giving a perfect swing joint when connected to the vertical riser or radiator connection, whereas the preferred connection does not give this swing without distorting the angle of the pipe. Runouts from the steam main are usually made about 5 ft long to provide flexibility for movement in the main.

Offsets in steam and return piping should preferably be made with 90-deg ells but occasionally fittings of other angles are used, and in such

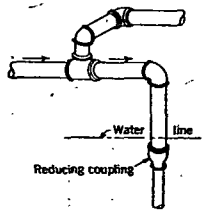


FIG. 19. DRIPPING MAIN WHERE IT RISES TO HIGHER LEVEL

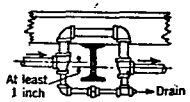


FIG. 20. LOOPING MAIN AROUND BEAM

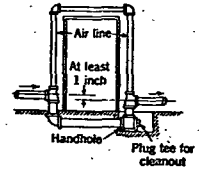


FIG. 21. LOOPING DRY RETURN MAIN AROUND OPENING

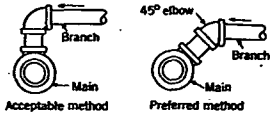
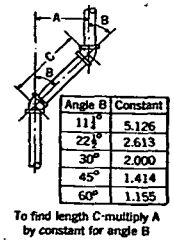


FIG. 22. METHODS OF TAKING BRANCH FROM MAIN



Angle B	Constant
11¼°	5.126
22½°	2.613
30°	2.000
45°	1.414
60°	1.155

FIG. 23. CONSTANTS FOR DETERMINING LENGTH OFFSET PIPE

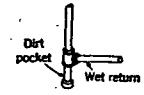


FIG. 24. DIRT POCKET CONNECTION

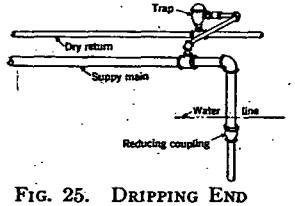


FIG. 25. DRIPPING END OF MAIN INTO WET RETURN

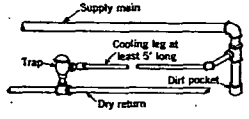


FIG. 26. DRIPPING END OF MAIN INTO DRY RETURN

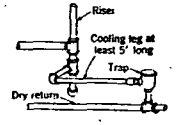


FIG. 27. DRIPPING HEEL OF RISER INTO DRY RETURN

cases the length of the diagonal offset will be found as shown in Fig. 23.

Dirt pockets, desirable on all systems employing thermostatic traps, should be so located as to protect the traps from scale and muck which will interfere with their operation. Dirt pockets are usually made 8 in. to 12 in. deep and serve as receivers for foreign matter which otherwise would be carried into the trap. They are constructed as shown in Fig. 24.

On vapor systems where the end of the steam main is dripped down into the wet return, the air venting at the end of the main is accomplished by an air vent passing through a thermostatic trap into the dry return

line as shown in Fig. 25. On vacuum systems the ends of the steam mains are dripped and vented into the return through drip traps opening into the return line. The same method may be used in atmospheric systems. A float type trap is preferable to a thermostatic trap for dripping steam mains and large risers. If thermostatic traps are used, a cooling leg (Fig. 26) should always be provided. The cooling leg is for cooling the condensation sufficiently before it reaches the trap so the trap will not be held shut by too high a temperature. On down-feed systems of atmospheric, vapor, and vacuum types, the bottoms of the steam risers are dripped in the manner shown in Fig. 27. On large systems it is desirable to install a gate valve in the cooling leg ahead of the trap.

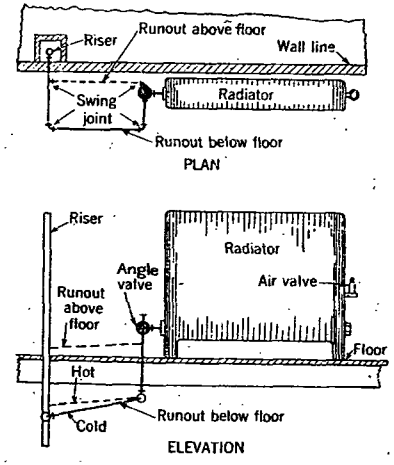


FIG. 28. ONE-PIPE RADIATOR CONNECTIONS

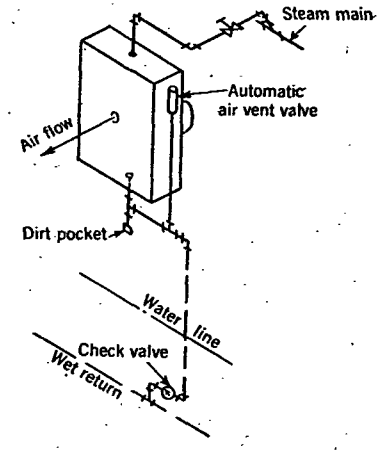


FIG. 29. UNIT HEATER CONNECTED TO ONE-PIPE AIR-VENT SYSTEM

CONTROL VALVES

Gate valves are recommended in all cases where service demands that the valve be either entirely open or entirely closed, but they should never be used for throttling. Angle globe valves and straight globe valves should be used for throttling, as done on by-passes around pressure reducing valves or on by-passes around traps.

CONNECTIONS TO HEATING UNITS

Riser, radiator and convector connections must not only be properly pitched at the time they are installed but must be arranged so that the pitch will be maintained under the strains of expansion and contraction. These connections may be made by swing joints which permit the expansion or contraction to occur under heating and cooling without bending of pipes. To take care of expansion in long risers, either expansion joints of commercial construction or pipe swing joints are used. Anchoring of pipes between expansion joints is desirable.