

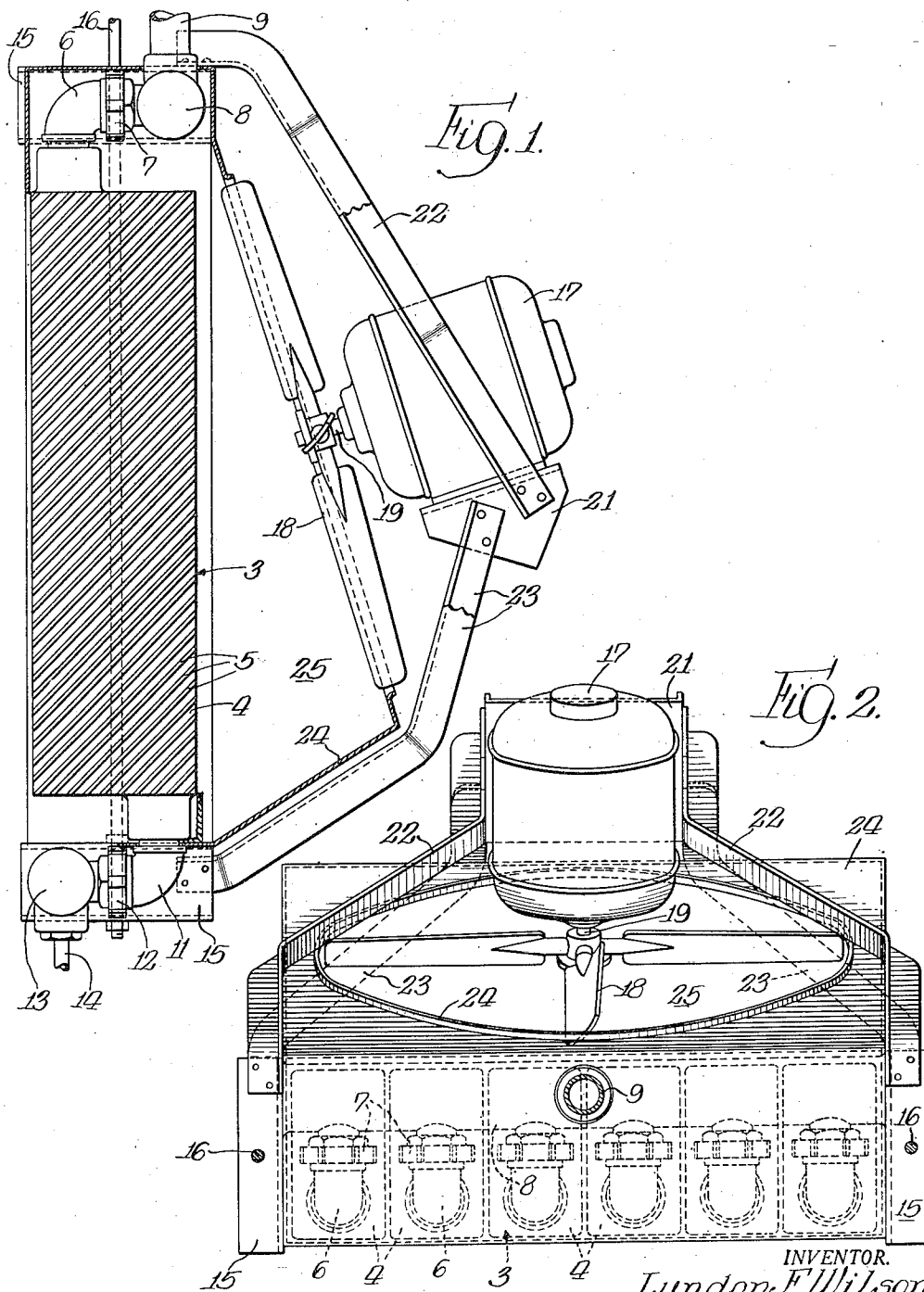
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UNIT HEATER

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UNIT HEATER

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2 Claims. (Cl. 257-137)

This invention relates to unit heaters of the general character commonly employed for space heating purposes.

Heaters of this type customarily comprise a heating element or unit to which the heating medium is supplied and a fan or blower by which air is blown across the unit to be heated thereby. The fan is customarily mounted to rotate upon a horizontal axis and the unit is equipped with louvers or deflectors by which the direction of discharge of the heated air is controlled.

My present heater is designed to eliminate the use of air directing louvers by disposing the heat radiating fins of the heating unit at an incline, so as to direct the heated air away from the unit in a downwardly inclined direction.

The end thrust of the motor fan shaft depends, of course, upon the size of the fan and the speed of rotation. The size of the fan in a unit heater and its speed are such that considerable shaft end thrust is developed which results in sufficient wear on the bearings to materially shorten the life thereof. This is particularly true where, as at present, shortage in material frequently necessitates the employment of sleeve bearings instead of ball bearings in equipment of this character.

One of the primary purposes of my present invention is to maintain the efficiency and prolong the wearing life of the motor fan unit by minimizing the fan end thrust and, consequently, the bearing wear resulting therefrom. This purpose is attained in my present invention by mounting the motor fan in an inclined position so that the end thrust induced by rotation of the fan is opposed by the weight of the fan, shaft and motor rotor. In other words, gravity acting upon these rotating parts in opposition to the thrust exerted by the fan counterbalances such thrust, or at least opposes it to such an extent as to minimize the end thrust wear on the bearings.

Another feature of my invention resides in the fact that the inclined fan delivers the air through the inclined radiating fins with less air deflection and resultant turbulence than is attainable when air is delivered horizontally by a fan and then deflected downwardly either by louvers or fins which act as an obstruction to the air flow and reduce the efficiency of the unit.

My invention in one of its preferred embodiments is illustrated on the accompanying drawing, referring to which,

Fig. 1 is a side elevation partially in section of a unit heater embodying my invention; and

Fig. 2 is a plan view thereof.

On the drawing, reference character 3 indicates generally the heating unit which consists of a series of vertically disposed sections 4 set in line adjacent to each other and each provided on its side faces with radiating fins 5 arranged in parallel relation at an inclination to the vertical. The fins, as shown in Fig. 1, are disposed substantially at an angle of 45° to the vertical, although other degrees of inclination might be found preferable in certain installations.

The upper ends of the unit sections are connected by elbows 6 and suitable joints 7 with a header 8 which receives a supply of heating medium, such as steam, from any suitable source through a supply pipe 9.

The lower end of each unit section is connected by a similar elbow 11 and joint 12 with an exhaust header 13 from which the heating medium is discharged through a discharge pipe 14. The assembly thus far described is mounted in a frame structure 15 which is suspended in the desired position upon supporting rods 16.

The fan motor unit, comprising an electric motor 17 and a fan 18 mounted upon the fan motor shaft 19, is mounted upon a shelf 21 supported by the tension members 22 and the compression members 23 attached to and projecting rearwardly from the upper and lower ends, respectively, of the frame 15. A housing 24 provided with an opening to accommodate the fan blades forms a plenum chamber 25 between the fan and the heating unit which facilitates the distribution of the air from the fan throughout the area of the heating unit.

It will be observed that the inclination of the radiating fins and the inclination of the fan motor unit are in the same general direction, so that the air delivered by the fan is discharged from the heating unit in a downwardly inclined direction and with much less turbulence and frictional loss in velocity than would be the case where louvers or other direct obstructions in the path of flowing air were employed to obtain the desired directional discharge.

The inclination of the fan may be varied in accordance with the size of the unit and other varying conditions, and may, if desired, be such that the gravity action on the rotating parts will just counterbalance the end thrust of the fan. If the inclination of the fan motor unit be less than sufficient to counterbalance the end thrust, it will in any event oppose such end thrust and to the extent of opposition will reduce the bearing wear and increase the longevity of the apparatus.

The structural details illustrated and described may obviously be varied within considerable limits without departing from the scope of the invention as defined in the following claims.

I claim:

1. A unit heater comprising a vertically disposed heating unit provided with heat radiating fins inclined with respect to the vertical so as to direct downwardly air blown across the unit, a motor driven fan, and means for supporting said fan in an inclined position to divert air in a downwardly inclined direction and deliver air through said unit in the general direction assumed by said fins and to afford gravity opposition to the end thrust of the fan shaft.

2. A unit heater comprising a vertically disposed heating unit provided with heat radiating fins inclined with respect to the vertical so as to direct downwardly air blown across the unit, a motor driven fan, means for supporting said fan in an inclined position to direct air in a downwardly inclined direction and deliver air through said unit in the general direction assumed by said fins and to afford gravity opposition to the end thrust of the fan shaft, and a housing providing a plenum chamber between said fan and said heating unit.

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