interfering with the relative sliding movement thereof. The relative longitudinal outward movement of the two frame sections may be limited in any suitable manner to prevent the separation thereof, and, in the present instance, the inner end members 13c and 14c of each frame section are provided with projections 17 which extend into the corresponding channel bars of the other section so that the corresponding projections of the two sections will engage one with the other to limit the outward movement of the sections.

Each section of the frame is provided with a section of screen material 11 which is secured at one end to the outer end member 13b or 14b, of that section and at its other end to the inner end member, 13c or 14c, thereof. The lateral edge portions of the screen material extend across the inturned flanges 15a of the respective channel bars of the frame section and have their said edge portions bent about the said flanges between the flanges and the clamping members, and are pressed tightly against said flanges and rigidly secured thereto by the clamping member 28. Preferably each lateral edge portion of the screen material extends between the clamping member and the transverse wall of the channel bar with which it is connected for a substantial portion of the width of that wall.

The clamping member 28 may be inserted in or secured in the channel bar in any suitable manner but in practice it has been found desirable to curve the transverse portion of the clamping member inwardly about a longitudinal axis, as shown in Fig. 6, and thus decrease the width of the clamping member to enable it to be easily inserted in the channel bar. After the screen material has been bent about the edge of the channel bar and the clamping member inserted therein the curved portion of the clamping member is subjected to heavy pressure or flatten the same and to force it to a position substantially parallel with and close to the transverse wall of the channel bar, thus moving the outer edge thereof into contact with the projections 30 of the channel bar and forcing the inturned edge portion 29 thereof into tight engagement with the screen material which extends about the inner flange 15a of the channel bar.

Mounted on one of the frame sections, in the present instance section 13, is an air circulating device, preferably a motor operated fan 12. This fan is supported in front of and in line with a portion of the screen material on the frame section on which it is mounted and it is so mounted on the frame section that it does not interfere with the relative adjustment of the two frame members. Consequently, when said frame members are at the inner end of their relative movement a substantial portion of the screen material on the other section, 14, will also be in line with the fan. Any suitable means may be provided for mounting the fan unit on the main screen

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frame and in the present arrangement a supplemental frame is supported on one section of the main frame and comprises transverse members 18 which are spaced laterally one from the other to receive between them the fan motor and to which the motor casing 20 is rigidly secured. The transverse members may be supported on the main frame in any suitable manner, but preferably a supporting structure, such as a panel 21, is mounted at its lateral edges on the channel bars of the frame section 13a, extends across that frame section and is provided with an opening, or passage, 22 through which air may be circulated by the fan. In the illustrated arrangement, the supplemental frame members 18 are provided with downwardly extending parts 23 having laterally extending lower end portions 24 which are secured to the supporting member 21 by bolts 25. These bolts extend through the supporting member and through the portions 24 of the supplemental frame members, and a spacing member 26 is mounted about each bolt between the supporting member and the corresponding portion 24 of the frame member, thus rigidly securing the supplemental frame, and therefor the motor, to the main frame and supporting the same in spaced relation to the main frame. The fan 12 is, in the present instance, directly connected with the motor shaft and is supported thereby between the transverse supplemental frame members 18 and the supporting member 21, so as to rotate in a plane adjacent to and substantially parallel with the supporting member.

The supporting member, or panel, 21 may be connected with the channel bars of the main frame in any suitable manner. Preferably it is formed of relatively stiff sheet metal and is of such width that the lateral edge portions thereof extend across the inner flanges 15a of the channel bars 13a. These edge portions are bent inwardly to provide the supporting member with hook-shape portions 27 which extend into the respective channel bars and are hooked about the inner flanges 15a thereof. The screen material 11 extends across that surface of the supporting member which is opposite the fan and its lateral edge portions are bent about the hook-shape portions 27 of the supporting member and into engagement with the inclined surfaces of the latter and with the transverse walls of the channel bars. The clamping member 28, when inserted in the respective channel bars, clamps the screen material against the hook-shape portions of the supporting member and against the inturned flanges 15a of the channel bars beyond the inner end of the supporting member.

It is also desirable to provide the fan with a guard of such a character that the air may pass freely through the same. Such a guard may be of any suitable perforated material and in the present instance is formed of large mesh and relatively stiff wire fabric 31. The central portion of this fabric is pressed outwardly to form a substantially circular housing which extends between the fan blades and the transverse portions of the supplemental frame and about the edges of the blades. The bolts 25 extend through the outer portion of the housing and clamp the same tightly to the spacing members 26. The lateral edges of the guard material are rigidly secured to the supporting structure or panel, as by gripping the several edges thereof between U-shaped binding strips 32 which are rigidly secured to the supporting member.

It will be apparent that a ventilating device

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so constructed can be easily inserted in a window and will cause an adequate circulation of air through the screen and in the room while maintaining the window opening fully screened, and without materially obstructing vision through the window.

While I have shown and described one embodiment of my invention, I wish it understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a room ventilating device, a frame section comprising laterally spaced channel bars, adjacent side walls of the two bars having oppositely extending flanges, a supporting member between said bars having at its lateral edges hook-shape parts extending about the flanges of the respective channel bars, a section of screen material having edge portions extending into the respective channel bars and engaging the hook-shape portions of the supporting member, means within said channel bars for firmly securing said screen material and said supporting member to said channel bars, and a motor operated fan mounted on said supporting member.

2. In a room ventilating device, a frame section comprising laterally spaced channel bars, the adjacent side walls of the two bars having oppositely extending flanges, a supporting member between said bars having at its lateral edges hook-shape portions extending about the flanges of the respective channel bars, a section of screen material having edge portions extending into the respective channel bars and engaging the hook-shape portions of the supporting member, a clamping member in each channel bar having a transverse portion adjacent the transverse portion of said bar, having at one edge thereof an intumed portion in gripping engagement with the screen material on the hook-shape portion of said supporting member and having the other edge thereof in tight engagement with a part of said channel bar to retain said intumed portion in gripping engagement with said screen material, and a motor operated fan mounted on said supporting member.

3. In a room ventilating device, a frame section comprising laterally spaced channel bars, the adjacent side walls of the two bars having oppositely extending flanges, a fan supporting structure having lateral edge portions extending across said flanges into the respective channel bars adjacent one end of said frame section, a section of screen material having edge portions extending across said flanges into said channel bars, and devices in said channel bars engaging the respective edge portions of said screen material and clamping the same to said flanges and to said edge portions of said supporting member and clamping said supporting member to said channel bars.

4. In a room ventilating device, a screen frame comprising two frame sections, each including two parallel channel bars rigidly connected one with the other in laterally spaced relation, means slidably connecting the corresponding channel bars of the two frame sections one with the other with the channels thereof in opposed relation one to the other, a section of screen material extending across each frame section for substantially the full length thereof and having lateral edge portions extending across the inner side

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walls of the channel bars of that section, means within said channel bars for securing said edge portions of said screen material thereto, a fan supporting member extending across the outer end portion of one of said frame sections and across the screen material thereon, means securing the lateral edge portions of said supporting member to the channel bars of the other of said frame sections, and a fan mounted on said supporting member.

5. In a room ventilating device, a screen frame comprising two frame sections, each including two parallel channel bars rigidly connected one with the other in laterally spaced relation, means slidably connecting the corresponding channel bars of the two frame sections one with the other with the channels thereof in opposed relation one to the other, a section of screen material extending across each frame section for substantially the full length thereof with its lateral edge portions extending across the inner side walls of the channel bars of that section and into the channels of said bars, a fan supporting member extending across the outer end portion of one of said frame sections and having a passage there-through in line with the screen material on said frame section, the lateral edge portions of said supporting member extending into the channels of the respective channel bars of said frame section, means within the respective channel bars of said frame section for securing said screen material and said supporting member thereto, and a fan mounted on said supporting member.

6. In a room ventilating device, a screen frame comprising two frame sections, each including two parallel channel bars and end bars rigidly connecting said channel bars one with the other in laterally spaced relation, the adjacent side walls of the channel bars of each frame section having oppositely extending flanges, means slidably connecting the corresponding channel bars of the two frame sections one with the other with the channels thereof in opposed relation one to the other, a section of screen material extending across each frame section for the full distance between said end members with its lateral edge portions extending across the flanges of the respective sections and into said channel bars, a fan supporting member extending across the outer end portion of one of said frame sections and having a passage therethrough in line with the screen material on said section, said supporting member having intumed lateral edge portions extending into the respective channel bars of that section in engagement with the edge portions of said screen material, a clamping member in each channel bar of said frame section securing said screen material and said supporting member thereto, clamping members in the channel bars of the other frame section securing the intumed edges of the screen material thereon to said channel bars, and a fan mounted on said supporting member.

7. In a screen assembly, a pair of adjustably mounted screen frame members, each of said screen frame members including a pair of parallel channel bars, a pair of spacing members attached to the channel bars and cooperating therewith to form a frame section having a rectangular opening, at least one end of each channel bar projecting beyond the opening, each of said channel bars including inwardly directed flanges, the outer side wall of each channel having inwardly directed projections, a section of screen material covering the rectangular open-

ing formed by the channel bars and the spacing members, the lateral edge portions of the screen material extending across the inturned flanges of the pair of channel bars, the lateral edge portions being bent about the flanges, a pair of clamping members, one for each of the pair of channel bars in a screen member, each clamping member having one margin abutting said inwardly directed projections, the opposite margin of the clamping member having an inturned edge portion cooperating with the channel bar to clamp said lateral edge portion of the screen member, said clamping member extending the full length of the channel bar, the channel bars of one screen frame member being arranged with their channels opposed to the channel bars of the other screen member, and substantially U-shaped pieces, the legs of which are substantially parallel one with the other and with the transverse walls of the respective channel bars, one leg of each U-shaped piece being fixedly secured in one channel, the other leg being slidably mounted in the channel of the adjacent channel bar so as to permit overlapping adjustment of the screen frame members.

8. In a screen assembly, a pair of adjustably mounted screen frame members, each of said screen frame members including a pair of parallel channel bars, a pair of spacing members attached to the channel bars and cooperating therewith to form a frame section having a rectangular opening, at least one end of each said channel bar projecting beyond the opening, each of said channel bars including inwardly directed flanges, a section of screen material covering the rectangular opening formed by the channel bars and the spacing members the lateral edge portions of the screen material extending across the

inturned flanges of the pair of channel bars, each lateral edge portion being bent about the flange, a pair of clamping members, one for each of the pair of channel bars in a screen member, each of said clamping members having an inturned edge portion cooperating with the channel bar to clamp said lateral edge portion of the screen member, said clamping member extending the full length of the screen member and extending from the lateral edge of the screen member to the opposite wall of the channel, and means for holding the clamping member in fixed position relative to the wall of the channel bar opposite the lateral edge of the screen material, the channel bars of one screen frame member being arranged with their channels opposed to the channel bars of the other screen member, and a plurality of substantially U-shaped pieces, the legs of which are substantially parallel one with the other and with the transverse walls of the respective channel bars, one leg of each U-shaped piece being fixedly secured in one channel, the other leg being slidably mounted in the channel of the adjacent channel bar so as to permit overlapping adjustment of the screen frame members.

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