

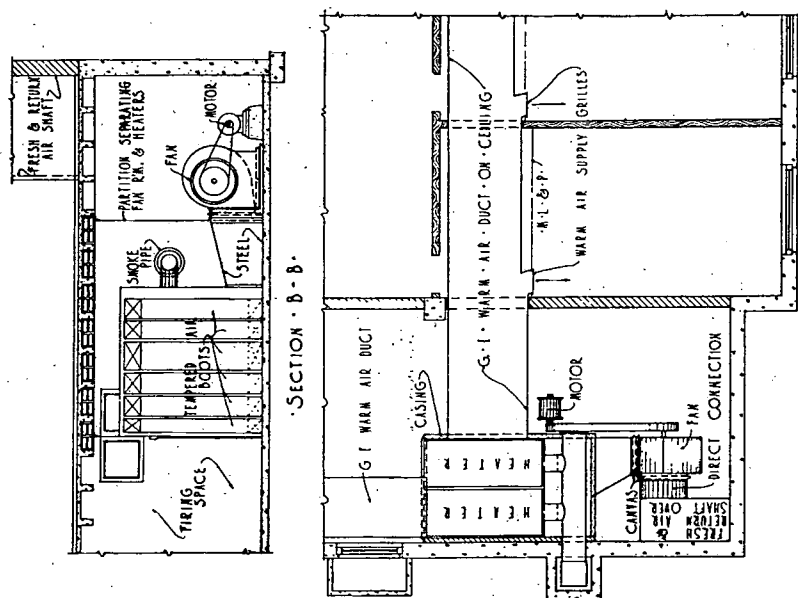


FIG. 3. FAN FURNACE WITH SINGLE DUCT

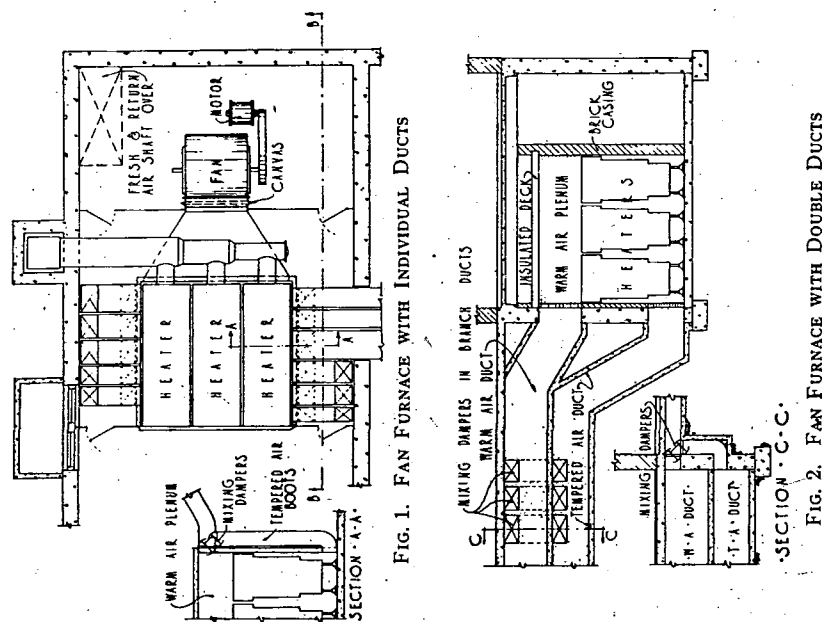


FIG. 1. FAN FURNACE WITH INDIVIDUAL DUCTS

FIG. 2. FAN FURNACE WITH DOUBLE DUCTS

Direct transmission heaters for fan-furnace systems are to be had made of cast-iron or steel. The former are made in sections which are cemented and then bolted together on the job; steel heaters are assembled with welded or riveted joints.

Efficiency of Heating Surface

The emission of heat from the heating surface of these furnaces will vary from 2000 to 3000 B.t.u. per square foot per hour; 2500 is a good average value.

Ratio of Heating Surface to Grate

In commercial sizes the ratio of the heating surface to the grate surface will vary from 30 to 1 to 50 to 1.

Free Area and Resistance

The free area through the heaters and resistance to the flow of air at varying velocities are characteristics depending upon the heater in question.

RATINGS

This class of equipment is usually rated in one of three ways, as follows:

1. The temperature rise of the air is listed over a certain range of velocities through the free area of the heater for varying combustion rates, for a certain heating value of the fuel.
2. The volume of air in cubic feet per minute is listed over several temperature rises with the necessary fuel consumption, taking coal of some known heating value as a standard.
3. The B.t.u. imparted to the air is listed for varying combustion rates.

Either of the first two methods is preferable to the third because of the inaccuracies that are apt to creep into the latter, due to the fact that for the same combustion rate on any given heater, the B.t.u. imparted to the air will not remain constant, but will vary with the volume of air passed over the heater.

SELECTING THE HEATER

In selecting heaters for any particular work, the engineer should be governed by certain considerations that arise through the nature of the service for which the plant is intended. The volume of air to be passed over and through the heaters limits the free area required in the latter, once the velocity at this point is agreed on. It will be evident that more heater capacity is required to offset the heat losses of a building with outside air than with recirculated air. Consequently when designing a plant for operation on recirculated air, the volume of air per heater will be considerably larger than would be the case for outside air. If the velocity through the heater in this case is not investigated, it may become excessive thus increasing the static resistance of the system unduly, spelling larger power bills for the owner. The free area may easily be increased by using wider casings, thus reducing the resistance and power