

Feb. 4, 1936.

H. E. CAMPBELL ET AL

2,029,610

WINDOW VENTILATOR

Filed Jan. 21, 1933

3 Sheets-Sheet 1

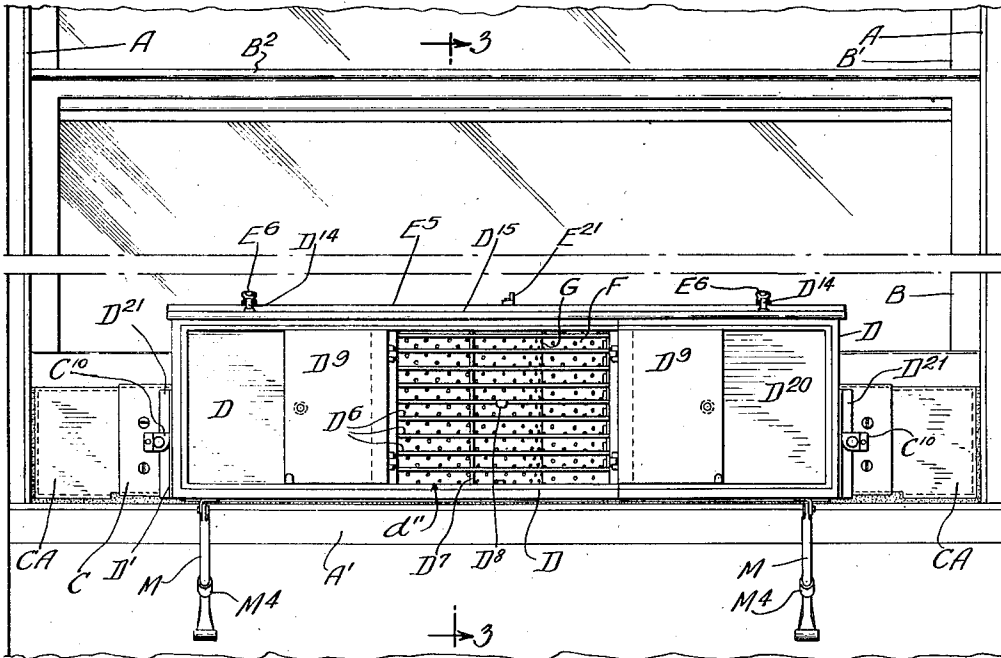


Fig. 1.

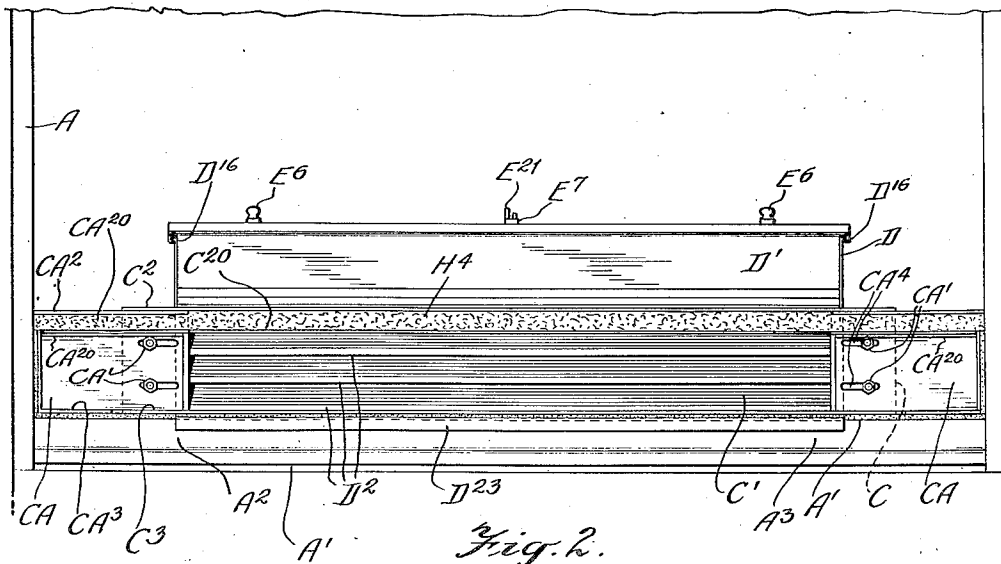


Fig. 2.

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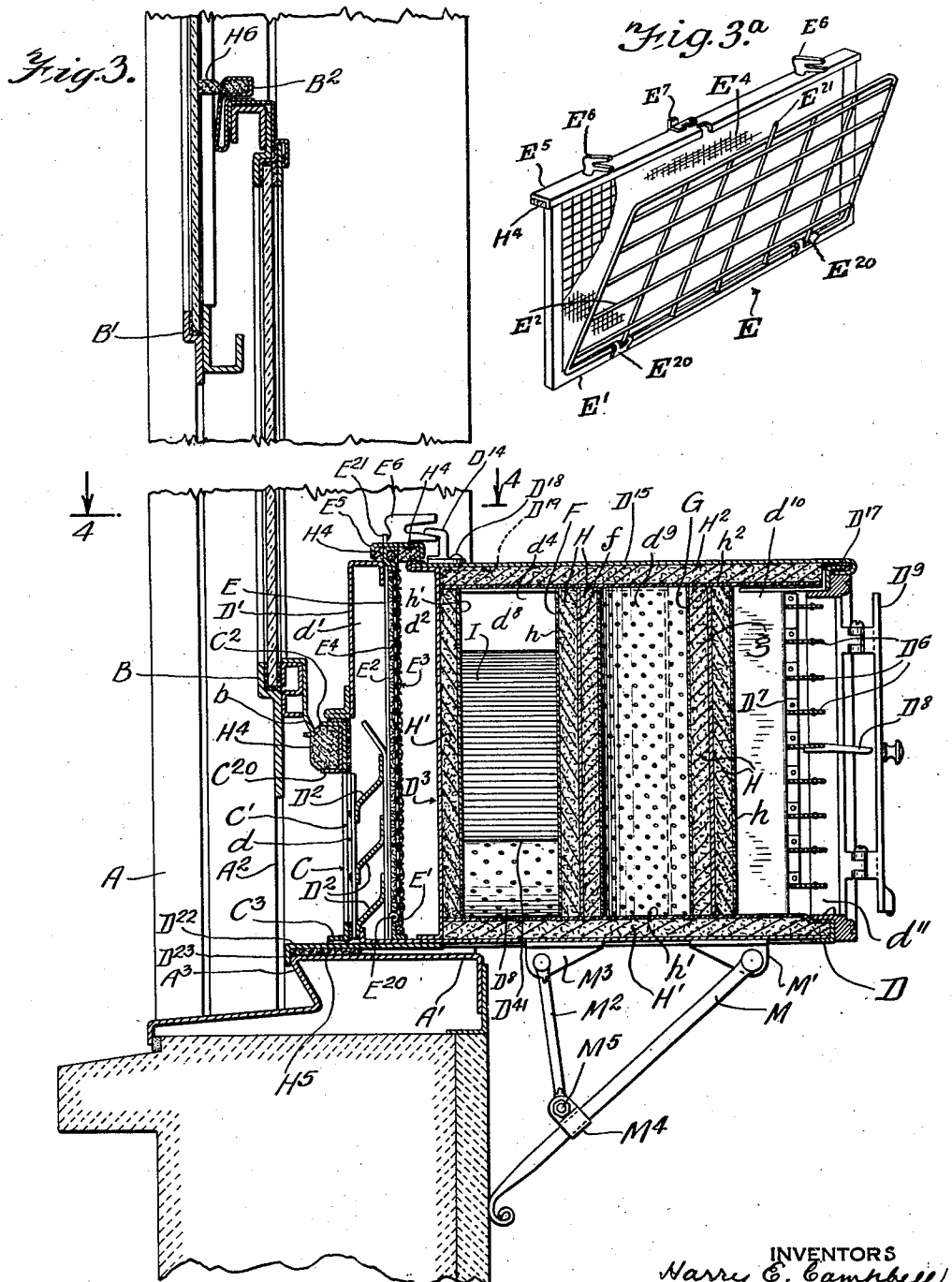
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WINDOW VENTILATOR

Filed Jan. 21, 1933

3 Sheets-Sheet 2



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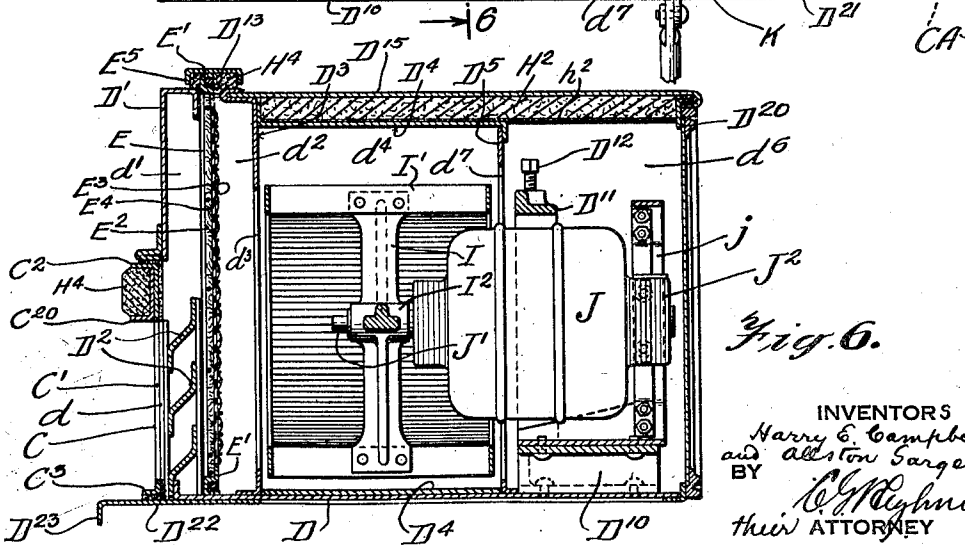
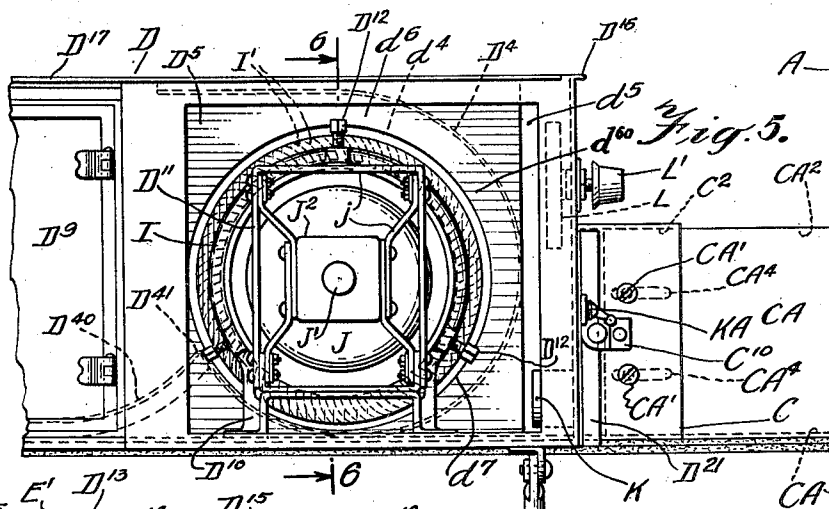
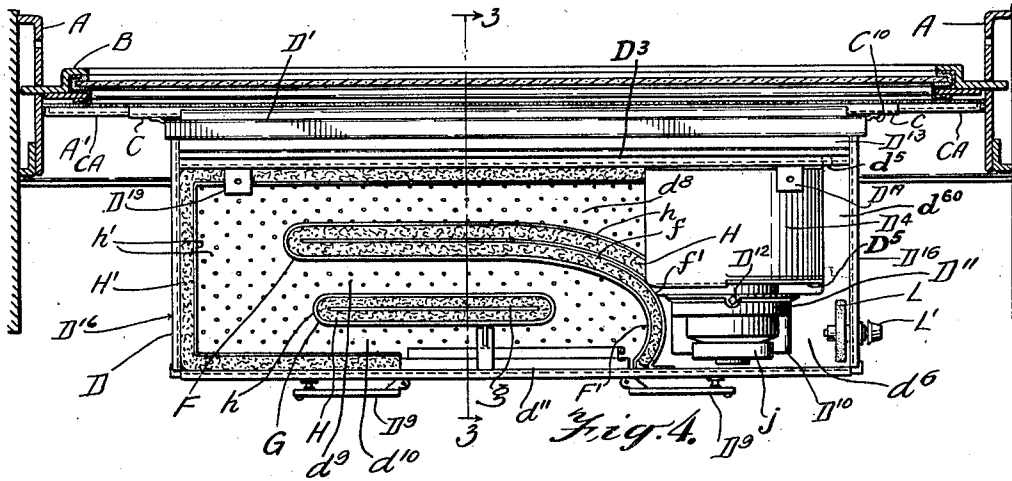
H. E. CAMPBELL ET AL

2,029,610

WINDOW VENTILATOR

Filed Jan. 21, 1933

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,029,610

WINDOW VENTILATOR

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Application January 21, 1933, Serial No. 652,834

12 Claims. (Cl. 98—94)

Our present invention relates to window ventilators of the known type comprising a chambered casing for mounting in the window opening of a building and comprising a motor driven fan mounted within said casing for moving air into the building from the outside atmosphere through said casing and comprising passages within the casing for the flow of the air so moved and sound absorbing material associated with said passages to eliminate or minimize the transmission through the ventilator to the interior of the building of out-door noise and noise due to the passage of the air through, and the operation of the air moving means within the casing.

The general object of the present invention is to provide an improved window ventilator of the above mentioned type. More specific objects of the invention are to provide a window ventilator of the above mentioned type having some, and preferably all, of the following characteristics, namely; mechanical simplicity and durability coupled with a relatively low inherent cost of manufacture; effective utilization of all of the space within the casing in accommodating the disposition therein of the air moving and noise eliminating provisions and division walls providing air passages of suitable shape and cross section whereby a ventilator of desirable form and compactness and of relatively small bulk is made possible; the provision within the casing of a suitable air filter readily removable for cleaning or renewal of the filter material when necessary; the formation of the casing with portions readily removable to provide suitable and convenient access to the interior of the casing; a form and type of construction minimizing the weight of the ventilator and facilitating its mounting on the window sill of an ordinary window opening without requiring modification of the window casing and permitting all portions of the ventilator except its noise eliminating and filter portions to be readily made of metal; and various features of construction and arrangement, whereby additional specific objects and advantages are obtained.

The various features of novelty which characterize our invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it reference should be had to the accompanying drawings and descriptive matter in which we have illustrated and described a preferred embodiment of the invention,

Of the drawings:

Fig. 1 is an elevation of the inner side of a portion of the wall of a building including a window opening and ventilator therein;

Fig. 2 is an elevation of the structure of Fig. 1 as seen from the outer side of the building;

Fig. 3 is a partial section on the line 3—3 of Fig. 1 and of Fig. 4;

Fig. 3A is a perspective view of the filter in an open condition of the latter;

Fig. 4 is a plan view of the ventilator with the casing top and air filter removed and with the window structure in section on the line 4—4 of Fig. 3;

Fig. 5 is a partial elevation taken similarly to Fig. 1, but on a larger scale and with an inner or front portion of the casing wall removed; and Fig. 6 is a section on the line 6—6 of Fig. 5.

In the drawings, A represents the sides, and A' the bottom or sill portion of a metallic window casing of known type, in which is mounted a vertically slidable lower window sash B and an upper window sash B' and on the sill of which rests the casing or housing D of our improved ventilator. The means shown for anchoring the casing D in place are hereinafter described in detail. At this point we merely note that preferably, and as shown, the casing D is detachably secured to a plate-like member C which, with its end extensions CA, forms, in effect, a separable flange-like portion of the casing D longer than the latter and anchored in the window opening and so disposed as to prevent the passage of outside air into the room through the space between the window sill and the lower sash B, except as air can then pass through an opening C' in the member C and a registering opening d in the outer wall D' of the casing D into the latter, and thence into the room.

The casing D as shown is a box-like structure of rectangular outline, and the port or opening d opens into an inlet chamber d' which extends for substantially the full length and vertical depth of the casing D, but has its lower portion divided by louvre-like members D² secured to the inner side of the outer or rear wall D' of the casing D. The members D² are horizontally disposed bars each having its body portion upwardly inclined to the horizontal away from the opening d and having oppositely extending flanges at the upper and lower edges of its inclined body portions. The members D² overlay and serve to intercept, and return to the outside of the opening d, rain, snow or heavy dust particles entering through the opening d, and also serve to divide

and arrest the velocity of air entering through the port d , particularly during windy weather periods.

At the inner side of the chamber d' , and separated therefrom by an air filter E, is a narrow chamber d^2 extending for the full length and vertical depth of the casing D. The inner or front wall of the chamber d^2 is formed by a plate-like partition member D^3 . Adjacent one end, the chamber d^2 communicates through a circular opening d^3 in the partition D^3 with a fan or blower chamber d^4 separated from the chamber d^2 by said partition D^3 . A second partition member D^5 parallel to but shorter than the partition D^3 forms the inner wall of the fan chamber and is formed with an opening d^7 substantially coaxial with the opening d^3 and connecting the fan chamber d^4 to a motor chamber d^6 . The latter receives air directly from the distribution chamber d' through a port d^5 and passage d^{60} . The port d^5 is a narrow vertically elongated port opening formed in the partition D^3 between the opening d^3 and the adjacent end of the casing D, and the passage d^{60} may be regarded as an extension of the motor chamber d^6 passing between the corresponding end of the casing D and the adjacent wall of the fan chamber d^4 . Preferably, and as shown, the distance between the partitions D^3 and D^5 is considerably greater than the corresponding dimensions of the chambers d' and d^2 , and is somewhat greater than the distance between the partition D^5 and the inner or front wall of the casing member D. The fan chamber wall transverse to and between the partitions D^3 and D^5 is advantageously formed by a metal plate D^4 terminating at one end in an upper horizontal portion at the top of the casing D and comprising an intermediate body portion spirally curved about the fan chamber d^4 for more than 180° , and an opposite end portion D^{40} rising from the bottom of the casing and forming the bottom wall of the inlet end of the passage d^8 into which the fan discharges. The lateral outlet from the chamber d^4 to the passage d^8 extends from the junction D^{41} of the part D^{40} with the body portion of the wall D^4 to the horizontal top portion of the latter.

The major portion of the casing interior lying at the left of the fan and motor chambers d^4 and d^6 , as they are seen in Fig. 4, forms a fan delivery space leading from the fan chamber outlet to the ventilator discharge opening d^{11} in the inner wall of the ventilator casing. As shown, the opening d^{11} extends substantially the full depth of the casing D for a horizontal length equal to about one-third of, and located centrally of the length of the casing D. The delivery space is divided by a vertical partition member F into a comparatively narrow passage d^8 extending from the fan chamber toward the opposite end of the casing and a somewhat wider return passage which is divided into portions d^9 and d^{10} by a second partition G between, and spaced away from, the previously mentioned partition member F and the inner or front wall of the casing D.

The partition F advantageously comprises a body member f in the form of a vertically disposed sheet metal plate generally parallel to the length of the casing but having its end adjacent the fan chamber d^4 curved inwardly to increase the width of the inlet end of the passage d^8 , the width of the body portion of the latter being less than the axial length of the fan or blower element I in the chamber d^4 . An extension f' of

the plate f , shown as a separate curved piece of sheet metal, forms the body portion of a curved division wall F' extending between the motor chamber d^6 and the adjacent ends of the passages d^9 and d^{10} . The plate f is covered at each side and at its end remote from the fan chamber, and the side of the member f' remote from the motor chamber d^6 is covered by suitable sound absorbing or deadening material, which may well consist of a comparatively thick layer of felt H cemented or otherwise secured to the plates f and f' , and between the latter and a surface covering or facing sheet h of perforated material, such as the well known material for such use known as Kribble cloth, which is cemented or otherwise secured to the felt. A metal plate portion g of the partition G is similarly surrounded by sound absorbing or deadening material comprising a felt body H and a perforated Kribble cloth cover or facing h . To further eliminate noise, the bottom wall and side walls of the air delivery space are similarly lined with felt H' at the inner side of which is a perforated Kribble cloth casing or jacket layer h' and beneath the portion of the top wall of the casing D at the inner side of the partition D^3 is located a felt layer H² with a Kribble cloth facing sheet h^2 at its under side.

Advantageously the discharge area into the room through the ventilator discharge opening d^{11} is regulable and, as shown, such regulation is secured by means of a shutter comprising a plurality of slats D^6 pivoted at their ends to the casing D adjacent the opposite vertical edges of the opening d^{11} . The slats D^6 are connected by linkage means D^7 so that they turn together about their pivots, and one of the slats is provided with an operating extension or handle D^8 by which the slats may be turned back and forth between the horizontal position shown in Fig. 3, and may be adjusted into intermediate positions to substantially close or to reduce the discharge flow area. When the ventilator is out of service, the opening d^{11} may be closed, and the shutter slats D^6 concealed, by closing doors D^9 hinged to the inner wall of the casing at the opposite sides of the opening d^{11} , and turned back against the inner vertical wall of the casing D as shown in Fig. 1 in the normal use of the ventilator. In addition to the regulation of the air flow through the ventilator attained by adjustment of the shutter slats D^6 , we preferably provide for a speed regulation of the fan I mounted in the fan chamber d^4 .

Advantageously, the fan or blower I employed is of the well known axial inlet, peripheral discharge type illustrated which comprises curved blades I' elongated in the direction of the fan axis and narrow, so that in operation their inner and outer edges define inner and outer cylindrical surfaces which do not differ greatly in their diameters. The hub portion I² of the fan is shown as mounted on the armature shaft J' of the motor J which drives the fan I. The major portion of the frame or shell of the motor J is located in the motor chamber d^6 , but preferably, and as shown, the outer portion of the motor frame extends through, but does not fill, the opening d^7 and into the space surrounded by the fan blades I'. Advantageously and as shown, the motor J and fan I are supported by bracket parts j attached to the inner hub portion J² of the motor frame and secured to and carried by a motor supporting part D¹⁰ secured to the bottom wall of the casing D. D¹¹ represents a yoke-like

member carried by the motor support D¹⁰ and provided with set screws D¹² distributed about the motor axis which may be screwed into contact with the motor shell in making the ventilator ready for shipment, but which in the normal use of the ventilator are advantageously backed off to give the motor freedom for vibration which is absorbed in the bracket provisions J, and hence is not transmitted to the casing D proper so as to be an objectionable source of noise. Mounted in the end wall of the casing D adjacent the motor chamber d⁶ is a socket part K for the attachment of external conductors for energizing the motor, a switch KA for opening and closing the motor circuit, and a rheostat L including an external operating knob L' for regulating the speed of the motor. Advantageously, and as shown, the rheostat L is spaced away from the casing wall so as to be swept by the air passing to the fan chamber d⁴ through the fan chamber d⁶.

The previously mentioned air filter E separating the chambers d' and d² is advantageously made readily removable, and as shown comprises a rectangular frame E' insertable through a slot D¹³ in the portion of the top wall of the casing D above the chambers d' and d². Between the sides of the frame E' extend two wire screen sections E² and E³ between which is located muslin E⁴ or analogous dust filter material. The frame E' is secured at its upper side in a channel member E⁵ with felt H⁴ at each side of the frame to form suitable joint sealing material between the member E⁵ and the marginal edges of the slot D¹³. As shown pivoted latch members E⁶ are secured to the upper side of the part E⁵ which may be turned into and out of locking engagement with bracket or hook members D¹⁴ secured to the member D¹⁵ which forms the portion of the top wall of the casing at the inner side of the slot D¹³. To facilitate the cleaning and renewal of the filter material E⁴ the screens E² and E³ are made readily separable. To this end while the screen E³ may be permanently fixed with respect to the frame E', the screen E² is connected thereto at its lower edges by hinges E²⁰ and is formed at its upper end with a projection E²¹ normally engaged by a latch member E⁷ carried by the part E⁵.

Advantageously and as shown the casing top wall member D¹⁵ is made readily removable to permit access to the casing interior. As shown the member D¹⁵ has its ends bent over to form channels receiving flange portions D¹⁶ carried at the upper portions of the end walls of the casing, and has its inner edge portion bent under to form a channel receiving a flange D¹⁷ at the upper edge of the inner or front wall of the casing, when the part D¹⁵ is in place as shown in Figs. 3 and 4 of the drawings. The part D¹⁵ may be removed by sliding it to the right as the parts are seen in Figs. 3 and 6. To prevent accidental or unwarranted removal of the cover member D¹⁵, the previously mentioned brackets D¹⁴ are secured in place by means of screws D¹⁸ which extend through the brackets and the member D¹⁵ into bracket parts D¹⁹ attached to the partition D³. The felt body H² beneath the removable cover member D¹⁵ is not attached to the latter, but is separately removable, and in the assembled casing is slightly compressed and held in place between the cover member D¹⁵ and the portions of the subjacent structure including in particular the partitions D⁵, F and G, and the felt lining H' for the side walls of the air delivery space. To permit further access to the motor chamber d⁶, the inner wall of the casing D is formed with a removable

panel D²⁰ at the inner or front side of the chamber d⁶.

As will be apparent from the foregoing, the ventilator casing D is so formed as to provide convenient access to its interior while permitting all portions of the ventilator proper, except the sound absorbing and air filtering materials, to be made of metal, and with the casing proper formed, except for the doors and the removable parts previously mentioned, of simple plate-like metallic parts suitably secured together as by spot welding, screws or rivets. The air flow through the casing may be regulated, whether the fan is in operation or not, by adjustment of the shutter slats D⁶ controlling the effective discharge area through the opening d¹¹, and when the fan is in operation, is subject to further regulation by rheostatic control of the fan motor. The simple air filter E described is characterized not only by the ease with which it may be removed for cleaning or renewal of the filter material, but by its relatively large effective area. The distribution chamber d² can receive air at all points along the side of the chamber formed by the air filter. The use of the fan type and disposition illustrated and described permits of a convenient fan location with a fan casing having axial fan inlet openings of proper cross section, and a lateral fan outlet opening of suitable shape and cross section to pass the air discharged through the spaces between the fan blades, thereby avoiding objectionable throttling of the air flow and unduly high local air velocity, and contributing to efficiency of operation and the avoidance of objectionable noises.

In apparatus of the character disclosed, noise elimination is effected as a result of the fact that the sound wave movement of air in the passages d⁸, d⁹ and d¹⁰ of the fan delivery space results in air impingement against the sound absorbing material lining said passages, with the result that the sound waves are damped and the sound wave energy is frictionally absorbed. An especially desirable characteristic of our improved ventilator is found in the provision therein of space in which the sound absorbing material is disposed which is of desirable form and relatively large volume, coupled with the provision of space for the air moving means, and for the passages in which outside air is filtered and is passed to the air moving means, which is of adequate volume and is desirably disposed.

In essence the interior of the ventilator is divided into three main parts, namely: a narrow admission or entrance space comprising the chambers d' and d² located adjacent the rear or outer side of the ventilator, a space for the air moving means comprising the fan chamber d⁴ and motor chamber d⁶ and located between the admission space and the front or inner wall of the ventilator adjacent one end of the latter, and a discharge or air delivery space containing the noise absorbing provisions and extending from the air moving means space to the opposite end of the ventilator and extending from the admission space to the front or inner wall of the ventilator. The fact that the filter E extends for the full length and vertical depth of the ventilator and provides a corresponding distribution of air flow into the chamber d², coupled with the simple form of the latter and the absence of flow obstructions therein, contributes to the practical feasibility of an admission space, which is relatively narrow. The use of an air moving fan or blower of the axial inlet, peripheral discharge

type with its axis transverse to the length of the blower, and receiving air at one end through the opening d^3 , and at its other end through the opening d^7 , and the by-pass including the motor chamber d^8 , passage d^{10} and port d^5 , contributes to the effective use of an air moving means space which occupies but a relatively short portion of the ventilator interior adjacent one end of the latter.

As a result of the form, dimensions and disposition of the other spaces, the discharge or delivery space is of relatively large volume and of desirable form. As a result of the very considerable length and cross section of the discharge space, it permits of an arrangement of passages, (d^8 , d^9 and d^{10}) which is especially desirable since, owing to the considerable length of the passages and their form, the sound absorbing material lining the passages may be disposed to provide a sufficiently extended and suitably disposed air contact surface for the desired sound absorbing effect with a relatively small number of passages which are simple in shape and of desirable small resistance to the air flow therethrough from the fan outlet to the amply large outlet d^{11} which is located in the front wall of the ventilator and extends from top to bottom of the latter. As a result of the features to which reference has just been made, an efficient ventilator is provided, the casing of which is neither too long nor too bulky from the practical considerations of sightliness and of available window opening space in the walls of rooms in which such ventilators are ordinarily used.

The previously mentioned anchor or holder member C has end portions which project beyond the corresponding ends of the casing D, but is not long enough to extend between the sides A of the window casing. At its top and bottom, the member C is formed with outturned horizontal flanges C^2 and C^3 , respectively. The end members CA are slidably received between the flanges C^2 and C^3 of the member C. At its upper edge each part CA is formed with a flange CA^2 overlapped by the flange C^2 of the member C. At its bottom each member CA has a short flange portion CA^3 which is in alignment with the flange C^3 of the member C.

In mounting the member C in the window, the end members CA are spread apart to bring them into snug contact with the sides A of the window casing, and are then secured to the member C by clamping bolts CA^1 , which pass through holes in the body of the member C and through slots CA^4 in the member C, the slots being of sufficient length to provide the adjustment for an appreciable variation in the distance between the sides of the window casing. A greater variation may be accommodated by the interchangeable use of extension parts CA of different lengths. Good frictional engagement between the ends of the members CA and the sides of the window casing is insured, and leakage is prevented, by interposing felt or analogous material between the members CA and the window casing sides. To provide a tight joint between the lower portion of the lower window sash B and the top edges of the anchor members C and CA, the latter are formed with aligned sections of an outwardly opening channel which receives a body H^4 of felt or the like. The latter is snugly engaged by a lower portion b of the lower window sash B, as shown in Fig. 3, when the ventilator is in place and the lower sash is in its normal partially open position. As shown the member C is provided with its channel

receiving the felt H^4 by spot welding or otherwise securing an angle bar C^{20} against the outer side of the member C with the outwardly extending flange of the bar C^{20} suitably spaced from the flange C^2 . The end members CA may have their corresponding felt channels similarly formed by means of welded on angle bar parts CA^{20} . With the adjustable holding element formed by the member C and its extensions CA secured in place in the window casing, the casing D may be detachably secured thereto. To this end latch members C^{10} are pivotally connected to the member C, one at each end and in position to releasably engage a corresponding end flange D^{21} of the casing D and clamp the latter snugly against the member C.

To avoid air leakage between the window sashes B' and B when the latter is partially raised to accommodate the ventilator, we employ a felt seal H^5 . The latter is carried by a resilient sheet metal holder B^2 secured to the top frame member of the lower sash and bears against the upper window for the full width of the latter. While we have illustrated the use of our ventilator in connection with window construction in which the window casing and sash frames are metallic, the ventilator is not limited to such use but may be used in windows in which the casing and sash frames are formed of wood. The capacity of the ventilator for use with window constructions of different forms constitutes a desirable characteristic of our invention.

In the case of relatively thick walls, the casing D may have its bottom wall wholly or largely in contact with the upper side of the window sill A' , and in such case, no means for securing the ventilator in place beyond those previously described are really necessary. When, as in the arrangement shown, the thickness of the portion of the room wall between the member C and the room face of the wall is substantially less than the corresponding dimension of the casing D, additional means are required to properly secure the casing D in place. The drawings show additional supporting means which are adjustable to accommodate different wall and window opening arrangements and which are attached to, and wholly supported by the ventilator casing D, so that their use involves no modification in, or defacement of, the building structure. The means first referred to comprise a hooklike part D^{22} engaging an uprising outwardly facing portion A^3 of the window sill, and one or more, two being shown, brace or strut members M extending from the casing D into engagement with the inner face of the wall below the window opening.

As shown, the part D^{22} is a horizontal plate secured against the under side of the casing D proper and projecting outwardly therefrom as much as may be required to permit the downturned flange D^{23} at its outer end to engage the window sill portion A^3 . Advantageously, felt H^5 is interposed between the plate D^{22} and the top surface of the window sill. Each brace or strut member M is shown as pivoted at its upper end to a corresponding bracket M' secured to the under side of the casing D adjacent the outer edge of the latter. In its operative condition, each strut M is fixed relative to the casing D at such an angle that its lower end engages the inner side of the building by means of a corresponding tension member M^2 pivotally connected at its upper end to a bracket M^3 secured to the casing D and having its lower end con-

5 nected to the strut M. The connection between
each member M² and the corresponding member
M comprises a yoke M⁴ longitudinally slidable
on the member M, when a clamping screw M⁵
10 is loosened, but when the latter is tightened,
the yoke is prevented from such movement, and
the brace members M and M² are rigidly con-
nected together. The described adjustment per-
mits of the same bracing means with walls of dif-
15 ferent thickness. With the described bracing
means and the hook plate D²², the casing D is
gravitationally held in place and the frictional
engagement of the member C with the win-
dow casing is not required to prevent gravita-

20 A readily apparent advantage of the ventilator
arrangement disclosed arises from the fact that
no portion of the ventilator casing, proper, is
exposed to external weather conditions, except
25 as such exposure occurs through the opening C'
in the member C, and the louver portions D²
of the casing so exposed are inherently adapted
to withstand such exposure. Moreover, the parts
D² are concealed so that any deterioration in their
30 appearance which may occur as a result of their
exposure will not be visible to ordinary occupants
of the room in which the ventilator is used. The
engagement with the felt body H⁴ of the part b
of the lower window sash B preferably, and as
35 shown, is of such character as to permit the
movement of the lower window sash into its
fully closed position without requiring the dis-
placement of the adjustable ventilator holder
formed by the member C and its extensions
40 CA. As plainly appears in Fig. 3, in the nor-
mal condition of the ventilator structure, the
lower portion of the window sash and the co-
operating joint sealing material H⁴ supported by
the ventilator structure are located between the
45 top of the inlet opening d and the top of the ven-
tilator casing which is then overlapped by the low-
er portion of the window sash. In consequence
the lower portion of the sash and the joint sealing
provisions are normally screened from the vision
50 of room occupants by the ventilator structure,
which may have its room side desirably pleasing
in appearance. Moreover, the lower portion of
the sash frame when below the top of the ven-
tilator structure does not restrict light transmis-
55 sion through the window opening. The pro-
vision of the narrow entrance space extending
for substantially the full length and depth of the
ventilator casing facilitates the use of an air
inlet opening d restricted to the lower portion of
the outer side of the ventilator so that the low-
er portion of the window sash may be below the
level of the top of the ventilator casing as shown
in Figs. 2 and 3.

60 While in accordance with the provisions of the
statutes, we have illustrated and described the
best form of embodiment of our invention now
known to us, it will be apparent to those skilled
in the art that changes may be made in the
form of the apparatus disclosed without depart-
65 ing from the spirit of our invention as set forth
in the appended claims and that in some cases
certain features of our invention may be used
to advantage without a corresponding use of other
features.

70 Having now described our invention what we
claim as new and desire to secure by Letters
Patent, is:

1. A ventilator comprising a casing of elon-
gated box-like form with an air inlet and an air
75 outlet, partition means in said casing dividing

the interior thereof into a narrow entrance space
receiving air through said inlet and adjacent
one long side of the casing, a second space be-
tween said entrance space and the side of the
casing remote from said entrance space and ad-
5 jacent one end of the casing and receiving air
from said entrance space, air moving means in
said second space, and a delivery space extend-
ing from said second space to the remote end
of the casing and extending between said en-
10 trance space and the side of the casing remote
from said entrance space and receiving air from
said second space and discharging air through
said outlet, and noise absorbing means disposed
in said delivery space to provide an extended and
15 distributed surface in contact therein with the
air moving therethrough.

2. A ventilator comprising a casing of elon-
gated box-like form with an air inlet and an air
outlet, partition means in said casing dividing
20 the interior thereof into a narrow entrance space
receiving air through said inlet and adjacent one
long side of the casing, a second space between
said entrance space and the side of the casing
remote from said entrance space and adjacent
25 one end of the casing and receiving air from said
entrance space, air moving means in said second
space, and a delivery space extending from said
second space to the remote end of the casing and
extending between said entrance space and the
30 side of the casing remote from said entrance
space and receiving air from said second space
and discharging air through said outlet, noise
absorbing means disposed in said delivery space
to provide an extended and distributed surface
35 in contact therein with the air moving there-
through, and a filter in said entrance space, the
latter and said filter extending for substantially
the full length and height of said casing and
said filter dividing said entrance space into two
40 side by side compartments one receiving air from
said inlet and the other delivering air to said
second space.

3. A ventilator comprising a casing of elon-
gated box-like form with an air inlet and an air
45 outlet, partition means in said casing dividing
the interior thereof into a narrow entrance space
receiving air through said inlet and adjacent one
long side of the casing, a second space between
said entrance space and the side of the casing
50 remote from said entrance space and adjacent
one end of the casing and receiving air from said
entrance space, air moving means in said second
space and a delivery space extending from said
second space to the remote end of the casing and
55 extending between said entrance space and the
side of the casing remote from said entrance
space and receiving air from said second space
and discharging air through said outlet, noise
absorbing means disposed in said delivery space
60 to provide an extended and distributed surface
in contact therein with the air moving there-
through, and a filter in said entrance space, said
entrance space and said filter extending for sub-
stantially the full length and height of said cas-
65 ing and said filter dividing said entrance space
into two side by side compartments one receiving
air from said inlet and the other delivering air
to said second space, said casing being formed
with a slot opening longitudinally into said en-
70 trance space and through which said filter is
removable.

4. A ventilator comprising a casing of elon-
gated box-like form with an air inlet and an air
outlet, partition means in said casing providing

a narrow entrance space receiving air through said inlet and adjacent one long side of the casing, and a blower chamber, a by-pass and a delivery space between said entrance space and the side of the casing remote therefrom, said delivery space discharging air through said outlet and said blower chamber and by-pass being adjacent one end of the casing and each in direct communication at one end with said entrance space and said blower chamber being in communication at its opposite end with said entrance space through said by-pass and having a lateral outlet to said delivery space, a blower in said blower chamber, and sound absorbing material disposed in said delivery space to provide extended and distributed contact therein with the air passing therethrough.

5. A ventilator comprising a casing of elongated box-like form with an air inlet and an air outlet, partition means in said casing providing a narrow entrance space receiving air through said inlet and adjacent one long side of the casing, and a blower chamber, a by-pass and a delivery space between said entrance space and the side of the casing remote therefrom, said delivery space discharging air through said outlet and said blower chamber and by-pass being adjacent one end of the casing and each in direct communication at one end with said entrance space and said blower chamber being in communication at its opposite end with said entrance space through said by-pass and having a lateral outlet to said delivery space, a blower of the axial inlet, peripheral discharge type mounted in said blower chamber to turn about an axis transverse to said entrance space, and sound absorbing material disposed in said delivery space to provide extended and distributed contact therein with the air passing therethrough.

6. A ventilator comprising a casing of elongated box-like form with an air inlet and an air outlet, partition means in said casing providing a narrow entrance space receiving air through said inlet and adjacent one long side of the casing, and a blower chamber, a by-pass and a delivery space between said entrance space and the side of the casing remote therefrom, said delivery space discharging air through said outlet and said blower chamber and by-pass being adjacent one end of the casing and each in direct communication at one end with said entrance space and said blower chamber being in communication at its opposite end with said entrance space through said by-pass and having a lateral outlet to said delivery space, a blower in said blower chamber, and sound absorbing material disposed in said delivery space to provide extended and distributed contact therein with the air passing therethrough, said casing having a removable top wall and said material including a removable body normally underlying said top wall.

7. A ventilator comprising a casing of elongated box-like form with an air inlet and an air outlet, partition means therein providing a narrow entrance space receiving air through said inlet and adjacent one long side of the casing, a motor chamber, a blower chamber, and a delivery space all between said entrance space and the side of the casing remote from the latter, said delivery space discharging air through said outlet, and said motor chamber and blower chamber being adjacent one end of the casing with said blower chamber between said entrance space and the motor chamber, a motor in said motor chamber with its shaft transverse to the length of the

casing and extending into the blower chamber, a blower of the axial inlet, peripheral discharge type mounted on said shaft, said motor chamber being in direct communication with said entrance space, and said blower chamber being in direct communication at one end of the blower with said entrance space and being in communication at its other end with the motor chamber and having a lateral outlet to said delivery space, and sound absorbing material disposed in said delivery space to provide extended and distributed contact therein with the air passing therethrough.

8. A window ventilator comprising a casing having an air inlet and flange end extensions at its outer side, and having an air outlet at its opposite side, and means for mounting said casing in a window opening comprising a plate-like member formed with an opening and longitudinally extensible to bring its ends into engagement with the side walls of the window opening, and latch means carried by said member adjustable into engagement with said flanges to thereby detachably secure said casing to said member with the opening in the latter in register with said inlet.

9. A window ventilator comprising a casing with an air inlet in its outer side and an air outlet at its inner side, and means for mounting said casing in a window opening provided with a window sash movable upwardly into a position in which it permits air flow into said inlet, said means comprising a plate-like member at the outer side of said casing and formed with an opening in register with said inlet and comprising parts relatively adjustable longitudinally of said member to permit the ends of the latter to be brought into engagement with side walls of said window opening, said parts having flange portions cooperating to form an outwardly opening channel above the opening in said member, and yielding material mounted in said channel and adapted for joint sealing engagement with the lower portion of said sash when the latter is in said position.

10. A ventilator comprising a casing of elongated box-like form having an air inlet and an air outlet, partition means in said casing dividing the interior thereof into a narrow entrance space receiving air through said inlet and adjacent one long side of the casing, a second space between said entrance space and the side of the casing remote from the latter and adjacent one end of the casing receiving air from said entrance space, air moving means in said second space, and a delivery space extending from said second space to the remote end of the casing and extending between said entrance space of the casing and the side of the casing remote from the latter and receiving air from said second space and discharging air through said outlet, the latter being formed in a portion of said remote side of the casing intermediate the ends of said delivery space and partition means in said delivery space providing a passage leading from the inlet thereto to the opposite end of said delivery space and a return passage between the last mentioned passage and said remote side, and partition means dividing said return passage into two branches through which air approaches said outlet from different directions, and noise absorbing means lining the walls of said passages.

11. A window ventilator comprising a casing with an air inlet in the lower portion of its outer side and an air outlet at its inner side, and partition means in said casing providing a narrow

entrance space adjacent said outer side and receiving air from said inlet and extending for substantially the full length and depth of said casing and a space communicating with said entrance space and extending between the latter and the inner side of said casing and adapted for the passage of air from said entrance space to said outlet, and noise absorbing means disposed in the second mentioned space to provide an extended and distributed surface in contact therein with air moving therethrough, and means for mounting said casing in a window opening provided with a window sash movable upwardly into a position in which it permits air flow into said inlet while the lower portion of the sash overlaps the portion of the casing above said inlet, said means comprising a plate-like member at the outer side of said casing and formed with an opening in register with said inlet and comprising parts relatively adjustable longitudinally of said member to permit the ends of the latter to be brought into engagement with side walls of said window opening, and yielding material supported by said member and parts and adapted for joint sealing engagement with the lower portion of said sash when the latter is in said position.

12. A window ventilator structure comprising a horizontally elongated casing with an air inlet

in the lower portion of its outer side and an air outlet at its inner side, and partition means in said casing providing a narrow entrance space adjacent said outer side and receiving air from said inlet and extending for substantially the full length and depth of said casing and a space communicating with said entrance space and extending between the latter and the inner side of said casing and adapted for the passage of air from said entrance space to said outlet, and noise absorbing means disposed in the second mentioned space to provide an extended and distributed surface in contact therein with air moving therethrough, means for mounting said structure in a window opening provided with a window sash movable upwardly into a position in which it permits air flow into said inlet while overlapping the upper portion of said casing, and joint sealing means supported by said structure at the outer side of the latter and at a level between the top of said casing and the top of said inlet and adapted to cooperate with the lower portion of said sash to provide a sealed joint between the casing and sash when the latter is in said position.

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