

FIG. 15. CONNECTING DROP FEED RISER DIRECT TO RADIATOR BY TURNING VALVE ON ITS SIDE

Note.—Suitable for up-feed with radiators below level of steam main. For atmospheric, vapor, vacuum, sub-atmospheric, and orifice systems.

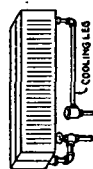


FIG. 17. HORIZONTAL SECTIONAL FIN-TYPE HEATING UNIT

Note.—Suitable for up-feed or down-feed. For atmospheric, vapor, vacuum sub-atmospheric, and orifice systems.

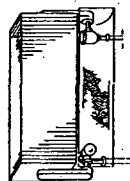


FIG. 18. FIN-TYPE HEATING UNIT VALVES BEHIND GRILLE

Note.—Suitable for up-feed or down-feed. For atmospheric, vapor, vacuum, sub-atmospheric, and orifice systems.

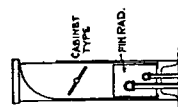


FIG. 19. FIN-TYPE HEATING UNIT CONCEALED IN CABINET

Note.—Suitable for any two-pipe system.

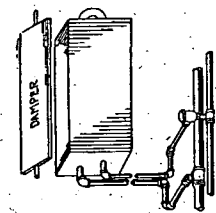


FIG. 16. CONVECTOR CONNECTIONS SAME END

Note.—Suitable for up-feed. For atmospheric, vapor, vacuum, sub-atmospheric, and orifice systems.

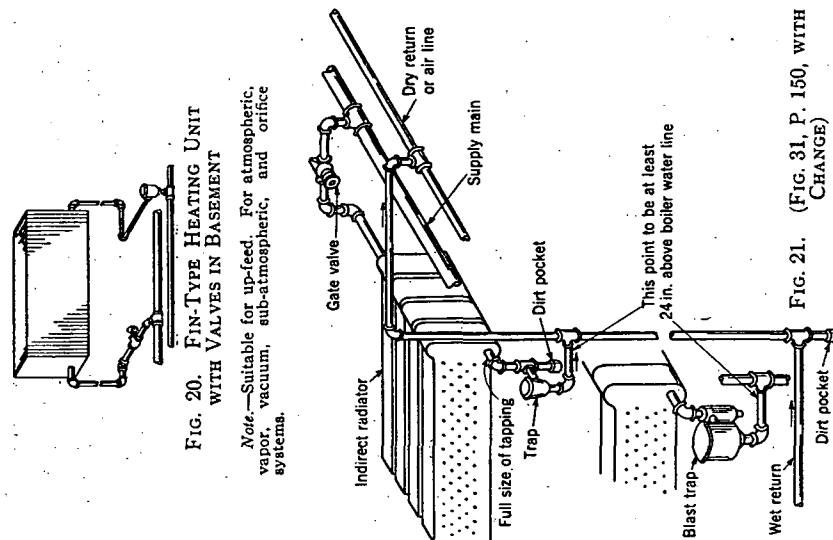


FIG. 20. FIN-TYPE HEATING UNIT WITH VALVES IN BASEMENT

Note.—Suitable for up-feed. For atmospheric, vapor, vacuum, sub-atmospheric, and orifice systems.

FIG. 21. (FIG. 31, P. 150, WITH CHANGE)

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. It is important to use a nipple the full size of the outlet tapping on the stack and to reduce the pipe size to the normal return size required, by the use of a reducing ell, as indicated in Fig. 25.

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. 26, to prevent air collecting at this point. Thermostatic control as applied to such heating units in modern practice 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. In this case no particular attention need be paid to the method of connecting the returns, that is, they do not need to be connected in parallel with the steam connections but may be hooked together in any convenient manner. The arrangement shown in Fig. 27 is satisfactory. A detail of the arrangement where a connection is made with a stack is shown in Fig. 28. It is essential to have a check valve on each individual stack to prevent reverse flow when the thermostatic valve in the steam line closes off and a partial vacuum is produced in the stack. The end of the steam main also should be dripped as indicated in Fig. 27.

If the separate air line is used as shown in Fig. 24, the blast traps may be supplied without thermostatic by-passes but if the piping is arranged as shown in Figs. 26 or 27, the blast traps must be supplied with the thermostatic by-passes to permit the passage of the air.

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.

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

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_h = 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.

Example 5. Assume that the heating units shown in Fig. 27 are handling 50,000 cfm of air and that the rise in the first row is from 0 to 40 F, in the second row from 40 to 65 F, and in the third row from 65 to 80 F. What is the load in EDR on each supply and return connection?