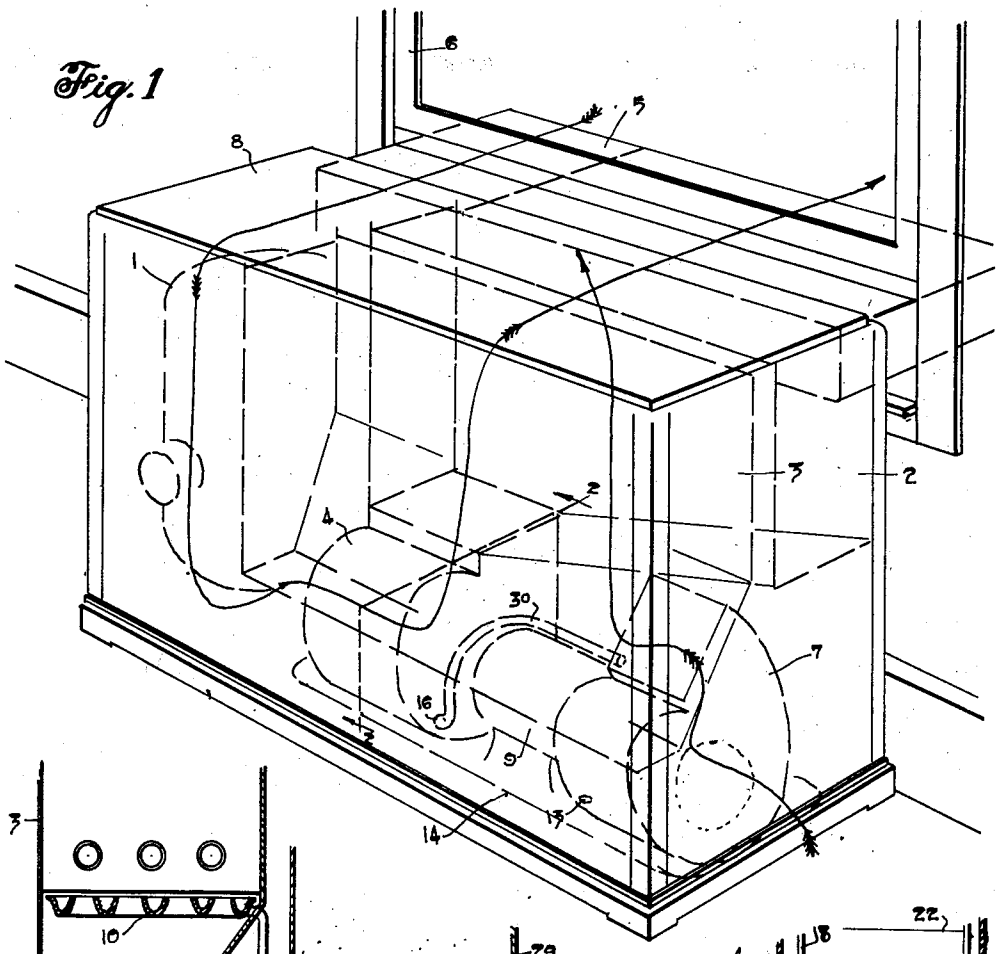
Oct. 25, 1938. A. WEILAND 2,134,349

CONDENSATE DISPOSAL MEANS FOR AIR CONDITIONING APPARATUS

Filed Aug. 16, 1935

Fig. 1



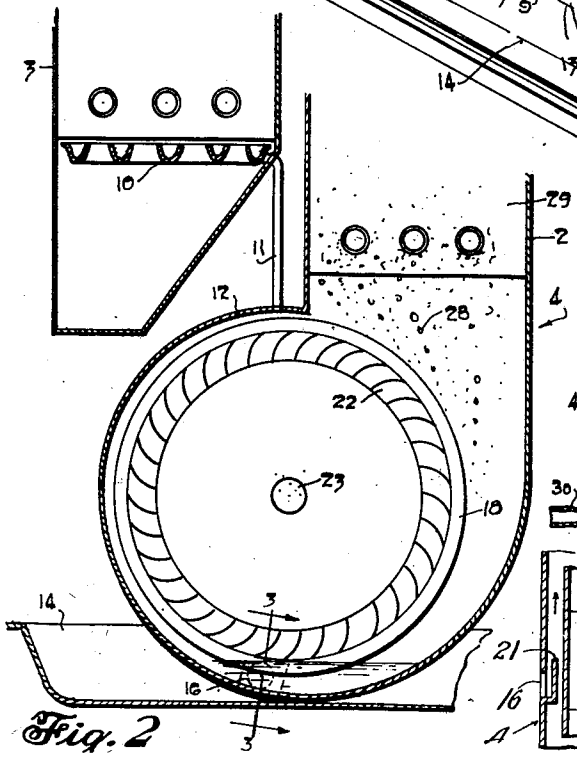
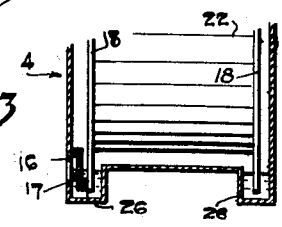


Fig. 2

Fig. 3



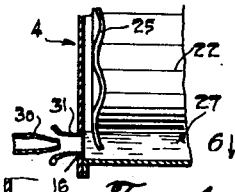


Fig. 4

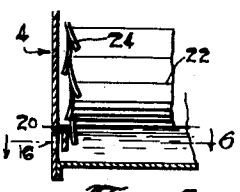


Fig. 5

Fig. 6.

INVENTOR
A. Weiland
BY
ATTORNEY

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CONDENSATE DISPOSAL MEANS FOR AIR CONDITIONING APPARATUS

Alfred Weiland, Philadelphia, Pa., assignor to Baldwin-Southwark Corporation, a corporation of Delaware

Application August 16, 1935, Serial No. 36,500

4 Claims. (Cl. 62—129)

This invention relates generally to air conditioning apparatus and more particularly to improved condensate disposal means.

It is well-known that in air conditioning apparatus for homes, offices or similar enclosures that on humid days a considerable quantity of water is condensed on the evaporator. Various means heretofore proposed for disposing of such water have been complicated or expensive, and it is one object of my invention to provide an improved water disposal means that will efficiently and effectively facilitate disposal of the quantity of water condensed in an air conditioning unit and at the same time will be simple and inexpensive in construction, operation and maintenance and will have a high degree of cooperative action with an air cooled condenser and the flow of cooling air thereover.

In one specific aspect of the invention I accomplish the foregoing results by providing a rotating disc arranged so that one portion is rotated in accumulated condensate whereby the disc picks up the water on its surface and throws the same outwardly by centrifugal force either directly against the condenser or into the path of condenser cooling air, or both. More specifically, I have provided a flange on the periphery of a fan used to circulate air over the condenser, or on the periphery of the evaporator fan in the case of humidifying the room, the fan casing being so arranged with respect to the condenser and evaporator that condensate flows downwardly from the evaporator and into the condenser fan casing and thence is thrown into the path of air.

While I have shown my invention specifically in connection with a self-contained air conditioning unit of the type shown in application of H. L. Galson, Serial No. 648,772, filed December 24, 1932, yet the invention may be employed with various other forms of units one of which is shown in application of A. S. Locke, Serial No. 722,714, filed April 27, 1934.

Other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawing in which:

Fig. 1 is a perspective of an air conditioning unit of the type adapted to embody my improved condensate disposal means;

Fig. 2 is an enlarged transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Figs. 4 and 5 are fragmentary sectional views similar to Fig. 3 but showing modified arrangements of the fan disc or flanges.

Fig. 6 is a horizontal section through the bottom portion of the blower taken substantially on the line 6—6 of Fig. 5.

In the particular embodiments of the invention which are shown herein merely for the purpose of disclosing certain specific forms among possible others that the invention might take in practice, I have shown in Fig. 1 a self-contained air conditioning unit of the general type described in said Galson application, although the invention as will be seen hereinafter may be embodied in a unit such as is described in said Locke application, the disclosure of said Galson application constituting the specific disclosure of an air conditioning unit referred to herein. However, such a unit will be briefly described as comprising a compressor 1, a vertical condenser passage 2 and a vertical evaporator passage 3. A blower 4 draws air inwardly through one portion of the outside air duct 5 and thence preferably down over the compressor 1 and into the blower 4 and thence upwardly through condenser passage 2 and over the condenser therein to the outside atmosphere through another portion of duct 5. This duct projects rearwardly from the upper portion of the unit through a suitable window 6 or other opening in the wall adjacent to which the unit is placed. Room air is circulated by a blower 7 and thence upwardly through passage 3 and over the evaporator therein to be discharged through a suitable opening in the top 8 of the air conditioning unit. The blowers 4 and 7 may be driven by any suitable means specifically shown as a motor 9 commonly driving said blowers.

Condensate from the evaporator or passage 3 may be suitably collected in troughs 10 disposed beneath the evaporator and then drained through a pipe 11 into the casing 12 of blower 4. If desired, the condensate may be allowed to drip down through the evaporator passage 3 and thence into the casing of blower 7 from which it would flow through a suitable small opening 13 into the base pan 14 in which the blower casings are disposed. The water in the base pan 14 may then be drawn through a suitable opening 16 near the bottom of blower casing 4. Inasmuch as the pressure in fan casing 4 is greater than the atmospheric pressure in base pan 14, suitable means may be employed to insure flow of water into fan casing 12. One such means is to have the opening 16 located very closely adjacent to a peripheral disc 17, Fig. 3, formed as a radial and axial continuation of the fan end plate 18 to

rotate therewith whereby the disc creates a dragging or ejector action adjacent the opening. An alternative arrangement is to have opening 16 provided as shown in Fig. 5 with a baffle 20. This baffle is directed in the direction of air whirl within fan casing 12 so as to create the same action as a Pitot tube pointing in a downstream direction. As a result, the pressure immediately adjacent the opening 21 formed by baffle 20 will be less than in fan casing 12, thus inducing or tending to induce flow of water from base 14 into blower casing 12. This Pitot tube action may be supplemented if desired by having the blower flange 17 disposed closely adjacent to said opening 21 whereby the same action is obtained as above described in connection with Fig. 5.

The rotors 22 for blowers 4 and 7 may be of any desired form but preferably are of the Sirocco type mounted upon a shaft 23 which is preferably directly connected to the armature of motor 9. The peripheral flange 17 may have a plain surface as shown in Fig. 3 or it may have a saw tooth surface as indicated at 24, Fig. 5, or a waved surface as indicated at 25, Fig. 4. The fan casing 12 may be suitably formed with recesses 26 receiving the peripheral flanges to pick up water accumulating therein. If desired, the recesses may be dispensed with in which case the water would accumulate across the bottom of the fan casing as generally indicated at 27. Also to augment flow of water from base 14 into opening 16, the outlet 13 from blower casing 7 may be provided with a pipe 30 which as shown in Fig. 4 would terminate adjacent a slightly flared or bell mouth 31 formed adjacent opening 16. Air flow from evaporator blower 7 would create a definite aspirator action at opening 16 so that water which may be present in base 14 and surrounding mouth 31 will be forced through opening 16 and into the fan casing 4. This arrangement will also carry condensate from the evaporator fan casing 7 directly to opening 16 but in case water should accumulate in base 14, then air which flows through pipe 30 would draw water from the base into opening 16.

From the foregoing disclosure it is seen that as condensate collects in the blower casing 4, either by dripping therein through collecting throughs 10 and pipe 11, or by any suitable aspirator or suction action through an inlet 16, the peripheral flanges 17 of blower 4 will pick up water and throw it off tangentially as diagrammatically indicated at 28. The condenser 29 disposed in passage 2 is preferably located close to the fan periphery so that the centrifugally discharged water will impinge directly on the condenser 29. In any event, it will be observed that the centrifugally discharged water will be formed as a fine spray or mist. The condensate will thus be effectively carried either against the condenser to assist in cooling the same or be carried away in the stream of outflowing air. The form of flanges shown in Figs. 4 and 5 will tend to agitate the water and cause it to be broken up both radially and laterally. The saw tooth flange 24 will be preferably arranged so that the face of the teeth enters the water in the blower casing, thereby functioning as a paddle wheel type of pump. This mode of operation may be magnified depending upon the degree of concavity or width of the face of the teeth. Such an arrangement would augment still further the tendency to draw water in through opening 16 against the higher pressure in the blower casing. Thus it is seen that I have provided an extremely simple means for facilitating disposal of condensate.

It will of course be understood that various changes in details of construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. The combination in an air conditioning unit comprising, means for accumulating condensate under a low pressure, a blower casing and rotor for circulating air under high pressure, means for transferring the condensate under low pressure from said accumulating means to said blower casing which is under a high pressure, and a peripheral blower flange for throwing the condensate from said blower casing into the path of air circulated by said blower.

2. The combination set forth in claim 1 further characterized in that a plurality of said peripheral flanges are provided on said blower rotor at axially spaced points thereof.

3. The combination set forth in claim 1 further characterized in that said condensate transferring means has provision for introducing condensate into said blower casing by an aspirator action.

4. The combination set forth in claim 1 further characterized in that the means for transferring the condensate includes an opening in the blower casing, and means, cooperating with said opening, rendered operative in response to operation of said blower.

ALFRED WEILAND.