

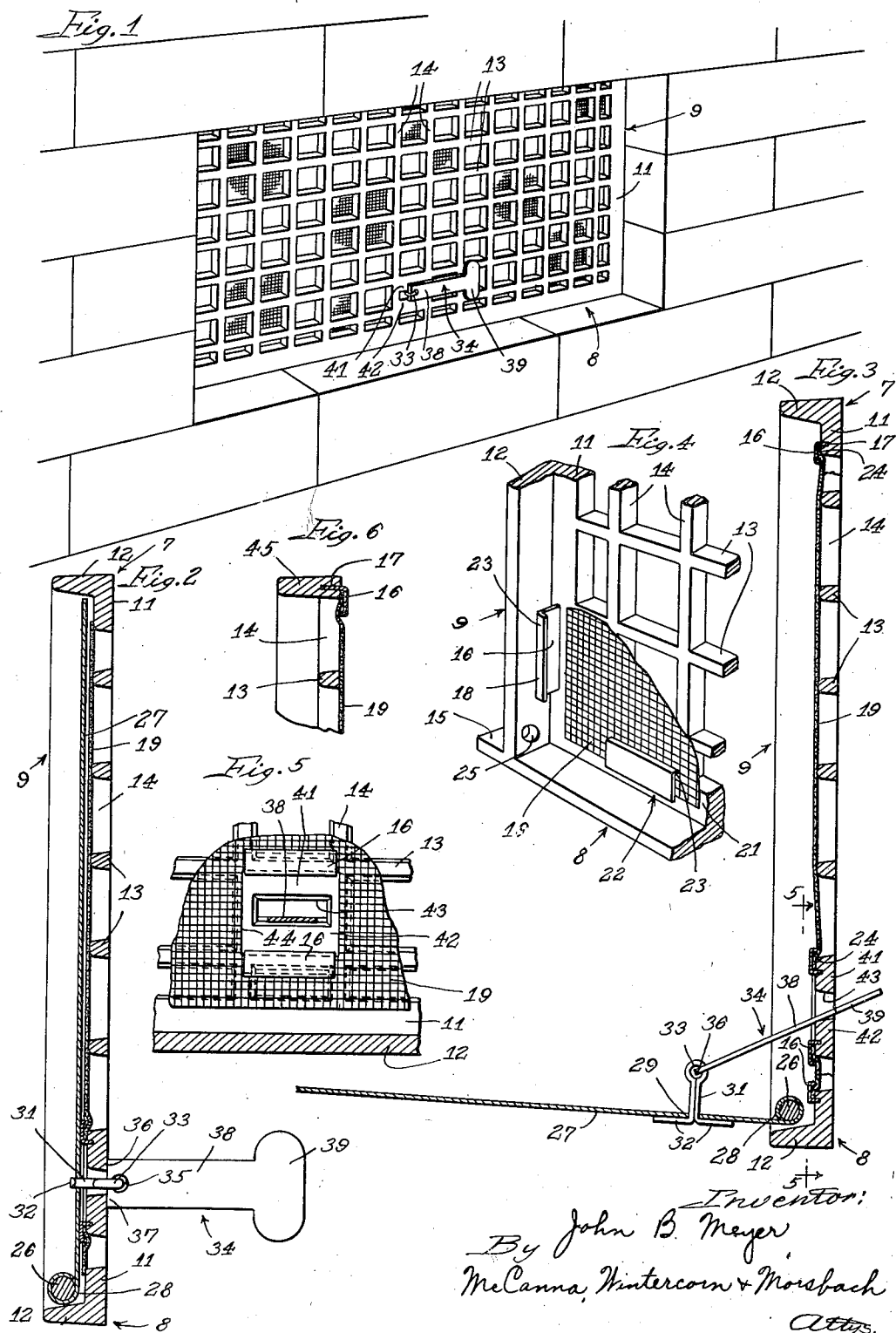
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GRATE

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GRATE

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This invention relates to a device for facilitating the changing of air in confined areas; more specifically it relates to a ventilator of the general type of the grate and screen combination.

In certain localities it is the present common practice to construct dwellings as well as multifarious other buildings entirely above ground dispensing completely with the once generally accepted excavated basement. With the recent developments in compact heating units which yield up a minimum of dirt and debris there has arisen a marked tendency to extend this type of house construction into vicinities where climatic conditions are, at certain seasons, comparatively severe. In substantially all construction of the type referred to, a foundation or sill construction of some type is employed and the flooring is stationed at an elevation appreciably above that of the ground level. As a result, a substantial air chamber practically invariably exists between the floor and the ground. When completely enclosed by a foundation or other structure this dark space, being comparatively cool and hence damp inasmuch as no facilities for change of air are afforded, constitutes an ideal place for the growth and destructive workings, upon exposed sills, girders, joists, and the like, of termites, rot fungi and other parasitic bacteria.

A variety of types of devices for ventilating these otherwise confined areas have been proposed. Among the eminently essential characteristics of such ventilators are facilities for permitting the ingress and egress of air, and means of preventing the entrances of rodents and the various types of insects. To this end, gratings of comparatively heavy structure and having openings of substantial size accompanied by a sheet of relatively fine wire fabric covering one broad surface thereof and secured thereto have been found to serve very acceptably.

Such ventilators, however, have been justifiably criticized for the reason that the wire screen or fabric element frequently requires replacement together with the fact that such an undertaking has been, with regard to ventilators heretofore in use, a major task. It has been the practice in the past to secure the screen member to the grate or grill by means of either rivets or screws extending through the wire mesh and anchored in the peripheral elements of the grate. In the case of rivets, an inherent difficulty in changing the screens is, of course, obvious. Concerning units employing screws, these ventilators, being normally stationed adjacent to the

outer surface of the foundation structure, are frequently subjected to the ravaging of the elements. Moisture deposited upon the exposed surfaces frequently finds its way to the rear faces of the peripheral members of the grate and the outer borders of the screen sheet, and hence to the retaining screws. There it almost invariably remains for a sufficiently long time to cause rusting and deterioration of the metal. Often by the time it is found necessary to replace the screen, the corrosion has proceeded to such an extent that the screws are rusted fast and cannot be removed except by application of such an amount of force as will turn the head from the shank, thus leaving the tapped holes filled and hence incapable of being used in securing into position the second screen. The seriousness of the situation is usually augmented by the fact that the ventilator has been formed integrally into the foundation, thus making difficult the replacement of the entire ventilator.

It is an object of this invention to provide a grate-screen combination ventilator of generally improved character, and in which the above recited faults are not apparent.

Another object of this invention is to provide a ventilator of the grate-screen type in which the screen member is readily and easily replaceable at all times.

A further object of this invention is to provide a ventilator grate element having tabs integrally molded with the peripheral members of said grate and protruding from the rear faces thereof.

A still further object of the invention is the provision of a screen-grate having a shutter, and improved means for actuating the shutter.

Other objects and advantages will appear from the following description and the accompanying drawing, in which—

Figure 1 is a perspective view of a wall having a grate embodying my invention incorporated therein;

Fig. 2 is a transverse section through the grate structure showing the shutter in closed position;

Fig. 3 is a section similar to Fig. 2 with the shutter in open position;

Fig. 4 is a fragmentary view of one corner of the grate structure, the shutter being removed;

Fig. 5 is a fragmentary view of the grate and screen adjacent the shutter actuating mechanism taken on the line 5—5 of Fig. 3, and

Fig. 6 is a fragmentary section through one edge of a modified form.

Figure 1 shows one common way in which the

grate structure is incorporated in the foundation or other portion of a building, in this instance the surrounding structure being of masonry and the frame structure being seated directly therein.

The grate structure per se comprises a rectangular frame portion having upper and lower sides 7 and 8 and oppositely disposed end portions 9, each of said portions having face flanges 11 and peripheral flanges 12 so that the portion is in the form of a right angle. Within the frame portion is a lattice of horizontal bars 13 and vertically disposed bars 14, the lattice and the frame preferably being unitary and formed as a casting. At its four corners the frame structure has outwardly extending fingers 15 adapted to be seated in the masonry of the wall or otherwise attached to the wall structure for the purpose of securing the grate in place.

Tabs 16 are cast directly into the metal of the grate at spaced intervals around the frame structure and so as to project from the inner side of the face flange 11, as best shown in Fig. 4. These tabs are formed of metal and preferably of such composition and microstructure as to take a comparatively rigid set when bent. The tabs are so fastened in the molds that one edge thereof as shown at 17 becomes surrounded with metal when the grate is poured, and thereby become rigidly and fixedly embedded within the material of the grate. Preferably the remote edge of the tabs is bent through a right angle as shown at 18 at a distance about $\frac{1}{8}$ " from the extreme edge. These peripherally spaced tabs serve to secure a woven wire screen 19 in position against the inner side of the grate. The screen 19 is of the type usually employed for the purpose of preventing the passage of insects, such as the common fly screen, and may be of any required mesh dependent upon the prevalent type of insects, though I find that the ordinary sixteen mesh is adequate. This screen is cut so as to completely cover the inner surface of the lattice and to extend across the inner edge of the face flange 11 substantially into abutment with the tabs 16, as shown at 21, and thereafter the tab 16 is bent over as shown at 22 so as to lie parallel with the inner surface of the face flange 11 and so that the edge portion 23 thereof engages the screen to press the screen against the inner corner of the frame as shown at 24 (Fig. 3) and thereby retain the screen taut against the inner surface of the lattice.

The marginal flanges 12 of the end members 9 are provided with openings 25 adjacent the bottom portion 8 of the frame (as shown in Fig. 4), which openings receive the opposite ends of a rod 26. Around this rod and intermediate the peripheral flanges of the end portions 9 is wrapped one edge of a sheet metal shutter 27, the edge thereof being wrapped around the rod as shown at 28 so as to permit of rotation of the shutter on the rod. The shutter is of such size as to be received within the peripheral flange 12 and to completely cover the lattice. The shutter 27 has an opening 29 adjacent its lower edge through which passes a cotter pin 31, the ends of the cotter pin being splayed as shown at 32, and the looped head 33 thereof being spaced from the outer surface of the shutter a distance such as to barely project beyond the front surface of the lattice when the shutter occupies the closed position, as shown in Fig. 2. An actuating lever designated generally by the numeral 34 has an opening 35 adjacent one end for the reception

of the head of the cotter pin, and has laterally disposed flanges 36 and 37 at its end, an arm portion 38 and a head portion 39. Two of the horizontally disposed bars 13, on opposite sides of the point at which the cotter pin passes through the lattice, are somewhat wider as shown at 41 and 42 to provide a narrow slot 43 through which a cotter pin passes, the widened portions 41 and 42 serving as shoulders against which the flanges 36 and 37 may abut to hold the shutter in the closed position. The cotter pin 31 is rotatable in the opening 29 so that with the parts occupying the position shown in Fig. 2, the handle portion 29 may be rotated through 90°, thereby releasing the shoulders 36 and 37 and bringing the lever 34 into registration with the opening 43. Thereupon the lever may be forced inward until the handle portion 39 abuts against the ends of the opening 43, thereby limiting the shutter in its movement to the position shown in Fig. 3. Thus, by reversing this movement, the shutter may be locked closed in the closed position, as shown in Fig. 2. Thereupon the lever 34 may be swung laterally to the position shown in Figure 1 in which it lies flat against the outer surface of the lattice.

The screen 19 has an opening as shown at 44 around the opening 43 for the passage of the lever 34, and the edges of the screen are secured in position by tabs 16, such as previously described.

In some instances the shutter 27 and associated mechanism is unnecessary, and it is desirable to attach the screen to the outer surface of the lattice. I have shown this form of structure in Fig. 6, from which it will be seen that the tabs 16 are caused to project from the face side of the marginal flange 45 of a grate similar to that described. However, in this instance the relatively wide face flange 11 may be eliminated and the tabs cast directly in the front edge of the peripheral flange 45 analogous to the flange 12.

It will be seen that I have thus provided an inexpensive but efficient form of grate structure which embodies a replaceable screen, and a manually actuatable shutter. The provision of the tabs 16 cast integral with the metal of the grate entirely eliminates the difficulties heretofore associated with screen fastening means. The screen may be replaced by prying the tab 16 outward slightly so as to release the old screen and by substituting this new screen and thereafter again forcing the tabs into the secured position.

It will be understood that the specific embodiments herein shown are by way of illustration and not limitation, and I do not wish to be limited thereby except as required by the prior art and the scope of the appended claims, in which—

I claim:

1. A ventilating device comprising a metal grate member adapted to be seated in the wall of the building structure to cover a ventilation opening, consisting of an integrally cast cross-hatching surrounded by a series of peripheral elements integrally cast therewith, a wire screen of smaller components, overspreading the rear surface of said crosshatching and at least partially overlapping the rear faces of said peripheral elements, and a multiplicity of sheet metal tabs integrally cast with said peripheral elements and rising beyond the rear faces thereof, respectively, at junctures surrounding said screen member, said tabs being bendable to press marginal areas of said screen member against said grate

member for securing the screen member in place and for replacement thereof.

2. A ventilating device as described in claim 1 in which the extreme free end of the tab is bent into a plane substantially at right angles to the next adjacent portion of the tab to crimp the screen against the edge of said peripheral member.

3. A ventilating device comprising a grate member consisting of a crosshatching surrounded by a series of peripheral elements secured thereto, a screen member of smaller mesh and smaller components, overspreading the rear surface of the said crosshatching and at least partially overlapping the rear faces of said peripheral elements, and a multiplicity of sheet metal strips cast into said peripheral elements beyond the margin of said screen member and rising beyond the rear faces thereof respectively, said strips being bent over against said elements to press marginal areas of said screen member against said grate member, said strips being of a composition capable of repeated bending whereby the pressure thereof may be comparatively readily released and reapplied for replacement of said screen member

4. The combination in a ventilating grate structure of an integrally cast crosshatching, a sheet of wire screen cloth overlying the same and secured thereto, a shutter mounted to rotate under gravity about the lower horizontal edge of the crosshatching between a closed position

thereagainst and an open position, and an operating lever extending through the crosshatching for manually returning the shutter, said lever being shaped to, in one rotative position thereof, engage against certain portions of the crosshatching to hold the shutter closed and when rotated about its longitudinal center to engage other portions of said cross-hatching to limit the rotation of the shutter to its open position.

5. The combination in a ventilating grate structure of an integrally cast crosshatching having a narrow slot adjacent one horizontal edge, a shutter supported for rotation about said edge between a closed position against the grate and an open position, said shutter having an opening registering with said slot in the closed position of the shutter, a pin rotatable in said opening, a lever of strip metal pivotally connected to said pin at a point spaced from said shutter and passing through said slot for rotating said shutter between said positions, said lever having shoulders at its attached end for engagement with the opposite side of said grate when the shutter occupies the closed position and the lever is rotated to a position transverse to the slot, said lever also having shoulders on its free end for engagement with the opposed side of said grate adjacent the ends of said slot when the shutter occupies its open position to limit opening movement of the shutter.

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