

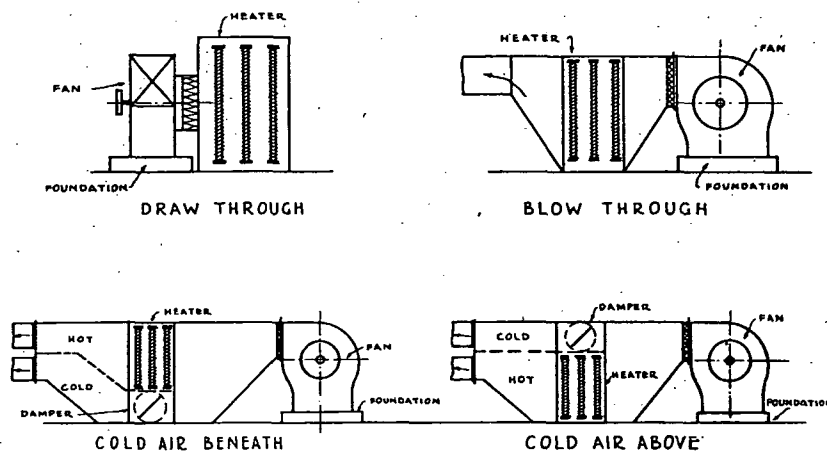
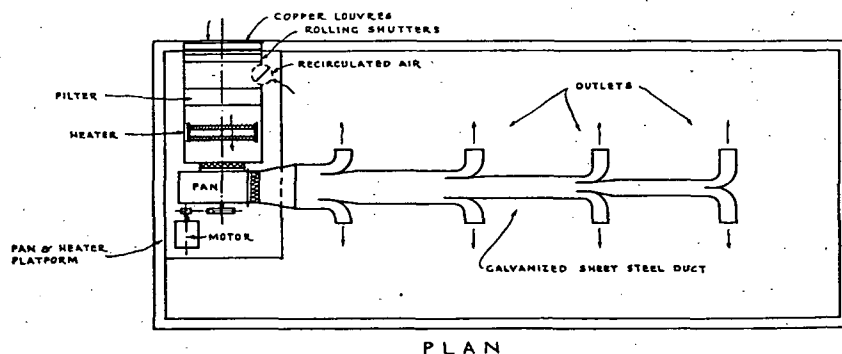
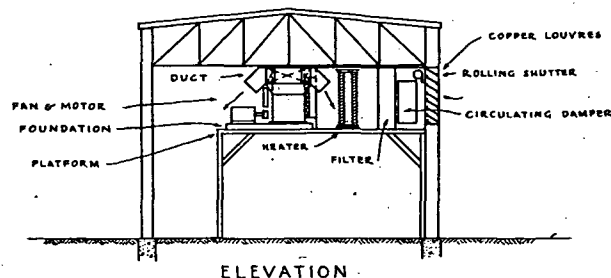


FIG. 9. STANDARD ARRANGEMENTS FOR HEATER AND BY-PASS



PLAN



ELEVATION

FIG. 10. COMMON ARRANGEMENT OF A FAN STEAM HEATING SYSTEM FOR A SHOP BUILDING

Distributing Systems for Small Installations

Fan-furnaces of this type are adaptable either to trunk line duct systems, to central chambers, or to individual pipe installations, the size and shape of building being the governing factors. The supply of air to individual rooms may be made with small branches, 6 in. and 8 in. diameters being used. These branches and also the main trunk lines may be either round or rectangular. Risers and registers of commercial sizes in use in gravity warm air heating practice are adaptable.

The basic principles of proportioning ducts apply to this system as well as to the larger fan systems. The velocity of air through the ducts depends upon the power furnished by the fan and motor, the limiting factors being economy and quiet operation. Both supply ducts and return air systems should be based upon equal friction throughout the design to assure proper circulation. The following velocities have been found satisfactory:

Over nominal area of registers.....	200-300 ft per minute
Branches and stacks.....	400-600 ft per minute
In main ducts of trunk system.....	500-800 ft per minute
In returns.....	500-700 ft per minute

With a central distributing system, standardized orifices, calibrated in terms of cubic feet, may be used. In this case all pipes may be the same size and the flow balanced by the orifices. It is desirable where orifices are not used to install equalizing dampers in all runs. Return air openings should provide easy recirculation to the central fan and should be cushioned against noise by sound deadening.

FAN STEAM HEATING

The fan steam or indirect type of central fan system differs only from the essentials of the fan furnace system in the medium for heating and the type of surface. With the central fan steam system it is usually 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.

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. 9. 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.

Arrangements of Apparatus for Indirect Type

A very common arrangement of the fan steam system of heating is illustrated by Fig. 10. The arrangement consists of a fan, indirect heater unit enclosed by a sheet-metal casing connected with the suction side of the fan, a sheet-metal casing connected to the heater casing run to the outside of the building and provided with an adjustable opening inside