Aug. 21, 1956 K. S. JENSON 2,759,411

ROTATABLE LOUVER UNIT

Filed Sept. 28, 1951

FIG. 1.

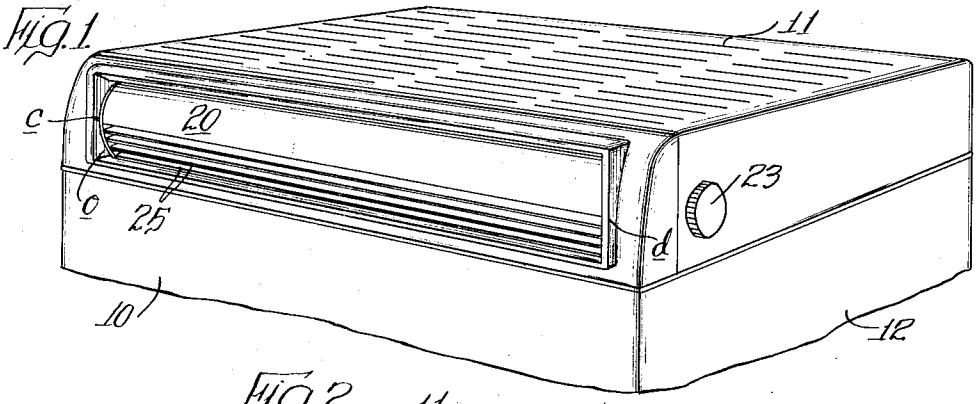



FIG. 2.

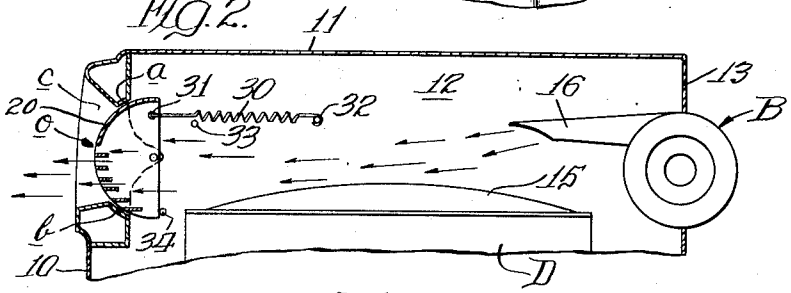



FIG. 3.

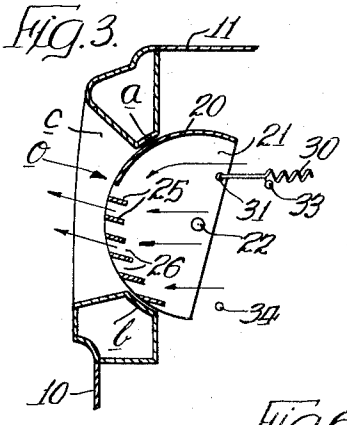



FIG. 4.

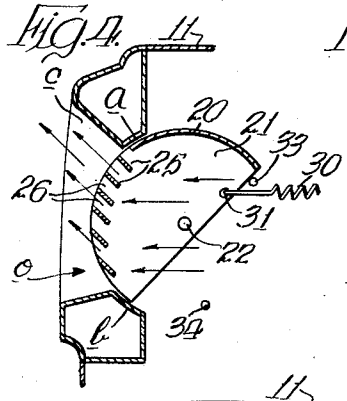



FIG. 5.

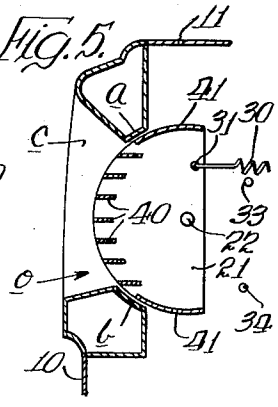
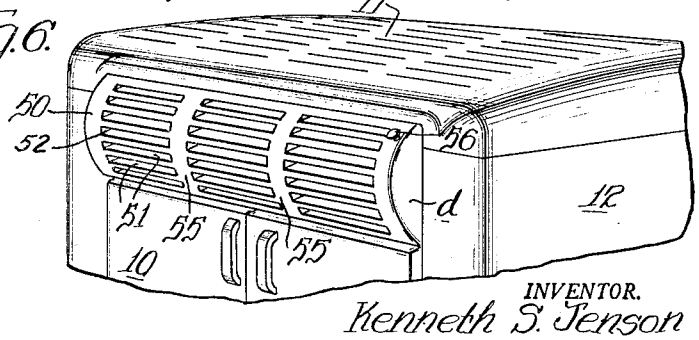



FIG. 6.




INVENTOR.
Kenneth S. Jenson
BY
Banning & Banning
Attys:

United States Patent Office 2,759,411 Patented Aug. 21, 1956



2,759,411

# ROTATABLE LOUVER UNIT

Kenneth S. Jenson, Wisconsin Rapids, Wis., assignor to Preway Inc., Wisconsin Rapids, Wis., a corporation of Wisconsin

Application September 28, 1951, Serial No. 248,737

1 Claim. (Cl. 98—40)

This invention is concerned with a louver unit supported on a pivotal mounting so that the several louvers which occupy fixed positions in the unit may be shifted from one position to another relative to the opening in an associated frame. Such a louver unit has the advantage that (1) the aggregate area of the louver openings, and (2) the overlap of each louver relative to the adjacent louvers, remain unchanged although the angular positions of the louvers relative to the horizontal may be varied considerably with each rotative adjustment of the unit.

A louver unit having these special features of construction may be used with advantage in a wide variety of installations. It is particularly adaptable to equipment from which is discharged a moving stream of air, either hot or cold. One special application of this invention, as an exemplification thereof, is herein illustrated and described in relation to a space heater having means for effecting a forced delivery of heated air therefrom.

The invention may be variously modified according to what may be considered best for a given installation. For example, the positions and arrangement of the louvers which remain fixed at all times are so disposed relative to the opening in an associated frame as to be covered thereby to a greater or lesser extent. In one rotative position of the unit, there is a substantial reduction in the aggregate area of the louver openings uncovered by the frame coincidentally with deflection of the air stream in a certain direction. When differently adjusted so as to deflect the air stream in another direction, the aggregate area of the uncovered louver openings may also be changed again. This permits of a wide variation in the performance of such a louver unit according to the manner of its adjustment in use.

It is a primary object of this invention to provide such a rotatable louver unit which is simple and dependable in its construction and also attractive in its appearance; a louver unit through which a moving stream of air may be passed with a variable deflection, but without any change in the aggregate area of the louver openings; and a louver unit through which a moving stream may be passed with a variable deflection, but without any change in the overlap resulting from staggering of each louver relative to the adjacent louvers.

These and various other objects and advantages, as will hereinafter appear, may be realized from this invention of which certain preferred embodiments are illustrated in the accompanying drawing in the manner following:

Figure 1 is a fragmentary perspective view of the top portion of a conventional space heater cabinet having a front opening which defines a frame wherein is mounted the rotatable louver unit of this invention in one form thereof;

Fig. 2 is a semi-diagrammatic view in vertical section of the upper portion of a space heater showing the present rotatable louver unit in operative relation to the associated frame therefor at the cabinet front and to a blower unit from which heated air is forwardly discharged for passage through the several louvers of the unit;



Figs. 3 and 4 are similar views showing the louver unit in two different positions of rotative adjustment;

Fig. 5 which is a similar view shows a rotatable louver unit modified in the single respect that its louvers are so positioned as to occupy an area which is medially of the arcuate width of the unit; and

Fig. 6 which is a view similar to Fig. 1 shows a further modification in the louver unit construction.

The several embodiments of this invention are herein illustrated in connection with a cabinet having a front wall **10**, a top **11**, side walls **12**, and a rear wall **13**. Within the cabinet is positioned a heating drum D whose top **15** is disposed well below the cabinet top **11**. A motor blower unit B which is mounted on the rear wall **13** is provided with a forwardly extending nozzle **16** arranged to discharge heated air into the space above the drum top **15** to be further heated in its advance toward the front wall **10** of the cabinet where a horizontally wide and vertically narrow outlet opening *o* is provided. This opening is constituted by a frame consisting of upper and lower walls *a* and *b* and opposite end walls *c* and *d*. Since the cabinet structure of Fig. 6 is similar in all essential respects, the same reference characters are applied thereto to designate corresponding parts.

In the form of the invention illustrated in Figs. 1–4, the louver unit comprises an elongated shield **20** in the form of a plate of metal, plastic, or the like, which is transversely arcuate for 90° or thereabouts. To opposite ends of this arcuate shield are affixed end plates **21**, each fixedly mounting a pivot pin **22**, concentrically of the arcuate shield **20** and coaxially disposed rearwardly of the frame opening *o*. The general from of each end plate may be that of a semi-circle, although such a contour is, of course, optional. The pivot pins are rotatably supported in the end plates *c* and *d* of the frame so as to provide for the louver unit a rotatable mounting. A knob **23** may be affixed to one of the pivot pins to provide an operating means for the louver unit.

The top wall *a* of the frame is located close to the arcuate shield **20**, and likewise the end walls of the frame are positioned close to the end plates **21** of the louver unit. The arcuate shield is, therefore, enclosed by the frame and in certain of its rotative positions is covered thereby to a varying extent. As herein illustrated, the arcuate shield extends through slightly less than 90° and the frame opening is slightly more than 90°, but this relationship of one to the other may be variously modified depending upon the results desired.

The shield **20** occupies substantially a quadrant of the circle whose center is the axis of the pivot pins **22**. The next adjacent quadrant is occupied by a plurality of elongated, thin, parallel vanes **25** defining between them slots **26**. At their ends these vanes are immovably affixed to the plates **21** to be carried thereby and, as a unit, be rotated therewith. All these vanes are fixed in relation to each other so that their spacings and staggerings never change, and their forward edges remain disposed in an arcuate path.

The slots and vanes together constitute the louvers which, in the construction of Figs. 2–4, occupy an arcuate area of approximately 90° which is located wholly within one quadrant of a circle. In such a construction, with a frame opening of the size illustrated, all the louver vanes are disposed horizontally when the louver unit is rotated to the position of Fig. 2. However, in this position some of the louvers are covered by the frame lower wall *b* so that the aggregate area of the louver openings is somewhat reduced. This is a condition which will obtain when the louvers are concentrated in one quadrant, and the frame opening is of a vertical width somewhat less than twice the radius of the arcuate path wherein the shield and louvers are disposed.

Air which is delivered horizontally or slightly downwardly from the blower nozzle **16** will advance through the louver openings without change of direction. When adjusted rotatably to the position of Fig. 3, the louver unit will deflect the horizontally moving air stream slightly upwardly as it issues through the frame opening. In this position more of the louvers are uncovered and less of the shield **20** so that the aggregate area of their openings is somewhat increased, thereby compensating fully for any resistance that is encountered at the points of deflection. In the further adjusted position of Fig. 4, the air is deflected sharply in an upward direction as it leaves the frame opening, and here all of the louver units are uncovered and none of the shield **20** so as to produce the maximum aggregate area of their openings.

In the illustrated constructions the preponderance of weight is forwardly of the pivotal connections **22**, so the louver unit will normally tend by gravity to rotate in a counter-clockwise direction. To hold the unit stationary in any selected position, a suitable friction device, detent, counterweight or tension means may be employed. For example, a light counterbalancing spring **30** may be connected at one end to one of the end plates **21** at a point **31** above its pivotal axis and extend rearwardly therefrom for connection at **32** with the cabinet wall **12**. Also a pair of stops **33** and **34** are positioned to be alternately engaged by opposite end portions at the rear of one of the end plates **21** to limit the distance through which the unit may be rotated between extreme positions such as are indicated in Figs. 2 and 4.

Another arrangement of the louvers is suggested in Fig. 5. Instead of concentrating all of the louvers in a single quadrant of the circle with which the arcuate shield **20** is concentric, the louvers **40** are here disposed in two adjacent quadrants so as to occupy about one-half of each, and two shields **41**, each having an arcuate width of about one-half a quadrant, are located at opposite ends thereof. In the position of Fig. 5 all of the louvers are exposed within the frame opening with the vanes occupying horizontal positions and in substantial alignment with the moving stream of air which is passed therethrough. If this louver unit be rotated to a different position of adjustment, either way, so as to deflect the air stream either upwardly or downwardly, there will be a reduction in the aggregate area of the louvers due to coverage by the associated frame. This reduction increases with increase in the angle of deflection of the air stream, and for certain purposes this may be desirable.

The louver unit illustrated in Fig. 6 is essentially the same as that already described with the exception that the shield **50** is continuous through an arcuate distance of about two quadrants save for approximately one-half that distance intermediately of its arcuate ends, where it is formed with vanes **51** extending rearwardly in parallelism, each adjacent a slot **52**. The louvers thereby provided may extend continuously for the length of the shield, or as illustrated in Fig. 6, be interrupted at intervals to provide continuously extending arcuate bands **55** which contribute to the strength and attractive appearance of the unit. A knob **56** affixed to the shield serves as an operating medium therefor. The louver unit may be rotatably adjusted to any position between limits which are fixed by spaced stops similar to those disclosed in Fig. 5 whereby to deflect a moving stream of air either upwardly or downwardly, as desired.



A louver unit of this description is advantageous in that the friction developed at the points of its pivotal mounting is reduced to a minimum. This contrasts sharply with the usual assembly of adjustable louvers wherein two pivotal mountings are required for each louver. The effort required for adjustment of the unit is appreciably less, and also the possibilities of obtaining special results in the way of air stream deflection and change in the location and number of the louvers in operation are greatly increased.

I claim:

A space heater comprising, in combination, a cabinet provided with side walls and a generally vertical front wall having means defining an elongated opening adjacent the top thereof extending for substantially the entire width of the front wall, a rotatable louver unit positioned in the cabinet, said louver unit comprising substantially semi-circular end plates of a height slightly greater than the height of said wall opening and having outer arcuate edges, a plurality of spaced-apart parallel vanes extending between the approximate lower half of the end plate outer edges with the front edges of said vanes substantially flush with said end plate arcuate edges, arcuate shield means extending between and substantially flush with the upper half of the end plate outer edges, means pivotally mounting said louver unit on the cabinet side walls in closely fitting relationship with said opening with substantially equal lengths of the upper and lower ends of said outer arcuate edges disposed rearwardly of said opening when said vanes extend generally normal to the plane of the cabinet front wall and substantially all the vanes are exposed to the opening, means limiting the pivotal movements of the louver unit so that the shield may only cover a portion of the opening at most, and means outside the cabinet for pivoting the louver unit to simultaneously vary the angle of all the vanes with respect to the cabinet front wall and vary the direction of air exhausted from the cabinet without substantial variation in the amount of air exhausted.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| D. 159,017 | Teague | June 13, 1950 |
| 622,375 | Leather | Apr. 4, 1899 |
| 855,778 | Hickey | June 4, 1907 |
| 2,057,494 | Leigh | Oct. 13, 1936 |
| 2,324,858 | Levine | July 20, 1943 |
| 2,513,463 | Eklund et al. | July 4, 1950 |
| 2,566,033 | Reeves | Aug. 28, 1951 |
| 2,656,781 | Spieth | Oct. 27, 1953 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 491,127 | Germany | Feb. 6, 1930 |
| 571,761 | Great Britain | Sept. 7, 1945 |
| 580,093 | Great Britain | Aug. 27, 1946 |
| 40,623 | Netherlands | Apr. 15, 1937 |