

The heating of the water usually is controlled by means of a thermostat placed in the path of the saturated air leaving the humidifier and controlling the heater through which the spray water passes.

In other cases, particularly in industrial work where high humidities are maintained, the control of the dew-point temperature is effected by a thermostat controlling the mixture of outside air and return air from the building by means of fresh and return air dampers at the inlet of the humidifier.

In industrial work the dew-point regulation is effected in winter time

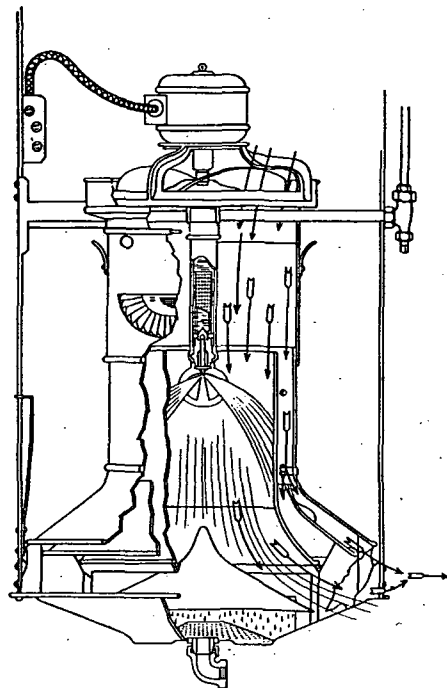


FIG. 5. ANOTHER TYPE OF HUMIDIFIER HEAD

by both of these means operating in conjunction. In those installations where all outside air must be employed, it is usual to provide in front of the air washer certain pre-heater coils of sufficient capacity to bring the air to a temperature slightly above the freezing point. In summer time operation, whenever the outside wet-bulb temperature is above the minimum dew-point desired in the building, all outside air supply is taken and it will be observed from the psychrometric principles previously discussed that the air issuing from the humidifier will have been cooled to the wet-bulb temperature of the entering air, provided, of course, that the water is neither heated nor cooled by recirculation, which is usually the case in such installations.

In most manufacturing processes relatively little moisture is added to, or extracted from, the air in the room by the process itself, and as windows and doors are closed, conditions in the room rapidly stabilize to the moisture content of the entering air. Thus, it is possible to control the relative humidity within the room by proportioning the quantity of the air in accordance with the heat sources within the room, such as heat from machinery and the occupants, electric lights, sunlight and outside radiation. The quantity of air to be supplied for each unit of heat thus removed is definitely dependent upon the relative humidity to be carried.

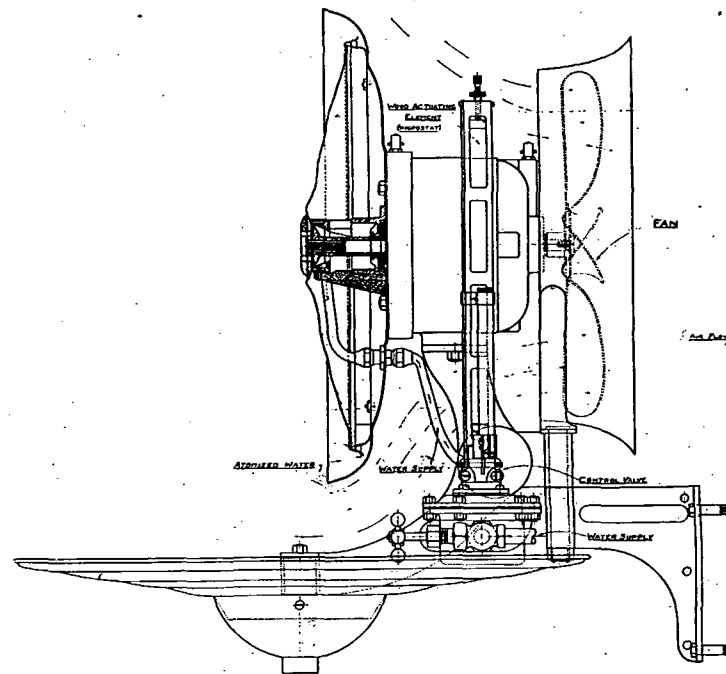


FIG. 6. TYPE OF HUMIDIFIER IN WHICH A SMALL JET OF WATER IS THROWN ON A ROTATING DISC

For example, if 50 per cent relative humidity is to be carried in the room the ventilation must be restricted so there shall be a rise of 20 deg. between the temperature of the entering air and that of the air in the room itself. Smaller temperature rises would give increased relative humidities. In textile mills, for instance, with the humidities usually carried it is possible to keep the room temperature within about 12 deg. of the outside wet-bulb temperature. Inasmuch as the wet-bulb temperature on hot days is usually 15 deg. to 25 deg. lower than the dry-bulb temperature, the mill temperature will be below the outside temperature and provision has to be made by inward transfer of heat through the walls for the heat thus absorbed. The general design of such a system of humidification and air conditioning is shown in Fig. 8.