

June 9, 1942.

A. E. KIETZMANN

2,285,984

DIRECTIONAL GRILLE

Filed June 19, 1940

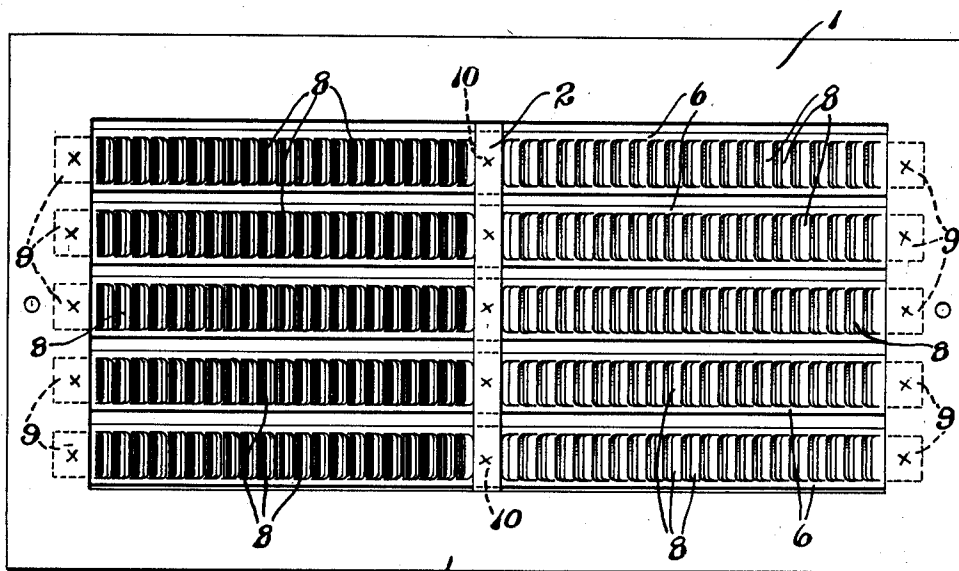


Fig. 1.

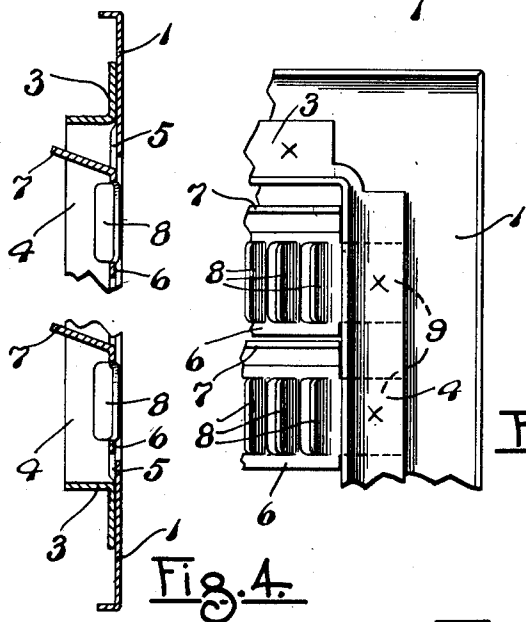


Fig. 4.

Fig. 2.

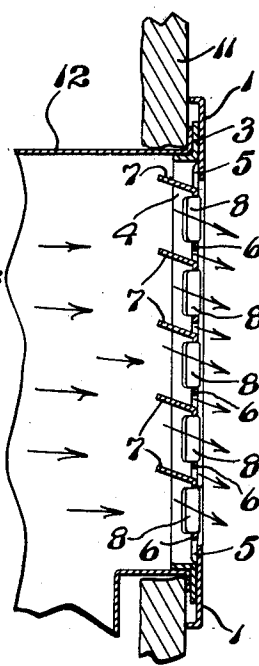


Fig. 5.

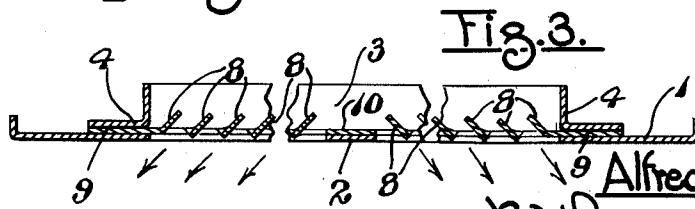


Fig. 3.

Inventor

Alfred E. Kietzmann

By J. L. Linsman and Van Antwerp
Attorneys

UNITED STATES PATENT OFFICE

2,285,984

DIRECTIONAL GRILLE

Alfred E. Kietzmann, Holland, Mich., assignor to
Hart & Cooley Manufacturing Company,
Holland, Mich., a corporation of Delaware

Application June 19, 1940, Serial No. 341,239

7 Claims. (Cl. 98—121)

This invention relates to a grille, particularly designed for the direction of air into a room from a flue which carries air. The air may be conditioned as to temperature, warm air in the cooler months of the year and cool air in the warmer months.

Grilles of this general character cover the unsightly outlet opening of the flue and also the edge portions of the opening which is cut through the wall of the room, making a better appearance. With my invention a particularly novel and economical structure and method of making the structure is provided for a grille of this character, readily made up and assembled of parts which are independently and individually made and thereafter connected together by welding or the like to make a permanent construction. With the grille of my invention the air which comes into the room is directed in selected directions away from the grille so as to spread out laterally in both directions and also directed downwardly. Of course, by changing the angles of the directional vanes of the grille the directions of the air may be likewise changed.

An understanding of the invention and of a preferred form of structure embodying the same may be had from the following description taken in connection with the drawing, in which—

Fig. 1 is an elevation of the grille made in accordance with my invention.

Fig. 2 is a vertical section therethrough as installed in the wall of a room.

Fig. 3 is a horizontal section through the grille.

Fig. 4 is a fragmentary enlarged vertical section similar to that shown in Fig. 2 of the grille alone, intermediate parts being broken away, and

Fig. 5 is a fragmentary perspective rear elevation of the grille at one side and at an upper corner thereof.

Like reference characters refer to like parts in the different figures of the drawing.

In the construction of the grille in accordance with the invention a rectangular frame 1 of sheet metal is provided having parallel upper and lower sides and parallel vertical ends as shown, preferably flanged at its peripheral edges for strength and a better appearance. In some cases and as shown in Fig. 1 the open space is divided by a vertical bar 2 extending between the upper and lower horizontal sides of the frame which bar may be either integral with the frame or secured in place by welding, brazing or other equivalent permanent connection.

At the rear side of the grille frame 1 a second rectangular frame is secured having upper and lower horizontal bars 3 of angle cross-section and vertical ends 4 likewise of angle cross section as shown. The bars 3 and 4 which comprise the sides and ends of this frame may be connected

at their corners, as shown in Fig. 4, or may not be connected together inasmuch as said bars are permanently welded to the other parts of the grille. It is not a matter of importance that the bars 3 and 4 be connected together at their meeting end at the corners of such inner frame. These bars surround the opening in the grille frame 1. The bars 3 have flanges or legs which lie against the inner side of the plate 1 and are spot welded or otherwise permanently secured thereto. Both bars 3 and 4 having inwardly extending legs as shown.

The vertical end bars 4 are spaced from the rear side of the frame 1 a short distance, as indicated at 5, so that the legs thereof which parallel the grille frame member 1 do not come against the rear side of said frame 1. Metal bars 6 made from lengths of flat metal are positioned horizontally one over the other so as to substantially fill the opening in the frame each at its upper edge having a directional vane 7 bent therefrom which in the drawing is shown as extending upwardly and inwardly at an angle to the horizontal. Each of the bars 6 in its length has a plurality of spaced apart vanes 8 struck therefrom being integrally connected with the bar at one other edge, said vanes 8 extending inwardly and at an angle to the vertical plane of the grille. In the disclosure of the drawing, the vanes 8 to one side of the middle vertical bar 2 of the grille frame extend oppositely to those at the other side as best shown in Fig. 3. All vanes as shown in Fig. 3 extend inwardly in a direction toward a vertical plane perpendicular to the vertical bar 2 of the grille frame.

The ends 9 of the bars lie against the rear side of the frame 1 at each end of the opening therein and the legs of the bars 4 which parallel the frame 1 lie against said ends 9, the three thicknesses of metal being permanently and inseparably connected by spot welding. At the middles of the bars 6 where they pass immediately back of the vertical bar 2 of the grille frame, each is provided with a flat section 10 which likewise is spot welded or riveted or equivalently connected to the bar 2.

The grille frame as thus constructed and the parts secured together is adapted to be associated with an opening in a wall 11 into which the outlet end of an air carrying conduit or flue 12 passes. The flue is usually of thin metal flanged at its outlet end to come against the wall. The grille frame is placed thereover with the inwardly extending legs of the bars 3 and 4 entering the outlet end of the flue as shown in Fig. 2. The grille is attached to the wall by screws or other suitable fastenings passing through openings which are shown in Fig. 1.

This grille is of a particularly practical and economical construction. The bars 6 are stamped

out, as many as may be needed, for a quantity production of the grilles. The bars 3 and 4 are cut to the desired lengths and as said before, do not necessarily have a joinder together at their ends. The parts assembled together are readily secured in permanent relation by spot welding whereupon the grille of an exceptionally strong and durable structure is complete.

It is to be understood that the angle of the vanes 7 may be varied. As shown in Fig. 2 with the vanes 7 at the angle shown the air is directed downwardly as shown by the arrows; and passing through the vanes 8 is carried in diverging directions at the opposite sides of the vertical bar 2. It is to be understood that the vanes 8 in the full length of the bar may all be inclined in the same direction so as to carry all of the air laterally to a selected side. The vanes 7 may be shaped to lie in a horizontal plane or to incline upwardly and outwardly instead of downwardly and outwardly as shown. These are all variations of the same thing, the bar 6 with the integral vanes 7 and 8 being elements independently produced as is also the frame 1 and the bars 3 and 4 of the inner frame member. It is also to be understood that it is not essential that in all grilles there be a middle dividing bar 2. The invention is the same where the length of the grille opening is less and is not divided into two parts as shown.

By dividing the air current into a plurality of comparatively narrow or thin strata each of which is controlled as desired in a horizontal plane by the vanes 8 and interposing directional vanes 7 between the strata which control the direction of the air in a vertical plane the desired direction of the air current is more definitely controlled. By this means each of the directional vanes 7 has only to operate upon a relatively narrow or thin stratum of air which it can control much more effectively than if it were trying to direct the flow of a wider strata or larger volume.

Although the vanes 8 have been shown and described as extending vertically and the vanes 7 are extending horizontally it is realized that in some instances it may be desired to install the grille in a different position such as turned 90° from the position shown in which case the vertical vanes will become horizontal and the horizontal vanes will become vertical and it is considered that any such change is the full equivalent of the device as shown and that the terms of the claims should be read with this understanding of equivalency.

Other variations in detail may be resorted to without changing the invention which is to be considered comprehensive of all forms of structure coming within the scope of the appended claims.

I claim:

1. A grille comprising, an open frame, a plurality of flat metal bars lying in parallelism with each other back of and across the opening in said frame with the end portions of the bars lying against the rear sides of the adjacent portions of the frame, said bars having a plurality of vanes struck therefrom at an angle to the planes of the bars thereby providing air passing openings and vanes to direct the air, and two bars, one lying over the common ends of the first mentioned bars and thereagainst, said bars, the ends of the first bars and the portions of the frame with which the ends of the first bars contact being permanently connected together.

2. A grille structure comprising, an open frame of flat metal, flat metal bars located in parallelism back of the frame and across the opening therein, the ends of said flat metal bar lying against the rear sides of the frame, said flat metal bars at a longitudinal edge having a vane bent therefrom for substantially its full length located at an angle to the plane of the bar with which associated, and said flat metal bars having a plurality of vanes struck from the bars transversely thereof and lying at an angle to the plane of the bar, and means permanently securing the ends of said bars to the contacting portions of the frame against which said ends of the bars engage.

3. A grille construction comprising, an open frame of flat metal, a plurality of flat bars located in parallelism back of the frame and across said opening, said flat metal bars having each a plurality of vanes struck therefrom transversely of said bars, said vanes being disposed at an angle to the plane of the bar, angle bars located over the common ends of said first bars and permanently secured thereto, said angle bars being located at two sides of said opening, and additional angle bars secured to the rear side of the frame at the other sides of the opening there-through, said angle bars having inwardly projecting legs adapted to be received in the outlet opening of an air carrying flue, as specified.

4. A grille comprising, an open frame of flat metal, a plurality of individual horizontal bars made from flat metal located back of the frame in parallel relation to each other and extending across and lengthwise of said opening in the frame, said flat bars having ends extending beyond the ends of the opening and bearing against the rear side of the frame, said flat bars in the length thereof having a plurality of transversely extending vanes struck therefrom, said vanes being located at an angle to the planes of the bars, and said bars at their ends having a permanent and inseparable connection with the end members of said frame, as specified.

5. A construction containing the elements in combination defined in claim 4, and two additional bars, one lying against the common ends of said horizontal bars, said additional bars having a permanent and inseparable connection with the ends of said bars and with said frame.

6. A grille comprising, an open frame of flat metal, a plurality of individual horizontal bars made from flat metal located back of the frame in parallel relation to each other and extending across and lengthwise of said opening in the frame, said flat bars having ends extending beyond the ends of the opening and bearing against the rear side of the frame, said flat bars in the length thereof having a plurality of vanes struck therefrom, said vanes being located at an angle to the planes of the bars, said bars at their ends having a permanent and inseparable connection with the end members of said frame, and at their upper edge portions having a longitudinal vane bent therefrom rearwardly at an angle to the plane of the bars, as specified.

7. A grille comprising, an open frame, and a plurality of elongated grille bars extending across the opening in said frame, each of said bars having a plurality of vanes struck therefrom transversely thereof, and at one of its longitudinal edges having a vane bent therefrom rearwardly at an angle thereto, as specified.