United States Patent

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[54] **REGISTER ASSEMBLY WITH A MOVABLE FRONT PANEL**
3 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** ..... **98/40 C,** 98/102, 98/106
[51] **Int. Cl.** **F24f 13/00**
[50] **Field of Search** 98/406, 41, 42, 101, 103, 108, 115, 121; 165/96, 55, 126; 287/20; 312/214, 327, 328; 49/75, 74, 90

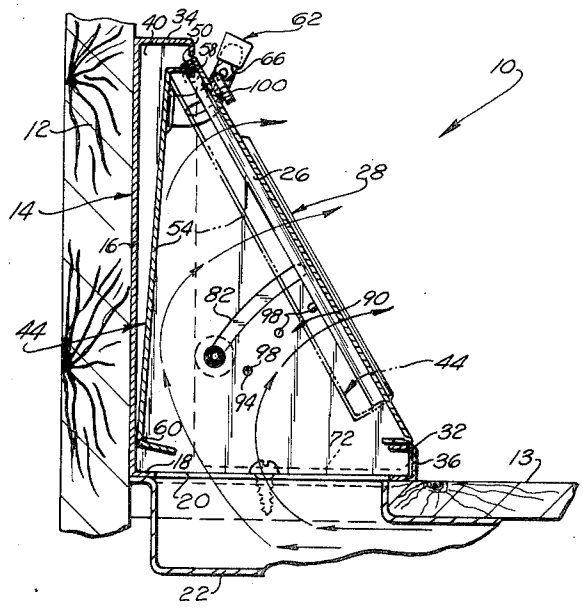
[56] **References Cited**

UNITED STATES PATENTS

3,083,632	4/1963	Brandes	98/40 C
3,190,209	6/1965	Goetz	98/40 C X
3,354,808	11/1967	Macrow	98/40 C
3,378,199	4/1968	Snell	98/40 C X

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ABSTRACT: An improved register assembly includes a louvered front panel which is movable between a closed position extending across an opening through which air flows and an open position extending upwardly to provide an unrestricted opening in the top portion of the register assembly. In the closed position the louvered front panel is adapted to disperse or diffuse a flow of warm air. A damper is advantageously mounted on the front panel to control this flow of warm air. When the front panel is in the open position, the register assembly is adapted to direct a relatively large flow of cool air upwardly.



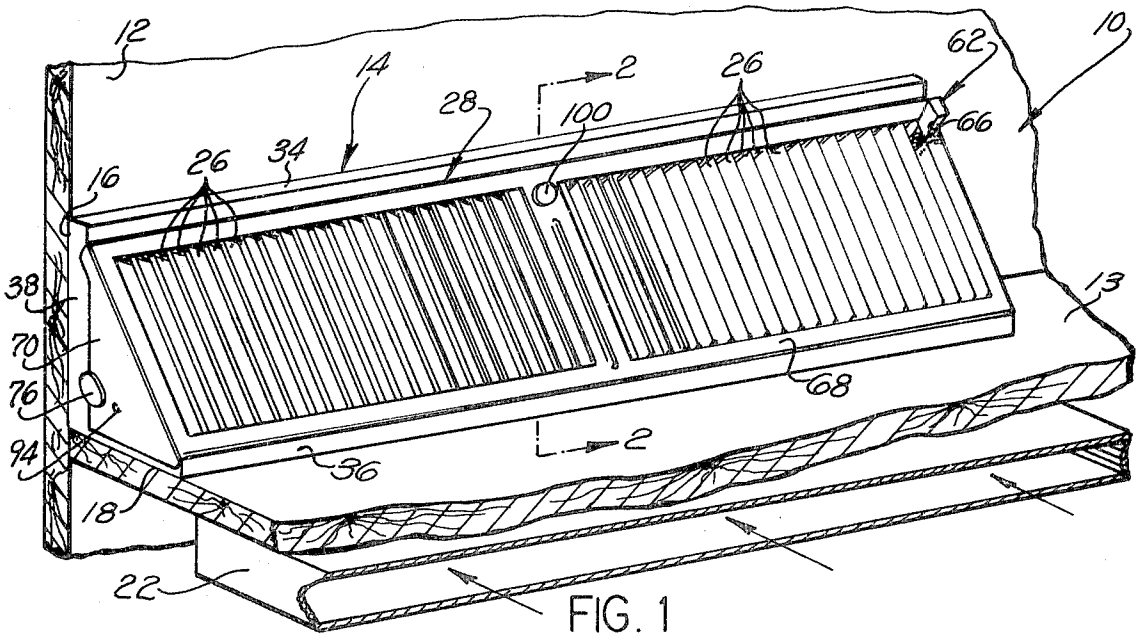


FIG. 1

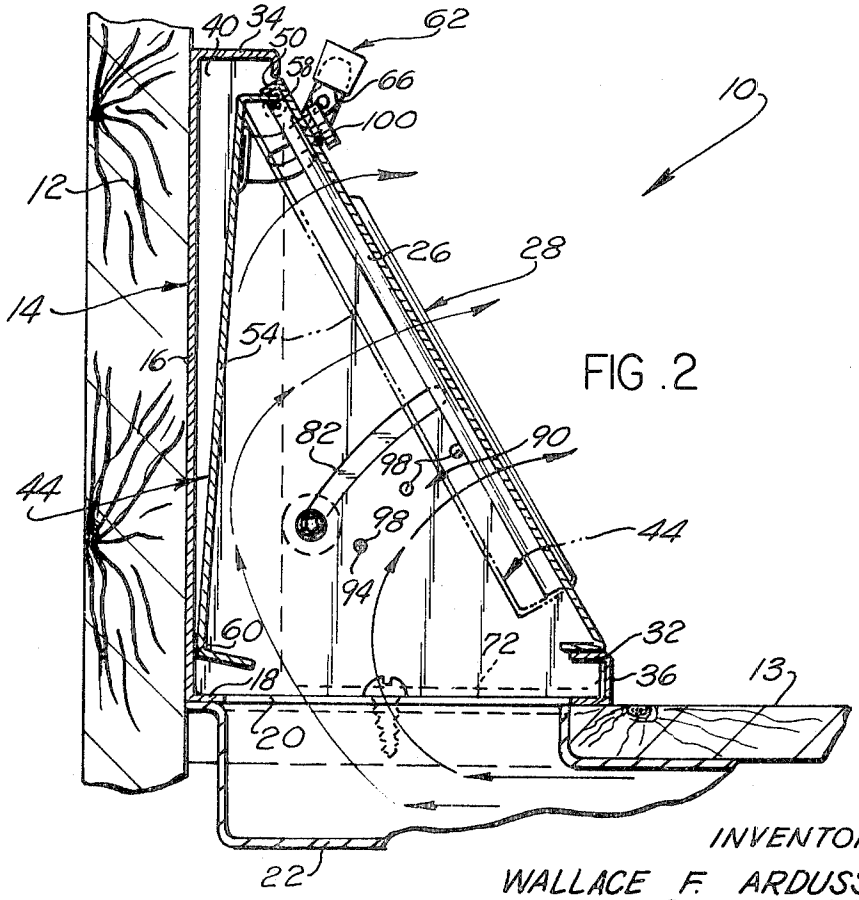


FIG. 2

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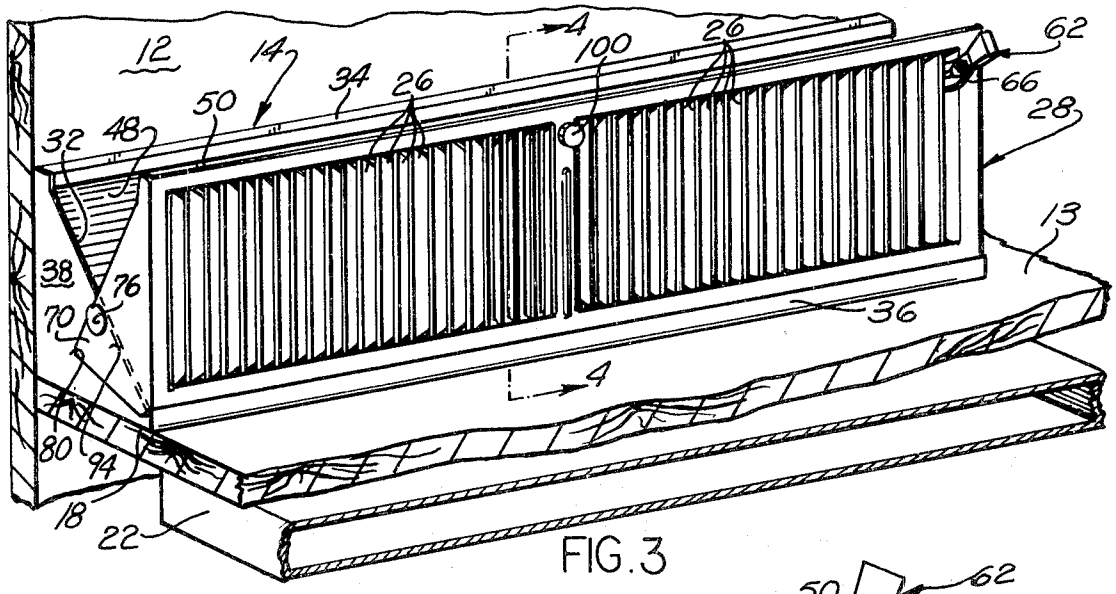


FIG. 3

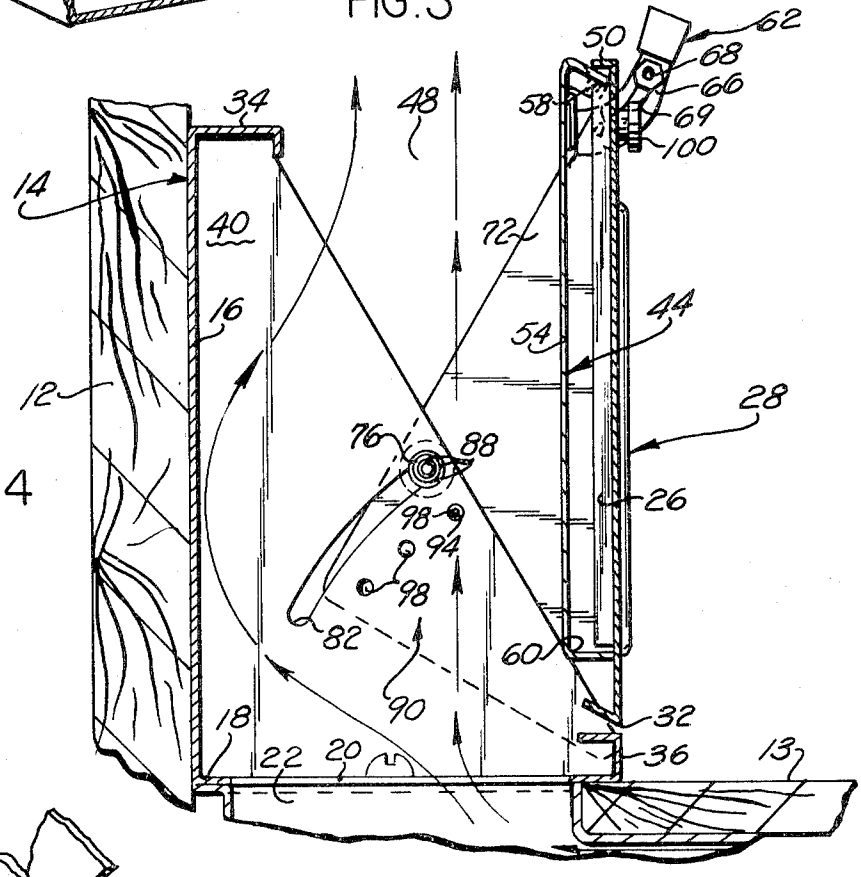


FIG. 4

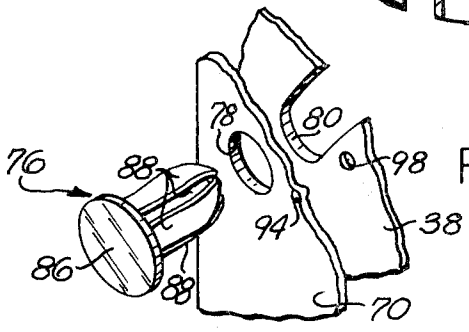


FIG. 5

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REGISTER ASSEMBLY WITH A MOVABLE FRONT PANEL

This invention relates generally to a register assembly and more particularly to a register assembly which is adapted to disperse a flow of warm air and to direct a larger flow of cool air upwardly through an unrestricted opening in the register assembly.

Air-conditioning units are commonly installed in conjunction with forced warm air furnaces so that the same ducts can be used to conduct warm air for heating and cold air for cooling. When a room is to be cooled, a relatively large flow of cold air should be directed upwardly toward the ceiling. Conversely, when a room is to be heated a somewhat smaller flow of hot air should be dispersed or diffused in the lower portion of the room to heat the relatively cold air which tend to collect adjacent to the floor of the room. Since many registers are installed near the floor of a room, they are well adapted to control only a flow of hot air. The louvers of these registers provide a relatively high resistance to the larger flow of cold air and are incapable of directing the cold air upwardly toward the ceiling of the room to effectively cool the room.

Accordingly, it is an object of this invention to provide a new and improved register assembly which is effective to disperse or diffuse a flow of warm air for heating purposes and to direct a larger flow of cold air upwardly for cooling purposes.

Another object of this invention is to provide a new and improved register assembly adapted for use in combination heating and cooling systems and having a louvered front panel which is movable between a closed position for dispersing or diffusing a flow of warm air and an open position in which the resistance of the register assembly to a flow of air is substantially reduced by the formation of an unrestricted opening through which a relatively large flow of cold air is directed upwardly toward the ceiling of the room.

Another object of this invention is to provide a new and improved register assembly including a damper which is pivotally mounted on a louvered front panel of the register assembly for limiting and directing a flow of warm air through the louvered front panel which disperses or diffuses the flow of warm air and wherein the front panel and the damper are movable together to an upwardly extending position forming an unrestricted opening through which a relatively large flow of cold air is directed upwardly.

These and other objects and features of the invention will become more apparent upon a consideration of the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is an elevational view illustrating a register assembly constructed in accordance with the present invention and mounted on a wall and floor of a building, the register assembly being shown with a front panel in a closed position;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1 illustrating the relationship of a damper to the front panel on which it is mounted, the damper being shown in solid lines in an open position in which the damper directs a flow of warm air through the louvered front panel and in dashed lines in a closed position in which the damper blocks airflow through the front panel;

FIG. 3 is an elevational view of the register assembly of FIG. 1 with the front panel in an open position extending upwardly to provide an unrestricted opening for the upward flow of a relatively large volume of cool air;

FIG. 4 is a sectional view, taken along the line 4—4 of FIG. 3 illustrating the relationship between the front panel, damper and base of the register assembly when the front panel is in the open position; and

FIG. 5 is an enlarged fragmentary view which is partially exploded to illustrate the construction of a fastener for securing the front panel to the base of the register assembly.

This invention provides a register assembly having a louvered front panel which is pivotal relative to a base defining an opening through which air for heating or cooling a room flows.

When the front panel is in a closed position extending across the opening, the louvers in the front panel disperse or diffuse an outward flow of warm air to effectively heat various parts of the room. To enable a relatively large volume of cold air required for cooling the room to flow easily through the register assembly, the resistance of the register assembly to a flow of air is substantially reduced by pivoting the front panel to an open position in which it extends upwardly to form an unrestricted opening between the front panel and the top of the base. The front panel is then effective to direct the relatively large flow of cold air upwardly through the unrestricted opening toward the ceiling of the room where warm air tends to collect.

Although a register constructed in accordance with the present invention can be used in many different environments and locations, a register **10** forming a preferred embodiment of the invention is illustrated in FIGS. 1 and 2 mounted on the wall **12** and floor **13** of a building. The register **10** includes a base **14** having a back panel **16** connected to the wall **12** and a bottom panel **18** connected to the floor **13** of the building. The bottom panel **18** defines an opening **20** through which air from a suitable duct **22** flows into a room of the building. When the room is to be heated, a flow of warm air is dispersed or diffused, in a known manner, by louvers **26** formed in a front panel **28** which extends across an opening **32** formed between top and front panels **34** and **36** (FIG. 2) and end panels **38** and **40** (FIGS. 1 and 2). A damper assembly **44** is pivotally mounted on the front panel **28** (FIG. 2). The damper assembly **44** is operable between an open position (shown in solid lines in FIG. 2) in which it is adapted to direct a flow of warm air through the front panel **28** and a closed position (shown in dashed lines in FIG. 2) in which the damper assembly blocks airflow through the front panel **28**.

In accordance with the present invention, the resistance of the register **10** to a flow of air can be substantially reduced to enable the register to be used for regulating and directing a relatively large volumetric flow of cold air required for cooling the room. To this end, the front panel **28** is mounted for pivoting movement from the closed position of FIGS. 1 and 2 to the open position of FIGS. 3 and 4. When the front panel **28** is in the open position, the resistance of the register **10** to a flow of air is substantially reduced by the formation of an unrestricted opening **48** between an upper portion **50** of the front panel **28** and the top panel **34** of the base **14**.

The formation of the opening **48** increases the "free area" of the register **10** to decrease the resistance to the flow of air by as much as 50 percent. This substantial reduction in resistance to the flow of air enables the large volume of cold air required for cooling a room to flow through the register **10** without a substantial increase in the air pressure in the duct **22** to which the register **10** is connected. If the front panel **28** was left in the closed position of FIGS. 1 and 2, the louvers **26** would tend to block the flow of air through the register **10** and the air pressure in the duct **22** would have to be substantially increased to provide the requisite volumetric flow of air for cooling the room.

Since hot or warm air tends to rise while colder air tends to sink, it is advantageous when heating a room to disperse or diffuse a flow of warm air into a space adjacent to the floor of the room where cold air tends to collect. Conversely, when cooling a room it is advantageous to direct the flow of cold air upwardly toward the ceiling of the room to cool the relatively warm air which tends to collect adjacent to the ceiling. To this end, the front panel **28** is closed (as shown in FIGS. 1 and 2) when hot air for heating is flowing through the register **10** so that the louvers **26** disperse the outward flow of hot air into an area adjacent to the floor of the room. When relatively cold air is flowing through the register **10** to cool a room, the front panel **28** is pivoted to the open position of FIGS. 3 and 4 so that the front panel extends upwardly parallel to the back panel **16** of the base **14** to direct the relatively large flow of cold air upwardly toward the ceiling of the room to thereby effectively cool the room. Of course, the provision of the un-

restricted opening 48 between the upper portion 50 of the front panel 28 and the top panel 34 of the base 14 facilitates this relatively large upward flow of air by substantially reducing the airflow resistance of the register.

In order to enable an occupant of the room to regulate the temperature of the room, the damper assembly 44 includes a panel 54 which is movable between an open condition, shown in solid lines at FIG. 2, in which air can flow through the opening 32 and a closed condition, shown in dashed lines in FIG. 2, in which the panel 54 blocks a flow of air through the opening 32. The damper panel 54 extends longitudinally across the opening 32 and is pivotally connected at 58 to the front panel 28. When the damper panel 54 is in the open condition of FIG. 2, the damper panel extends downwardly into engagement with the back panel 16 of the base 14 to deflect air flowing through the opening 20 in the base panel 18 toward the louvered front panel 28. In the fully open condition, a lowermost edge portion 60 engages the back panel 16. When the damper panel 54 is in the closed condition shown in dashed lines in FIG. 2, the damper panel extends parallel to the front panel 28 and blocks a flow of air through the louvers 26. In the fully closed condition, the lowermost edge portion 60 engages the front panel 28. Varying the downward and rearward slope of the damper panel 54 varies the amount of warm air directed toward the front panel 28 by the damper panel 54.

An actuator assembly 62 is connected to the damper panel to enable the damper panel to be moved relative to the base 14 to vary the rate of flow of air through the opening 20. To this end, the actuator assembly 62 includes an actuator lever 66 which projects through a louvered slot in the front panel 28 (see FIGS. 1 and 3). The actuator lever 66 is fixedly connected to the damper panel 54 and is movable relative to the front panel 28 to pivot the damper panel relative to the front panel. A stop screw 68 is mounted in a slot 69 in the actuator lever 66 to limit movement of the actuator lever relative to the front panel 28. It should be noted that both the damper panel 54 and damper actuator assembly 62 are moved with the front panel 28 relative to the base 14.

The front panel 28 includes rearwardly extending end portions 70 and 72 (FIGS. 3 and 4) which slidably engage end panels 38 and 40 of the base 14. The front panel 28 is pivotally connected at opposite ends to the base 14 by fasteners 76 (FIGS. 1, 4 and 5). One of the fasteners 76 extends through a circular opening 78 in the end portion 70 of the front panel 28 (FIGS. 1 and 5) and then through an arcuate slot 80 in the end panel 38 of the base 18. Similarly, the fastener 76 at the opposite end of the register 10 extends through an opening in the end portion 72 of the front panel 28 and through an arcuate slot 82 in the end panel 40 of the base 14 (FIGS. 2 and 4). The fasteners 76 each include a head portion 86 with projecting legs 88 which flare slightly outwardly in a direction away from the head portion. This outward flaring of the legs 88 enables them to resiliently grip the associated end panel of the base 14 to interconnect the front panel 28 and the base.

Upon movement of the front panel 28 between the open and closed positions, the fasteners 78 slide in the slots 80 and 82 to enable the front panel to pivot relative to the base 14. It should be noted that the front panel 28 is connected to the base 14 by only the fasteners 76 to thereby facilitate assembly of the register 10. The front panel 28 is held in a position to which it is moved by indexing arrangements 90 between the end panels 38 and 40 of the base 14 and the end portions 70 and 72 of the front panel 28. The indexing arrangement 90 each include a protuberance or indentation 94 (FIG. 1) in an associated end portion of the front panel 28. This protuberance 94 engages one of a plurality of apertures 98 in the associated end panels 70 and 72 to retain the front panel 28 in an open position to which it is moved. Movement of the front panel 28 is facilitated by a knob 100 on the front panel.

In view of the foregoing remarks, it can be seen that the register 10 includes a louvered front panel 28 which is movable between a closed position (FIG. 1) in which it is effective to disperse or diffuse a flow of hot air and an open position in which the front panel 28 extends vertically upwardly and directs a flow of relatively cold air upwardly through an unrestricted opening 48 to cool a room. The formation of the unrestricted opening 48 by movement of the front panel 28 to the open position substantially reduces the resistance of the register 10 to a flow of air and thereby enables relatively large volumes of cold air for cooling to flow through the register. The damper assembly 44 is mounted on the back of the front panel 24 to control the rate of airflow through the register and to direct the flow of air.

Having described a specific preferred embodiment of the invention, the following is claimed:

1. A register assembly for directing and controlling a flow of air, said register assembly comprising a base having top, bottom, front, back and end portions with an air inlet in aid bottom portion, a louvered front panel pivotally connected to said end portions of said base and extending across an opening in aid front portion of said base, said louvered front panel having a pair of end panels integrally formed therewith and disposed in sliding engagement with said end portions of said base, said louvered front panel being movable between a closed position extending transversely to said back portion of said base and engaging said top portion of said base and an open position extending generally parallel to said back portion and spaced from said top portion of said base to at least partially define an opening between said top portion of said base and an uppermost portion of said louvered front panel, a damper member, connection means for pivotally mounting said damper member on said uppermost portion of said louvered front panel, said connection means including a plurality of outwardly projecting leg sections connected to said head portion, each of said head portions of said fastener members being disposed in abutting engagement with one of said end panels with said legs extending through an opening in the associated one of said end panels and an elongated arcuate opening in an associated said end portion of said base to thereby interconnect said base and said louvered front panel, said damper member being movable with said louvered front panel upon movement of said louvered front panel between said open and closed positions, said damper member being pivotal relative to said louvered front panel between a first position in which said damper member is generally parallel to said louvered front panel and blocks a flow of air through said louvered front panel and a second position in which said damper member extends downwardly and rearwardly from said uppermost portion of said louvered front panel to direct a flow of air through said louvered front panel, and a manually operable actuator member fixedly connected at one end portion to said damper member and extending through said louvered front panel to enable said damper member to be pivoted between said first and second positions, said manually operable actuator member being movable with said louvered front panel upon movement of said louvered front panel between said open and closed positions, said register assembly being operable between a first condition in which said louvered front panel is in said closed position and said damper member is in said second position to enable a flow of relatively warm air to be directed outwardly by said louvered front panel and a second condition in which said louvered front panel is in said open position and said damper member is in said first position to direct a flow of relatively cool air through the opening formed between said uppermost portion of said front panel and said top portion of said base, said damper member being pivotal from said first position to a position intermediate said first and second positions when said louvered front panel is in said open position to direct one portion of a flow of relatively cool air through said louvered front panel and another portion of the flow of relatively cool air through the opening formed between said uppermost portion of said front panel and top portion of said base.

2. A register assembly or directing and controlling a flow of air, said register assembly comprising a base having top, bottom, front, back and end portions with an air inlet in said bot-

tom portion, a louvered front panel pivotally connected to said end portions of said base and extending across an opening in said front portion of said base, said louvered front panel has a pair of end panels integrally formed therewith and disposed in sliding engagement with said end portions of said base, said louvered front panel being movable between a closed position extending transversely to said back portion of said base and engaging said top portion of said base and an open position extending generally parallel to said back portion and spaced from said top portion of said base to at least partially define an opening between said top portion of said base and an uppermost portion of said louvered front panel, including indexing means cooperating with said end portions of said base and said end panels on said louvered front panel to retain said louvered front panel in said open and closed positions, a damper member, connection means for pivotally mounting said damper member on said uppermost portion of said louvered front panel, said damper member being movable with said louvered front panel upon movement of said louvered front panel between said open and closed positions, said damper member being pivotal relative to said louvered front panel between a first position in which said damper member is generally parallel to said louvered front panel and blocks a flow of air through said louvered front panel and a second position in which said damper member extends downwardly and rearwardly from said uppermost portion of said louvered front panel to direct a flow of air through said louvered front panel, and a manually operable actuator member fixedly connected at one end portion to said damper member and extending through said louvered front panel to enable said damper member to be pivoted between said first and second positions, said manually operable actuator member being movable with said louvered front panel upon movement of said louvered front panel between said open and closed positions, said register assembly being operable between a first condition in which said louvered front panel is in said closed position and said damper member is in aid second position to enable a flow of relatively warm air to be directed outwardly by said louvered front panel and a second condition in which said louvered front panel is in said open position and said damper member is in said first position to direct a flow of relatively cool air through the opening formed between said uppermost portion of said front panel and said top portion of said base, said damper member being pivotal from said first position to a position intermediate said first and second positions when said louvered front panel is in said open position to direct one portion of a flow of relatively cool air through said louvered front panel and another portion of the flow of relatively cool air through the opening formed between said uppermost portion of said front panel and top portion of said base.

3. A register assembly as set forth in claim 2 wherein said damper member extends from said uppermost portion of said louvered front panel into engagement with said back portion of said base when said damper member is in said second position and said louvered front panel is in said closed position.

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