

nections are the same as for vapor systems in that they have graduated valves on the radiator supply ends and thermostatic traps on the radiator return ends. All drips from the supply main and the steam side of the system must pass through thermostatic drip traps before entering the return system where only atmospheric pressure exists. Fig. 13 illustrates a typical scheme of piping used on atmospheric systems. Such systems do not maintain heat in the radiators under declining fires. As the steam supply diminishes, air from the atmosphere re-enters through the open vent pipe retarding the inflow of steam and cooling the radiator.

CONDENSATION RETURN HEATING SYSTEMS

When an automatic condensation return pump is substituted for the gravity return of a two-pipe vapor system they are quite generally known

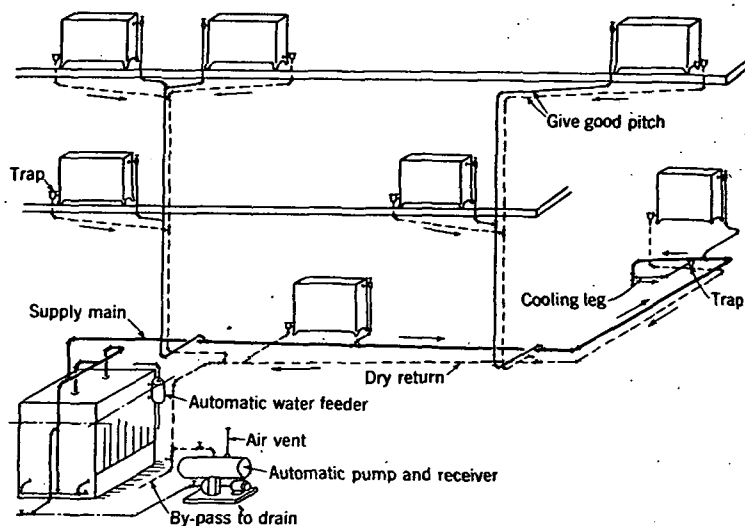


FIG. 14. TYPICAL INSTALLATION USING CONDENSATION PUMP

as *return systems* or *return pump heating systems*. A typical installation of a motor driven automatic condensation unit is illustrated in Fig. 14. It will be noted that the returns are graded to cause flow by gravity to the vented receiver. As the receiver is filled, the float mechanism operates either a pilot or an across-the-line switch to start the pump, and upon emptying the tank disconnects the power and stops it. The pump may be used to deliver the condensate direct to the boiler, to a feed water heater or to raise the water to any higher elevation or pressure than that of the return line. A useful application is to use a small condensation unit to handle a remote section of radiation that otherwise would be difficult to grade to the main return.

VACUUM SYSTEMS

In the vacuum system, a vacuum is maintained in the return line practically at all times but no vacuum is carried on the steam side. The pump is usually controlled by a vacuum regulator which operates the pump to maintain the vacuum within limits and operates in response to a pressure difference between the atmosphere and the return to control the vacuum in the return main. The source of steam supply may be from a low pressure boiler as shown in Fig. 15, or a high pressure line through a pressure reducing valve.

The supply main slopes down in the direction of flow; the runouts pitch down toward the riser if it is dripped (Fig. 3) or upward toward the riser if it is not dripped (Fig. 2). The dripping of the risers depends largely on

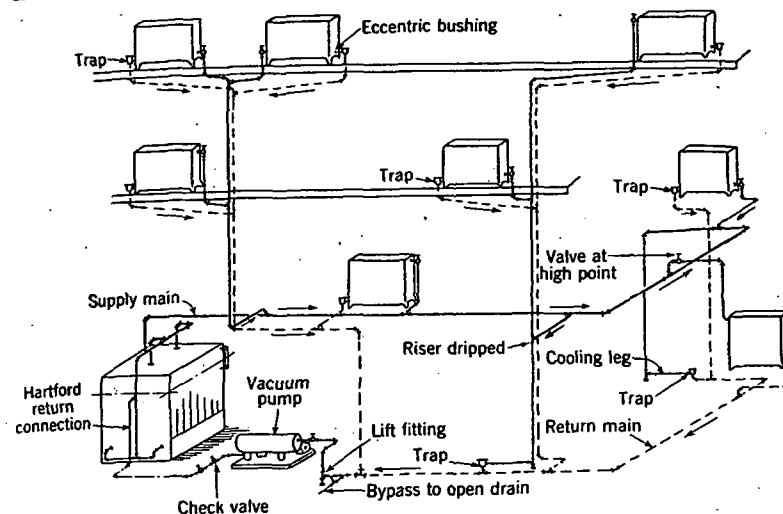


FIG. 15. TYPICAL UP-FEED VACUUM PUMP SYSTEM

the height of the riser. Ordinarily risers less than three stories high are not dripped; while those more than four stories high are usually dripped. When risers are dripped the runouts from the steam main may be taken from the bottom, if desired, and each runout then serves as a drip for the main. The runouts from the dripped risers slope back toward the riser.

Where graduated manual control of the radiators is desired, graduated valves may be used to control the supply of steam to the radiator. Angle or corner pattern radiator valves may be used. The radiators must be drained through thermostatic traps which pass air and water but prevent the passage of steam. Combination float and thermostatic traps are preferable for draining mains and risers.

The return risers are connected in the basement into a common return main which slopes downward toward the vacuum pump. The vacuum