

MISCELLANEOUS UNITARY EQUIPMENT

There are a number of units available which were not covered in the previous discussion that accomplish only one or two of the functions of air conditioning.

Unit Window Ventilators

Window ventilators consist of filters and motor-driven fans enclosed in a cabinet to be mounted on the window sill of homes or offices. These units accomplish ventilation, air cleaning and air circulation. The direction of air discharge is manually adjustable for seasonal operation.

Attic Fans

Attic fans, used during the warm months of the year to draw large volumes of outside air through a house, offer a means of using the comparative coolness of outside evening and night air to bring down the inside temperature of a house.

Because the low static pressures involved are usually less than $\frac{1}{8}$ in. of water, disc or propeller fans are generally used instead of the blower or housed types. The fans should have quiet operating characteristics, and they should be capable of giving about twenty air changes per hour. The two general types of attic fan installations in common use are:

Open attic fans, in which the fan is installed in a gable or dormer and one or more grilles are provided in the ceilings of the rooms below. Fresh air, which enters the house through open windows, is drawn into the attic through the grilles, and is discharged out-of-doors by the fan. An attic stairway may be used in place of the central grille. It is essential that the roof and the attic walls be free from air leaks.

Boxed-in fans, in which the fan is installed within the attic in a box or housing directly over a central ceiling grille, or in a bulkhead enclosing an attic stair. The fan may be connected by a duct system to the grilles in individual rooms. Fresh air entering through the windows of the rooms below is discharged into the attic space and escapes to the outside through louvers, dormer windows, or screened openings under the eaves.

The locations of the fan, the outlet openings, and the grilles should be selected after consideration of the room and attic arrangement in order to give uniform air distribution in the individual rooms served. If the outlet for the air is not on the side away from the direction of the prevailing wind, openings should be provided on all sides. Kitchens should be separately ventilated because of the fire hazard, and to prevent the spread of cooking odors.

Some typical data on an attic fan installation in an average six room house of frame construction containing 14,000 cu ft and located in the southern part of this country are:

Installation cost.....	\$75 to \$400, average \$250
Fan data.....	9000 cfm average, 280 rpm if belt driven, 570 rpm if direct connected, 500 watts input
Operating period.....	April 15 to October 15, intermittently as weather conditions demand
Power consumption.....	500 kwh per year for 8 months' operation

Humidifiers

Humidifying units may be installed as part of an air conditioning unit system, or may be installed individually to furnish additional humidity. Fig. 23 illustrates a humidifying unit for installation in connection with a warm air heating system, and as such it is located at the intake of the furnace. The air passes through a lint filter, then through the fans and finally through an air washer or spray system. Surplus spray is eliminated and the air delivered to the air distribution system. In other cases, similar spray type apparatus is used to deliver humidified air through ducts to openings beneath existing radiators in a steam heated residence.

For other steam heated homes, there is a humidifying unit as illustrated in Fig. 24. This unit is normally placed at some central location on the

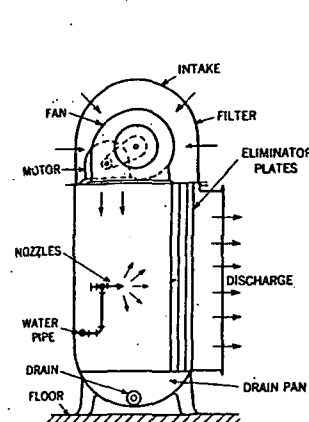


FIG. 23. HUMIDIFYING UNIT FOR WARM AIR FURNACE

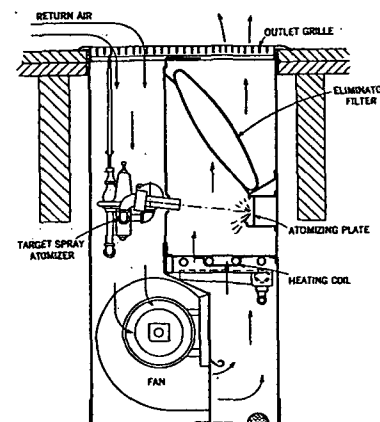


FIG. 24. HUMIDIFYING UNIT FOR RADIATOR HEATED HOMES

first floor, and receives the air from the floor into fans, delivering it through a heating coil and up through a target spray atomizer. Surplus moisture is removed by means of an eliminator filter and the humidified air is delivered upward through the other half of the floor grille. Since a large percentage of the heater capacity is transformed into the latent heat of humidification, this unit does not eliminate any existing steam radiation. It may also be used with hot water systems but its capacity is considerably reduced.

PROBLEMS IN PRACTICE

1 • Is it satisfactory to use superheated steam in unit heaters?

Superheated steam can be satisfactorily used in unit heaters provided the capacity is based on the saturated steam temperature and not on the total temperature. If unusually high superheat is used, trouble may be experienced from the excessive expansion and contraction of the heating elements.