April 16, 1968 E. L. SNELL 3,378,199

REGISTER FOR HEATING AND AIR CONDITIONING

Filed June 30, 1966 4 Sheets-Sheet 1

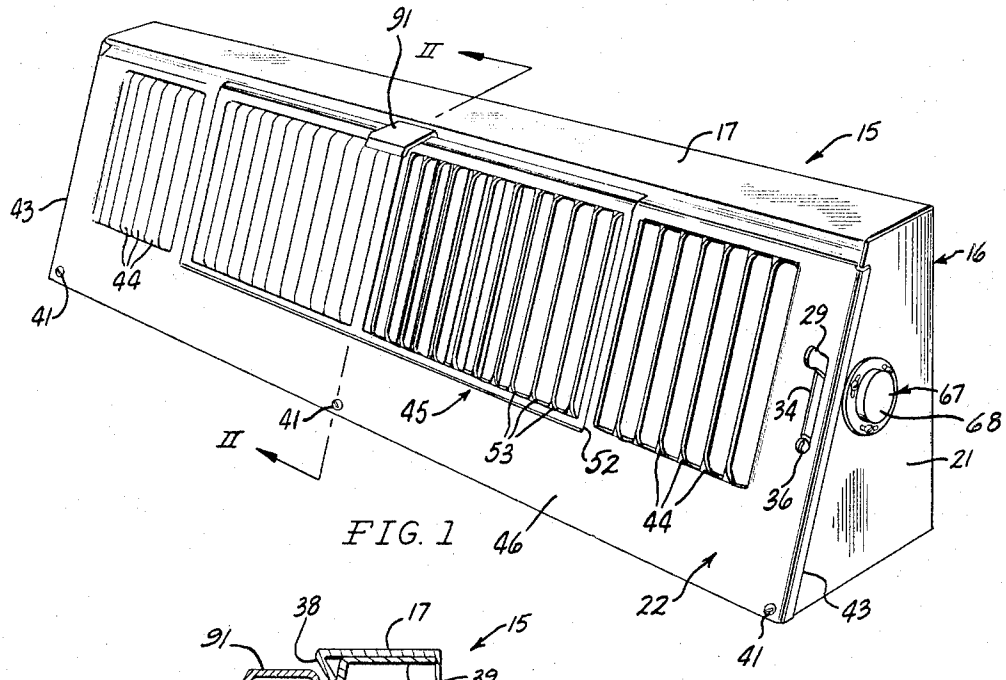



FIG. 1

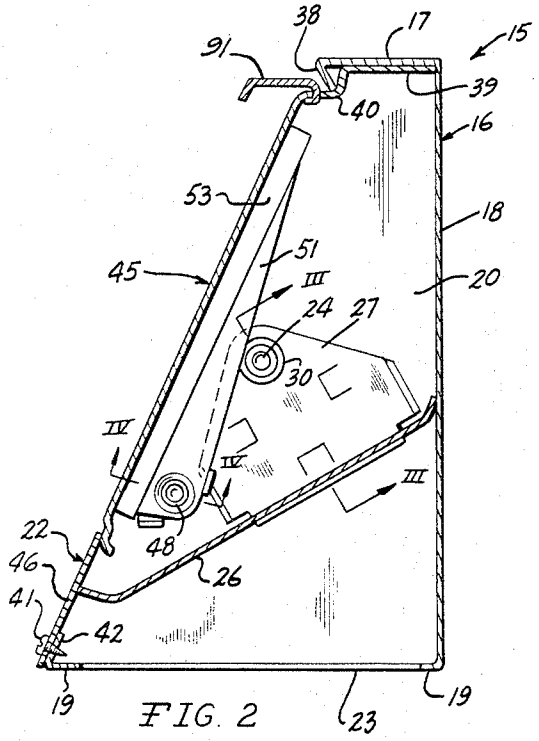



FIG. 2

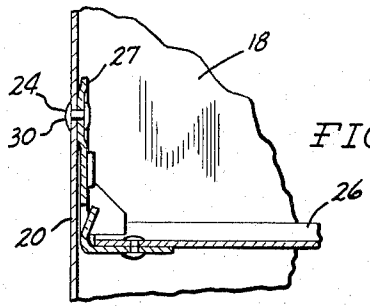



FIG. 3

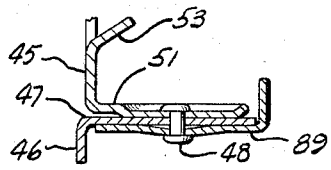



FIG. 4

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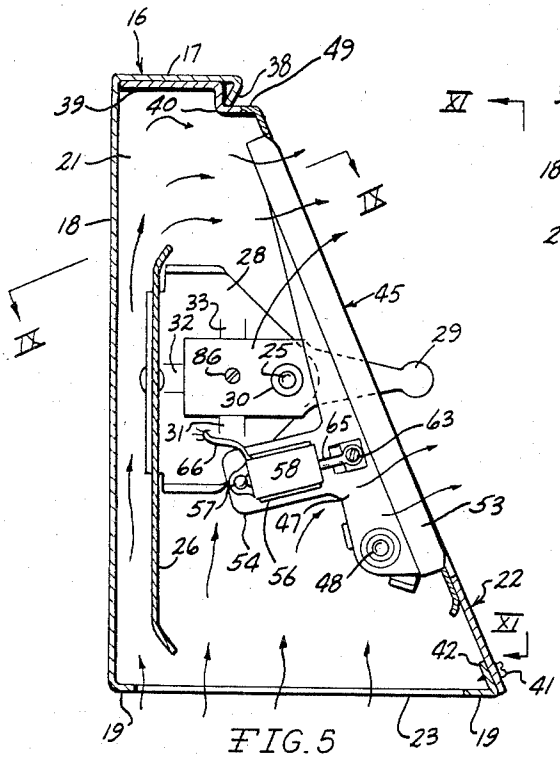



FIG. 5

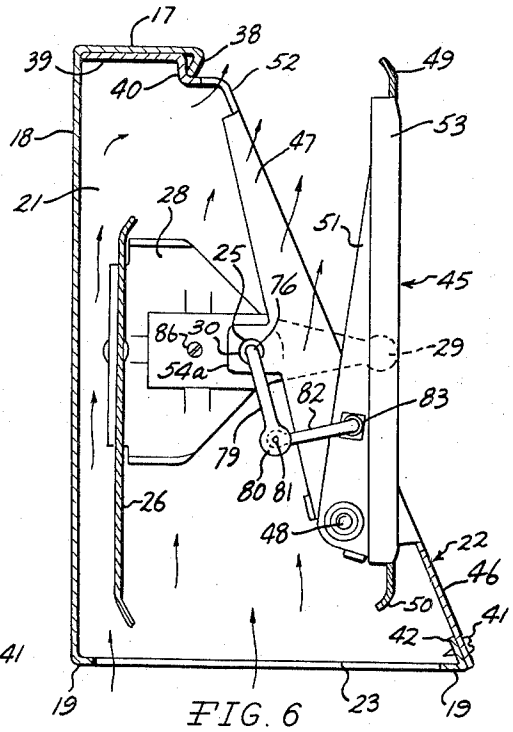



FIG. 6

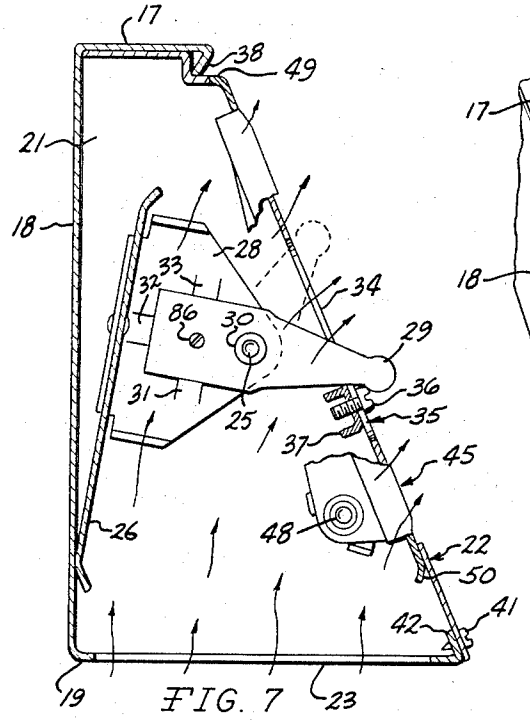



FIG. 7

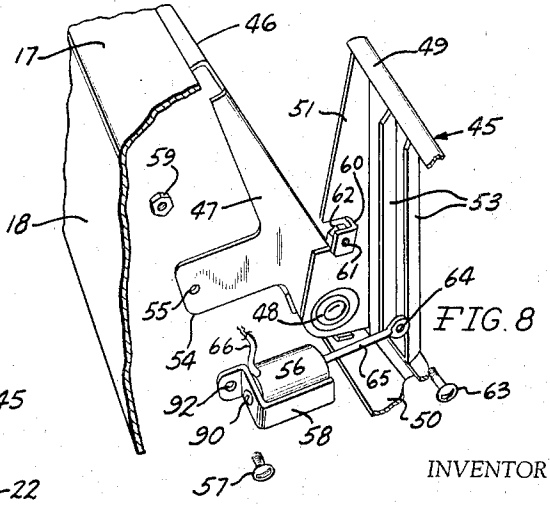



FIG. 8

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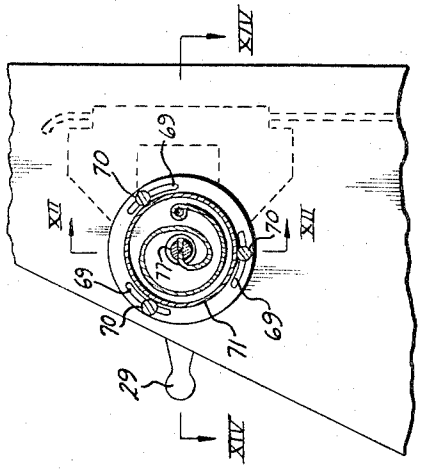



FIG. 10

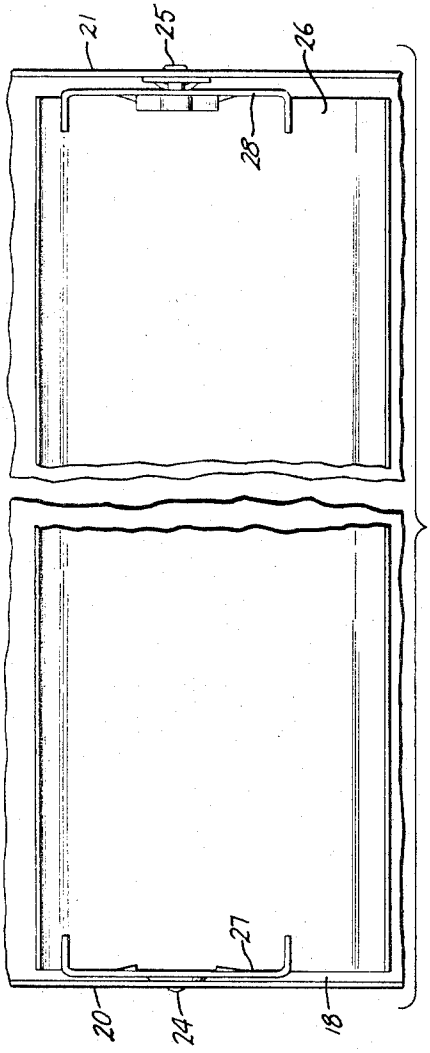



FIG. 11

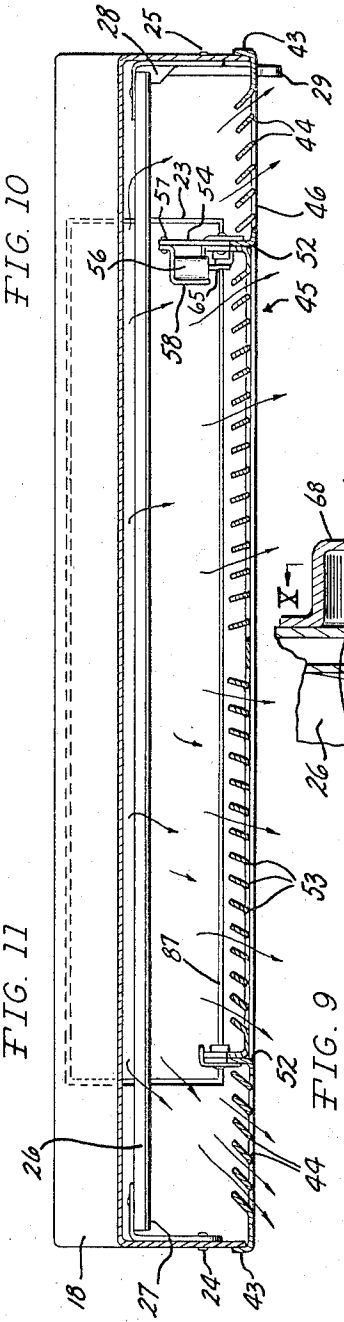



FIG. 9

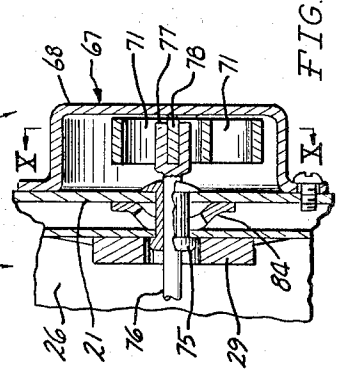



FIG. 12

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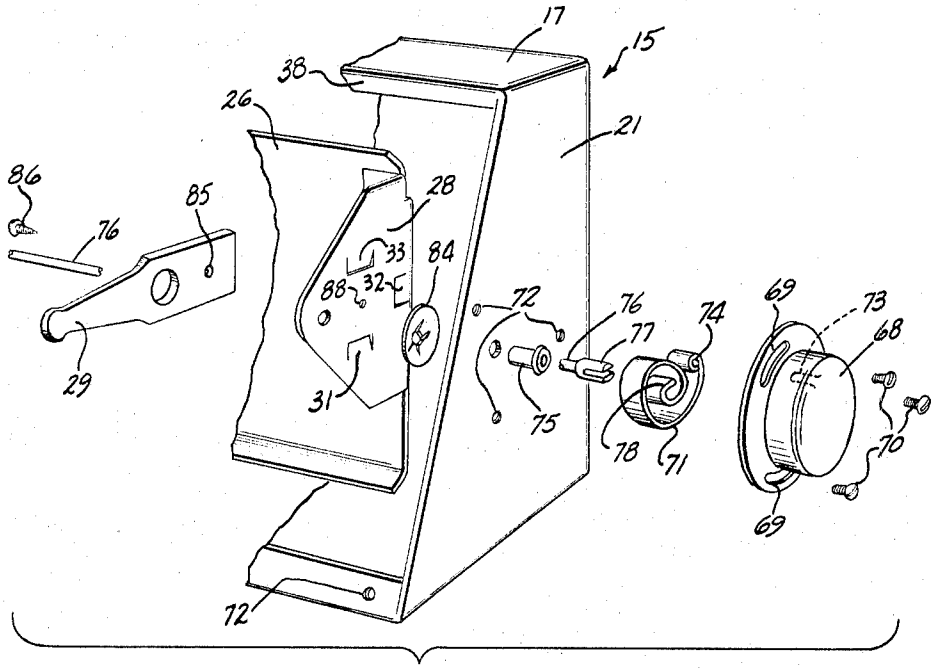



FIG. 13

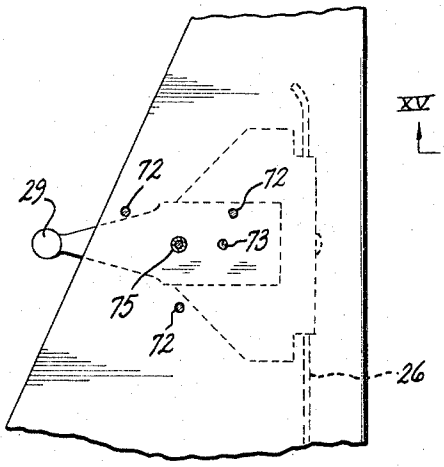



FIG. 15

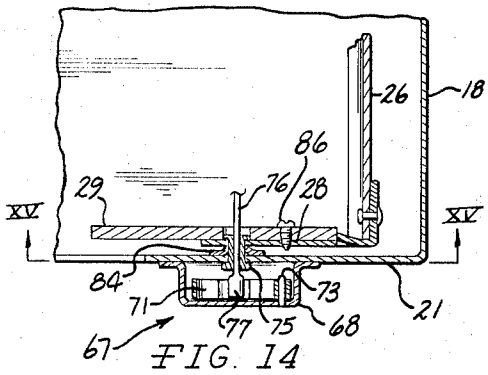



FIG. 14

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United States Patent Office 3,378,199
Patented Apr. 16, 1968



3,378,199

# REGISTER FOR HEATING AND AIR CONDITIONING

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Filed June 30, 1966, Ser. No. 561,831
17 Claims. (Cl. 236—49)

## ABSTRACT OF THE DISCLOSURE

This is a new type of combination heating and air conditioning register having a balanced damper pivoted at the ends of the register between the top and bottom of the damper but nearer its top and forward of its front face. Said damper being manually shiftable from parallel to but spaced forward of the rear face of the register to facilitate air flow behind said damper to provide a plenum effect and more uniform air distribution full length of the register, to a position stopping air flow behind the damper and directing same forward and upward, and lastly to a shut-off position with the bottom edge of the damper forward to the front panel and its top back to the back panel. The front panel having a bottom hinged central portion with vertical louvers, at least part of which taper toward its ends, said central portion being actuatable by means hinging same outward upon flow of cold air, and closing same when hot air is flowing. Said front panel also having outwardly tapering vertical louvers in its end portions adjacent the opposite ends of said pivoted central portion.

The present invention relates broadly to registers adapted for use with either hot air heating systems or air conditioning systems, or a combination of both, and more specifically with this type of register in the form of a baseboard diffuser, which has a bottom hinged, outwardly pivotable louvered front panel member.

Baseboard diffusers in one form have upwardly and backwardly inclined front panel members with louvers angled so that the front discharge of air through same comes out substantially forward and upward from the central portion, with the louvers tapering sidewise more and more as the side edges of the diffuser are approached. This is highly satisfactory for heating situations where the diffuser is mounted at the baseboard under a window since it then spreads and blankets all or a large portion of the window with a curtain of warm air when the furnace is operating. However, it is common practice in newer installations to use combination units which will furnish heat in winter and cooled air in the summer. With this type of system the above described style of baseboard diffusers is not wholly satisfactory since the cool air should not be used to blanket a window in hot weather but rather should be delivered directly upward to the ceiling to cool the heated room air which rises to the ceiling area. It was a recognition of this problem and the need of a solution for same which led to the conception and development of the present invention.

Accordingly, among the objects of the present invention is the provision of a register or so-called baseboard diffuser which is adapted for use with air circulating fan type heating and/or cooling systems and adapted for outward and sidewise distributing of hot air for blanketing a window or the like, and at the same time being adjustable for air conditioning use where the cooled air is largely delivered in a body substantially straight up toward the ceiling where hot air rises and stratifies.

Another object is to provide this baseboard diffuser which is adapted for sidewise diffusion of hot air as well



as upward delivery of cold air under air conditioning conditions with minimum sidewise diffusion, with a damper which is of balanced type and not hinged at either its bottom or top edges, and moreover, is pivotally mounted at the ends of the baseboard diffuser housing rather than on the air outlet grill member itself.

A further object is to provide a baseboard register which can be shifted from heating to cooling position, or vice versa, depending upon the air flow pattern desired.

A further object is to provide a baseborad diffuser of the character described which will automatically shift from heating position to air conditioning position and vice versa in accordance with the type of operation (heating or cooling) called for.

Still further objects and advantages of the invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends the invention, then, consists of the improved register or baseboard diffuser hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain means for carrying out the invention, such disclosed means illustrating, however, but several of various ways in which the principles of the invention may be used.

In the annexed drawings:

FIGURE 1 shows in reduced size a front perspective view of a preferred form of a register embodying the present invention.

FIGURE 2 shows a sectional view taken along line II—II of FIGURE 1, looking in the direction of the arrows and showing the damper in closed position.

FIGURE 3 shows a fragmentary sectional view of one end of the register damper as taken along line III—III of FIGURE 2, looking in the direction of the arrows.

FIGURE 4 shows a fragmentary sectional view of one of the pivot mountings of the pivotally mounted louvered front center portion of the register as taken along line IV—IV of FIGURE 2, looking in the direction of the arrows.

FIGURE 5 shows a vertical sectional view of a modified construction looking in a direction opposite to the arrows on line II—II of FIGURE 1, but with the damper upright in balanced position and the pivotally mounted, solenoid operated, louvered front center portion in retracted position.

FIGURE 6 shows a sectional view in similar position to that shown in FIGURE 5 but of modified construction with the pivotally mounted louvered front center portion in outwardly extended position where it has been pushed by a thermostat operated means of the type shown in FIGURES 1, 10, 12 and 13.

FIGURE 7 shows a fragmentary sectional view similar to FIGURES 5 and 6 with the pivotally mounted register front center portion partially broken away, some of the parts omitted to facilitate showing others, and with the lower end of the damper tilted back to the back panel of the register.

FIGURE 8 shows a fragmentary, exploded, sectional view of the mounting of the electrical mechanism for actuating the pivotally mounted louvered front center portion of the register illustrated in FIGURE 5.

FIGURE 9 shows a sectional view of the register shown in FIGURE 5 as taken along line IX—IX thereof, looking in the direction of the arrows.

FIGURE 10 shows a fragmentary and partially sectional end view of the register illustrated in FIGURE 1, as taken along line X—X of FIGURE 12, looking in the direction of the arrows.

FIGURE 11 shows a fragmentary front view of FIGURE 5 with the front louvered portion and its operating mechanism removed and showing the damper, which is behind same, in upright open position, as taken along

line XI—XI of FIGURE 5, looking in the direction of the arrows.

FIGURE 12 shows a fragmentary sectional view as taken at line XII—XII of FIGURE 10, looking in the direction of the arrows.

FIGURE 13 shows a fragmentary, exploded perspective view of the right-hand end of the register illustrated in FIGURE 1.

FIGURE 14 shows a fragmentary sectionaly view as taken along line XIV—XIV of FIGURE 10, looking in the direction of the arrows.

FIGURE 15 shows a fragmentary sectional view as taken along line XV—XV of FIGURE 14, looking in the direction of the arrows.

Referring more particularly to FIGURES 1 and 2, the register or base diffuser 15 has an open front housing 16 with top 17, back 18, bottom 19, ends 20 and 21, and a front panel assembly 22. Bottom 19 has an opening 23 to permit flow of hot or cold air into the register 15 from a suitable air flow duct 87, FIGURE 9, connected to a source of hot or cold air (not shown) having means for delivery same through said duct to said register 15.

Mounted inside said housing 16 and connected to end panels 20 and 21 by suitable pivots 24 and 25 is a damper 26 having end members 27 and 28. This damper is provided with an operating lever 29 conventionally fastened to end member 28 such as by means of a screw 86 passing through opening 85 and threadedly engaging opening 88, FIGURE 13, together with stop tongues 31, 32 and 33, FIGURE 5. Front panel assembly 22 is provided with a slot 34, FIGURE 1, with an adjustable stop 35, FIGURE 7, consisting of a screw 36 and nut 37 movable lengthwise of said slot. This adjustable stop may be adjusted to permit damper 26 to be moved to the position shown in FIGURE 7 where all of the air flowing through register 15 will pass in front of said damper. The adjustable stop 35 may also be set at any other desired point of damper operating limit such as in the balanced air flow position shown in FIGURES 5 and 6, or in the fully closed position shown in FIGURE 2.

Top panel 17, FIGURE 5, of the housing 16 is preferably provided on its front edge with a downturned portion 38 which provides a smooth top edge at the front of the register and at the same time facilitates the use of a special form of interengagement with the front panel 22. The front panel assembly has, in turn, a special top member 39 which extends back to the back panel 18 of the register 15. At the front edge of this top member 39 same is provided with a downturned and outturned portion 40 which engages the rear face of downturned portion 38 of top panel 17 to stabilize the top of front panel assembly 22. The front panel assembly 22 then extends down and forward to the lower edge of the register 15 where it is fastened in place by means of screws 41. These screws 41 engage the upturned edge 42 of bottom 19 of the register 15, FIGURE 2. The front panel assembly 22 is preferably provided at its ends with turned back side edges 43, FIGURES 1 and 9. This manner of fastening front panel assembly 22 on the front portion of the register 15 provides a neat appearance for the register, and at the same time stabilizes the front panel assembly throughout.

The front panel assembly 22, if desired, may be provided with louvers 44, as shown in FIGURES 1 and 9. It is intended that these louvers 44 be considered as diagrammatically showing louvers which are either fixed or pivotable as desired. Between the groups of louvers 44 at each end of the front panel assembly 22 is mounted a grille assembly 45 fitting front panel 46 of assembly 22. The side edges of the front panel 46 are provided with inturned members 47 which form the side members of the opening 52 in which grille assembly 45 fits, the purpose of which will be hereinafter described.

Grille assembly 45 is pivotally mounted on inturned members 47, FIGURE 6, by means of pivots 48 which may be in the form of rivets, as shown in FIGURE 4.



Pivotal holding of grille assembly 45 can be readily accomplished with friction spring washers 89 which, for instance, may be of the "Tinnerman" type. Front panel 46, as noted, is provided with an opening 52 of which inturned members 47 form the side edges and mounting member for said pivots 48. The grille assembly 45, in turn, is provided with an inturned upper edge 49, FIGURE 6, and an inturned lower edge 50, together with inturned side edges 51 so that the grille assembly 45 will be rigid and closely but freely fit into opening 52 of the front panel 46 for pivotal motion relative thereto. It is thus to be seen that the grille assembly 45 may fit substantially flush with the front of the register, as shown in FIGURE 1, or may be tilted outward, as shown in FIGURE 6. The FIGURE 1 assembly shows the register in position for heating use, while FIGURE 6 shows grille assembly 45 tilted out where air conditioning or the like would be in use. Two preferred means for actuating the grille assembly 45 will be hereinafter set forth.

Under heating conditions it should be recognized that the louvers 44 at both ends of front panel 46 as well as louvers 53 in the operable portion or grille assembly 45 are preferably angled, as shown in FIGURE 9, progressively outward from the midpoint of the front of register 15 so as to provide, where the register is placed along the baseboard underneath a window (not shown), for the spreading of the hot air flow in order to substantially or completely blanket the face of the window with heated air when heating is being used in wintertime or the like.

The flow of air through louvers 44 and 53 depends to a considerable extent upon the actual positioning of the damper 26. For instance, when the damper is in the position shown in FIGURE 2, it blocks off the flow of air through the register 15. Where the register is used under conditions involving heating, then it is desirable to have the output of the register as uniform as possible throughout its length. In this connection it must be noted that the air flow duct 87 and inlet opening 23 into the register is normally, as shown in FIGURE 9, shorter than the length of the register itself. Under those conditions, unless the register is specially arranged inside, the bulk of the hot air will come straight out of the register in the area directly in front of the opening 23 in the bottom of the register and very little at the ends of same. To overcome this situation and better balance the output of the register, recognizing that the damper extends substantially from end to end of the register as shown in FIGURES 9 and 11, it is desirable to set the damper 26 in the position shown in FIGURES 5 and 6. Here, part of the air coming up into the register through the air flow duct 87 and opening 23 in the bottom 19 of the register passes behind the damper 26 and into the upper portion of the register which produces a plenum effect which spreads the air flow toward the ends of the register so that as it comes out through the louvers 44 and 53 it will be more uniform than would be the case if the damper 26 was in the position shown in FIGURE 7.

Where the register is to be used in connection with air conditioning, it is desirable to open the openable portion or grille assembly as shown in FIGURE 6 and turn the damper 26 to the position shown in FIGURE 7. With the openable portion of the register front and the damper in these positions, the cold air flowing up into the register will be guided mainly out through the open top of the register front, as shown in FIGURE 6. The plenum effect of the damper previously described will be largely overcome by this setting of the damper and grille assembly so that the cold air will flow mainly in a body straight upward toward the ceiling where it sweeps out stratified hot air, and thus facilitates better cooling effect than would be the case if the air was spread so as to blanket the front of a window or the like and which would tend to deliver the air into the room at a lower level, so far as the top of the stream of cold air would be concerned, and thus

have less effect on the stratified heated air along the ceiling.

The damper 26, of course, can be manually operated by means of the damper operating lever 29 which moves the damper to various positions, such as shown in FIGURES 2, 5 and 7. The adjustable stop member 35, FIGURE 7, can be used, of course, to limit the travel of damper operating member 29 so that, for instance, in the winter when heating is desired for blanketing of the window in front of which the register is placed, then the adjustable stop may be set at a position such that the damper operating lever 20 cannot move lower than the position which would leave the damper 26 in the position shown in FIGURES 5 and 6. Then, after the heating season is over and the air conditioning season is reached, the adjustable stop 35 can be moved down substantially to its lowermost position, as shown in FIGURE 7, so that the damper 26, with the damper operating lever 29 in such position, will direct the cold air flow in a body toward the opening above the opened grille assembly 45, as shown in FIGURE 6. The improved assembly thus facilitates efficient use of the register for either heating or air conditioning purposes.

While the openable front portion or grille assembly 45 of the front panel could be manually operated by operator 91, and the damper 26 also manually operated to meet the needs of either heating or air conditioning, as a rule I prefer to manually operate the damper 26 and automatically operate the openable front portion or grille assembly 45 so that such grille assembly is closed during heating use as shown in FIGURES 1 and 5, or opened under air conditioning conditions, as shown in FIGURE 6, and with the damper in the latter case preferably being in the position shown in FIGURE 7. Two ways of automatically operating the damper assembly under either heating or air conditioning conditions will be described now in detail.

First, let us consider the automatic operating mechanism for the register, as set forth in FIGURES 5 and 8 and in top view in FIGURE 9. Here it will be noted that the inturned member 47 of front panel 46 has an inwardly projecting arm 54. This arm has an opening 55 in its rear end, as is more particularly shown in FIGURE 8. Mounted on arm 54 by means of a pivot pin 57 is a bracket 58 onto which is conventionally anchored, as by means of a screw 90, a reversible solenoid 56. Referring more particularly to FIGURE 8, it will be noted that the bracket 58 pivots on pivot pin 57 which passes through openings 92 and 55 and is anchored in place by means of a nut 59. This pivot pin 57 is preferably in the form of a shoulder screw so that when nut 59 is tightened bracket 58 will be free to pivot about said pivot pin 57. Again referring to FIGURE 8, it will be noted that the inturned side edge 51 of grille assembly 45 has an inwardly bent ear 60 with a hole 61 therethrough and a nut 62 at the outside of this ear 60 and alined with said hole 61. This nut 62, if desired, may be spot welded to the side of ear 60 in the position shown. Threadedly engageable with said nut 62 is a pivot pin 63 which, preferably, is in the form of a shoulder screw. This pivot pin 63 is adapted to pass through opening 64 in the end of rod 65 of reversible solenoid 56. This pivot pin 63 after passing through hole 61, engaging nut 62 and tightened in place, as shown in FIGURE 5, allows bracket 58 to pivotally move about pivot pin 57, and opening 64 on the end of rod 65 to freely pivot about pivot pin 63 so that as the solenoid is actuated by means of electric current delivered to the solenoid through connecting wires 66 the grille assembly 45 can be pushed out by the solenoid under one condition of operation and pulled backward by the solenoid under conditions of another operation.

It is very common to have a combination heating and air conditioning unit which can be manually shifted from one to the other as required, with the heating portion having one fan operating motor and the air conditioning portion having another fan operating motor (neither of which are shown). Thus, it would be a simple matter to connect the solenoid 56 to the motor of the heating unit so that the moment the heating motor was started up it would actuate the solenoid 56 to pull the grille assembly 45 to retracted position, as shown in FIGURE 5, and disconnect the solenoid electrically at that point. On the other hand, when air conditioning time came around the motor on the air conditioning unit would in turn be connected to the solenoid 56 and deliver current to it to cause the extension of rod 65 and the pushing of the grille assembly outward to the position shown in FIGURE 6, and then disconnect the electric current from the solenoid when in that position. When cold weather came again, then the starting of the heating unit would cause the electric circuit to the heating unit motor to actuate the solenoid 56 to pull the grille assembly back to closed position, as shown in FIGURE 5, and then disconnect the solenoid from the electric circuit, in which condition it would remain until the air conditioner motor was started again and which would reverse this process. It is thus to be seen that we have an electric system wherein the grille assembly 45 is actuated to close same under heating conditions and to open same under air conditioning conditions, thus meeting the requirements of blanketing a window with heated air for heating purposes, while opening up the register for direct flow, upward toward the ceiling, of cold air in accordance with the requirements for best cooling conditions.

Another control system involves the use of an automatic thermostat for operating the register 15 and same is shown in FIGURES 1, 6, 10, 12, 13 and 14. One desired position for mounting the thermostat assembly 67 is shown in FIGURE 1. This thermostat assembly 67 has a housing 68 which is provided with three slots 69, as shown more particularly in FIGURE 10, where the slots are shown with fastening screws 70. By using slots and screws in the manner noted the housing can be rotated so that at normal room temperature the grille assembly 45 will be held closed, and yet when colder air is flowing through the register the thermostat 71 which, for instance may be of the bi-metal type, will automatically open grille assembly 45 so that same takes the position shown in FIGURE 6.

As shown in the exploded view of FIGURE 13, the end panel 21 of the register 15 will be provided with threaded holes 72 in position to be engaged by screws 70. The thermostat housing 68 is provided with an inwardly extending pin 73 in position to engage hole 74 in the end of a bi-metal type thermostat member 71, as shown in FIGURE 14. End panel 21 of the register 15 is provided at the center of the thermostat housing 68 with a tubular rivet 75, FIGURES 13, 14 and 15. Passing through said tubular rivet 75 is a rod 76 for operating the grille assembly 45, with the outer end of this rod bifurcated at 77 for engaging and holding the inner end of the thermostat member 71. The opposite end of operating rod 76 is provided with a downturned arm 79, FIGURE 6, after passing through pivot 25 of arm 54*a* extending inward from inturned member 47 of front panel 46. The lower end 80 of arm 79 is connected by means of pivot 81 to link 82 which in turn is connected by means of a pivot 83 to inturned side edge 51 of the grille assembly 45.

Again referring to FIGURES 13 and 14, it will be noted that there is a spring washer 84 between end panel 21 and end member 28 of damper 26. If desired, a washer of the same type as 84 may be used on pivot 24 at the opposite end of housing 16, and it is intended that the showing in FIGURE 3 be considered to diagrammatically illustrate either a plain pivot or a spring washer mounted pivot connection to frictionally hold damper 26 in adjusted position as determined by damper operating lever 29. A typical washer of the type shown as 84 in FIGURE 13, is commercially on the market and known as a "Tinnerman" washer or nut.

While several forms of the invention have been shown and described, other forms will now be apparent to those skilled in the art. Therefore, the embodiments of the register, or so-called baseboard diffuser, shown in the drawings. are merely for illustrative purposes, and are not intended to limit the spirit and scope of the invention as above described and illustrated. It is further to be noted that while directional terms have been used, same are not to be construed as a limitation of the invention since such use has been availed of to better describe the invention in the various positions shown in the drawings.

Other modes of applying the principle of my invention may be employed, instead of those explained, change being made as regards the register and combinations herein disclosed, provided the means and features stated by any of the following claims or the equivalents of such stated means or features be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A register for air flow systems of the heating and air conditioning types wherein same comprises:
   (a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its front,
   (b) a damper in said housing and extending substantially from end to end of same,
   (c) means at each end of said damper having substantially symmetrical damper pivot points intermediate the top and bottom of each of said damper end,
   (d) said housing having substantially symmetrically located pivot points at the ends thereof between the front and back of same for said damper pivots,
   (e) pivot means operably joining said pivot points of said damper to said pivot points at the ends of said housing,
   (f) said damper sitting forward from the back of said register housing and terminating below the top of said housing so that air can flow in front of said damper as well as behind and forward over the top of said damper when it is substantially parallel to said back with the air flow behind said damper being subjected to a plenum effect at the top of said damper for improved distribution of air by said register,
   (g) an extending arm for use in manually adjusting said damper,
   (h) means fastening said arm to said damper,
   (i) said front of said housing comprising a front panel with openings substantially full length of same for outlet of said air flowing through said register,
   (j) an openable portion of said front panel with said opening portion also having openings for air flow therethrough,
   (k) pivot means connecting said openable portion substantially at the bottom of same to said front panel near the bottom of the latter, and
   (l) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from the top of said register.

2. A register for air flow systems as set forth in claim 1, wherein:
   (a) said openings in said front panel extend generally up and down and at least part of same taper sidewise on opposite sides of the vertical central portion of said front panel and open toward the corresponding end of said register, whereby sidewise spreading of the air flow through the register is facilitated.

3. A register for air flow systems as set forth in claim 2, wherein:
   (a) said openable portion of said front panel is substantially centered on same, and
   (b) said openable portion has said openings in the form of louvers which extend substantially full length of same and taper sidewise substantially from the mid-



length of said openable portion toward the corresponding end of same.

4. A register for air flow systems as set forth in claim 3, wherein:
   (a) said front panel has louvers in its front face between its ends and the ends of said louvered openable portion with said louvers in said end portions alongside of said openable portion tapering toward the corresponding ends of said register.

5. A register for air flow systems of the heating and air conditoning types wherein same comprises:
   (a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its, front,
   (b) a damper in said housing and extending substantially from end to end of same,
   (c) means for pivotally mounting said damper inside of said housing between the top and bottom edges of said damper, forward of the back portion, rearward of the front portion, and substantially intermediate the top and bottom of said housing, including means for adjustably holding same in various positions,
   (d) means for manually pivotally shifting said damper to various fixed rotational positions including spaced from but parallel to the back portion of said housing, as well as with its bottom against said back portion, and also in a position closing said register,
   (e) said front of said housing comprising a front panel with openings substantially full length of same for outlet of air flowing through said register,
   (f) an openable portion of said front panel with said openable portion also having openings for air flow therethrough,
   (g) pivot means connecting said openable portion substantially at the bottom of same to said front panel near the bottom of the latter,
   (h) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from said front panel, and
   (i) said means for pivotally moving said openable portion about its pivots actuating said openable portion to hold it closed when warm air passes through said register and to hold same open when cooled air passes through said register.

6. A register for air flow systems as set forth in claim 5, wherein:
   (a) said openable portion of said front panel is substantially centered lengthwise of same, and
   (b) said openable portion of said front panel has said openings in the form of a multiplicity of substantially vertical louvers substantially full length of same with at least a portion of said louvers at one end of same inclining toward that end while at least a portion of said louvers at the other end of same incline toward that other end.

7. A register for air flow systems as set forth in claim 6, wherein:
   (a) said front panel also has substantially vertical louvers in its front face between its ends and the ends of said openable front panel, with said two end groups of louvers inclined toward the corresponding adjacent end of said front panel.

8. A register for air flow systems as set forth in claim 5, wherein:
   (a) said means for pivotally moving said openable portion of said front panel on its pivots comprises a reversible solenoid,
   (b) means operably connecting said solenoid to said register and to said openable portion thereof, and
   (c) means for supplying operating electricity to said solenoid for opening said openable portion of said front panel when cooled air flows through said regis-

ter and closing it when warmed air flows therethrough.

9. A register for air flow systems as set forth in claim 5, wherein:

(a) said means for pivotally moving said openable portion of said front panel on its pivots comprises a thermostat, and

(b) means for operably connecting said thermostat to said register and pivotally to said openable front panel portion for opening the latter when cooled air flows through said register and closing it when warmed air flows therethrough.

10. A register for air flow systems of the heating and air conditioning types wherein same comprises:

(a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its front,

(b) a damper in said housing and extending substantially from end to end of same,

(c) means for pivotally mounting said damper inside of said housing and adjustably holding same in various positions,

(d) means for pivotally shifting said damper to various fixed rotational positions,

(e) said front of said housing comprising a front panel with openings substantially full length of same for outlet of air flowing through said register,

(f) an openable portion of said front panel with said openable portion also having openings for air flow therethrough,

(g) pivot means connecting said openable portion substantially at the bottom of same to said front panel near the bottom of the latter,

(h) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from said front panel,

(i) said means for pivotally moving said openable portion about its pivots actuating said openable portion to hold it closed when warm air passes through said register and to hold same open when cooled air passes through said register,

(j) said means for pivotally moving said openable portion of said front panel on its pivots comprises a reversible solenoid,

(k) means mounting one end of said solenoid at a point inside of said register and adjacent but spaced from said openable portion of said front panel,

(l) a rod actuatable by said solenoid and extending thereinto,

(m) means pivotally connecting the outer end of said rod to said openable portion of said front panel to facilitate operably moving same about its pivot means, and

(n) means for supplying operating electricity to said solenoid for opening said openable portion of said front panel when cooled air flows through said register and closing it when warm air flows therethrough.

11. A register for air flow systems of the heating and air conditioning types wherein same comprises:

(a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its front,

(b) a damper in said housing and extending substantially from end to end of same,

(c) means for pivotally mounting said damper inside of said housing and adjustably holding same in various positions,

(d) means for pivotally shifting said damper to various fixed rotational positions,

(e) said front of said housing comprising a front panel with openings substantially full length of same for outlet of air flowing through said register,

(f) an openable portion of said front panel with said openable portion also having openings for air flow therethrough,

(g) pivot means connecting said openable portion substantially at the bottom of same to said front panel near the bottom of the latter,

(h) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from said front panel,

(i) said means for pivotally moving said openable portion about its pivots actuating said openable portion to hold it closed when warm air passes through said register and to hold same open when cooled air passes through said register,

(j) said openable portion of said front panel is substantially centered lengthwise of same,

(k) said openable portion of said front panel has said openings in the form of a multiplicity of substantially vertical louvers substantially full length of same with at least a portion of said louvers at one end of same inclining toward that end while at least a portion of said louvers at the other end of same incline toward that other end,

(l) said front panel also has substantially vertical louvers in its front face between its ends and the ends of said openable front panel, with said louvers inclined toward the adjacent end of said front panel,

(m) said means for pivotally moving said openable portion of said front panel on its pivots comprises a reversible solenoid,

(n) means mounting one end of solenoid at a point inside of said register and adjacent but spaced from said openable portion of said front panel,

(o) a rod actuatable by said solenoid and extending thereinto,

(p) means pivotally connecting the outer end of said rod to said openable portion of said front panel to facilitate operably moving same about its pivot means, and

(q) means for supplying operating electricity to said solenoid for opening said openable portion of said front panel when cooled air flows through said register and closing it when warm air flows therethrough.

12. A register for air flow systems as set forth in claim 11, wherein:

(a) said pivotally mounted damper sets forward from the back of said register housing with the top of said damper terminating below the top of said housing so that air can flow in front of said damper as well as behind and forward over the top of said damper when it is substantially parallel to said back with the air flowing behind said damper being subjected to a plenum effect at the top of said damper for improved distribution of air by said register.

13. A register for air flow systems of the heating and air conditioning types wherein same comprises:

(a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its front,

(b) a damper in said housing and extending substantially from end to end of same,

(c) means for pivotally mounting said damper inside of said housing and adjustably holding same in various positions,

(d) means for pivotally shifting said damper to various fixed rotational positions,

(e) said front of said housing comprising a front panel with openings substantially full length of same for outlet of air flowing through said register,

(f) an openable portion of said front panel with said openable portion also having openings for air flow therethrough,

(g) pivot means connecting said openable portion sub-

stantially at the bottom of same to said front panel near the bottom of the latter,

(h) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from said front panel,

(i) said means for pivotally moving said openable portion about its pivots actuating said openable portion to hold it closed when warm air passes through said register and to hold same open when cooled air passes through said register,

(j) said means for pivotally moving said openable portion of said front panel on its pivots comprises a thermostat which supplies power for pivotally moving said movable portion,

(k) a rotatable rod operably connected to said thermostat,

(l) an arm on the end of said rotatable rod opposite to the end connected to said thermostat,

(m) means for rotatably supporting said rod adjacent the arm thereof,

(n) a link, and

(o) means pivotally connecting said link to the end of said arm and to said openable portion of said front panel for operably actuating same.

14. A register for air flow systems as set forth in claim 13, wherein:

(a) said thermostat is of bi-metal unit type,

(b) adjustable anchoring means for said bi-metal unit, and

(c) means for anchoring one end of said bi-metal unit to said rod for rotating same and its other end to said adjustable anchoring means for holding said bi-metal unit in predetermined fixed locaton operable position.

15. A register for air flow systems of the heating and air conditioning types wherein same comprises:

(a) a housing of generally rectangular shape having top, bottom, front, back and end portions with an air inlet in its bottom and an outlet for said air in its front,

(b) a damper in said housing and extendng substantially from end to end of same,

(c) means for pivotally mounting said damper inside of said housing and adjustably holding same in various positions,

(d) means for pivotally shifting said damper to various fixed rotational positions,

(e) said front of said housing comprising a front panel with openings substantially full length of same for outlet of air flowing through said register,

(f) an openable portion of said front panel with said openable portion also having openings for air flow therethrough,

(g) pivot means connecting said openable portion substantially at the bottom of same to said front panel near the bottom of the latter,

(h) means for pivotally moving said openable portion about its pivots on said front panel so that the upper end of said openable portion may be moved to and from said front panel,

(i) said means for pivotally moving said openable portion about its pivots actuating said openable portion to hold it closed when warm air passes through said register and to hold same open when cooled air passes through said register,

(j) said openable portion of said front panel is substantially centered lengthwise of same,

(k) said openable portion of said front panel has said openings in the form of a multiplicity of substantially vertical louvers substantially full length of same with at least a portion of said louvers at one end of same inclining toward that end while at least a portion of said louvers at the other end of same incline toward that other end,

(l) said front panel also has substantially vertical louvers in its front face between its ends and the ends of said openable front panel, with said louvers inclined toward the adjacent end of said front panel,

(m) said means for pivotally moving said openable portion of said front panel on its pivots comprises a thermostat connected to said movable portion so as to supply said moving power,

(n) a rotatable rod operably connected to said thermostat,

(o) an arm on the end of said rotatable rod opposite to the end connected to said thermostat,

(p) means for rotatably supporting said rod adjacent the arm thereof,

(q) a link, and

(r) means pivotally connecting said link to the end of said arm and to said openable portion of said front panel for operably actuating same.

16. A register for air flow systems as set forth in claim 15, wherein:

(a) said thermostat is of bi-metal unit type,

(b) adjustable anchoring means for said bi-metal unit, and

(c) means for anchoring one end of said bi-metal unit to said rod for rotating same and its other end to said adjustable anchoring means for holding said bi-metal unit in predetermined fixed location operable position.

17. A register for air flow systems as set forth in claim 15, wherein:

(a) said pivotally mounted damper sets forward from the back of said register housing with the top of said damper terminating below the top of said housing so that air can flow in front of said damper as well as behind and forward over the top of said damper when it is substantially parallel to said back with the air flowing behind said damper being subjected to a plenum effect at the top of said damper for improved distribution of air by said register.

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