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2,920,549

ADJUSTABLE GRILLE

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FIG. 1

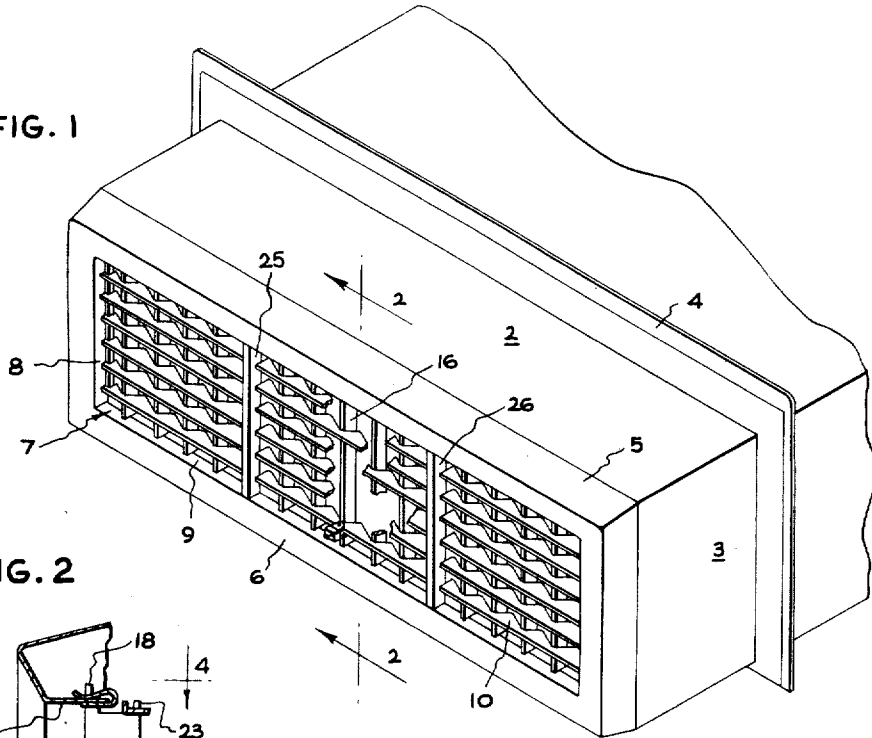


FIG. 2

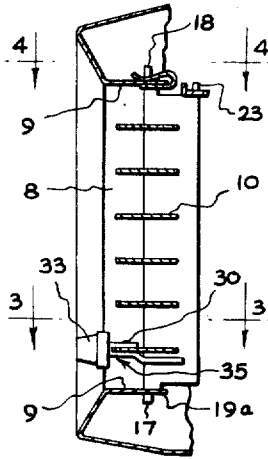


FIG. 3

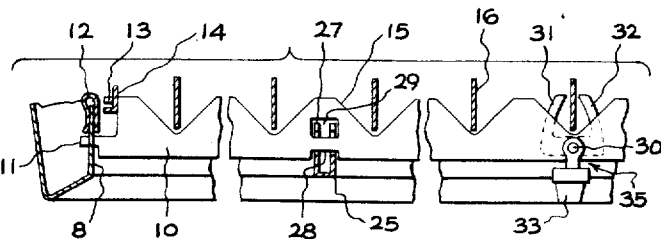
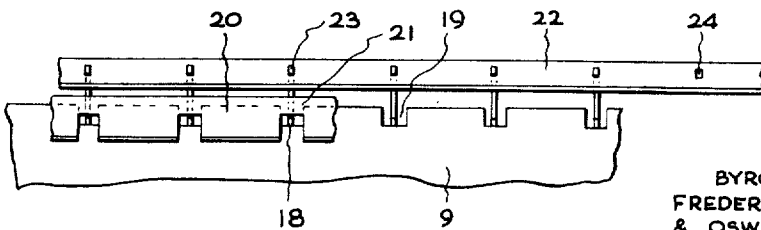


FIG. 4



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ADJUSTABLE GRILLE

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5 Claims. (Cl. 98—40)

This invention relates to grilles for controlling the direction of air discharged into a space and more particularly to an air distribution grille having selectively adjustable dual sets of vanes to vary the angle of discharge of air from ventilating devices.

In air distribution devices from which ventilating air is discharged, sets of spaced-apart parallel louvers or vanes have been employed which are collectively or gang-operated to vary over a wide range the angle at which the air is discharged into a room or space. To adjust the discharge angle in both a horizontal and vertical plane two sets, each comprising a plurality of spaced-apart parallel vanes perpendicularly disposed to each other have been employed. The vanes or louvers in each set have been collectively adjustable whereby the ventilating air can be adjustably discharged in any desired forward angular direction. To adjust the angles of both sets of vanes a single manual control has been provided.

It is therefore an object of this invention to provide an air distribution grille to be used with air ventilating or air conditioning apparatus utilizing intersecting sets of vanes which are rapidly and collectively adjustable by a single control means to give a uniform discharge of air over a wide angular range.

Another object of this invention is to provide a single control means for an air distribution grille whereby the angle of the vanes in both dual intersecting sets may be collectively varied.

A further object of this invention is to provide an arrangement for an air distribution grille containing two intersecting sets of parallel vanes and a single control means whereby the vanes in each set may be angularly adjustable collectively over a wide range without interfering with the vanes in the other set.

A still further object of this invention is to provide an adjustable louvered deflector grille for air conditioning apparatus comprising two intersecting sets of parallel vanes and which can be assembled from a minimum number of parts to present a pleasing and attractive appearance and in which the louvers or vanes can be readily stamped from sheet metal of uniform thickness.

In accordance with one aspect of our invention, a ventilating or air conditioning device which discharges air into a room or space is equipped with a louvered grille positioned within the discharge opening. This grille comprises a set of horizontal and a set of vertical parallel louvers or vanes which intersect. Each set of vanes can pivot collectively due to linking members to vary the angle of the air stream. Through a single manual control attached to one of the vanes both sets can be individually pivoted to any desired angle.

The features of our invention believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing in which:

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Fig. 1 is a partial perspective view of an air conditioning apparatus containing the invention;

Fig. 2 is a partial sectional view of the invention taken along line 2—2 of Fig. 1;

Fig. 3 is a partial sectional view of the invention taken along line 3—3 of Fig. 2; and

Fig. 4 is also a partial sectional view of the invention taken along line 4—4 of Fig. 2.

Fig. 1 shows an air conditioning device 1 on which the present invention is mounted. The air conditioner of which only a portion is of generally rectangular shape having a top wall 2, side walls 3, and a bottom wall. A flange member 4 extends peripherally around side walls 3 and top wall 2 of the conditioner and provides sealing means with the enclosure opening.

Attached to the forward end of the device is a sheet metal rectangular-formed frame 5 having an inwardly tapering surface 6 terminating in a rectangular opening 7.

Within the opening 7, the frame 5 has surfaces extending within the opening forming a generally rectangular enclosure having a pair of generally vertical side walls 8 and upper and lower generally horizontal walls 9.

A plurality of parallel horizontal louvers or vanes 10 are positioned between the upper and lower horizontal walls 9 at spaced intervals. These vanes are formed of relatively thin strips of metal stock or other suitable material (Fig. 3). At either end of each vane 10 an ear or projection 11 is formed which is received in corresponding apertures or slots in the wall 8 when the vanes are in the assembled position. These ears serve to pivotally support the vanes permitting them to swing about uniformly spaced and parallel horizontal axes. The pins preferably fit in the slots closely enough to provide the friction necessary to retain the various positions of adjustment of the vanes. Other friction devices could be utilized to perform this function. The ears 11 are retained in the wall apertures by a folded retainer strip 12 secured by appropriate means, such as press-fitting, to the edge of walls 8. A second ear or projection 13 is stamped adjacent to the ends of each of the vanes 10. These ears are inserted into apertures provided in a vertical linking member 14, preferably an angle or channel member of light material similar to that of the vanes, provided at either end of the vanes. In this manner the vanes are securely connected together for collective movement. The horizontal vanes are further formed with a plurality of longitudinally-spaced and transversely disposed triangular recesses or notches 15. The notches are also located so that corresponding notches of different vanes 10 are aligned with each other.

A vertically disposed set of vanes 16 is similarly constructed from strips of the same thickness. These vanes are provided with end projections or ears 17, 18 which are inserted into corresponding slots 19 in the upper wall and holes 19a in the lower wall (Fig. 2). The upper ear 18 is also retained in position by a folded retainer strip 20 secured to the edge of the top wall 9 by appropriate means such as press fitting. Slots 21 are provided in the strip 20 whereby the ear 18 can be received and retained in cooperation with the top wall 9. Thus the vanes are permitted to swing about uniformly spaced and parallel vertical axes. As shown in Fig. 3 the forward edge of each vertical vane 16 is received within a notch 15 adjacent the apex. The vanes 16 can therefore pivot on the ears 17, 18 which are substantially aligned with the forward edge of the vane 16 within the limits defined by the sides of the V-shaped notches 15. A linking member 22 is also provided for the vertical vanes at their upper extremity. This link may be of angle shape and stamped from the thin stock similar to link 14. A second ear 23 is provided on the top ends

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of each of the vanes 16 which is inserted within apertures 24 provided in the link 22 connecting together for collective movement of all of the vertical vanes.

In order to support the elongated horizontal vanes along their length one or more vertical members 25, 26 are positioned within the frame 5 at spaced intervals. These members are preferably channel strips formed from thin stock or other suitable material. A series of slots 27 are cut within these members 25, 26 to accommodate the vanes 10 and to support them for pivotal movement. As shown in Fig. 3 segments are stamped from the vanes 10 to provide notch 28 and aperture 29. Thus the vanes can pivot while supported and restrained from lateral movement by the engaging surfaces of the slot 27.

For operating the vanes, a stamped or molded operator 35 is pivotally connected as by riveting to one of the horizontal vanes 10 at 30 (Fig. 2). It is connected to the vane 10 for pivoted movement about a vertical axis. The portion of the device 35 extending beneath the vanes is bifurcated to form converging arms 31, 32. These arms are so positioned on the horizontal vanes 10 that an edge portion of a vertical vane 16 is received within the enclosure formed by the converging ends of the arms. The operator 35 may be provided with an operating knob 33 if desired.

In operation of the air conditioning unit 1 conditioned air is discharged through the grille assembly comprising the vanes 10, 16 and through the opening 7 in the end frame 5. When all of the vanes are disposed normal to the grille face and parallel to the axis of the frame, the entire air stream will be directed forwardly of the device. By moving the operator 35 downwardly or upwardly the horizontal vanes 10 will rotate collectively about the end supporting ears 11 due to the linking members 14 and the air stream will be deflected downwardly or upwardly respectively. With the horizontal vanes adjusted at the desired angle the vertical vanes 16 can then be rotated by pivoting the operator 35 to right or left about the rivet 30. One of the operator arms 31, 32 will contact the enclosed vane depending on the direction of rotation desired and all the vanes 16 will swing collectively linked by the member 22 to divert the air stream to the right or left of the discharge opening 7. The notches 15 in the horizontal vanes permit the adjustment of the vertical vanes over a wide range.

Therefore there is provided a grille in which either or both of the vertical and horizontal vanes can be adjusted by a single operator so that the air stream discharged from the conditioning device may be directed over a wide range.

While a specific embodiment of the invention has been disclosed herein it is obvious that many modifications may be made by those skilled in the art without actually departing from the invention. It is therefore aimed in the appended claims to cover all such equivalent variations as come within the true spirit and scope of the foregoing disclosure.

What we claim as new and desire by Letters Patent of the United States is:

1. A ventilator grille comprising a first set of spaced-apart vanes, means pivotally supporting said vanes to collectively swing about spaced parallel axes, a second set of spaced-apart vanes, means pivotally supporting said second set to collectively swing about spaced parallel axes normal to the axes of said first set of vanes, and manually movable means attached to a vane of said first set of vanes for varying the angle thereof, said manually movable means being pivotally mounted on said vane and including means engaging opposite sides of a vane of said second set of vanes for varying the angle of said second set of vanes independently of said first set of vanes.

2. A ventilator grille comprising a set of vanes each having outwardly flaring notches spaced along one edge thereof, means pivotally supporting said vanes to swing

about spaced parallel axes with the corresponding notches of the various vanes aligned with each other, a second set of vanes each disposed in and extending through one set of the aligned notches of the first vanes, means pivotally supporting the vanes of the second set to swing about spaced parallel axes, and means pivotally mounted on one vane of one of said sets of vanes for varying the angle of said set of vanes, said means including portions engaging opposite sides of a vane of said second set of vanes for varying the angle of said second set of vanes independently of said first set of vanes.

3. A ventilator grille comprising a frame, a plurality of horizontal spaced-apart parallel vanes pivotally supported in said frame, means connecting said vanes together for collective movement, a set of vertical spaced-apart parallel vanes pivotally supported in said frame, means connecting said vertical set of vanes together for collective movement, and control means mounted on one of said horizontal vanes for varying the angle of said horizontal vanes about horizontal axes, said control means being mounted for pivotal movement about an axis normal to said horizontal vane and including means engaging opposite sides of one of said vertical vanes for varying the angle of said vertical vanes independently of said horizontal vanes.

4. A ventilator grille comprising a frame, a plurality of horizontal spaced-apart parallel vanes pivotally supported in said frame, means connecting said vanes together for collective movement, a second set of vertical spaced-apart parallel vanes pivotally supported in said frame, means connecting said second set of vanes together for collective movement, a handle on one of said horizontal vanes whereby said vanes can be collectively pivoted, said handle being mounted on said one horizontal vane for pivotal movement substantially in the plane thereof, a bifurcated extension on said handle having converging arms thereon arranged to receive an edge portion of one vertical vane within the enclosure formed by the converging ends of said arms with said ends of said arms closely adjacent opposite sides of said one vertical vane whereby pivotal movement of said handle in the plane of said one horizontal vane causes said bifurcated extension to pivot said one vertical vane to collectively pivot said vertical vanes without interfering with said horizontal vane angle.

5. A ventilator grille comprising a frame, a set of horizontal spaced-apart parallel vanes pivotally supported in said frame, linking members connecting said vanes together at each end whereby said vanes can collectively move about parallel axes, outwardly flaring notches spaced along one edge of said vanes with the corresponding notches of the various vanes aligned with each other, a second set of vertical spaced-apart parallel vanes pivotally supported in said frame, a linking member connecting said vanes together at their top portion whereby said vanes can collectively move about parallel axes, each of said second set of vanes disposed in and extending through one set of said aligned notches of said horizontal vanes, and manually movable means attached to one of said horizontal vanes for collectively adjusting the angle of said set of horizontal vanes, means on said one vane for mounting said manually movable means for pivotal movement in the plane of said one horizontal vane, said manually movable means having a pivotal bifurcated extension with converging arms thereon arranged to receive an edge portion of one of said vertical vanes within the enclosure formed by the converging ends of said arms with said ends of said arms closely adjacent opposite sides of said one vertical vane whereby pivotal movement of said manually movable means in the plane of said one horizontal vane causes said bifurcated extension to pivot said one vertical vane to collectively pivot said set of vertical vanes within

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said notches without interfering with said horizontal vane angle.

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