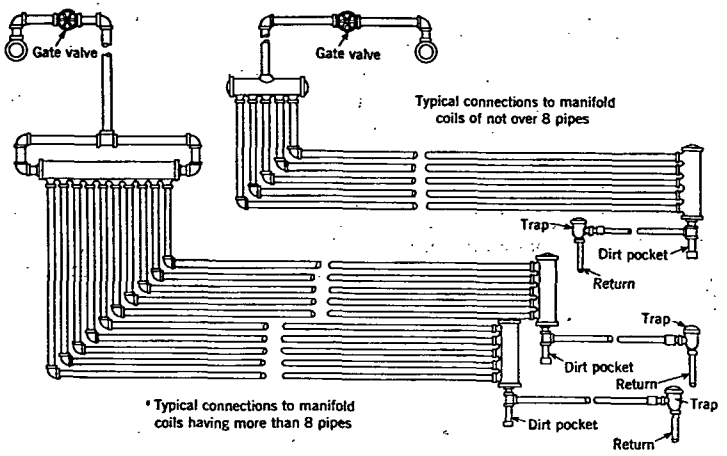



FIG. 22. TYPICAL PIPE COIL CONNECTIONS

The piping shown in Fig. 23 is for small stacks and has the steam connected at only one end. On the return side all of the returns are collected together through check valves and are passed through blast traps which are connected to the vacuum return or to an atmospheric return. The air from the stacks, in the case illustrated, passes up into a small air line and through a thermostatic trap into a line connecting into the return beyond the blast trap.

Where the stacks contain some thirteen or more sections, an auxiliary air tapping is made to the lower portion of one of the middle sections, in the manner illustrated in Fig. 24, to prevent air collecting at this point. Thermostatic control as applied to such heating units in modern practice

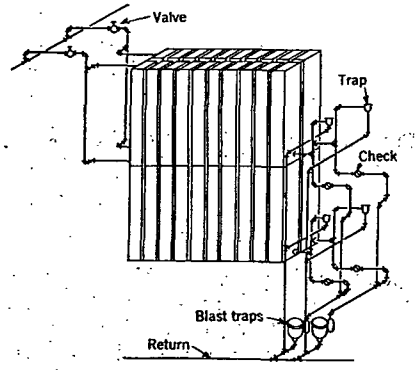



FIG. 23. SUPPLY AND RETURN CONNECTIONS FOR HEATING UNITS OF CENTRAL FAN SYSTEMS

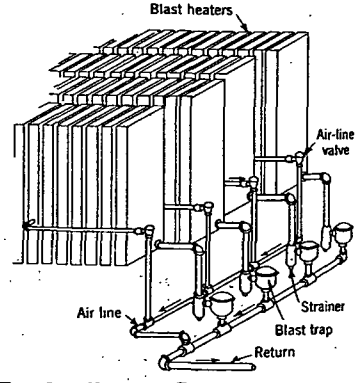



FIG. 24. TYPICAL CONNECTIONS TO CENTRAL FAN SYSTEM HEATING UNITS EXCEEDING 12 SECTIONS





consists of a thermostatic valve located in each main branch from the steam line so that each valve will open or close a complete row of stacks across the entire face of the heating unit. The stack closest to the outside air intake usually is not equipped with a thermostatic valve. A gate valve on the steam pipe to the first coil is operated manually to supply steam continuously in freezing weather. Good practice demands that the returns be connected in parallel with the steam supplies, with a separate steam trap for each bank of coils having a separately valved steam supply. This arrangement is illustrated in Fig. 23, for blast traps having external thermostatic by-passes and integral thermostatic by-passes, respectively.

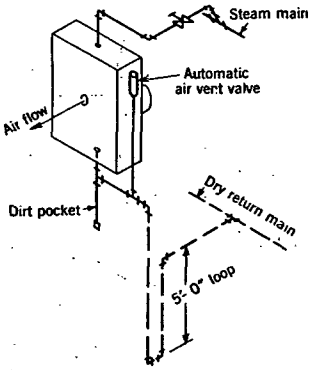



FIG. 25. UNIT HEATER CONNECTED TO ONE PIPE AIR VENT SYSTEM

A method of connecting a unit heater to a one pipe air-vent steam heating system is illustrated in Fig. 25.

## PIPE SIZING FOR INDIRECT HEATING UNITS

Pipe connections and mains for indirect heating units are sized in a manner similar to radiators, but the equivalent direct radiation must be ascertained for each row of heating unit stacks and then must be divided into the number of stacks constituting that row and into the number of connections to each stack.

$$EDR = \frac{Q \times 60 \times (t_1 - t_e)}{55.2 \times 240} = \frac{Q \times (t_1 - t_e)}{220.8} \qquad (3)$$

*where*

$EDR$ = equivalent direct radiation, square feet.
$Q$ = volume of air, cubic feet per minute.
$t_e$ = the temperature of the air entering the row of heating units under consideration, degrees Fahrenheit.
$t_1$ = the temperature of the air leaving the row of heating units under consideration, degrees Fahrenheit.
60 = the number of minutes in one hour.
55.2 = the number of cubic feet of air heated 1 F by 1 Btu.
240 = the number of Btu in 1 sq ft of EDR.