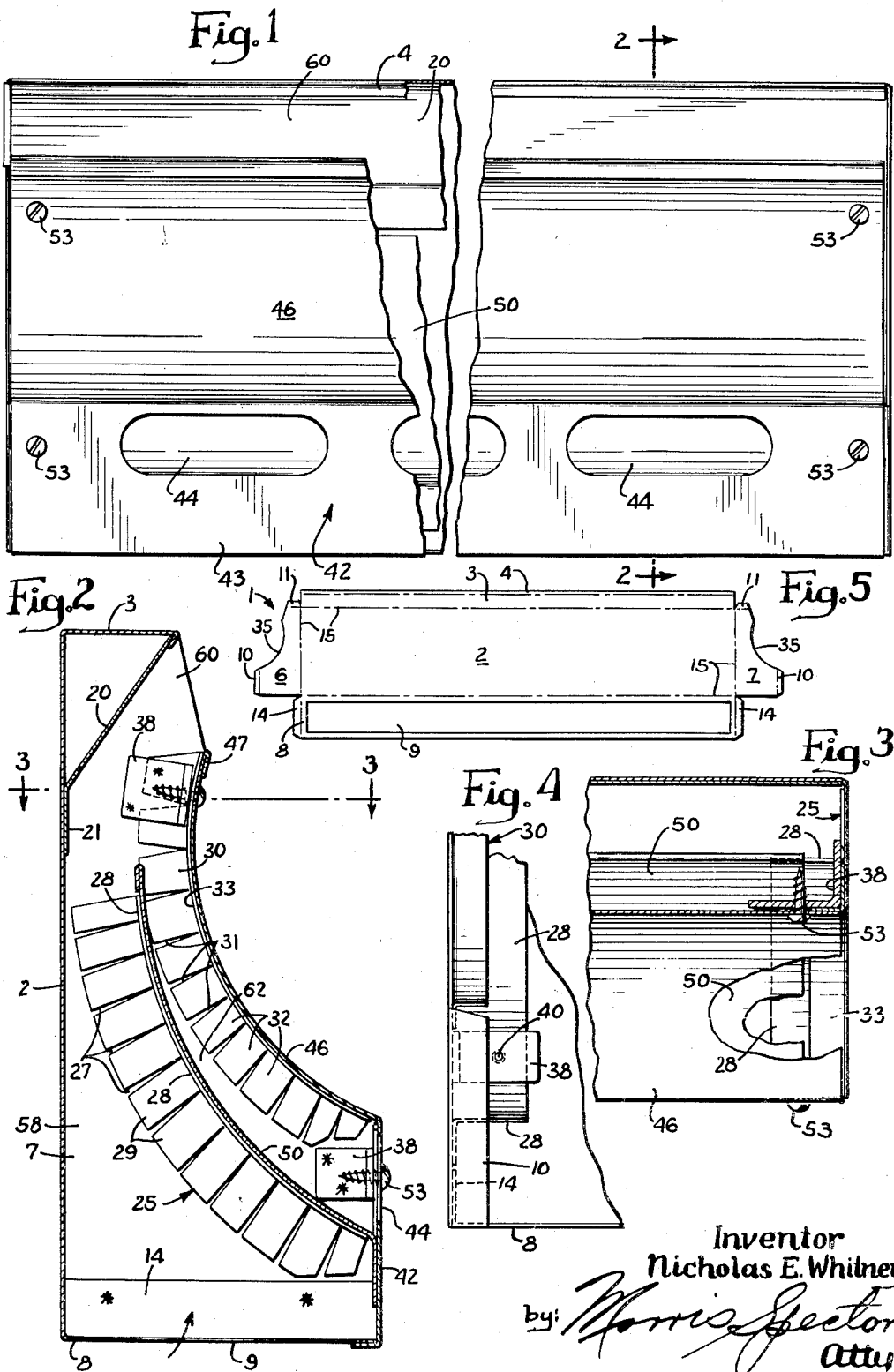


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RECIRCULATING REGISTER

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2,734,445

RECIRCULATING REGISTER

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This invention relates to registers for use in connection with warm air heating systems for both heating and cooling, and is particularly concerned with registers of the type that are so constructed that movement of air supplied through the register to the room causes the register to draw air from the room and mix it with the supplied air that is being delivered thereto.

It is one of the objects of the present invention to provide a recirculating air register, of the type above set forth, that may be used for baseboard heating and which will draw in air from adjacent to the floor of the room, mix it with the air flowing through the register from furnace, and deliver it into the room. It is a still further object of the present invention to provide such a baseboard register wherein the direction of flow of the air from the furnace is such as to cause the recirculating of a comparatively large amount of room air. It is a still further object of the present invention to provide a register of the above mentioned construction which will be simple and economical of construction.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a front view of a register constructed in accordance with the present invention, with parts thereof broken away to show the interior construction;

Figure 2 is a transverse sectional view taken along the line 2—2 of Figure 1;

Figure 3 is a fragmentary sectional view taken along the line 3—3 of Figure 2 and looking in the direction of the arrows;

Figure 4 is a fragmentary enlarged front view of a corner of the register, with the front panel removed; and

Figure 5 is a reduced plan view of the blank that forms the body of the register.

Reference may now be had more particularly to the drawing wherein like reference numerals designate like parts throughout.

Figure 5 shows a blank from which the body of the register is formed. The blank 1 is formed of a single piece of sheet steel that is cut to the shape shown to form a solid back panel 2 from which extends a top panel 3 having a narrow, longitudinally extending securing flap 4. Also extending from the back panel 2 are left and right panels 6 and 7 and a bottom panel 8 having a forced air supply or air inlet opening 9. Each of the side panels 6 and 7 has securing flaps 10 and 11 extending therefrom and the bottom panel has side securing flaps 14—14 extending therefrom. The metal is folded along fold lines indicated at 15, and the bottom flaps 14—14 are spot welded to the side flaps 6—7. The flaps 10—10 of the side panels are folded parallel to the front of the unit, and the flaps 11—11 are folded at right angles to the sides and are overlaid by the top

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panel 3, which top panel is spot welded to the flaps 11—11. The flap 4 is bent downwardly and acts as a support for the upper end of an anti-turbulence plate 20 that extends from the left side to the right side of the register and is welded at 21 to the back 2. The back and side walls 2, 6 and 7 are vertical and the bottom and top walls 8 and 3 are horizontal. Baffle plate supports and guides 25 are secured one to the left side panel 6 and one to the right side panel 7. Each support and guide 25 comprises an angle iron strip one flange of which is cut by a series of cuts 27 to permit flexing of the other flange 28 thereof, which flange 28 is then flexed along a smooth curve, and the fingers 29 between the cuts 27 are welded to the side 6 or 7, as the case may be. The flange 28 extends as a smooth curve along the sides 6 and 7 to act as a support for a baffle, in a manner which will be more fully set forth as this description proceeds. Two supports 30 are provided for supporting the front of the register, said supports being secured one to each of the sides 6 and 7. Each support 30 comprises an angle-shaped metal strip one flange of which is cut by a series of cuts 31—31 to provide a series of fingers 32—32 between the cuts and permit flexing of the other flange 33 of the support 30. The flange 33 of the support 30 is flexed to extend along a curve, corresponding to the curve 35 of the sides 6 and 7. The fingers 32 are then welded to the inner sides of the sides 6 and 7, with the flange 33 in line with the edge of the curve 35 of the sides 6 and 7. Thereafter, upper and lower metal angle clips 38—38 are secured to each side wall, each of said clips having a tapped hole 40 extending through one flange thereof for receiving a mounting screw for mounting the front of the register onto the body of the register.

The front of the register, indicated at 42, comprises a unitary plate having a vertical flat bottom portion 43 having slots 44 constituting induced air supply inlets. These slots extend across the full length of the bottom portion 43 and are comparatively close together and together constitute induced air inlets of substantial area. The vertical bottom portion 43 extends substantially less than half the height of the register. A concave portion 46 extends from the top of the vertical bottom portion 43 and curves rearwardly and upwardly along a smooth curve and terminates an appreciable distance rearwardly of the vertical bottom portion 43 in a smooth bead 47. The bead 47 is spaced from the top of the register to provide a discharge opening 60. The concave portion 46 is identical in shape with the arc 35 of the side members 6 and 7.

A baffle plate 50 is secured to the back surface of the front portion 42 of the register as by spot welding. The baffle is curved along an arc coinciding substantially with the curvature of the flange 28 of the baffle support 25 but pressing against said support by its own resiliency. The baffle extends for substantially the full length of the front 42. The front 42 of the panel is secured to the body of the panel by two screws 53 at the right hand end and two screws 53 at the left hand end, said screws threading into the holes 40 of the angle members 38.

An explanation will not be given of the manner of operation of the register thus far described. Assume that the air register is to be used in connection with a forced warm air heating system. The register is mounted at the desired location on a vertical wall in a room, preferably at the floor level, and is connected at its lower end to an air supply duct that snugly fits into or around the opening 9 and supplies forced warm air to the register. The air moves upwardly in the register, through a forced air passageway 58, toward a discharge opening 60, encountering the baffle 28 in its passage through the register. The baffle constricts the cross section of the hot air

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flow stream to a minimum at the top of the baffle, which thereby constitutes a venturi, producing a negative pressure in the region of the top of the baffle 50, thereby creating an induced air flow through the passageway 62 between the baffle 50 and the front plate 46. Room air is therefore drawn into the openings 44, said room air flowing up the induced air passageway 62 and mixing with the warm air that flows to the discharge opening 60. It is to be noted that any gravitational movement of the warm air up the discharge passageway 58 to the discharge opening 60 will draw room air through the openings 44 into the passageway 62, which room air mixes with the upwardly flowing warm air.

I have herein spoken of the recirculating register as used in connection with a forced warm air system. It may also be used in connection with a forced cold air system, as an air conditioner, wherein forced cold air is delivered to the opening 9 in the register.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction herein shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. An air baseboard register designed to be mounted near the baseboard of a wall, comprising a housing defining an enclosed air space and including rear and side walls, a top wall and a front wall, the front wall having a bottom portion which extends appreciably less than half the height of the register and a concave portion bridging said side walls and curving rearwardly and upwardly in a smooth curve from the top of said bottom portion of the front wall and terminating an appreciable distance rearward of the bottom portion of the front wall of the register, said bottom portion of the front wall having an induced air inlet opening and said housing having a discharge opening therein at its upper front portion, the bottom wall of the register having a forced air inlet opening, and baffle means in said housing bridging the side walls thereof and extending from said front wall below said inlet opening therein and curving rearwardly and upwardly behind said concave portion of said front wall and terminating below said discharge opening, said baffle means being spaced from the concave portion of the front wall and also from the rear wall of the housing to provide a front induced air passageway between said induced air inlet opening and a space communicating with said air discharge opening and to provide a rear forced air passageway extending between said forced air inlet opening and said latter space, the spacing between said concave baffle means and the front and rear walls, respectively, gradually decreasing to the top of the baffle means so that both the forced air passageway and the induced air passageway have minimum cross sections at their juncture.

2. A baseboard register designed to be mounted adjacent to the baseboard of a wall comprising a housing having a front exposed wall, the lower portion of the

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front wall having an induced air inlet opening for receiving air from a room, the upper portion of the front wall being concave and curving rearwardly and upwardly from said lower portion of the front wall and terminating rearwardly of said induced air inlet opening, the housing having in the lower portion thereof a forced air inlet opening for receiving heated air, said housing having a discharge opening therein at its upper front portion for discharging a mixture of heated air from said forced air inlet opening and room air from said induced air inlet opening, baffle means in said housing extending from said front wall between said induced air inlet opening and said forced air inlet opening and curving rearwardly and upwardly behind said concave portion of said front wall, said concave baffle means being spaced from the concave portion of the front wall and providing a front induced air passageway extending from said induced air inlet opening to a space in the housing communicating with said air discharge opening and a rear forced air passageway extending between said forced air inlet opening and said latter space, and the cross section of said rear forced air passageway gradually decreasing toward the top of the baffle means and reaching a minimum cross section at its juncture with the induced air passageway, said portion of minimum cross section constituting a venturi throat to draw air through said induced air inlet passageway.

3. A baseboard register designed to be mounted near the baseboard of a wall comprising a housing having an exposed front wall, and rear, side and top walls, the bottom portion of the front wall having an induced air inlet opening for receiving air from the room, said housing having a forced air inlet opening for receiving heated air, said housing having a discharge opening therein at its upper front portion for discharging a mixture of heated air from said forced air inlet opening and room air from said induced air opening, baffle means in said housing extending from a point beneath said induced air inlet opening and between the latter opening and the forced air inlet opening and terminating below said air discharge opening to provide a front induced air passageway extending between said induced air inlet opening and said discharge opening and a rear forced air passageway extending between said forced air inlet opening and said discharge opening, the spacing between the said baffle means and the front and rear walls, respectively, of the housing gradually decreasing to the top of the baffle means to provide the forced air passageway and the induced air passageway with tapering cross sections reaching a minimum cross section at their juncture.

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