May 6, 1924. 1,492,750

C. L. ROGERS ET AL

AIR DISTRIBUTING MEANS

Original Filed Sept. 18, 1919

Fig. 1.

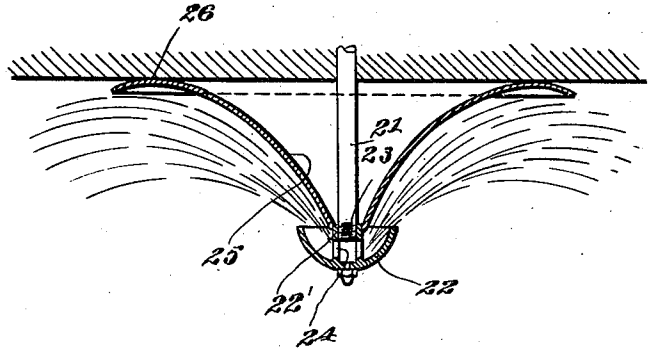
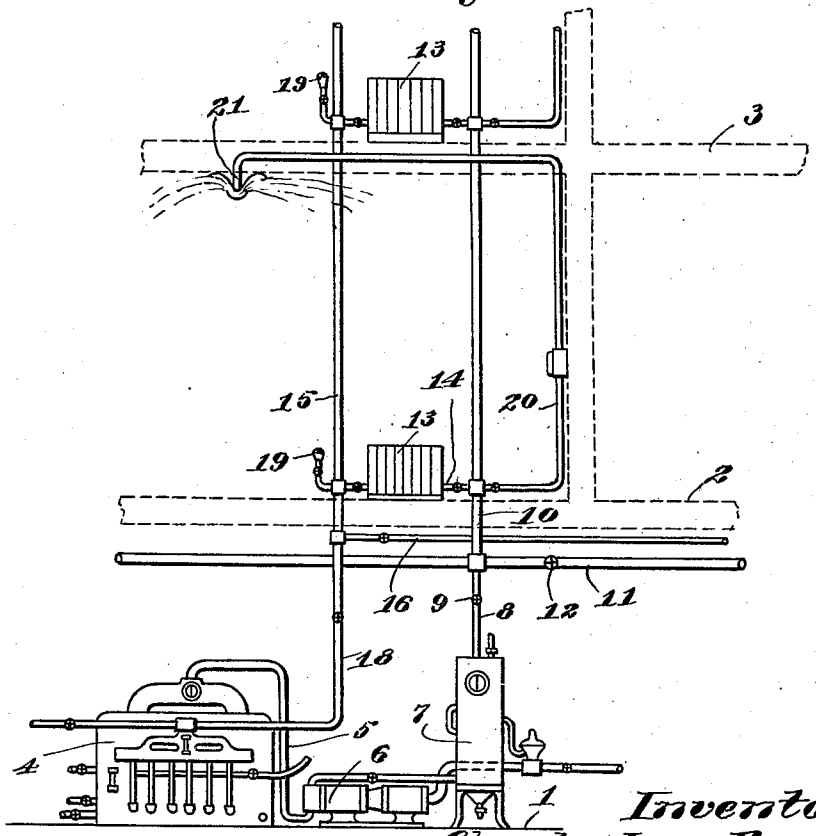


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES L. ROGERS, OF ROCHESTER, NEW YORK, MANLY C. ROGERS, OF WEEHAWKEN, NEW JERSEY, AND WILLARD W. BROWN, OF BLAIRSDEN, CALIFORNIA.

AIR-DISTRIBUTING MEANS.

Original application filed September 18, 1919, Serial No. 324,300. Divided and this application filed March 8, 1922. Serial No. 542,076.

To all whom it may concern:

Be it known that we, CHARLES L. ROGERS, MANLY C. ROGERS, and WILLARD W. BROWN, citizens of the United States of America, and residents, respectively, of Rochester, Weehawken, and Feather River Inn, Blairsden, in the counties of Monroe, Hudson, and Plumas, States of New York, New Jersey, and California, have invented new and useful Improvements in Air-Distributing Means, of which the following is a specification.

This invention relates to cooling and ventilating apparatus and more particularly to means useful in connection with such apparatus whereby air delivered to the apartment to be ventilated may be distributed therein in a substantially uniform manner.

In the application of Charles L. Rogers, Manly C. Rogers and Willard W. Brown, Serial No. 324,300, September 18, 1919, for cooling and refrigerating apparatus, of which the present application is a division, there is disclosed an air cooling and ventilating apparatus for buildings, such apparatus comprising means for withdrawing air from the apartment or room to be ventilated, causing such air to pass in heat transferring relationship to a suitable cooling medium and reintroducing such air, after cooling, into the room or apartment. In introducing the cooled air into the place to be ventilated, it is desirable to admit such air at a point substantially above the floor and preferably adjacent to the ceiling, in order that full advantage may be taken of the relatively high specific gravity of such cooled air in establishing a proper circulation of the cooled air throughout the apartment. It is manifestly undesirable, however, to permit such air to enter as a solid and unbroken stream, as such a stream of inflowing air would undoubtedly cause discomfort to occupants of the room, while at the same time such an arrangement would be highly inefficient from the standpoint of the ventilating engineer.

On the other hand, undesirable complexity in the piping system whereby the air is brought to the apartment is to be avoided, and for this reason the simultaneous discharge of air from a multitude of delivery openings distributed over the walls of the apartment is not feasible from a practical standpoint. It is accordingly necessary, if the air is to be delivered to the apartment through a single conduit, that some efficient distributing means be supplied, whereby to secure a proper diffusion of the entering air. As such distributing means must almost necessarily be arranged within the apartment, it should not be of unsightly appearance nor produce an objectionable sound in its operation, and preferably the device should be of such character that no auxiliary power is required for its operation.

The object of the present invention is accordingly to provide an air delivery terminal of compact and pleasing appearance, having no moving parts, and capable of installation at any desired point in an apartment, and which at the same time is capable of distributing air received through a single supply pipe in all directions laterally and in such a manner as to cause such air to be diffused in a substantially uniform manner throughout the apartment and without causing appreciable noise, or setting up undesirable drafts therein.

In the accompanying drawings is illustrated by way of example one embodiment of means suitable for carrying the invention into effect, and in such drawings:—

Fig. 1 is a vertical, diametral cross section illustrating the delivery terminal forming the subject matter of the present invention; and

Fig. 2 is a diametral elevational view illustrating an air cooling system having such delivery terminal applied thereto.

In Fig. 2 the numeral 1 indicates the basement floor, 2 the first floor, and 3 an upper floor of a building having an air cooling and ventilating system therein, such system comprising a cooling apparatus 4 of any known type, but preferably of the form disclosed in the application of Rogers, et al, Serial No. 324,300, filed September 18, 1919, of which this application is a division, such cooling apparatus being arranged within the basement and delivering the cooled air through a pipe 5 to a fan or pump device 6. From the fan or pump the air passes to a reservoir 7, and from such reservoir the air is conducted by means of a pipe 8, controlled by a valve 9, to a riser pipe 10 which extends upwardly through the various stories of a building. This riser pipe may

preferably comprise the steam main for a steam heating system operating alternatively with the cooling system, and to which steam may be supplied from any suitable source by means of the pipe 11 controlled by the valve 12.

To the pipe 10 steam radiators such as 13, arranged within the various apartments of the building, are connected by means of branch pipes 14, such radiators being also connected to the down pipe 15 which at its lower end is connected to the return steam pipe 16. The pipe 15 is also connected to the pipe 18 which leads to the air cooling apparatus 4, and for admitting air to such pipe from the various apartments of the building, intake devices 19 are provided. From the pipe 10, branch pipes such as 20 lead, such pipes preferably extending upwardly and along the ceiling of the apartments to be ventilated and having downwardly turned extremities as 21 which project downwardly through the ceilings of the respective apartments. Upon the extremity of the down-turned end 21 of each pipe 20 is secured a substantially hemi-spherical cup-like member 22 having a central hollow boss 22′ which is internally screw threaded for engagement with screw threads 23 upon the lower end of the pipe member 21. The boss 22′ is provided with openings 24 whereby air issuing from the pipe 21 may pass laterally into the hollow of the cup 22 and thence upwardly toward the ceiling. Resting upon the boss 22′ is a conical deflector device 25 concentric with the pipe member 21 and having an opening at its smaller end for the passage of the latter, said deflector preferably bearing at its upper portion as indicated at 26 against the ceiling and being retained in position upon the pipe by means of the cup 22. The deflector 25 is of generally conical form, its sides however, flaring outwardly as illustrated in Fig. 1. While herein disclosed as an independent appliance, it is clear that the discharge orifice and associated parts may well be embodied in a chandelier, or other ornamental or useful appurtenance within the apartment.

In the operation of the apparatus the air, after being cooled by passing through the cooling device 4 is forced by the fan or pump 6 into the reservoir 7 and thence it passes up through pipes 8, 10 and 20 to the upper part of the apartment to be ventilated. The air then issues through the downwardly directed end 21 of the pipe 20 and upon striking the inner curved surface of the cup 22 is deflected upwardly and against the outer surface of the deflector 25 whereby it is caused to spread outwardly in a broad sheet, covering a very substantial area of the apartment, and as it is delivered at the upper portion of the latter it naturally tends to fall by reason of its greater specific gravity. It will be noted that the air receiving devices 19 are located near the floor of the apartment so that the incoming air delivered through the terminal device illustrated in Fig. 1 tends to displace the warmer and foul air, causing the latter to pass outwardly through the devices 19 from which it may be returned to the cooling device 4 for washing and cooling thus providing a very thorough and complete circulation of air in the apartment. The delivery terminal as thus provided operates in a highly efficient manner to distribute air over the apartment and requires no mechanically driven parts for producing its proper function. The device is substantially noiseless in operation, occupies but little room and may be of decidedly ornamental appearance in accordance with the material from which it may be made.

While as herein illustrated the deflector device 25 is shown as separate from the cup 22 it is evident that such elements might, if desired, be made as an integral structure, and it is also to be understood that various changes in the specific shape and arrangement of the cup and deflector might well be made without departing from the spirit of the invention.

What we claim and desire to secure by Letters Patent of the United States is:

1. An air delivery terminal for ventilating purposes comprising an air supply conduit, a cup like member having its open side presented opposite to the delivery end of the pipe, and a deflector of substantially conical form concentric with the pipe and having its smaller end disposed substantially in the plane of the edge of the cup like member.

2. An air delivery terminal for ventilating purposes comprising an air supply conduit, a cup like member of substantially hemispherical form having its open side presented opposite to the delivery end of the conduit, and a deflector of substantially conical form concentric with the conduit and having its smaller end disposed substantially in the plane of the edge of the cup, the surface of the deflector flaring outwardly in a gradual curve.

3. An air delivery terminal comprising an air supply pipe having a screw threaded extremity, a cup-like member having an axially disposed boss within its concavity, said boss being screw threaded for engagement with the end of the pipe and having lateral openings to permit air to discharge from the pipe into the cup, and a deflector of generally conical form concentric with the pipe and having its smaller end resting upon the end of said boss.

4. Air distribution apparatus including a depending supply pipe, a perforated sleeve-

like member carried by the pipe and having discharge openings formed therein, a cup-like member surrounding the sleeve and extending above the discharge openings therein to reversely deflect air in the direction of the feed pipe, and an outwardly flaring deflector member surrounding the pipe and having lateral portions curving outwardly and rearwardly from the cup to gradually intercept and deflect the air reversely deflected by the cup, said deflector terminating in an annular portion with a slight reverse curve to deflect downwardly from the ceiling the general upward current created along the deflector by initial direction of the air current thereagainst by the cup.

Signed by us at Rochester, N. Y., San Diego, Cal., and Feather River Inn, Blairsden, Cal., respectively, on Feb. 20, Jan. 27, and Jan. 19, 1922.

CHAS. L. ROGERS.
MANLY C. ROGERS.
WILLARD W. BROWN.