

July 17, 1934.

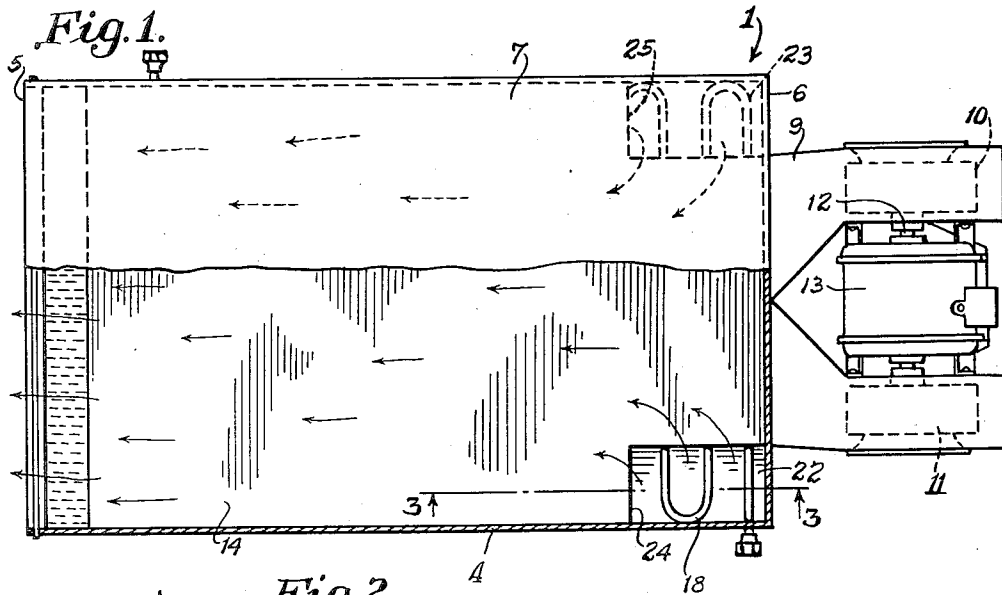
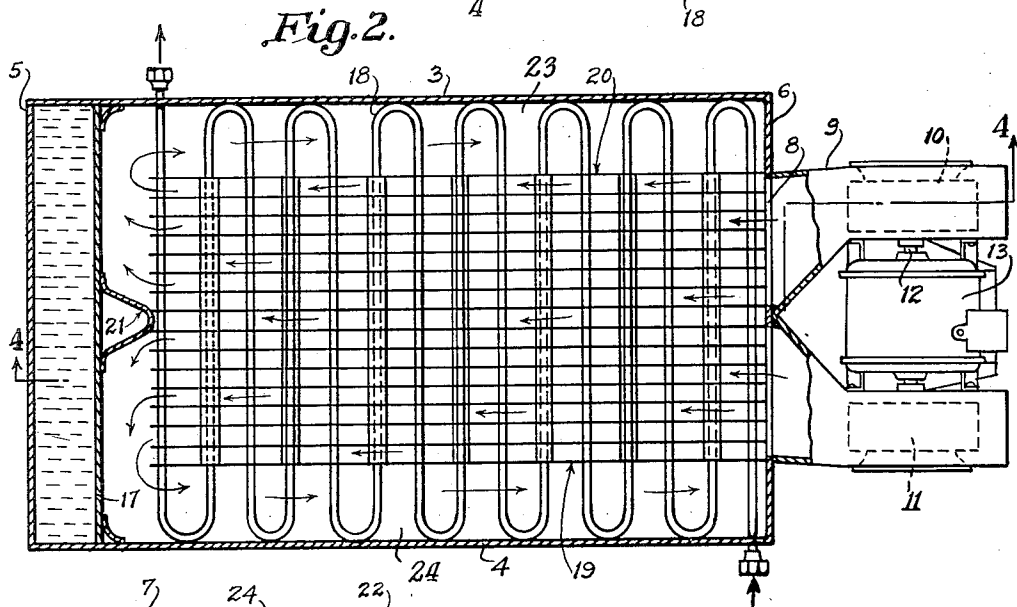
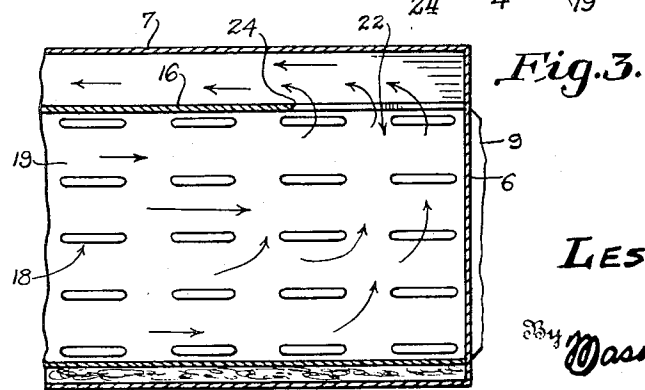
L. U. LARKIN

1,966,632

AIR CONDITIONER

Filed Sept. 1, 1933

2 Sheets-Sheet 1



Inventor

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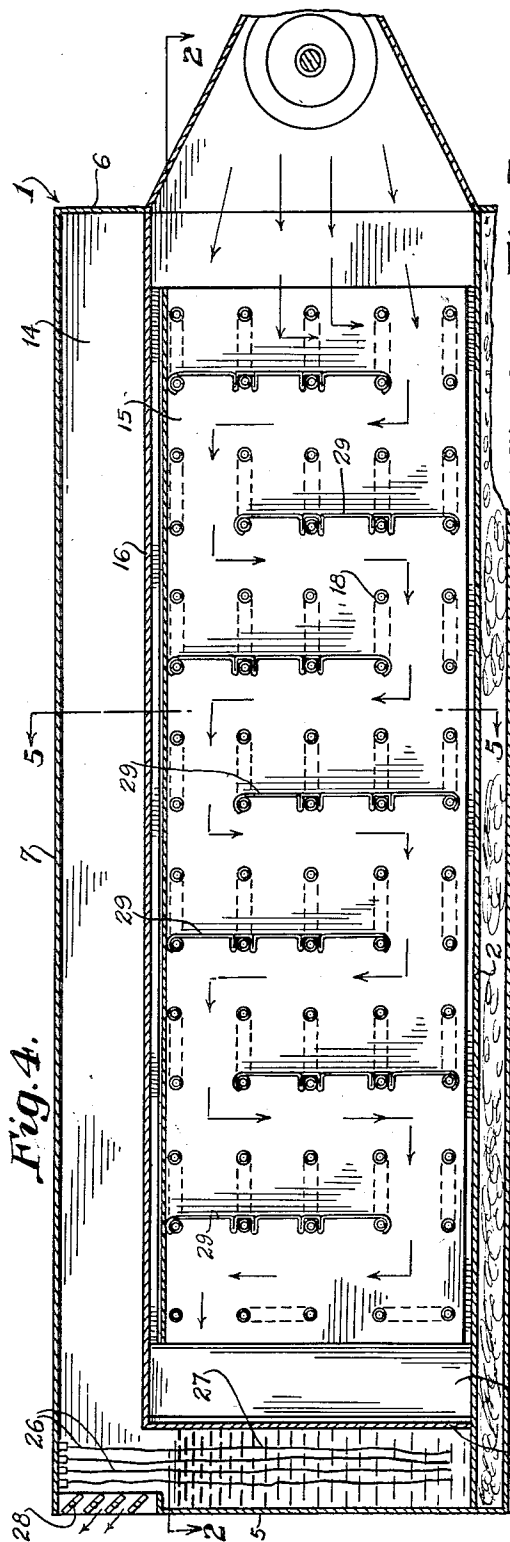


**Fig. 6.**

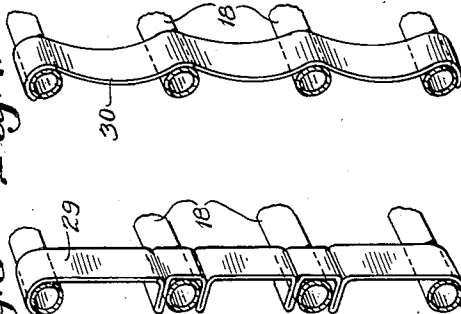


**Fig. 7.**

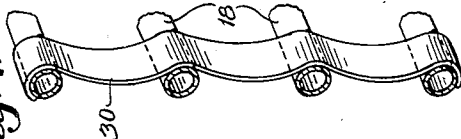
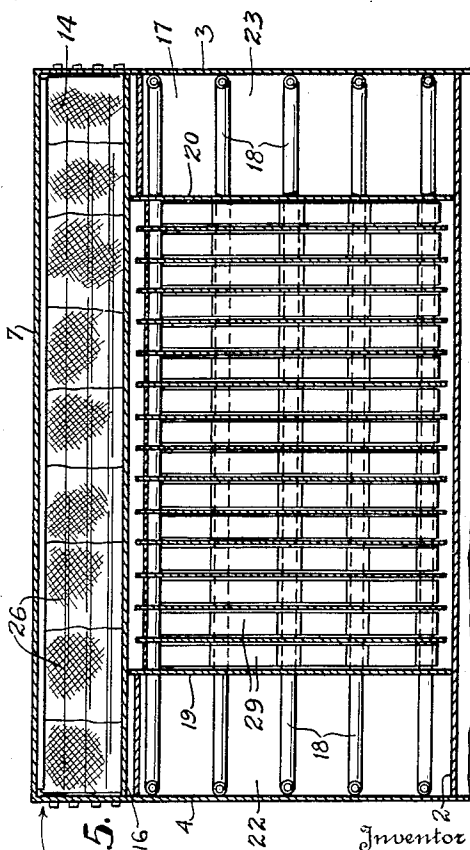


**Fig. 5.**

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## UNITED STATES PATENT OFFICE

1,966,632

## AIR CONDITIONER

Lester U. Larkin, Atlanta, Ga., assignor to Larkin Refrigerating Corporation, Atlanta, Ga., a corporation of Georgia

Application September 1, 1933, Serial No. 687,873

7 Claims. (Cl. 257-202)

This invention relates generally to ventilating systems, and more particularly to air conditioning or cooling apparatus adapted for use in residences, hotels and the like.

5 The main object of the invention is to provide a very compact highly efficient apparatus designed not only to cool and circulate air, but also to restore to the cooled air such moisture as may have been extracted therefrom by condensation during the cooling thereof.

10 The air cooling is effected mainly by passing it through a compartment containing a cooling unit of the type illustrated in the Larkin Patent No. 1,776,235, September 16, 1930. As shown  
15 in said patent, this unit includes a cooling unit, through which refrigerant fluid is circulated, provided with a large number of fins extending perpendicularly to the piping of which the coil is formed. In the present case, the cooling  
20 efficiency of the unit is enhanced by the addition of heat conducting baffle strips, staggered in the unit and mounted in direct contact with the piping between the aforesaid fins.

A further object of the invention is, therefore, to provide cooling devices of the general type referred to with cooling units in which the air is conducted through a circuitous path by means of baffle plates directly incorporated and brought into the unit itself.

30 Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawings:

35 Figure 1 is a top plan view of the invention, with the top wall of the same broken away to show details of construction;

Figure 2 is a horizontal section taken on the line 2-2 of Figure 4;

40 Figure 3 is a vertical section taken on the line 3-3 of Figure 1, but with tubing shown in end elevation;

Figure 4 is a vertical section taken on the line 4-4 of Figure 2;

45 Figure 5 is a transverse section taken on the line 5-5 of Figure 4;

Figure 6 is a perspective view illustrating one form of baffle strips used in connection with this invention;

50 Figure 7 is a perspective view of a modified form of the strip shown in Figure 6.

As shown in the drawings, the apparatus includes a casing designated generally by the reference numeral 1. This casing comprises a bottom 2, side walls 3 and 4, end walls 5 and  
55 6, and a top 7. The end wall 6 is provided with

an aperture 8 encompassed by a casing 9 in which blowers 10 and 11 are mounted for rotation by the shaft 12 of a motor 13. The casing 1 is divided into upper and lower compartments 14 and 15 by a partition 16 extending from the end wall 6 parallel to the bottom 2 and terminating at the upper end of a vertical partition 17 which forms an end wall for the lower compartment 15.

60 In the lower compartment 15 there is arranged a refrigerating unit 18, the coils of which are arranged in parallel spaced apart vertical rows in the compartment 15. The pipes forming the unit are arranged horizontally across the compartment 15, and their opposite bends  
70 extend through longitudinal partitions 19 and 20. These partitions 19 and 20 are made preferably of conducting material, and constitute heat absorbing fins perpendicular to the piping which forms the refrigerating unit. The fins  
75 19 and 20 extend from the end wall 6 of the casing and terminate at some distance from the partition 17 to form lateral air passages.

The refrigerating unit between the fins 19 and 20 is provided with heat conducting fins  
80 extending perpendicularly to the piping which forms the unit. These fins and the coil arrangement in general are preferably constructed as shown in the United States patent to Larkin, No. 1,776,235, September 16, 1930. The partition  
85 17 is provided centrally between the walls 3 and 4 of the casing 1 with a vertical V-shaped deflector plate 21 suitably secured to the inner face of the partition 17 and extending from the bottom 1 to the horizontal partition 16.

90 The partition 17 is designed to deflect air forced through the refrigerating unit to the opposite sides of the unit and rearwardly along the chambers 22 and 23 formed by the partitions 19 and 20, and the side walls 3 and 4.  
95 It is to be noted here that the pipe bends of the unit, where they project into the chambers 22 and 23, are not provided with fins or with any other object which might obstruct the air flowing through said chambers.

100 The horizontal partition 16 has its corners adjacent the end wall 6 cut away immediately above the chambers 22 and 23, to form passageways for the cooled air forced through the aforesaid chambers 22 and 23 into the compartment 14 formed at the upper end of the casing 1. These passageways from the chambers 22 and 23 are designated by the reference numerals 24 and 25 in Figure 1 of the drawings. The cooled air forced through the passageways  
105 110

24 and 25 passes along the compartment 14 through a series of humidifying strips 26 which are suitably secured to the top 7 of the casing 1 and depend into a water tank 27 formed between the end wall 5 and the partition 17. This end wall 5 is provided at its upper end with a louvered register 28 adjustable to control the flow of cooled air from the conditioner.

To increase the efficiency of the conditioner, 10 the refrigerating unit 18 is provided with a series of baffle plates 29 which are zigzagged vertically in the compartment 15 and secured by friction or otherwise to the piping forming the unit and between the conducting fins which 15 extend vertically from said piping. It will be apparent from Figure 4 of the drawings that the air forced into the compartment 15 by the blowers 10 and 11 is compelled by the strips 29 to travel a tortuous path through the bank of 20 coils located in said compartment.

Obviously, the strips 29 provide additional heat absorbing surfaces to lower the temperature of the air forced against them. The baffle strips 29, shown in Figures 4 and 6 of the drawings, may be replaced by strips 30 such as are 25 shown in Figure 7 of the drawings. The plates 29 obviously have greater thermal contact than the strips 30 with the pipes 18 of the unit, but are not so easily manufactured and applied.

30 As usual in apparatus of this kind, the motor and refrigerant unit are designed to be controlled by thermostatic switches operated automatically in accordance with the variations in the temperature of the conditioned air. The 35 details of these switches form no part of the present invention and are therefore not illustrated herein.

It is thought that the invention and many of its advantages will be understood from the foregoing description, and it is obvious that 40 numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of my invention, or sacrificing any of its advantages; the form herein described being a 45 preferred embodiment for the purpose of illustrating my invention.

What I claim is:

1. In ventilating apparatus, a casing, rows of 50 cooling pipes spaced apart parallel to each other in said casing, means for forcing air through said casing across said pipes, heat conducting fins perpendicular to said pipes and heat conducting baffle plates mounted on said rows between said fins and in contact with said pipes 55 and staggered between opposite walls of said casing to force the air to move in a circuitous path through said casing.

2. In ventilating apparatus, a casing comprising: a top, bottom, side, and end walls, a 60 horizontal partition parallel to the top and bottom dividing the casing into upper and lower

compartments, a vertical transverse partition adjacent and parallel to one of said end walls and extending from the bottom to said horizontal partition, vertical partitions extending 80 from the other end of said casing from the bottom to said horizontal partition and terminating a short distance from said vertical transverse partition to form side chambers and an intermediate chamber in the lower compartment, a 85 refrigerating unit in said intermediate chamber, and means for forcing air through said intermediate chamber across said unit and through said side chambers into the upper compartment, said horizontal partition being provided with 90 air outlets for said side chambers.

3. The apparatus set forth in claim 2, in which said refrigerating unit includes parallel 95 vertical rows of piping extending across the intermediate chamber and into the side chambers.

4. The apparatus set forth in claim 2, in which said unit includes parallel vertical rows of piping extending across the intermediate chamber 100 and into the side chambers, and heat conducting fins on the rows of piping in said intermediate chamber.

5. The apparatus set forth in claim 2, in which said unit includes parallel vertical rows of piping extending across the intermediate chamber 105 and into the side chambers, heat conducting fins on the rows of piping in said intermediate chamber, and heat conducting baffle strips connected to said vertical rows of piping between the fins mounted thereon, each of said strips 110 being shorter than the height of said intermediate chamber, and the strips being staggered to force the air to travel in a circuitous path through said intermediate chamber.

6. In refrigerating apparatus, a casing, means for forcing air through said casing, a cooling 115 coil in said casing having parallel limbs extending in parallel rows across the casing, heat absorbing fins extending perpendicularly to and in heat absorbing contact with each of said limbs, and heat absorbing baffle strips extending partly 120 across each of said rows and in contact with the limbs thereof between said fins and at right angles to said fins, said strips being staggered to provide a circuitous path for the air forced 125 through said casing.

7. In refrigerating apparatus, a cooling unit comprising piping having a cooling fluid circulating therethrough and having parts thereof 130 arranged in rows substantially parallel to each other, heat absorbing fins spaced along said parts perpendicularly thereto, and in heat conducting contact therewith, and heat absorbing baffle strips extending partly across and in contact 135 with the piping of some of said rows between said fins and at right angles to said fins.

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