

heater, and for protecting the surfaces from the corrosive action of the sulphurous or sulphuric acid formed.

In special cases provision must be made for producing a draft in the flue pipe and for protection against the formation of condensation therein.

Oil-Fired Fan-Furnace Systems

Special types of fan furnaces adapted to oil fuel, which include air conditioning apparatus, are also available.

Oil-fired heaters must be equipped with high temperature limit control to cut off the oil burner in case of fan failure. Oil-fired fan furnaces are usually provided with direct acting thermostats connected to the burner for maintaining the proper temperature. A device should be provided to cut off the fan whenever the thermostat cuts off the burners, to prevent overheating of rooms that are thermostatically controlled.

Chapter 8

FAN STEAM HEATING

Essential Parts of System; Typical Arrangements of Apparatus; Design of Fan Steam Heating Systems; Selection of Heating Surface; Problems Involving Air Volume and Heat Requirements.

TECHNICALLY, any heating system consisting of a fan and heater employing the use of steam as the heating medium, is a *fan steam system* and would include the central fan system described in this chapter, and the so-called unit heater system described in Chapter 9. Usage, however, has decreed that a system comprising a number of small heating elements attached directly to individual fans and motors be termed a *unit heater* and a system in which the equipment is consolidated into a large central unit with ducts to convey the heated air to various parts of the building be termed a *fan steam heating system*.

With the central fan steam system it usually is possible to place a fan and heater in an equipment room in close proximity to the boiler room where the supply and return piping can be simplified, and where the operation of the fan and heater can be under the close observation of the engineer. Maintenance costs can also be reduced to a minimum with this type of system.

ESSENTIAL PARTS OF SYSTEM

The fan steam system is particularly adapted to the warming and ventilating of large structures, and is made up of three units:

1. A heater constructed of steel or wrought-iron pipes, steel, copper, brass or tubes of other metal, or cast iron sections, through which steam may be passed.
2. A fan or blower to circulate air over the heater surfaces, the air acting as a heat carrier or medium of heat transfer.
3. A system of ducts or pipes to convey the heated air from the heater to points where heat may be required.

When the heater is located between the fan and main duct, the combination is termed *blow-through*, and when the fan is installed between the heater and the duct, the arrangement is known as *draw-through*. These two arrangements are shown by Fig. 1. The draw-through combination is more often used for shop and factory installations where compactness is desirable, the blow-through combination being used principally for *hot and cold* systems as installed in schools and public buildings.