Dec. 24, 1940. F. R. PENMAN 2,225,885

SHUTTER GRILLE

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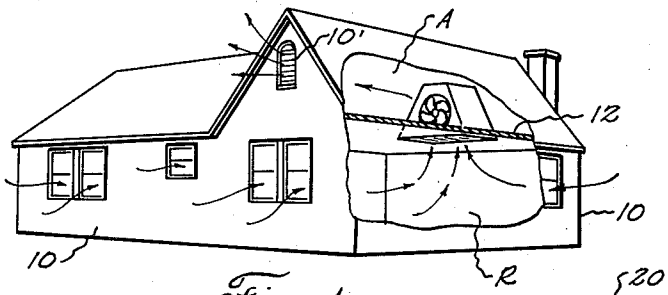


Fig. 1.

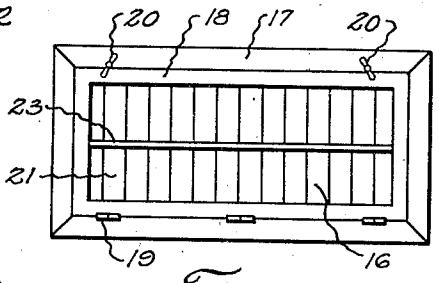


Fig. 4.

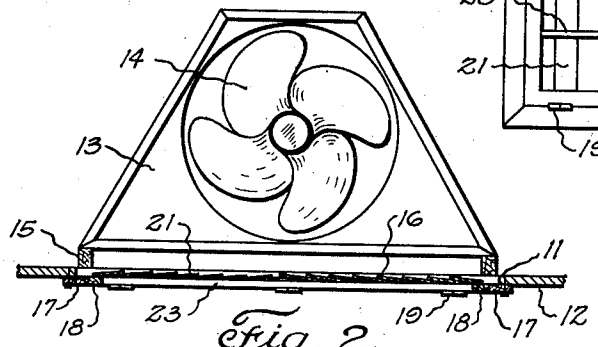


Fig. 2.



Fig. 3.

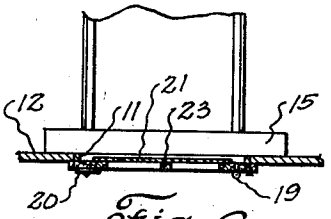


Fig. 6.

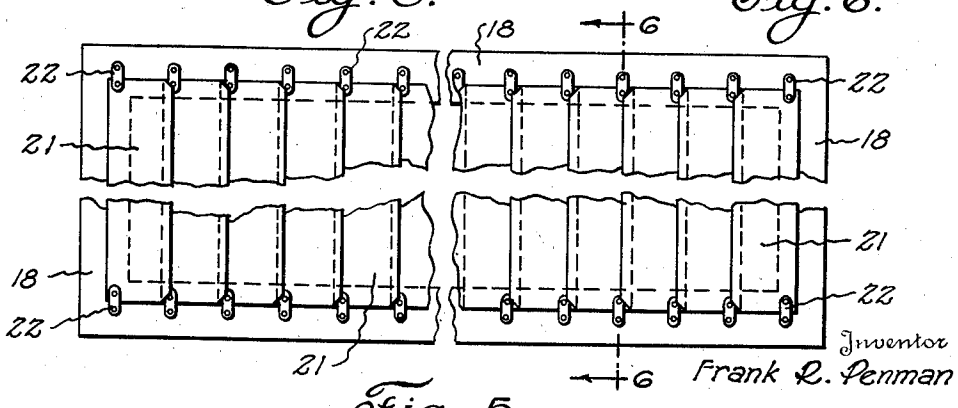


Fig. 5.

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SHUTTER GRILLE

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Application May 31, 1938, Serial No. 210,877

6 Claims. (Cl. 98—116)

This invention relates to new and useful improvements in shutter grilles.

It has become the practice to cool apartments and homes, as well as commercial structures, by setting up a constant circulation of air through the building. This circulation is accomplished by a method, generally known as "attic ventilation," which comprises providing an opening in the ceiling of one of the rooms and placing a suction fan or blower in the attic above said opening. When the fan is operated, air is drawn from the rooms of the building into the attic and is then forced from said attic through an open window, or other discharge opening provided for the purpose. The windows of the rooms of the building are also opened, with the result that a constant circulation of fresh air through the building and attic is obtained. Thus, the stagnant hot air, which is normally trapped in the attic of the building, is removed and this, together with the constant circulation or draft of fresh air through the rooms, results in a cooling of the building.

Ordinarily, the opening in the ceiling below the fan is smaller than the fan housing in order to permit said housing to be supported thereabove on the attic floor and, therefore, the fan must be inserted through the attic, instead of through said opening. Further, it has been the practice to cover the opening with a grating which prevents the passage of objects through the opening but permits the passage of air therethrough. When the fan is not operating, air can circulate from the rooms of the building to the attic and this is most undesirable, as well as dangerous in case of fire in the building because, obviously, a through draft would greatly increase the fire hazard. To overcome this disadvantage, doors have been provided to swing over the grating to close the opening, as well as to cover the grating which is rather unsightly in appearance.

One object of the invention is to provide an improved shutter grille for closing the ceiling opening in an "attic ventilation" system, which grille is attractive in appearance and readily installed; the use of the grille permitting the opening to be made of a sufficient size to allow the blower to be inserted into the attic through the grille, whereby installation of the blower is facilitated.

An important object of the invention is to provide an improved shutter grille, of the character described, which is normally in a position closing the opening and which is arranged to automatically open to permit flow of air therethrough, when the blower is operated.

A further object of the invention is to provide an improved grille constructed of a plurality of overlapping slats which are mounted to allow swinging thereof to separate the slats, whereby passage of air therethrough is permitted; the construction of the slats being such that when in a closed position, the appearance of a solid closure is produced, which makes for an attractive and neat appearance.

A further object of the invention is to provide an improved grille including shutters which are mounted within a frame, whereby the latter may be hinged to the ceiling in a position overlying the opening; such arrangement permitting the entire unit to be swung from a closed to an open position, whereby access to the blower and attic may be had.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specifications and by reference to the accompanying drawing, in which an example of the invention is shown, and wherein:

Figure 1 is an elevation of a building having an attic ventilating system installed therein, a portion of the building wall and roof being broken away to more clearly illustrate the installation,

Figure 2 is a transverse, vertical, sectional view taken through the ceiling of the room and showing the blower or fan with the improved shutter grille, constructed in accordance with the invention, closing the opening in said ceiling,

Figure 3 is a longitudinal, sectional view taken through the shutter and showing the same in its open position,

Figure 4 is an elevation or face view of the shutter grille, viewing the same from its underside,

Figure 5 is a plan view, and

Figure 6 is a transverse, sectional view taken on the line 6—6 of Figure 5.

In the drawing, the numeral 10 designates a building, such as an ordinary cottage or bungalow. The ceiling 12 of one of the rooms is formed with an opening 11, whereby a communication between the attic A and the interior of the room R is established. The opening 11 has a general rectangular shape corresponding to the general shape of the rectangular casing 13 of a blower or fan 14. The size of the opening 11 is such that the fan may be inserted up-

wardly therethrough into the attic A from the room R. The fan or blower may be of any desired construction and may be purchased on the open market. The casing of said fan may be supported in any suitable manner above the opening 11, but it is preferable to support the same on bars 15 which extend transversely across the ends of the opening 11.

When the fan 14 is operating, fresh air is drawn from outside the building 10 through the open windows therein. This fresh air is drawn through the rooms of the building and is pulled upwardly through the opening 11 into the casing 13 of the fan; from the casing, the air is forced outwardly through a suitable window 10' provided in the attic wall. In this manner, fresh air is constantly circulated through the rooms of the building, as well as through the attic, with the result that hot air which might accumulate in said attic is removed. The constant circulation of fresh air through the rooms sets up a draft which results in cooling. The foregoing is the usual type of attic ventilation which has come into use in the past several years and it is specifically pointed out that the particular blower or fan, together with its associated parts, is subject to variation.

For controlling the flow of air through the opening 11, whereby said opening is closed when the fan 14 is not operating, a shutter grille 16 is adapted to be secured to the ceiling 12 so as to overlie said opening. The grille includes a substantially rectangular outer frame 17 which is nailed, or otherwise secured, to the ceiling. An inner frame 18 is adapted to fit within the outer frame 17 and is hinged to said outer frame along one longitudinal side thereof by suitable hinges 19, whereby the inner frame may be swung downwardly to permit access to the blower 14. The inner frame is normally held within the outer frame by means of suitable pivotal latches 20, which latches are mounted on the outer frame and are adapted to be rotated so that their ends overlie the inner frame, as is clearly shown in Figure 4.

A plurality of transverse slats 21, which form a shutter, are mounted on the top side of the inner frame 18 (Figure 5) and extend thereacross. These slats are preferably constructed of aluminum, or other similar light-weight material, and each slat has its ends secured to the frame 18 by leather straps 22, as is clearly shown in Figure 5. One strap is located at each transverse end of the slat and is disposed nearer one longitudinal edge of said slat, whereby the straps permit a limited upward swinging of the slat. Each slat has its longitudinal edge portion overlapping the longitudinal edge portion of the adjacent slat and, as is clearly shown in Figures 2 and 3, one-half of said slats are directed inwardly toward the transverse center of the frame, while the other half are also directed inwardly toward the transverse center. When the slats are in a lowered or closed position (Figure 2) they rest upon a longitudinal supporting bar 23, which is secured centrally within the inner frame 18.

Normally, when the blower 14 is not operating, the weight of said slats causes them to fall to a closed or overlapping position as shown in Figure 2, with the result that a flow of air through the opening 11 is not permitted. When the fan or blower 14 is started, the suction created by said fan causes the slats to be pulled upwardly to the position shown in Figure 3, whereby air may be drawn therethrough. It is noted that the slats being of relatively light material are readily movable to an open position by the suction of the fan. So long as the fan is operating, the slats remain in open position to permit the necessary circulation of air through the rooms and attic. As soon as operation of the fan is stopped, the slats will, by gravity, fall to their lowered position to automatically close the opening 11. In this manner, the operation of the slats is entirely automatic, being controlled by the fan.

Since the slats are constructed of a relatively thin and light material, their appearance, when in a closed position, gives the effect of a solid closure, whereby they do not detract from the appearance of the room. When it is desired to gain access to the attic or the blower 14, it is only necessary to swing the pivoted latches 20 which permits the entire inner frame 18 to swing downwardly on its hinges 19, after which access to the blower through the outer frame 17 may be had. Although the slats have been shown as secured to the frame 18 by means of leather straps 22, it is obvious that other means of mounting said slats may be employed. Also the particular disposition of the slats is subject to variation.

What I claim and desire to secure by Letters Patent is:

1. A shutter grille including, a frame, and a plurality of transversely extending slats mounted in overlapping relation on the frame, each slat being fastened to the frame at its ends and nearer one longitudinal edge thereof by strips of flexible material, whereby said slat may undergo a limited swinging movement.

2. A shutter grille for closing the air opening adjacent a blower fan including, a frame, and a plurality of slats extending transversely of the frame and normally closing the opening and arranged to be moved to an open position by the suction of the fan to permit passage of air through the opening, the slats being fastened to the frame by strips of flexible material which tend to hold the same in a closed position.

3. A shutter grille for closing the air opening adjacent a blower fan including, an outer frame surrounding the opening, an inner frame hinged to the outer frame and arranged to be swung within said outer frame, and a plurality of transverse slats mounted in the inner frame and being normally in overlapping relation to each other to close the air opening, said slats being adapted to be automatically moved from overlapping position when the fan is operated whereby circulation of air through the opening is permitted, and strips of flexible material for fastening the slats to said inner frame.

4. A shutter grille for closing the air opening adjacent a blower fan including, an outer frame surrounding the opening, an inner frame within said outer frame, and a plurality of transversely extending metallic slats mounted in overlapping relation on the inner frame, each slat being flexible and being fastened by strips of flexible material to the frame at its ends and nearer one longitudinal edge thereof, whereby the opposite longitudinal edge of said slat may undergo a limited swinging movement.

5. A shutter grille for closing the air opening adjacent a blower fan including, an outer frame surrounding the opening, an inner frame within

said outer frame, a plurality of transversely extending slats mounted in overlapping relation on the inner frame, and strips of flexible material for fastening each slat to the frame at its ends and nearer one longitudinal edge thereof, whereby said slat may undergo a limited swinging movement, said slats being of sufficiently light material to permit the blower suction to bend and swing the same from overlapping position.

6. The combination with an attic ventilating system of a building having an air opening in the ceiling of a room and also having a fan in the attic and adjacent the opening, of a shutter grille including, a plurality of transversely extending slats normally disposed in overlapping relation to close the air opening and arranged to be swung from overlapping position by the fan suction, whereby air may pass through said opening when the fan is operating, and flexible straps for fastening the slats in position.

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