A. G. SCHERER.

COMBINED HOT AIR AND COLD AIR REGISTER.

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1,329,802.


3 SHEETS—SHEET 1.
To all whom it may concern:

Be it known that I, ALBERT G. SCHEERER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Combined Hot-Air and Cold-Air Registers, of which the following is a full, clear, and exact specification.

My invention relates to a combination register for the cold-air inlet and hot-air outlet of furnaces and heaters, and more particularly to that type of apparatus known as "pipeless" furnaces or reheatners.

The circulation of air in such apparatus is usually accomplished by drawing off the cold air from the room through one section of a floor register, passing said cold air down around the heating element of the furnace where it is heated, and then discharging the thus heated air into the apartment or room through another section of the same register. As is well known, registers of this type are very large and unsightly because they occupy a space of from forty (40") inches to seventy (70") inches square, and on account of the principle upon which the circulation is accomplished, these registers are usually positioned in the central portion of a room or apartment. The occupant of the apartment is therefore not able to place furnishings above or near this large floor register for the reason that it would hinder and retard the circulation of the air both into and out of the register, and consequently a "dead" area is left on the floor. As rentals are usually estimated upon the square footage basis it will be seen that this useless space on the floor is an item of expense to a tenant especially when the apparatus is installed in a store or mercantile establishment. In addition, dust and dirt, as well as coins, find too easy ingress through the reticulations of such floor registers.

I have designed a register for pipeless furnaces or reheatners that is adapted to be installed in the walls or partitions of the building it is desired to heat so that it will occupy only a very small area of floor space, and which may be positioned in the central portion of a room or apartment, and when so located may be utilized as a table or counter or other article of furniture without detracting from its efficiency in heating and ventilating the apartment. I have also designed this register in a manner so that it may be installed upon either one or upon opposite sides of a wall or partition so that, in the latter event the heating will take place in two adjoining rooms simultaneously from the same register structure thereby materially increasing the effectiveness of the heating plant without detracting from the appearance of the rooms. So far as I am aware, this double heating from a single register has not been heretofore accomplished. I have also designed the structure so that much larger outlets and inlets may be had with a material reduction of the floor space occupied by the register.

The objects of my invention therefore are to provide a combined hot-air and cold-air register that is compact in construction, effective in its operation, economical to manufacture and install, and which, when installed in a room or apartment will add rather than detract from the furnishings and appearance thereof. I prefer to accomplish the divergent objects of my invention in substantially the manner and by the means hereinafter fully described and as more particularly pointed out in the claims, reference being now made to the accompanying drawings that form a part of this specification and which are in a sense merely diagrammatic for the purposes of convenient illustration.

In the drawings,

Figure 1 is a vertical sectional view of my improved register showing the manner of connecting the same with the pipeless furnace or reheatner, the latter being shown partly in elevation and partly in section.

Fig. 2 is a perspective view of my register having a portion of the grille or front wall broken away to disclose the interior arrangement.

Fig. 3 is a vertical section taken transversely of Fig. 1, and drawn to an enlarged scale, and illustrating the manner of installing my register upon both sides of a wall or partition for the purpose of heating two rooms or apartments simultaneously.

Fig. 4 is a horizontal section on line 4—-4, Fig. 1, the size of the drawing being reduced.

Fig. 5 is a view similar to Fig. 4 taken on line 5—-5, Fig. 1.

Fig. 6 is a vertical section showing in detail...
tall the construction of the baffle vanes and taken on line 6—6, Fig. 5.

Referring more particularly to Fig. 1 of the drawings, it will be observed that the device is adapted to be installed so as to communicate with the inlet and the discharge flues of what is known to the trade as a "pipeless" or "inverted" type heater. The furnace structure preferably consists of a heating element A which is of the usual type employed in hot-air furnaces and which is surrounded by a shell or casing B of cylindrical shape. The top of this shell is divided into a central heat compartment C from which the hot air is discharged upwardly, and an outer chamber D concentric therewith for the admission of air to the heating chamber. The upper edges of the casing B are preferably assembled with a cylindrical section E having a tapering or conical upper portion F and inside the compartment thus formed is a conical shaped head G extending inwardly adjacent the upper edge of the shell or casing B and which has its its central portion merged into a cylindrical member H so as to provide and complete the heat compartment C heretofore mentioned. In order that the cool air returning from the heating chamber through the passageway D may be conducted thereto independently of the shell or casing B, I have provided the upper member E with outlet openings and the lower portion of the casing B with corresponding inlet openings and connect said openings by suitable conduit or piping I, as shown.

The type of heating apparatus above described is well-known, and in the customary installation the cold-air and hot-air passages lead upwardly to a large fireplace of square or circular shape and divided so as to discharge the heated air through one section thereof and receive the cold air through the remaining portion thereof.

The upper portion of the conical shaped member F extends in the form of a cylindrical pipe J up to and terminates adjacent the floor of the partition it is desired to heat immediately below the studding or partition dividing the rooms. For the purpose of installing my register several of the studding are cut off at their lower ends and framed up to provide an opening through the wall into which the register is fitted.

Extending upwardly from the floor, and approximately concentric with the pipe J, is a suitable reticulated wall or metallic grille 20 that is preferably cylindrical in shape and which is surrounded at its lower edge and rests upon a flanged ring or strap 21. As the type illustrated in Figs. 1 to 5 is adapted for use in heating two adjoining rooms, this cylindrical wall 20 and strap 21 are positioned partly on one side and partly on the opposite side of the studding or partition wall X through the opening heretofore mentioned. The wall 20 provides the lower or cold-air section of the register and is adapted to receive the inflowing air from adjacent the floor of the room. An annular strap or ring 22, having an outwardly projecting bead 23, is mounted on the top of said wall 20 so that it rests on the upper edge thereof as shown in Fig. 3 of the drawings, while the lower edge of the strap is bent laterally both inwardly and upwardly to provide a ledge or shelf 24, the purpose of which will hereinafter more fully appear.

The upper or hot-air section of the register preferably comprises a similar reticulated wall or grille 35, also of cylindrical shape, and having its lower edge supported on the bead 23 of strap 22, and said wall 25 carries upon its upper edge an annular strap or ring 36 of substantially the same construction as the strap 22 and having a lateral outer bead 27 that supports the same upon the upper edge of the top wall section 25. The lower edge of this strap 26 is similarly flanged inwardly and upwardly to provide a shelf 28, the purpose of which will also hereinafter more fully appear.

The structure thus far described presents the appearance of a substantially half-cylindrical extending out into the room upon each side of the partition wall X, and the upper open portions on each side of the wall are each closed by means of a suitably shaped top or cover 29, having an upright wall board 30 along its rear edge while its curved front edge is provided with a downwardly projecting flange 31 that rests upon the bead 27 of the adjacent strap, thereby closing the opening at the top of the register on both sides of the wall X and presenting a pleasing appearance to the room. Owing to the height of this register, which I propose shall extend approximately thirty (30') inches from the floor to the upper surface of the top or cover, the same may be utilized as a wall table or serving stand, or other article of furniture as desired, and upon which articles may be conveniently placed if desired.

The upper portion of the pipe H heretofore referred to as forming the hot-air passageway from the heater, preferably interferes with a cylindrical pipe or conduit 32 that extends up through the pipe J to a point above the floor line and which is then flared outwardly and upwardly at 35 toward the intermediate strap, while its upper edge 34 is bent or flanged laterally so as to rest upon the shelf or flange 23 of the strap 22 which is adapted to assist in supporting this conduit 32 in concentric relation with the pipe J. This provides a cold-air duct or passageway 33 that surrounds the hot-air passageway and communicates with the pipes I to return
the cold-air to the heating chamber inside the furnace casing and separates the hot-air passage leading from the furnace casing so that the heated air will be discharged at the top of the register, or in other words, outwardly through the upper grille 29. This arrangement also insulates the hot-air pipes from the flooring and studding and avoids the danger of fire resulting from overheating the woodwork. In order to assist in the discharge of the heated air through the upper grille, I prefer to provide an inverted conical shaped deflector or baffle 36 that is preferably made of sheet metal and suspended immediately above the discharge end of pipe 32 by a suitable flange 37 extending laterally from the upper edge of this cone and which is hung upon the shelf 28 of the strap 26.

Thus it will be seen that the heated air arising through the pipe 32 will be discharged through the upper portion of the grille upon each side of the partition wall X, and I have found it desirable to fill the conical deflector 36 with sand or like heat-retaining material which will store up and retain a quantity of heat so that when the furnace is running under ordinary conditions this sand will become heated, and when the furnace is shut down, as it usually is during the night, this material will continue to heat the air as the latter rises through the pipe 32. I also provide a wall 39 upon each side of the deflector that preferably extends from the lower edge of the ring 26 down to the upper edge of the ring 22 and from the adjacent surface of the partition wall inwardly to the tapered walls of the deflector. This will insure a more or less equal distribution of the heated air and will also prevent persons looking from one room into the other through the upper section of the register.

In order to obstruct the view into the lower interior of the cold-air passageway, which starts close to the floor, a series of transverse or radial baffle plates 40 are provided that are mounted between the inner and outer rings 41 and 42, respectively, and which are inclined at an angle of substantially forty-five degrees, said rings being adapted to fit respectively against the exterior surface of the hot-air pipe 32 and the outer pipe J of the structure and to be positioned at approximately the plane of the floor.

What I claim is:

1. A register structure comprising a reticulated element shaped to provide the perforated front and side walls of an interior chamber, a top closing said chamber, and means extending upward into said chamber and dividing the same into inner and outer passageways, said means terminating intermediate the top and bottom of said element whereby the inner passageway communicates with the upper portion of the front and sides of said wall and the outer passageway communicates with the lower portion of the front and sides of said element.

2. A register structure comprising a reticulated element shaped to provide a perforated wall upon the front and sides of an interior chamber, a top closing said chamber, and means extending upward into said chamber and dividing the same into inner and outer passageways, said means being flared to terminate intermediate the top and bottom of said element and having its upper edge engaging said element whereby the inner passageway communicates with the upper portion of said element and the outer passageway communicates with the lower portion of said element.

3. A register structure comprising a reticulated element shaped to provide a perforated wall upon the front and sides of an interior chamber, a top closing said chamber, and a flue pipe extending upward into said chamber and dividing the same into inner and outer passageways, said flue pipe terminating intermediate the top and bottom of said element whereby the inner passageway communicates with the upper portion of the front and sides of said element and the outer passageway communicates with the lower portion of the front and sides of said element.

4. A register structure comprising a reticulated element shaped to provide a perforated wall upon the front and sides of an interior chamber, a top closing said chamber, and a flue pipe extending upward into said chamber and dividing the same into inner and outer passageways, said flue pipe terminating intermediate the top and bottom of said element and flared at its upper edge to engage said element whereby the inner passageway communicates with the upper portion of the front and sides of said wall and the outer passageway communicates with the lower portion of the front and sides of said wall.

5. A register structure comprising a reticulated element shaped to provide a perforated wall upon the front and sides of an interior chamber, a top closing said chamber, and means extending upward into said chamber and dividing the same into inner and outer passageways, said means terminating intermediate the top and bottom of said element whereby the inner passageway communicates with the upper portion of the front and sides of said wall and a baffle consisting of a member inclined from the upper portion of said wall downwardly into said inner passageway.

6. A register structure comprising a reticulated element shaped to provide a perforated wall upon the front and sides of an...
interior chamber, a top closing said chamber, means extending up into said chamber and dividing the same into inner and outer passageways, said means terminating intermediate the top and bottom of said element whereby the inner passageway communicates with the upper portion of the front and sides of said wall and the outer passageway communicates with the lower portion of the front and sides of said wall, a receptacle positioned in the upper portion of said inner passageway and inclined downwardly from the upper portions of said reticulated wall into said inner passageway, and heat-storing material disposed in said receptacle.

7. A register structure comprising a reticulated wall shaped to provide a chamber, a top closing said chamber, a flue-pipe extending up into said chamber and dividing the same into inner and outer passageways, said flue-pipe terminating intermediate the top and bottom of said wall and having its upper edge engaging said wall whereby the inner passageway communicates with the upper portion of said wall and the outer passageway communicates with the lower portion of said wall, a receptacle positioned in the upper portion of said inner passageway and inclined downwardly from the upper portions of said reticulated wall into said inner passageway, and heat-storing material disposed in said receptacle.

8. A register structure comprising a lower vertically disposed reticulated wall section, an annular member mounted on said wall and provided with an internal flange, a concentric flue-pipe spaced from said wall and having its upper portion flared outwardly and seated on said flange and its lower end communicating with the heating unit of a furnace, an upper vertically disposed reticulated wall section mounted on said annular member, an annular member mounted on said upper wall and provided with an annular flange, and a heat-storing baffle carried by said latter flange and having an inclined bottom extending across said flue-pipe.

9. A register structure comprising a lower vertically disposed reticulated wall section, an annular member mounted on said wall and provided with an internal flange, a concentric flue-pipe spaced from said wall and having its upper portion flared outwardly and seated on said flange and its lower end communicating with the heating unit of a furnace, an upper vertically disposed reticulated wall section mounted on said annular member, an annular member mounted on said upper wall and provided with an annular flange, a cover for said register consisting of a plate fitted on the upper edge thereof, and a heat-storing baffle carried by said latter flange and having an inclined bottom extending across said flue-pipe, whereby the cover is protected from the heat arising through said central flue pipe.

10. A register structure comprising a lower vertically disposed reticulated wall section, an annular member mounted on said wall and provided with an internal flange, a concentric flue-pipe spaced from said wall and having its upper portion flared outwardly and seated on said flange and its lower end communicating with the heating unit of a furnace, an upper vertically disposed reticulated wall section mounted on said annular member, an annular member mounted on said upper wall and provided with an annular flange, a heat-storing baffle carried by said latter flange and having an inclined bottom extending across said flue-pipe, and means establishing communication between the lower wall section and the lower portion of the furnace casing.

11. A register for installation in an apertured partition of a building, comprising a cylindrical register-wall of reticulated material adapted to be positioned so as to be intersected by said partition, covers for said register wall upon opposite sides of said partition, a hot air pipe positioned within and concentric with said register wall the upper end of which pipe is flared outwardly and engages said register wall mediate its height, and a concentric cold air pipe forming a continuation of the lower portion of said register wall and surrounding said hot air pipe.

12. A register for installation in an apertured partition of a building, comprising a cylindrical register-wall of reticulated material adapted to be positioned so as to be intersected by said partition, covers for said register wall upon opposite sides of said partition, a hot air pipe positioned within and concentric with said register wall the upper end of which pipe is flared outwardly and engages said register wall mediate its height, a concentric cold air pipe forming a continuation of the lower portion of said register wall and surrounding said hot air pipe, and an inverted conical baffle carried by the upper portion of said register and having its apex positioned above and at substantially the axis of said hot air pipe.

13. A register for installation in an apertured partition of a building, comprising a cylindrical register-wall of reticulated material adapted to be positioned so as to be intersected by said partition, covers for said register wall upon opposite sides of said partition, a hot air pipe positioned within and concentric with said register wall the upper end of which pipe is flared outwardly and engages said register wall mediate its height, a concentric cold air pipe forming a continuation of the lower portion of said register wall and surrounding said hot air pipe.
an inverted conical baffle carried by the upper portion of said register and having its apex positioned above and at substantially the axis of said hot air pipe and a suitable heat-storing material disposed in said baffle, whereby the covers are protected from the heat arising through said central flue pipe.

14. A register structure comprising a reticulated cylindrical shell adapted to be positioned in an aperture in a wall and extended upon both sides thereof, a concentric hot-air pipe disposed within and spaced from said shell and the upper end thereof is flared outwardly to engage said shell intermediate its top and bottom, and a concentric cold-air pipe below and communicating with said shell and surrounding said hot-air pipe, whereby the cold air from the room being heated is adapted to be drawn off through the lower portion of the register shell and the hot-air discharged into the room through the upper portion of said register shell.

15. A register structure comprising a reticulated cylindrical shell adapted to be positioned in a room to be heated, a concentric hot-air pipe disposed within and spaced from said shell and adapted to discharge through the upper portion of said shell, and a concentric cold-air pipe surrounding said hot-air pipe and communicating only with the lower portion of said shell.

16. A register structure comprising a shell having a reticulated wall upon the front and sides thereof and having cold-air and hot-air passageways within the same, a chambered deflector positioned within said hot-air passageway, and a heat-retaining substance contained in said deflector.

17. A register structure comprising a reticulated shell having cold-air and hot-air passageways within the same, and a hollow deflector having outwardly inclined walls positioned within said hot-air passageway, and adapted to receive a quantity of comminuted heat-retaining substance.

18. A register structure comprising a reticulated shell open at its top and having cold-air and hot-air passageways, a hollow deflector positioned at the upper end of said hot-air passageway and having outwardly inclined walls, a heat-retaining substance within said deflector, and a cover closing the top of said shell whereby access is had to the interior of said deflector and said cover is protected from the heat arising through said hot air passage way.

19. In combination with an air-duct having a vertical opening permitting discharge therefrom in a plurality of horizontal directions, a grille mounted to extend around said opening.

20. A register box having an opening permitting discharge therefrom and entrance thereto in a plurality of horizontal directions, and a grille mounted in said opening and formed to face the plurality of directions in which discharge from and entrance to said register box is had.

21. A register comprising a cylindrical reticulated shell, a top therefor, a cold air pipe connected to the lower edges of and having radial communication with said shell, and a hot-air pipe extending up into said interior chamber and discharging radially in all directions through said shell above said cold-air pipe.

22. A register box having a vertical opening, a reticulated grille extending in a plurality of planes in front of the plane of said opening to provide a discharge therefrom in a plurality of directions whereby the capacity and directions of discharge from said opening is increased.

Signed at Chicago, county of Cook and State of Illinois, this first day of October, 1918.

ALBERT G. SCHEERER.

Witnesses:
E. K. LUNDY, JR.;
J. H. JOCHUM, JR.