July 9, 1968 E. L. SNELL 3,391,629

REVERSIBLE FLOOR MOUNTED REGISTER

Filed July 18, 1966 2 Sheets-Sheet 1

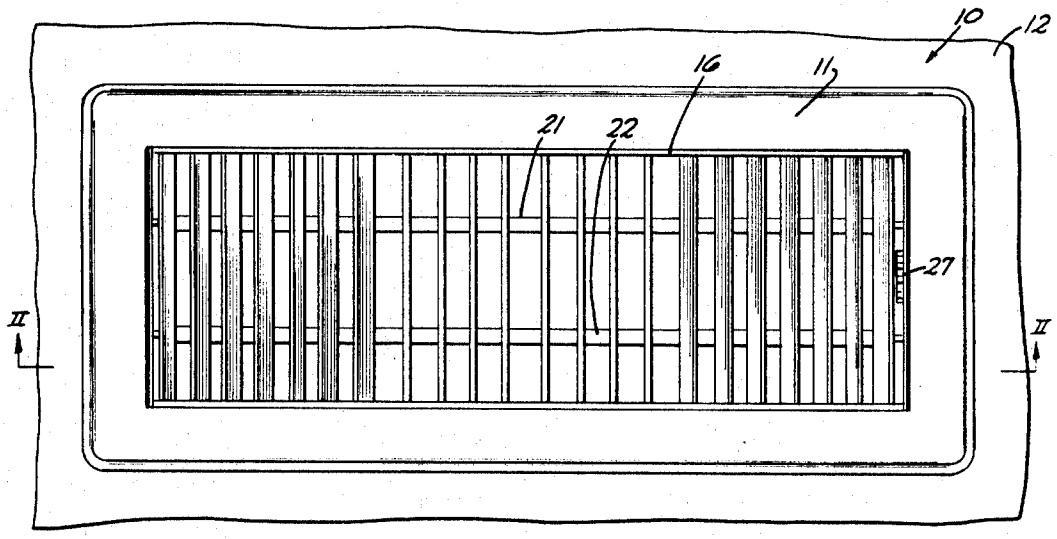



FIG. 1

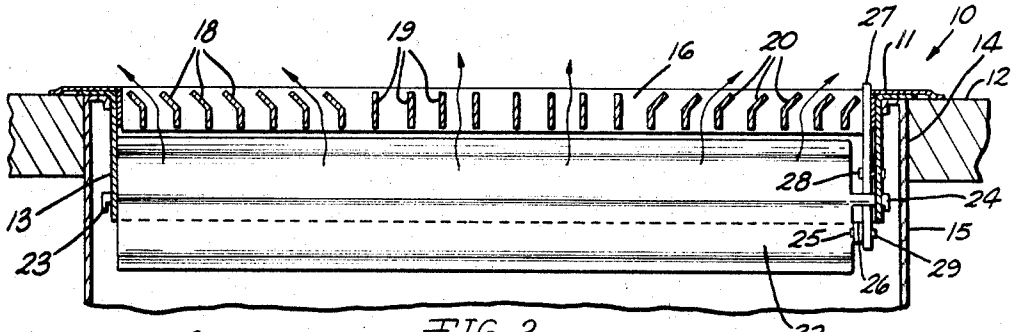



FIG. 2

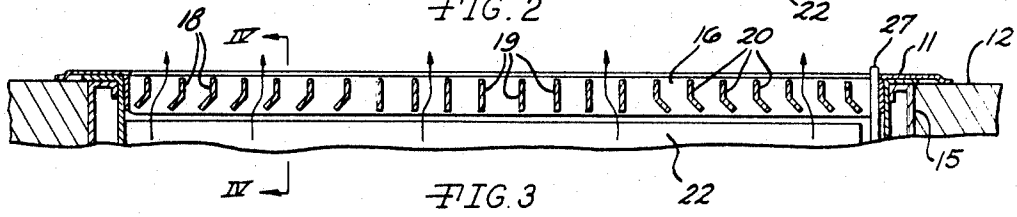



FIG. 3

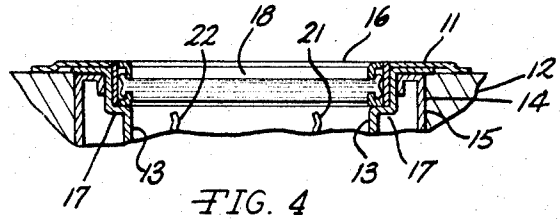



FIG. 4

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July 9, 1968 E. L. SNELL 3,391,629

REVERSIBLE FLOOR MOUNTED REGISTER

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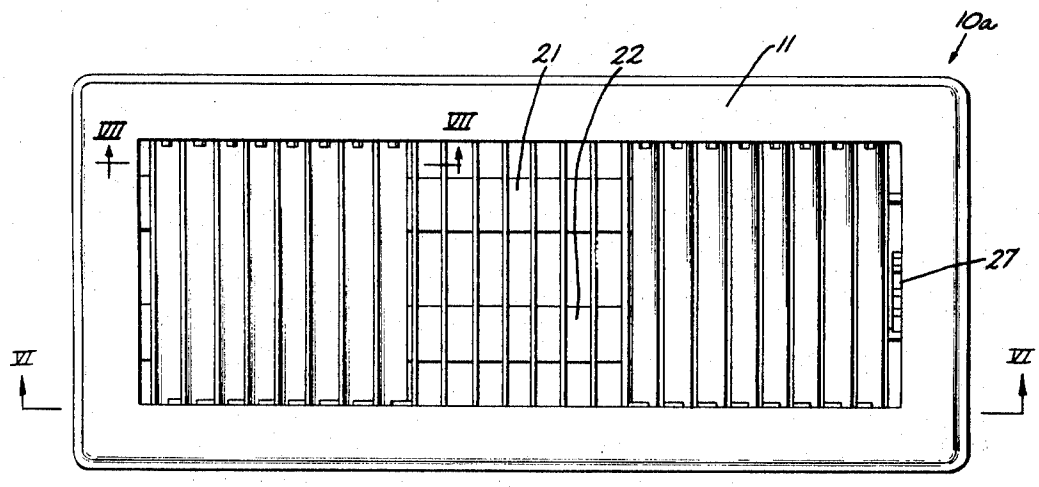



FIG. 5

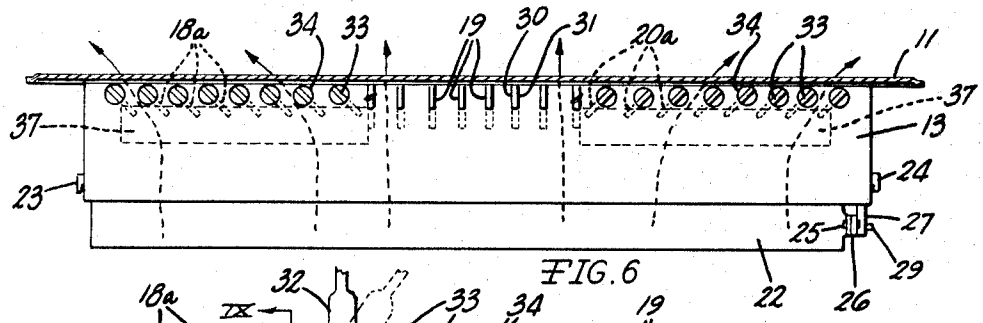



FIG. 6

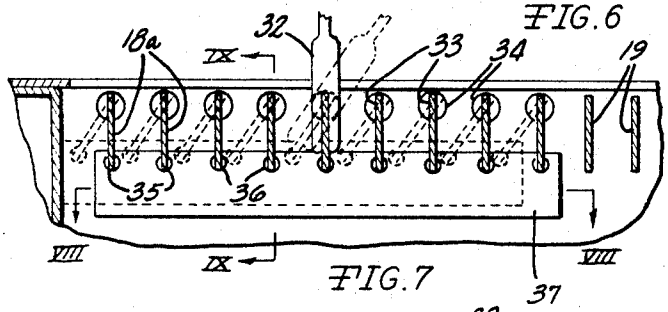



FIG. 7

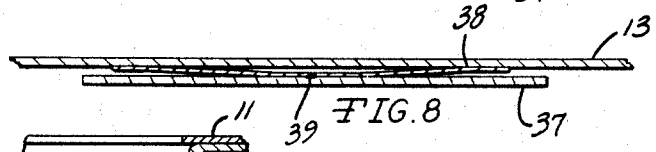



FIG. 8

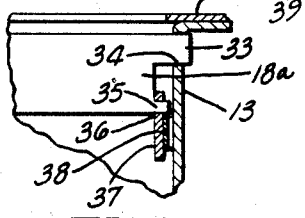



FIG. 9

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3,391,629

# REVERSIBLE FLOOR MOUNTED REGISTER

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13 Claims. (Cl. 98—103)

## ABSTRACT OF THE DISCLOSURE

A floor mountable heating and air conditioning register for use in an air duct system which has a sidewise extending floor engaging flange at opposite sides of its outlet face. A damper means is pivotally mounted at the inlet end of the register so that the damper means can be adjusted to either open or closed position. There are louvers located at opposite ends of the register and its outlet face. Means are provided for changing the position of the louvers to provide an air flow in a substantially unidirectional outward pattern for air conditioning use, or in a fan pattern with air flowing out between the louvers for the purpose of dissipating the air flow during heating use.

*Background of the invention*

The present invention relates broadly to registers for air duct systems, and in its more specific forms to a new and improved floor register for incorporation in a duct type forced flow heating and/or air conditioning system.

Some modern hot air registers which are designed for mounting under a window are provided with fixed louvers which spread the air flow sidewise to blanket the front of the window with a curtain of hot air, thus overcoming the effect of the cold air flowing down the face of the window, while at the same time providing improved and more uniform room heating than ordinarily would be the case. However, this type of air flow with its window blanketing effect is not the one which is considered best for use with air conditioning systems. Here it is desirable to avoid blanketing the face of the window with cooled air since current work in this field indicates that the cooled air should be held together and delivered in the form of a substantially solid stream directly upward toward the ceiling where it can break up stratified hot air and provide a more uniform room cooling effect. In the past registers for air duct systems have almost universally been either of the air flow spreading type or the substantially non-spreading type and not of a type which can do either and thus meet the current requirements for both heating and air conditioning. It was a recognition of this problem and the lack of a successful commercial solution to same which led to the conception and development of the present invention, as well as another invention having a different solution, including a bottom edge pivoted front panel portion, and wherein I recently applied for a patent to protect same.

Accordingly, among the objects of the present invention is the provision of an improved register for air duct systems wherein such register is adapted to be readily adjusted for use under either heating or air conditioning operation.

Another object of the present invention is to provide a register which is manually convertible from heating type to air conditioning type, and vice versa, without replacement of parts.

Another object is to provide a floor mountable combination heating and air conditioning register for air flow ductwork systems where stabilized adjustable louvers are used at opposite ends of the outlet face of same so that the air flow can be directed in a straight upward relatively solid stream, or in an upward and sidewise spreading blanketing stream.



Another object of this invention is to provide a floor mountable combination heating and air conditioning register having a removable and invertible grille member, which when one side up delivers the air flow in an upward relatively solid stream, and when inverted spreads the air flow in an upward and sidewise spreading pattern to produce a blanketing effect.

A further object is to provide a floor mountable combination heating and air conditioning register, wherein said register has on its front face a group of adjustable louvers at one end and a separate group of adjustable louvers at its other end, said louvers being pivotally mounted for ease of adjustment.

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

*Brief description of the drawings*

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

In the annexed drawings:

FIGURE 1 shows a top view of one form of the present combination heating and air conditioning register.

FIGURE 2 is a longitudinal sectional view as taken along line II—II of FIGURE 1, looking in the direction of the arrows.

FIGURE 3 is a fragmentary sectional view similar to FIGURE 2 but with the removable grille inverted.

FIGURE 4 is a fragmentary sectional view as taken along line IV—IV of FIGURE 3, looking in the direction of the arrows.

FIGURE 5 shows a top view of a modified form of the present combination heating and air conditioning register.

FIGURE 6 is a partially sectioned view as taken along line VI—VI of FIGURE 5, looking in the direction of the arrows.

FIGURE 7 is an enlarged fragmentary sectional view as taken along line VII—VII of FIGURE 5, looking in the direction of the arrows.

FIGURE 8 is a fragmentary sectional view as taken along line VIII—VIII of FIGURE 7, looking in the direction of the arrows.

FIGURE 9 is a fragmentary sectional view as taken along line IX—IX of FIGURE 7, looking in the direction of the arrows.

*Description of specific embodiments*

In the drawings which have been briefly described above, two forms of a register construction made in accordance with the present invention have been shown, and which forms have proven to be of advantage from the several standpoints of manufacture, installation, and use, and while the construction shown in these two forms of the invention will be rather specifically described for ease of understanding, it is to be understood that variations may be made within the spirit and scope of the invention as claimed.

Referring now to FIGURES 1 to 4, inclusive, it will be noted that the register assembly **10** has a top flange **11** which rests on floor **12** with the register body **13** extending down through opening **14** in the floor, as seen more particularly in FIGURE 2. It should be noted at this point that an air duct boot **15** extends up adjacent the sides of opening **14** with the register body **13** fitting inside of this air duct boot **15**, as diagrammatically

shown. Mounted inside of said register body **13** is a removable grille member **16** which rests on supporting means such as side shoulders **17** of register body **13**, as is more particularly shown in FIGURE 4.

Now referring more particularly to FIGURES 2 and 3, it will be noted that the grille member **16** is provided with end anchored louvers **18**, **19** and **20**. The center louvers **19** are preferably made straight as shown to permit the air flowing past same to be guided in a direction substantially straight outward from the face of the register. Louvers **18** and **20**, on the other hand, are of two directional shape and preferably are of substantially V-shape in cross section as shown. The two leg portions of the V-shaped cross-section louvers **18** and **20** are preferably approximately equal in length, with one leg portion being substantially perpendicular to one face of the grille member **16** and the other leg portion of the louvers **18** and **20** angling toward opposite ends of the grille member **16** or in other words the lower edge portion of each group will incline away from the lower edge portion of the other group, as shown. The preferred range of this angling would be between 40° and 50°, from the register face with the preferred angle being 45°.

With the grille member **16** in the position shown in FIGURE 2, the air passing through the register will be fanned outward as shown by the arrows so that, with this register set in the floor in front of a window and using hot air, the flowing air will blanket or substantially cover the front face of the window in accordance with modern heating practice. By inverting the grille member **16** so that it is in the position shown in FIGURE 3, it will be noted that the portions of the louvers **18** and **20** which are perpendicular to one face of the grille member **16** will be upward and act to direct the air flow substantially vertically of the register assembly in accordance with the current ideas of delivering air-conditioned air directly up toward the ceiling in a body rather than fanned out into a sidewise pattern. While the louvers **18** and **20** have been shown to be of substantially identical shape, those near the center of the register could be a little straighter and gradually taper more and more sidewise as the end of the register is approached, and it is intended that the drawings be considered as diagrammatically showing this type of construction, as well as the fixed uniform size and shape louvers as illustrated.

Now referring to FIGURE 2 for a side view and FIGURE 1 for a top view, it will be noted that inside of the register body **13** and adjacent the bottom thereof there are mounted a pair of dampers **21** and **22**, with each of said dampers being supplied substantially at the midpoint of their ends with pivot arms **23** and **24** which pivotally fit suitable openings (not shown) in the ends of the register body **13**. These dampers are of a size such that when they are turned to closed position they will substantially seal the register against flow of air therethrough and yet when they are at their midpoint and perpendicular to the bottom face of the grille member **16**, they offer very little resistance to air flow through the register assembly **10**. Each of the dampers **21** and **22**, at least at one end thereof as shown in FIGURE 2, are provided with operational pivots **25** symmetrically located on each of the dampers. These pivots are connected by means of a link **26** so that the two dampers **21** and **22** will pivotally move in unison. A damper operator **27** is pivotally mounted on register body **13** substantially midway between dampers **21** and **22** by means of a pivot pin **28**. The lower end of this damper operator **27** is preferably longitudinally slotted (not shown) and conventionally connected to the operational pivot **29** which is located substantially midlength of link **26**.

Thus, as the damper operator **27**, FIGURE 1, is moved either forward or back, it will operate dampers **21** and **22** in conventional manner. It is also to be noted that by merely lifting out grille member **16** and inverting it the register assembly **10** can be used either for heating or air conditioning, depending upon which way up the face of the grille member **16** is placed. In this connection, FIGURE 2 shows the position of the grille member **16** for heating use, and FIGURE 3 shows the grille member in the air conditioning position.

Now referring to the modified register assembly **10*a*** as shown in FIGURES 5 to 9, inclusive, it will be noted that the register assembly has dampers **21** and **22** mounted and operated in identically the same manner as described above in connection with FIGURES 1 to 4, inclusive. The modified register is also provided with straight fixed louvers **19** in the central portion of the register. These louvers **19** have ears **30**, FIGURE 6, which extend through openings **31** in the sides of register body **13** which corresponds with the mounting of these same louvers in the grille member **16** illustrated in FIGURES 1, 2 and 3.

The louvers at the opposite ends of the register body **13** and which are denoted by the numerals **18*a*** and **20*a***, instead of being fixed as shown in FIGURES 2 and 3, are adjustable in either direction by means of a suitable forked-end wrench **32**, as shown in FIGURE 7. Since the louvers **18*a*** and **20*a*** are of like construction and operate in the same manner, only louvers **18*a*** as shown in FIGURE 7 will be described in order to avoid unnecessary duplication of description.

Louvers **18*a***, as shown in FIGURE 7, have end bearings or ears **33** which fit into suitable round hole bearing openings **34** in the sides of register body **13**. These bearings or ears, it is to be noted, are at the very upper end of the louvers **18*a*** so that one can walk on the top of the register in contact with the upper edge of these louvers without shifting them out of place so far as their angular setting is concerned. The lower end of these louvers **18*a*** are provided with end bearings or ears **35** which pivotally fit into round hole bearing openings **36** in louver connecting link **37**. It is thus to be seen that by use of wrench **32**, all of the louvers **18*a*** (or **20*a***) will be simultaneously moved to the pre-chosen adjusted position. In order to more firmly hold the louvers **18*a*** in adjusted position, I prefer, as shown in FIGURE 8, to fasten on louver connecting link **37** a spring-like stabilizing friction member **38** which will frictionally slide on the inner surface of the side of register body **13**. The central portion of this stabilizing friction member **38** may be anchored, if desired, at its central point to louver connecting link **37** by a spot welding point **39**.

While but two forms of the register invention have been shown and described, other forms will now be apparent to those skilled in the art. Therefore, the embodiments of the floor register 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 as illustrated in the drawings and in the normal position of use of the floor register.

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 stated by any of the following claims or the equivalent of such stated means be employed.

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

**1.** A floor mountable heating and air conditioning register for use in air duct systems which comprises

(a) a register body including an inlet end and an outlet end and having a sidewise extending floor engaging flange at opposite sides of its outlet face,

(b) damper means at the inlet end of said register body,

(c) means for pivotally mounting said damper means on said register body so that said damper means can be moved either to an open or to a closed position,

(d) means substantially flush with the top of said register body for operating said damper means,

(e) a removable grille member comprising a frame having louvers fixedly mounted within said frame to control air flow through said register, said grille member having a first face providing a substantially unidirectional outward flow pattern position and a second face providing a fan flow pattern position, and

(f) means removably supporting said grille member at said outlet end whereby said grille member may be positioned with either said first face or said second face at said outlet end.

**2.** A floor mountable heating and air conditioning register as set forth in claim **1**, wherein the frame further includes

(a) groups of louvers which are located at the ends of said grille member and are pivotally mounted.

**3.** A floor mountable heating and air conditioning register as set forth in claim **2**, wherein

(a) said pivoted louvers are in two groups with one group at each end of said register, and further including

(b) means pivotally connecting said louvers of each group for pivotal movement of each group of louvers in unison and independent of the other group.

**4.** A floor mountable heating and air conditioning register as set forth in claim **3**, wherein

(a) the supporting pivots of all of said pivoted louvers are at the ends of same and adjacent their upper edge which is substantially at the top of said register body.

**5.** A floor mountable heating and air conditioning register as set forth in claim **4**, wherein

(a) there are means including an actuating member for shifting all of said pivoted louvers of each group simultaneously either to a heating position or to an air conditioning position, and

(b) means for stabilizing said louvers in the position to which they are shifted.

**6.** A floor mountable heating and air conditioning register as set forth in claim **2**, wherein

(a) fixed straight upwardly directed louvers are mounted between the adjacent ends of said pivotally mounted groups of louvers.

**7.** A floor mountable heating and air conditioning register as set forth in claim **3**, wherein

(a) said means pivotally connecting said pivoted louvers of each group is in the form of a link having substantially equally spaced pivots connected to pivots at the lower edge portion of the ends of said louvers.

**8.** A floor mountable heating and air conditioning register as set forth in claim **7**, wherein

(a) fixed straight upwardly directed louvers are mounted between the adjacent ends of said pivotally mounted groups of louvers, and

(b) each group has means substantially stabilizing said pivoted louver groups against accidental shifting under normal conditions of use.

**9.** A floor mountable heating and air conditioning register as set forth in claim **1**, wherein

(a) said louvers at each end of said grille member are of two directional shape relative to the opposite faces of said grille member,

(b) said two directional louvers being in two groups with one at each end of said grille member,

(c) means for fixedly anchoring said two directional shape louvers to said grille member, and

(d) wherein both of said groups of two directional louvers have one edge portion of each louver substantially perpendicular to the same face of said grille member, and the angling other edge portion of each group of said two directional louvers inclined toward the adjacent end of said grille member so that the angling lower edge portion of each group will incline away from the lower edge portion of the other group, whereby with the grille member mounted so that the perpendicular edge portion of the louvers is up, the upward flowing air will flow in a substantially straight path while inverting the grille member will cause the air flow to spread sidewise into a blanketing or fan pattern.



**10.** A floor mountable heating and air conditioning register as set forth in claim **1**, wherein

(a) said means removably supporting said grille member on said register body is in the form of inwardly extending support members on opposite sides of said register body.

**11.** A floor mountable heating and air conditioning register as set forth in claim **9**, wherein

(a) said means removably supporting said grille member on said register body is in the form of inwardly extending shoulders on opposite sides of said register body.

**12.** A floor mountable heating and air conditioning register as set forth in claim **1** wherein said grille member has a substantially rectangular frame with individual louvers at each end of said frame, said louvers having a first portion substantially perpendicular with respect to said first face and a second portion inclined with respect to said second face toward the corresponding end of said register.

**13.** A floor mountable heating and air conditioning register as set forth in claim **1** wherein said louvers in said removable frame include two inclined groups with one group at each end of said frame in fixed position to direct air flow in a substantially unidirectional outward pattern when said first face is up in said register body, and to direct air flow in a fan pattern when said second face is up in said register body.


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