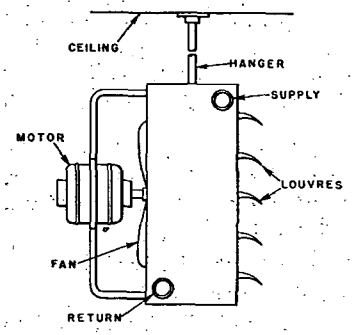


Fig. 1. Suspended Unit Heater, Propeller Type Fan

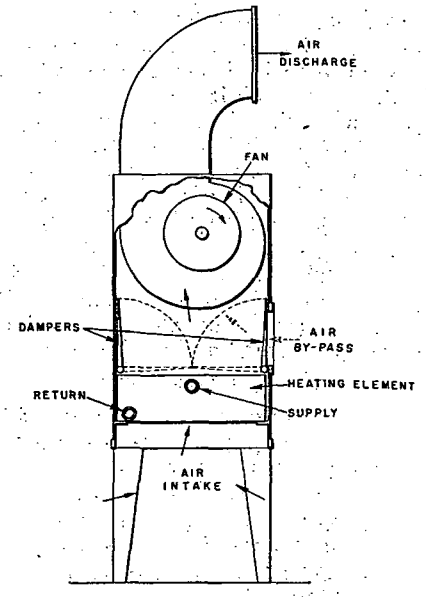


Fig. 2. Floor Mounted Unit Heater, Housed Type Fan

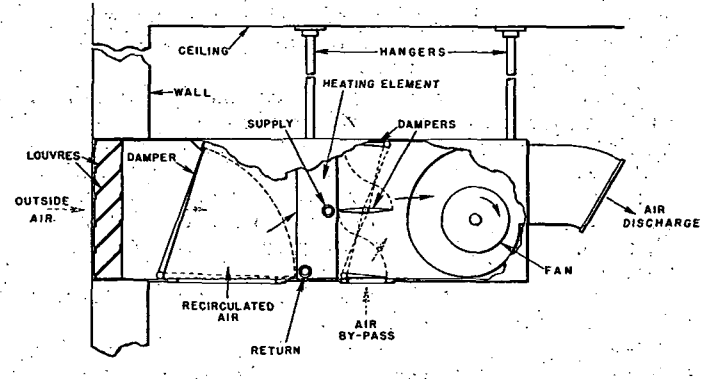


Fig. 3. Suspended Type Unit Heater, Housed Type Fan





other, thus greatly reducing the piping and loss of floor space as a result of the heating equipment. Propellor-type fan units with outlet velocities of from 300 to 1000 fpm are usually placed from 30 up to 100 ft apart.

Fig. 1 shows a typical suspended type unit heater with propellor type fan. Fig. 2 illustrates a typical floor mounted type unit heater with by-pass feature. Such units are available either with or without this air by-pass. For purposes of this control feature see Chapter 14. Fig. 3 shows suspended high-velocity type unit heater connected to outside air intake with damper to control volume of ventilation.

## HEATING MEDIUM

The convectors of unit heaters or ventilators may be supplied with either hot water or steam. When water is used, it should be circulated mechanically and the pump rate and friction loss should be based upon test data for the particular unit to be employed. Normally the friction within the convector is too great for gravity circulation. The heat output of a given heater will normally be less when using water than with steam at the same temperature, unless high rates of circulation are maintained.

Either high or low pressure steam may be used but it is essential that proper venting of the air from the coil be obtained at all times. Where unit heaters are used with outside air in freezing climates, it is unwise to use steam of less than 5 lb pressure at the coil, due to the possible danger of freezing of condensate in the tubes. It is essential that properly constructed traps and some form of thermostatic air by-pass be used with high pressure steam as well as adequate condensing legs to prevent steam in the returns. Increasing the return temperature tends to increase return line corrosion, especially at points where overheated condensate or steam enters the return line.

When low pressure steam is used with unit heaters and ventilating units, it is important that proper means be provided for the removal of the heavy condensation. Such units should not be applied to low pressure gravity return systems except where the difference in heater level and boiler water line is large enough to compensate for the pressure loss through the convector at its highest condensation rate. The use of vacuum or return pumps and receivers is advisable with jobs of any considerable size, as the best method of taking care of the condensate and at the same time providing for proper venting of the units directly into a vacuum return line system, or into an open vented return system, the latter having some advantage in preventing the formation of any vacuum in the unit itself, which sometimes tends to hold up condensate and causes freezing.

## ESTIMATING HEAT LOSSES

The heat losses of a building to be equipped with unit heaters are determined in the same manner as for any other heating system, excepting so far as the unit heaters may prevent air stratification and thus reduce the temperature difference between the ceiling and floor. (See Chapter 7.)

Unit heaters may be arranged to recirculate the air or to supply warmed air from the outside for ventilation or to make up air exhausted.