to heat it until some of the water is vaporized into the air stream. This type of unit is usually used in the same range of capacities as the spray type described previously.

A third type of unit humidifier used extensively is the larger spray type of unit to deliver enough humidifying capacity for a residence. In this type of unit either the water or air is heated. Fig. 11 illustrates a typical unit of this type. These units usually include air filters and in some cases provide ventilation air by means of an outside air duct 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.

For a complete discussion of the principles of the various methods of humidification, refer to Chapter 27.

Chapter 23

UNIT AIR CONDITIONERS, COOLING UNITS, ATTIC FANS

Unit Air Conditioners, Functions, Types, Application, Cooling Units, Attic Fans

A UNIT is an assembly of the functional elements indicated by its name, such as air conditioning unit, room cooling unit, etc. A unit of this type may be complete in itself employing its own direct means of air distribution and source of refrigeration or heating, in which case it represents a complete self-contained unit. Or it may be coupled with separate means of refrigeration and air distribution, in which case it will still be considered a unit system in comparison with customary field fabricated central station systems.

The code, Standard Method of Rating and Testing Air Conditioning Equipment[1], defines the various types of unitary equipment:

1. A *Cooling Unit* is a specific air treating combination consisting of means for air circulation and cooling within prescribed temperature limits.

2. An *Air Conditioning Unit* is a specific air treating combination consisting of means for ventilation, air circulation, air cleaning and heat transfer with control means for maintaining temperature and humidity within prescribed limits.

3. A *Cooling Air Conditioning Unit* is a specific air treating combination consisting of means for ventilation, air circulation, air cleaning and heat transfer with control means for cooling and maintaining humidity within prescribed limits.

4. A *Self-Contained Air Conditioning or Cooling Unit* is one in which a condensing unit is combined in the same cabinet with the other functional elements. Self-contained air conditioning units are classified[2] according to the method of rejecting condenser heat (water cooled, air cooled, and evaporatively cooled), method of introducing ventilation air (no ventilation, ventilation by drawing air from outside, ventilation by exhausting room air to the outside, or ventilation by a combination of the last two methods), and method of discharging air to the room (free delivery or pressure type).

5. A *Free Delivery Type Unit* takes in air and discharges it directly to the space to be treated without external elements which impose air resistance.

6. A *Pressure Type Unit* is for use with one or more external elements which impose air resistance.

UNIT AIR CONDITIONERS

This equipment takes the form of an encased assembly including the apparatus necessary to perform either some or all of the functions of

[1]Prepared by a Joint Committee of the *American Society of Refrigerating Engineers*, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, *Refrigerating Machinery Association*, *National Electrical Manufacturers' Association* and *Air Conditioning Manufacturers' Association*.

[2]Standard Method of Rating and Testing Self-Contained Air Conditioning Units for Comfort Cooling prepared by a Joint Committee of the *American Society of Refrigerating Engineers*, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, *Refrigerating Machinery Association*, *National Electrical Manufacturers' Association*, and *Air Conditioning Manufacturers' Association*.