Sept. 9, 1941. L. E. HEASLEY ET AL 2,255,616

DIRECTIONAL GRILLE

Filed Aug. 1, 1938 3 Sheets-Sheet 1

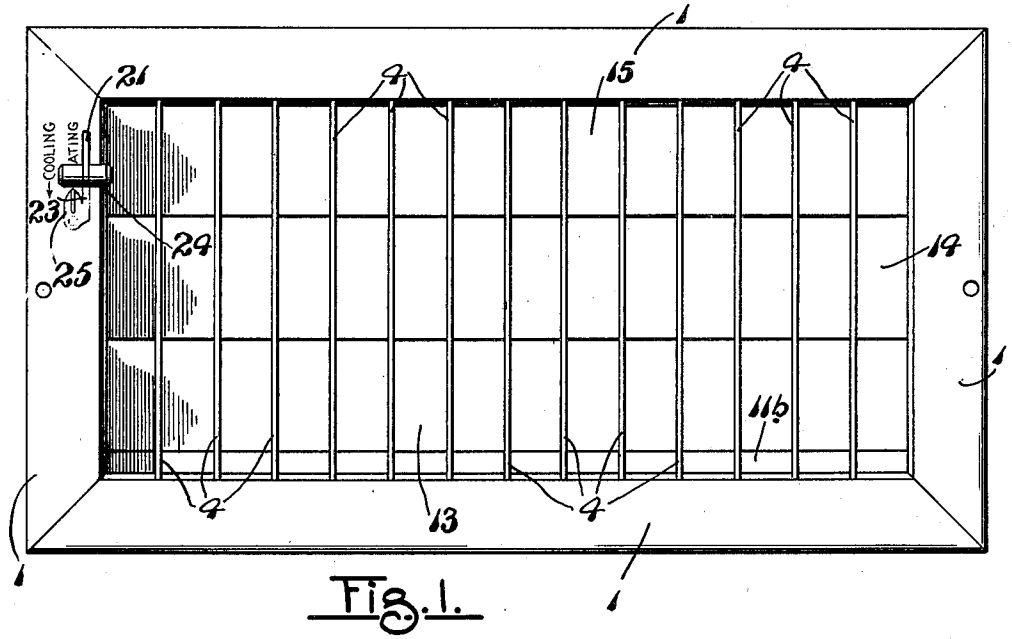


Fig. 1.

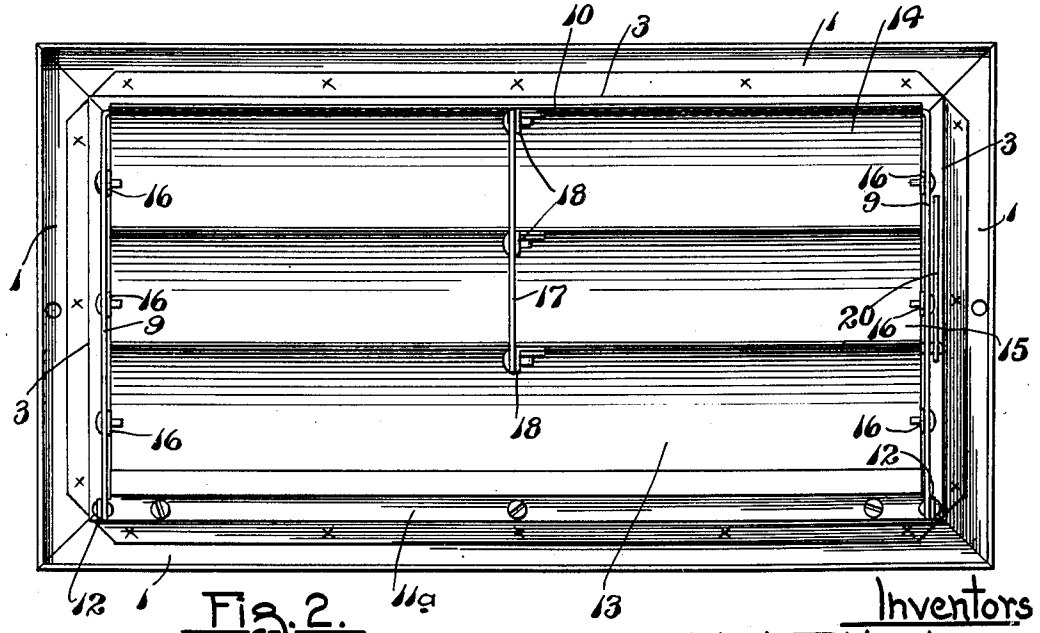


Fig. 2.

Inventors
Loyd E. Heasley
Harold S. Covell
Nelson E. Cole
By Pierce & Van Antwerp
Attorneys

Sept. 9, 1941. L. E. HEASLEY ET AL 2,255,616

DIRECTIONAL GRILLE

Filed Aug. 1, 1938 3 Sheets-Sheet 2

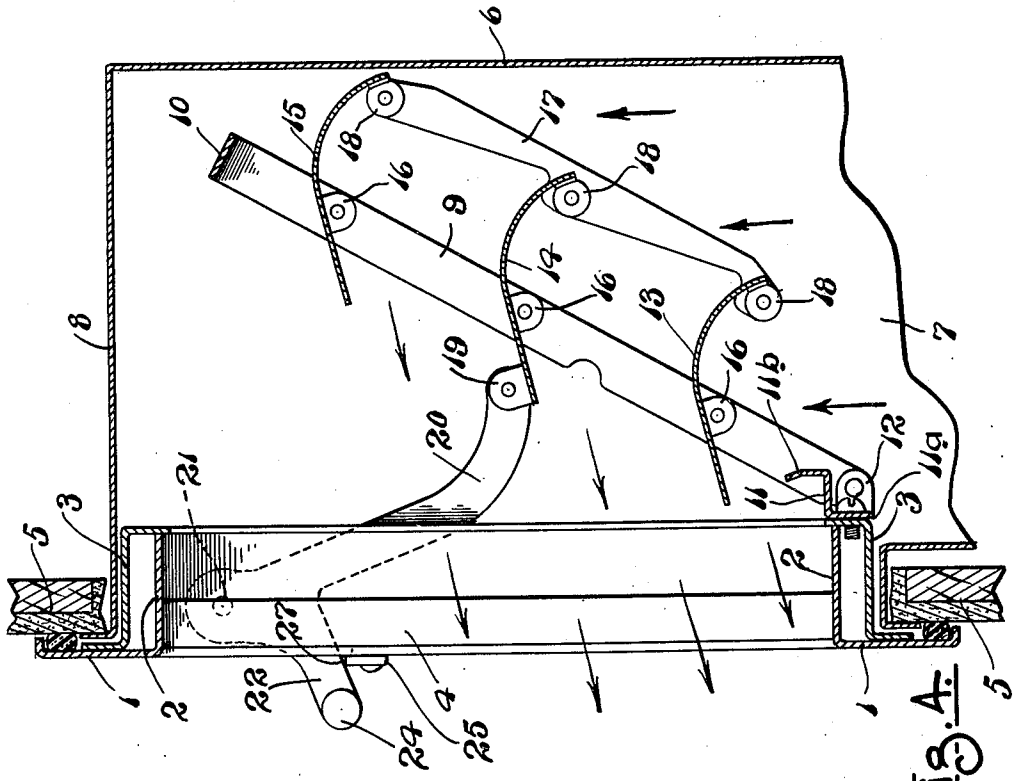


Fig. 4.

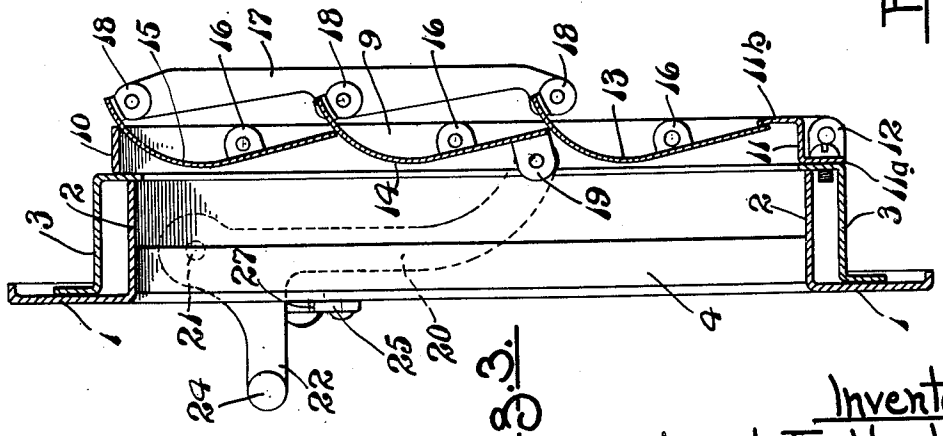


Fig. 3.

Inventors
Loyd E. Heasley
Harold S. Covell
Nelson E. Cole
By Limbacher & Van Antwerp
Attorneys

Sept. 9, 1941. L. E. HEASLEY ET AL 2,255,616

DIRECTIONAL GRILLE

Filed Aug. 1, 1938 3 Sheets-Sheet 3

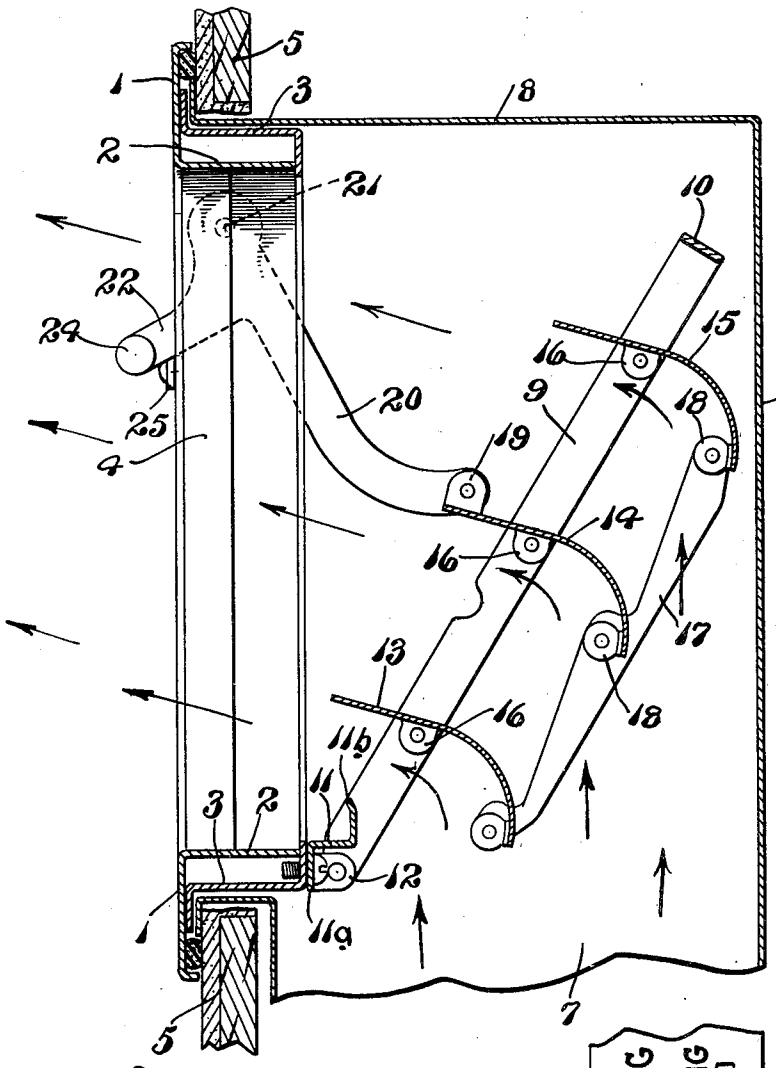


Fig. 5.

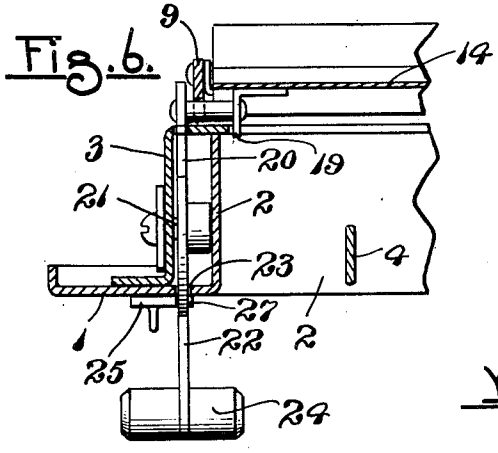


Fig. 6.

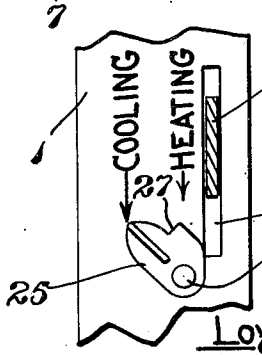


Fig. 7.

Inventors
Loyd E. Heasley
Harold S. Covell
Nelson E. Cole

By Lorenz and Van Antwerp
Attorneys

Patented Sept. 9, 1941 2,255,616

UNITED STATES PATENT OFFICE

2,255,616

DIRECTIONAL GRILLE

Loyd E. Heasley, Harold S. Covell, and Nelson E. Cole, Holland, Mich., assignors to Hart & Cooley Manufacturing Company, Holland, Mich., a corporation of Delaware

Application August 1, 1938, Serial No. 222,436

11 Claims. (Cl. 98—106)

The present invention is in connection with a novel construction of register in heating and ventilating systems for controlling and directing the passage of air into a room or the like from a flue which carries the air, the air moving upwardly through the flue either by natural or forced circulation. Registers of the type to which our invention pertains may be placed in the vertical wall of a room, the vertical side of a railroad passenger car or other enclosure which is to be supplied with the air and at the present time are usually placed at an upper position in the vertical wall, though it is to be understood that the particular location of the register in the wall is not a necessary feature of the present invention. The air may be warmed during the cooler portions of the year and cooled during the warmer portions. Heated or warmed air should be directed downwardly rather than upwardly toward the ceiling, particularly when the register is located adjacent the ceiling, while colder air should be directed upwardly from the register. Of course if the register is located adjacent the floor of the room, the direction of the heated or cooled air may be changed.

The present invention provides a novel structure of register in which the air rising in a vertical flue may be readily directed either upwardly or downwardly at a slight angle, not generally exceeding 15° to the horizontal, or the register may be completely closed. It is a primary object and purpose of the present invention to provide a very practical, economically constructed and easily operated register for attaining the advantageous results stated and for adjusting the register for either such upward or downward direction of air with respect to a horizontal plane in a particularly simple and effective manner.

The invention may be understood from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of the register made in accordance with our invention.

Fig. 2 is a rear elevation thereof.

Fig. 3 is a vertical section between the ends of the register and with the same closed against air delivery.

Fig. 4 is a similar section showing the register associated with an air carrying flue and mounted in a vertical wall, but adjusted so as to direct the air downwardly at an angle to the horizontal.

Fig. 5 is a view similar to Fig. 4, illustrating the position of the parts when the air is directed upwardly at an angle to the horizontal.

Fig. 6 is a fragmentary somewhat enlarged horizontal section through the side of the register where the operating handle is located, and

Fig. 7 is a front elevation of the structure shown in Fig. 3, with the handle shown in transverse vertical section.

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

The register frame ordinarily is of rectangular form and includes upper and lower side and end members of angle formation having face flanges 1 and inwardly extending flanges 2. Around the flanges 2 a reinforcing and strengthening frame is made from Z-bars 3, the intermediate web portion of which parallels the flanges 2 and is spaced therefrom, while one of the legs at the ends of the webs 3 are spot-welded to the rear side of the face members 1, while the others extend inwardly over the inner edges of the flanges 2, as shown in Figs. 3, 4 and 5. Such frame structure is not novel and is not, in its specific form, required for our invention. The described structure is that of a conventional open rectangular register frame. Between the upper and lower inwardly extending flanges or legs 2, a plurality of vertical grille bars 4 are mounted and secured in spaced apart parallel relation to each other from one end of the opening in the register to the other. Such frame bar structure also is of a conventional form and the frame and grille bars furnish an environment in which our invention may be utilized.

As shown in Figs. 4 and 5, the register frame is installed in a suitable opening in a vertical wall of a room, railway car or the like. The flue which carries air has a vertical back 6, vertical sides 7 and an upper closed end 8, and has an opening in its outer side at its upper portion into which the frame of the register is inserted so that air passing upwardly through the flue may thence pass outwardly through the register. It is to be understood that the flue does not necessarily have to terminate immediately above the register, but may be carried further upward and have other openings in which air passing registers may be mounted, as in the upper rooms of houses and the like.

At the rear side of the frame an inverted U-shaped bail having parallel spaced apart sides connected at their upper ends integrally by a cross member 10 is located, the lower ends of the sides 9 coming immediately back of the lower horizontal member of the register frame. At the

rear side of such lower horizontal member of the register frame a Z-bar having an intermediate horizontal web 11 and two end flanges or legs 11a and 11b is secured, the depending flange 11a having screws passing therethrough to secure it to the register frame; and at the ends of the depending flange 11a ears 12 are turned rearwardly, to which the lower ends of the sides 9 of the bail are pivotally connected.

A plurality of air directing vanes 13, 14 and 15 of the shape shown, extend between the sides 9 of the bail and between their front and rear edges and at each end have depending ears 16 which are pivotally connected with the adjacent sides 9. The air directing vanes are spaced apart from each other and while shown as three in number in the disclosure, the number of vanes used may be changed without departing from our invention. The vanes include curved rear sections and flat forward sections which extend substantially tangential to the curved portions, as shown in Fig. 5.

Said vanes at their rear portions are connected by a bar 17 of flat metal, the upper and lower ends of which have pivotal connection to ears 18 secured to the rear edge portions and at the under side of said vanes, while the middle portion of the bar 17 is pivotally secured to an ear 18 similarly secured to the intermediate vane 14. The lower and intermediate vanes 13 and 14 at their rear edges are slotted so that the bar 17 projects partially into the slots.

The intermediate vane 14 at one end and very near its forward edge, has an upturned ear 19 which is pivotally connected to the lower rear end of a lever arm 20 which in turn is pivotally mounted on a pivot pin 21 (Fig. 6) located between the vertical inwardly extending flange 2 at one end of the register and the adjacent Z-bar frame member 3. An arm 22 extends forwardly from the arm 20 and passes through a vertical slot 23 in the face member 1 of the adjacent end of the register frame. At its outer end the arm 22 is equipped with an operating knob 24, by means of which the lever may be turned about its pivot 21 to swing the inverted U-shaped member or bail 9, 10 from a vertical position, such as shown in Fig. 3, to the inclined positions shown in Figs. 4 and 5, the air directing vanes 13, 14 and 15 being carried by and moving with said inverted bail.

Near the lower end and at one side of the vertical slot 23, a dog 25 is pivotally mounted upon a pivot pin 26. Such dog is manually operated so that it may be swung from the inclined position shown in Fig. 7, to a vertical position. At the inclined position the lever arm 22 may be moved downwardly to its lowest point of travel, whereupon the bail carrying the air directing vanes is moved to its rearmost position in the air carrying flue, as in Fig. 5. In such position the forward outwardly extending flat portions of the vanes 13, 14 and 15 are upwardly and outwardly inclined at an angle of approximately 15° to the horizontal. When the dog 25 is turned to vertical position a stop shoulder 27 thereon interposes in the path of movement of the arm 22 and prevents its moving to its extreme lowermost position whereby the vanes 13, 14 and 15 take the position shown in Fig. 4, the outer flat portions thereof in such case being inclined downwardly and outwardly at approximately 15° to the horizontal. On lifting the lever 22 to its uppermost position as in Fig. 3, the vanes and the bail carrying them are swung to a vertical position directly back of the register, the vanes closing against each other and the lowermost vane 13 coming against the front side and at the upper edge of the upwardly extending leg 11b of the Z-bar upon which said bail carrying the vanes is pivotally mounted. In this position, as in Fig. 3, there is a complete closure against the passage of air.

The face member 1, upon which the dog 25 is mounted, may carry indicia which give directions to the operator. For example, in the summer months when cool air is directed into a room or the like, the upper end of the dog will be swung to the left so as to point toward the direction appearing as "Cooling". In such case operation of the arm 22 downwardly to its lowermost position carries the vane structure to the position of Fig. 5. The air rising in the flue 6 is caught by the downwardly curved rear portions of the vanes and directed outwardly and upwardly at the slight angle to the horizontal shown. During the colder months of the year when warm air is forced or otherwise carried upwardly through the flue, the dog 25 is moved so that its upper end is pointed toward the indication "Heating", whereupon operation of the handle 22 downwardly as far as it can go, or until stopped by the shoulder 27, positions the vanes as in Fig. 4 and the rising heated air is caught by the curved rear portions of the vanes and directed outwardly and downwardly at an angle to the horizontal.

The construction described is particularly practical and useful and with it a desired control of the air and its direction of entrance to a room or other enclosed space which is to be either heated or cooled is obtained in a very simple and effective manner.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

We claim:

1. A register construction comprising, an open register frame, a mounting member pivotally mounted at the rear side of said register frame, a plurality of air directing vanes pivotally mounted in spaced apart relation on said mounting member, means for moving said mounting member to a vertical position adjacent the frame or to an upwardly and rearwardly inclined position, and means for automatically moving said vanes with the movement of said member to substantially vertical position to close the register opening when said member is moved to vertical position against the frame, and to occupy a position approaching horizontal when said member is moved to inclined position away from the frame.

2. In a structure of the class described, an open register frame, an inverted U-shaped member having spaced apart parallel sides pivotally connected at the rear side and lower portion of the register frame, a plurality of air deflecting vanes pivotally mounted in spaced apart relation to each other on and between the sides of said member, said vanes being mounted between their front and rear edges, means connecting the rear edges of said vanes whereby the movement of one causes corresponding movements of the others, and manually operable means connected to one of said vanes at its forward edge whereby said inverted U-shaped member and the vanes may be moved to a vertical position at the rear side of said register frame or to a position wherein said frame is inclined upwardly and rear-

wardly and said vanes approach an approximately horizontal position, as specified.

3. A construction containing the elements in combination defined in claim 2, combined with means mounted on the register frame and adapted to be moved into the path of movement of said manually operable means for limiting the extent of movement of the latter, whereby said vanes are stopped at a position such that their forward portions incline downwardly and outwardly at a relatively small angle to the horizontal, said stop means when moved to inoperative position permitting a further movement of the manually operable means and the vanes whereby the vanes at their outer edge portions are inclined at a slight upward angle to the horizontal.

4. In a construction of the class described, an open register frame, a member having spaced apart sides pivotally mounted at the lower ends of said sides at the rear lower portion of the register frame, a plurality of thin vanes pivotally connected between their front and rear edges to and located between the sides of said member, the pivot points of said vanes being spaced apart in the length of the sides of said member, a lever pivotally mounted between its ends on the register frame having an arm extending downwardly from the pivot, the lower end of said arm having a pivotal connection to the forward portion of one of said vanes, said lever having a second arm extending forwardly in front of the register frame, and means connecting said vanes causing the vanes to move simultaneously and equally when said vane connected to the arm is moved, as specified.

5. A construction containing the elements in combination defined in claim 4, said second arm of the lever having movement in a slot in said frame in a downward direction, the lower end of the slot stopping the movement of the lever and positioning the vanes such that their outwardly extending portions extend upwardly at an acute angle to the horizontal, and means adapted to be moved across said slot at the lower portion thereof to stop the lever at an upper position wherein said vanes have their outwardly extending forward portions positioned at a downwardly inclined angle to the horizontal.

6. In a register construction, an open register frame, mounting means pivotally mounted on the register frame, a plurality of pivotally mounted vanes carried by said mounting means, said vanes being spaced apart vertically at their pivot means and located one over the other, means connecting the vanes whereby they are moved about their pivot points simultaneously, and equally with the movement of any one of said vanes, and manually operable means connecting to one of said vanes for moving said vanes and the mounting means carrying them toward or away from the register frame and at the same time changing the planes of said vanes relative to the horizontal.

7. In a construction of the class described, an open register frame, spaced apart bars pivotally connected at their lower ends to the lower end of and at the rear side of the register frame, a plurality of vanes located horizontally between said bars, means pivotally connecting said vanes to said bars between the edges of the vanes, a manually operable lever pivotally mounted on said register frame connected at one end to one of said vanes for swinging said bars between a vertical position wherein said bars are directly behind the register frame, to an upwardly and rearwardly inclined position and simultaneously swinging said vane from a substantially vertical position toward a horizontal position, and means connecting said vane to which the lever is connected with the other vanes to cause said other vanes to move simultaneously and equally with said lever connected vane, as specified.

8. In a construction containing the elements in combination defined in claim 7, said vanes being of thin sheet metal and including a curved section and a flat section substantially tangential to the curved section, said flat sections of the vanes extending downwardly from the pivots when said vanes and the bars to which connected are in a vertical position, and extending forwardly at an acute angle to the horizontal when said bars and the vanes carried thereby are moved rearwardly away from the register frame, the curved portions of the vanes in the latter position thereof extending in a downward and rearward direction.

9. A structure of the class described comprising, a register frame having an opening, a mounting member movably mounted at one side of said frame, a plurality of air directing vanes pivotally mounted in spaced apart relation on said mounting member, means for maintaining said vanes substantially parallel relative to each other, a single operating means, acting to both move the mounting member toward or from said opening and to change the positions of said vanes relative to the horizontal, and means for selectively stopping the operation of said operating means at two different positions, in one of which the forward portion of the vanes will extend downwardly and outwardly at an angle to the horizontal and in the other of which they will extend upwardly and outwardly at an angle to the horizontal.

10. A structure of the class described comprising, a register frame having an opening, a mounting member movably mounted at one side of said frame, a plurality of air directing vanes pivotally mounted in spaced apart relation on said mounting member, means for maintaining said vanes substantially parallel relative to each other and a single operating means, acting to both move the mounting member toward or from said opening and to swing the vanes about their pivots when moved away from said opening to a position to direct the air upwardly through said opening or to a position to direct the air downwardly through said opening.

11. The combination of elements defined in claim 10 in which said operating member is connected to one of said vanes.

LOYD E. HEASLEY.
HAROLD S. COVELL.
NELSON E. COLE.