

FIG. 33. BOILER RETURN TRAP OR ALTERNATING RECEIVER

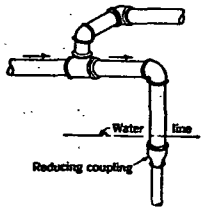


FIG. 34. DRIPPING MAIN WHERE IT RISES TO HIGHER LEVEL

horizontal position and closes the discharge valve, and is again in position to accumulate condensate.

Tilting traps are necessarily intermittent in operation, except that once the trap is in the discharge position, it will discharge condensate continuously as long as the flow of condensate is sufficient to overcome the balance of the counterweight.

This type of trap employs packing around the trunnion and valve stem in order to prevent the loss of steam and condensate. Tilting traps are used for draining laundry and dry cleaning equipment, steam cookers, drips from steam mains, steam separators and purifiers and other equipment. They are made in sizes from 1 to 3 in., and for pressures varying from 0 to 250 psig. Fig. 31 illustrates a type of tilting trap which is in use at the present time.

Lifting Traps. This type of trap is an adaptation of the upright bucket trap. It has the added feature of an auxiliary pressure inlet through which steam is introduced at a pressure higher than that of the trap inlet pressure. This high pressure steam forces the condensate to a point above the trap, and against a back pressure higher than that which is possible with normal steam pressure. Lifting traps are made in sizes from one to 3 in., and for pressures ranging from vacuum to 150 psig. Fig. 32 illustrates a trap of the lifting type.

Boiler Return Trap or Alternating Receiver. This device is not actually a steam trap in that it is not used to trap or hold steam, but is an adaptation of the lifting trap. It is used for returning condensate to a low pressure boiler, when due to excess pressure, the condensate cannot flow to the boiler by gravity without flooding the return mains, and endangering the boiler by permitting it to go dry. The boiler return trap is a vessel into which condensate alternately collects and is discharged into the boiler by boiler steam pressure. These traps are available in sizes from 1½ to 2½ in., and for pressures varying from 0 to 100 psig. A typical boiler return trap is shown in Fig. 33, and a typical connection to a low pressure heating system is indicated in Fig. 13.

Steam Trap Installations

The following general rules should govern the installation of traps of all types:

1. A vertical drip as long as possible and a strainer should be installed between the trap and the apparatus it drains. Exceptions to this rule are the installation of thermostatic traps in radiators, convectors and pipe coils. These, in general, are attached directly to the units without strainers.

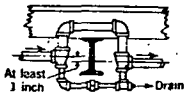


FIG. 35. LOOPING MAIN AROUND BEAM

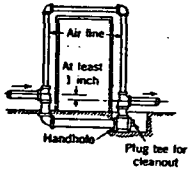


FIG. 36. LOOPING DRY RETURN MAIN AROUND OPENING

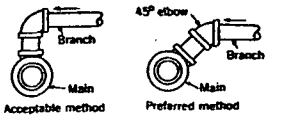


FIG. 37. METHODS OF TAKING BRANCH FROM MAIN

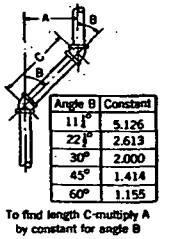


FIG. 38. CONSTANTS FOR DETERMINING LENGTH OF OFFSET PIPE



FIG. 39. DIRT POCKET CONNECTION

2. Whenever it is necessary to maintain in continuous service, apparatus which is to be drained, it is advisable to install a gate valve on each side of the trap, and a valved by-pass around the trap, so that the trap may be removed and repaired and condensate drained through the throttled by-pass valve.

3. Whenever it is necessary to install traps for lift service, as when the condensate must be discharged to a main located above the trap or where the trap must discharge against a definite back pressure, a check valve and a gate valve should be installed on the discharge side of the trap, the check valve to prevent continuous pressure on the discharge side of the valve, and the gate valve to shut off pressure in case the trap is removed for service or repair.

DRIPS

A steam main in any type of steam heating system may be dropped to a lower level without dripping if the pitch is downward with the direction of steam flow. Any steam main in any heating system can be elevated if dripped. Fig. 34 shows a connection where the steam main is raised and is drained to a wet-return. If the elevation of the low point is above a dry-return, it may be drained through a trap to the dry-return in two-pipe vapor, vacuum and sub-atmospheric systems. Horizontal steam pipes may also be run over obstructions without a change in level, if a small pipe is carried below the obstruction to care for the condensate (Fig. 35). Horizontal return pipes may be carried past doorways and other obstructions by using the scheme illustrated in Fig. 36. It will be noted that the large pipe, in this case, runs below the obstruction, and the smaller one over it.

Branches from steam mains in one-pipe gravity steam systems should use the *preferred connection* shown in Fig. 37, but where radiator condensate does not flow back into the main, the *acceptable* method shown in the same figure may be used. This acceptable method has the advantage of

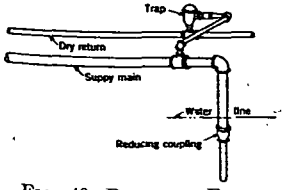


FIG. 40. DRIPPING END OF MAIN INTO WET RETURN

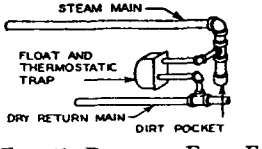


FIG. 41. DRIPPING END OF STEAM MAIN INTO DRY RETURN

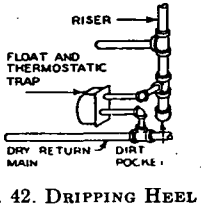


FIG. 42. DRIPPING HEEL OF RISER INTO DRY RETURN