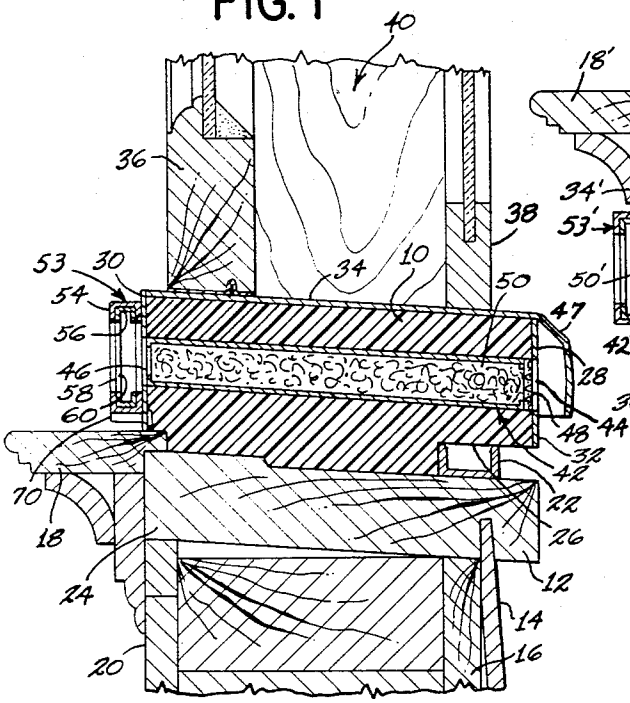
Sept. 26, 1967 J. H. COSTLEY 3,343,475

BUILDING WALL WITH INSULATING AND AIR-FILTERING VENTILATOR

Filed Oct. 20, 1965

FIG. 1



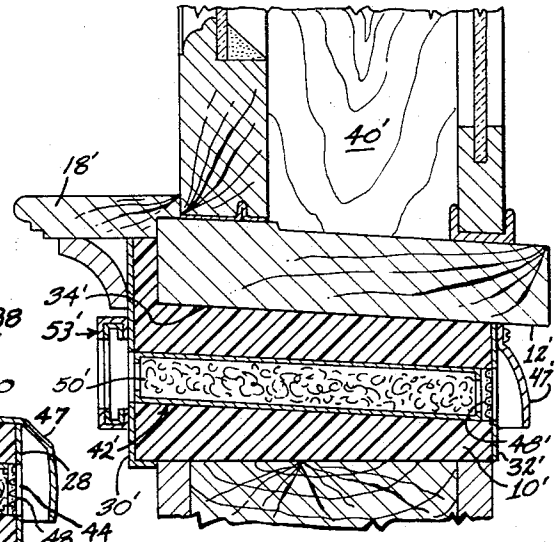
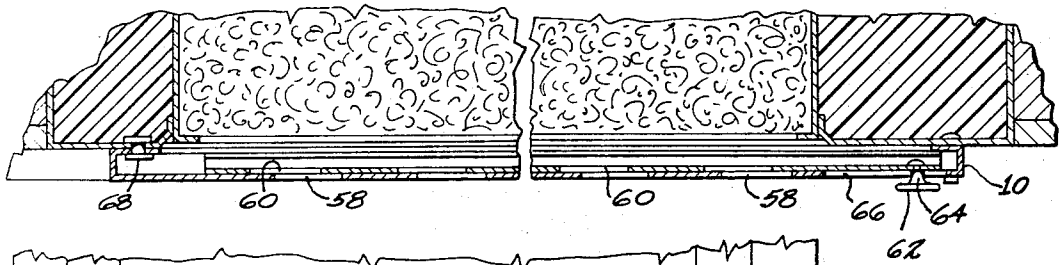


FIG. 4

FIG. 3



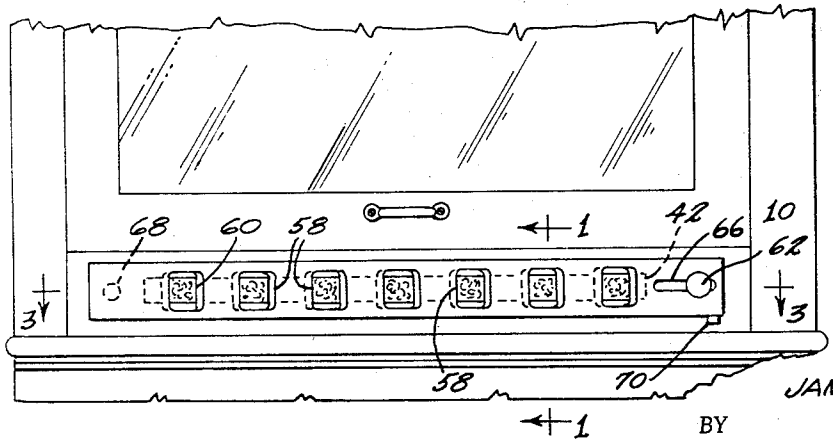


FIG. 2

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BUILDING WALL WITH INSULATING AND AIR-FILTERING VENTILATOR

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ABSTRACT OF THE DISCLOSURE

A cartridge filter is placed in a relatively narrow, elongated slot formed in a block of insulating material of lightweight, rigid foam plastic. A sliding grille mechanism is disposed at the inner face of the block and a hood is disposed at the outer face. The slot slopes upwardly from the outer face to the inner face. Consequently, when the block is installed in the outside wall of a building, the movement of air is slowed down to a speed where a cold draft is not felt and also condensation is avoided.

This invention relates to the art of ventilation. More particularly, the invention relates to a device for use in a dwelling or other building to provide ventilation therefor without sacrificing heat insulation and without permitting airborne contaminants to enter the building.

Ventilation is a difficult problem in homes provided with storm windows. Of course, the purpose and function of the storm windows is to provide a dead air space between the windows, this air space acting as an insulator and minimizing the heating expenses that must be borne by the homeowner. In order to avoid breaking or disrupting the dead air space, many people will simply refrain from opening the windows during cold weather and will depend upon leakage and the effects of opening doors for replenishing the fresh air in the home. On the other hand, some people will raise both the main window and the storm window slightly in order to admit fresh air. This sacrifices the insulation provided by the dead air space and, in addition, permits moisture to build up between the windows, which results in damage to the paint and to the wood of the sill and frame. The opening of the windows therefore adversely affects both heating and maintenance costs.

In certain localities, the direct admission of outside air is also apt to produce health problems for the occupants. Soot in industrial areas, automobile exhaust fumes, and pollen may be cited as examples of undesirable airborne substances which can freely enter the building through the open windows.

Accordingly, it is an object of the present invention to provide a building ventilating device which overcomes the above-mentioned disadvantages. In particular, it is an aim of the invention to provide a means for admitting outside air into a building while maintaining heat insulation and while preventing the entrance of undesirable air contaminants.

Another object of the invention is to provide an insulated, air-filtering building ventilating device which is simple and inexpensive to construct and which is easy to install and maintain. In this regard, the device is intended to be installed either through an existing opening

in the building wall, such as a window, or through an opening constructed elsewhere in the wall, if desired.

Briefly described, the invention consists basically of a block of material which has heat insulation properties. This block of material is inserted in the wall of the building and extends therethrough, having an inner face and an outer face adjacent the inner surface of the wall and its outer surface, respectively. The block contains an elongated, narrow slot extending from its inner face to its outer face. This slot accommodates a filter material through which the outside air must pass to enter the building, the filter removing the undesirable contaminants. In addition, the inner face of the block carries a means for effectively blocking and opening the slot to provide ventilation when desired.

Other objects, advantages and new features of the invention will become apparent from the following detailed description when read in conjunction with the accompanying drawing wherein:

FIGURE 1 is an elevational sectional view taken through an embodiment of the invention which is adapted to be placed above the sill of a window;

FIGURE 2 is an elevational view of the inside end of the ventilator of FIGURE 1;

FIGURE 3 is a horizontal sectional view taken generally on the line 3—3 of FIGURE 2; and

FIGURE 4 is a view of another embodiment of the invention, wherein the ventilator is mounted below the sill of a window.

With reference now to FIGURE 1, it will be apparent that the illustrated embodiment of the invention consists of a block **10** made of a material which is light in weight and which is a good insulator for heat, such as a foamed polystyrene plastic material, for example. In this embodiment, the block **10** is adapted to be placed in an existing window opening adjacent the sill, so that the device may be quickly and conveniently installed in a finished home.

For illustrative purposes, the invention has been shown as applied to a double-hung window frame which conventionally has a lower sill **12** extending to and beyond the outside surface **14** of the building wall **16** and a stool **18** mounted adjacent the inner wall **20** thereof. If the window has been provided with a sliding track storm window, the sill **12** will carry a lower channel element **22** of the storm window frame.

Since window structures vary widely as to size and configuration, the invention contemplates that the block **10** will be made of such size that it may be trimmed and shaped by the installer to fit closely within a particular window frame. Thus, as shown in FIGURE 1, the lower surface **24** of block **10** has been shaped to conform with the stool **18** and the sill **12**, the block being stepped as at **26** to clear the channel **22**, if this element is present. While the shape of the ends of the block does not appear in the drawing, it will be understood that these too are shaped to fit the window frame.

Those surfaces of the block which are not in abutment with the window frame are preferably covered by a skin **28** of suitable material, such as thin-gauge aluminum sheet or fiber glass, for example. As shown, the skin **28** is disposed on a vertically disposed inner face **30**, a parallel outer face **32** and a top face **34** on block **10**.

After the block **10** has been fitted to the window opening, the inner main window sash **36** and the storm window **38** are lowered onto the top surface **34** thereof to form a tight fit and to define the dead air space **40** between the windows. It will be necessary, when using the ventilator of the invention in this manner, to complete the dead air space **40** by blocking the gap which will exist between the meeting rails of the window **36** when it is in the partially raised condition. This blocking is similar to what is done in association with window mounted air conditioner units and is deemed to be of such known character as to require no further explanation.

A ventilation opening in the form of a narrow slot **42** forming an elongated passage that extends through the block **10** from its outer face **32** to its inner face **30**. Slot **42** extends in the lateral direction substantially across the width of the block **10** and is sloped downwardly as shown so that its outer end **44** is lower than its inner end **46** for drainage purposes or at least so that rain water cannot flow into the building. A hood **47** is preferably formed on block **10** above and in spaced, overlying relation to the slot, as shown, so that wind pressure does not impinge directly on the outer end **44** of the slot.

Adjacent its outer end **44**, the slot has disposed transversely thereacross a screen **48**, which may be ordinary insect screen, for example. The screen **48** serves primarily as a limit stop for a cartridge filter **50** which is placed in the slot **42** for the purpose of removing airborne contaminants such as pollen, as mentioned above. The permeability of the filter **50** will vary according to the nature of the airborne particles which are desired to be removed, the filter ranging from a relatively open material, such as is found in conventional furnace filters, to much denser configurations.

Adjacent its inner face **30**, the block **10** carries a mechanism **53** for selectively opening and closing the inner end **46** of the slot **42**, so as to provide ventilation when the occupant desires. Mechanism **53** consists of a sliding grille mechanism, having an outer box-like casing **54** and an inner slide member **56**. The casing **54** has a plurality of openings **58** therein and the inner slide has a plurality of openings **60**, which can be registered with the openings **58** to provide the open or ventilated condition. For moving the inner slide between its open and closed positions, the slide is provided with a knob **62** which has a shaft portion **64** extending through an elongated slot **66** in the member **54**. By grasping the knob **62**, the slide member **56** can be moved horizontally within the box **54** to effect the desired adjustment of the registry of the openings **58** and **60**.

To permit access to the slot **42** to replace the filter **50**, the entire mechanism **53** is pivotally mounted on the front face **30** of the block by means of a pivot pin **68**. The normal position of the groove assembly is defined by means of a stop **70** which is embedded in the material of the block **10** and which extends outwardly from the front face **30**, as shown, so that the groove assembly may rest thereon. When it is desired to service the filter **50**, the knob **62** may be grasped and the mechanism **53** pivoted around the pin **68** to expose the inner portion **46** of the slot. Thereafter, the mechanism **53** may be returned into engagement with the stop **70** to place it in its operative position.

An alternative embodiment of the invention is illustrated in FIGURE 4 where the parts of the ventilator which correspond to the parts in FIGURE 1 are indicated by primed reference numerals to distinguish this embodiment from that of FIGURE 1. In the FIGURE 4 embodiment, the block of insulating material is indicated at **10'** and is mounted below the window sill **12'**. The construction of the slot **42'** and its associated elements, such as screen **48'** and filter **50'**, is the same as in the FIGURE 1 embodiment so that no further explanation thereof is deemed necessary.

The block **10'** may be bolted in place or secured in any other desired manner, as, for example, by employing an adhesive along the top surface **34'** thereof and thereby adhering the block to the lower surface of the sill **12'**. This construction is particularly useful with pre-hung window frame assemblies adapted to be mounted as a unit in a building wall, since the ventilator block **10'** can be attached before the frame is inserted in the wall. All that is required then is to form the rough opening in the wall slightly larger to accommodate the additional depth provided by the block. Normally, the outer end of the sill **12'** will extend beyond the outer face **32'** of block **10'** so that the sill itself will act as a drip shield. Of course, with the embodiment of FIGURE 4, the windows can be used in the conventional manner.

It will be noted that the position of the grille mechanism **53'** under the stool **18'** is such that the mechanism **53'** cannot be swung upwardly as in the FIGURE 1 embodiment. Another way of exposing the slot **42'** is necessary, therefore. This can be simply accomplished, for example, by mounting the mechanism **53'** on the inner face **30'** by means of screws (not shown) so that it may be removed entirely from the block **10'** when it is desired to service the filter.

It should now be apparent that the use of the present invention will provide ventilation for the building in which it is installed without sacrificing the heat insulation provided by the storm windows and without admitting undesirable airborne contaminants into the building. Numerous other benefits arise from maintaining the dead air space between the windows, among which may be mentioned the fact that condensation is reduced to a minimum thereby preserving the paint on the window frame. Moreover, this eliminates dry air conditions within the building since moisture is not lost by condensation on the glass.

Besides removing contaminants, the filter material in the ventilating opening will serve to block the direct flow of air to eliminate drafts while permitting the fresh outside air to mix with the air within the building. In addition, the filter material will act as a sound absorber to enhance the privacy within the building by absorbing street noise and other undesirable outside noise.

Various changes and modifications of the invention will occur to those skilled in the art upon reading the above description and the invention is not intended to be limited thereby. For example, the insulating ventilator block need not be installed in an existing opening, but may be placed in an opening cut through a wall in an older home, if desired. Accordingly, within the scope of the appended claims, the invention may be practiced otherwise than herein specifically described.

I claim:

1. In combination with a building having an outside wall, an insulated ventilating device comprising a block of lightweight, rigid foam plastic, heat insulating material disposed through the outside wall of said building and having an inner face, an outer face and a slot extending completely through said wall from the outer face of said block to its said inner face to form a passage for the flow of air from said outer face to said inner face, said slot being elongated in the direction of air flow from said outer face to said inner face, a cartridge filter containing filter material filling said slot, and means adjacent said inner face for selectively blocking and opening said slot whereby, upon the opening of said means, filtered air may enter said building from the exterior to the interior thereof through said slot.

2. The combination as defined in claim **1**, further comprising a screen disposed across said slot adjacent said outer face.

3. The combination as defined in claim **1**, said blocking and opening means comprising a sliding grille mechanism having a casing having a plurality of openings therein and a slide mounted within the casing, said slide having a plurality of openings selectively registrable with the

openings in said casing, said casing being mounted on said inner face of said block in blocking relation to said slot and being movable to permit access to said slot to remove and replace said filter material.

4. The combination as recited in claim 1, the end of said slot adjacent said outer face being lower than the end thereof adjacent said inner face.

5. The combination as defined in claim 1, further comprising a hood disposed in spaced, overlying relation to the end of said slot adjacent said outer face, whereby wind pressure cannot impinge directly on said slot.

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