evaporation is effected by adiabatic heat transfer. Units of this type in simplest form spray a fine mist of water directly into the air in a space. They are used to a great extent in the textile industry.

To the simple type of nozzle unit may be added the following accessories; a water heater whose function is to increase the vapor pressure, an air heater to heat the air either before or after humidification takes place, a screen or air filter over which the water is sprayed and through which the air is drawn for intimate contact with the water, a fan to create an air stream and to deliver air to the space to be humidified, and a housing to enclose all the elements. This type of unit is procurable in practically all of the variations mentioned. It has the disadvantage of clogging the nozzles and must be serviced continually.

Fig. 11 illustrates a nozzle unit having a humidifying capacity sufficient for a residence or small building. These units usually include air filters and in some cases provide ventilation air by means of an outside air duct

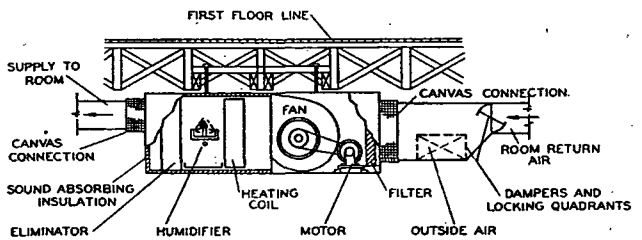


FIG. 11. TYPICAL UNIT HUMIDIFIER OF THE SPRAY TYPE WITH STEAM COIL TO PREHEAT THE AIR FOR RESIDENCES

connection to the unit. The units are available for either floor or ceiling mounting and are usually placed in a central location in the basement with short supply and return duct connections from the first floor. Room air is brought into the unit through the return duct connection and first passes over a tempering coil heated by steam or hot water, then is humidified by passing through some type of spray humidifier. Surplus moisture is removed by an eliminator and the humidified air is delivered to the room through a duct connection. Since a large percentage of the tempering coil capacity is transformed into latent heat during the humidifying process, the unit does not generally eliminate any existing steam radiation but does tend to improve comfort conditions by supplying heating during the off-period of furnace operation[7].

In the *rotary type* of humidifier the spray is created by rotating vanes or discs which throw the water by centrifugal force and in so doing break it up into a fine mist. In all other respects, this type of humidifier is similar to the nozzle type. It has the advantage over the nozzle type of being less liable to become clogged.

In the *cascade type* the humidification takes place by water falling in sheets over a series of baffles or trays. This type is usually furnished with a fan, air heater, and air filter all enclosed in a housing.

In the *heater type* of humidifier the water is heated either to the boiling point or to a temperature at which the water vapor readily passes into

[7]Estimating the Humidification Requirements of Residences, by W. H. Severns (Papers Presented at the First Annual Conference on Air Conditioning, University of Illinois, *Engineering Experiment Station Circular. No. 26*, October. 1936).



the air stream. There are many variations of this type of humidifier. In the simplest form the heating element is placed in a pan or vessel of water and the vapor passes from the surface of the water to the stream of air. The heating medium may be steam, hot water, gas, oil or electricity.

A modification of this type of humidifier is the combination of spray nozzle and heater type in which the water is sprayed over a hot surface and evaporated. It has the disadvantage of accumulating scale on the surfaces of the vessel or heating surface.

For a complete discussion of the principles of the various methods of humidification refer to Chapter 26.