

properly constructed with materials and solder that will properly withstand the maximum temperature of the steam.

*Low-pressure traps* of the various types are equipped substantially the same as high-pressure traps of similar types. Thermostatic traps are generally used for draining radiators and heaters except for very large capacities where bucket, float or blast traps are used. Thermostatic traps for this service usually pass both condensate and air and in case of float and bucket traps the air is usually relieved through an auxiliary thermostatic trap in a by-pass around the main trap. Sometimes this auxiliary air trap is an integral part of the trap. Blast traps are sometimes used on a vacuum heating system for connecting old one or two-pipe gravity systems in parallel with vacuum return line systems; in which case the blast traps should not be provided with auxiliary air by-pass, as the action of this will allow the vacuum to draw air into the old system through its air valves, especially when the steam is wholly or partially cut off. The air from the returns of such old systems should be relieved just ahead of the blast traps by means of quick venting automatic air valves, preferably of the non-return type, especially if the other air valves on the old system are non-return valves.

*Lifting traps* will discharge from a lower to a higher pressure and are usually of the tilt or alternating type. Either of the two former types of traps are provided with two or three valves, operated by the action of the trap.

In case of the two-valve traps, one valve closes a steam inlet and the other valve opens a vent outlet while the trap is filling and as soon as the trap dumps the first valve opens the steam inlet and the second valve closes the vent outlet, while the trap discharges. In this type of trap there must be a swinging check valve on each side of the trap, in addition to the usual by-pass, to prevent the pressure in the trap, while discharging, from backing up through the inlet and the pressure in the discharge line from backing up into the trap while it is filling. This type of trap will blow steam out through the vent while filling, if the pressure on the inlet side is sufficient, and should not be used, therefore, with such pressures unless the vent is properly piped back into the return to a feed water heater, condenser or to a perforated pipe in the bottom of the receiver to which the trap discharges, in such a way as to prevent the escape of the steam that comes in with the condensate and passes through the vent. In the three-valve traps of this type there is an extra valve for closing the discharge while the trap is filling.

Some tilting traps are designed for use without venting any steam but with automatic thermostatic air trap for venting the air. Some of these are equipped with automatic valves for introducing a water spray while the trap is filling thus condensing the steam, not only from the former discharge but from the intake and re-evaporation. Such may be used as vacuum traps for producing pressures below atmosphere on the system to which the trap is connected.

Fig. 9 shows a lifting trap, a receiver and a return trap connected for lifting condensate from a system of returns and returning same to a boiler. The venting and condensing arrangements referred to above are also shown.

Fig. 10 shows a direct return trap and receiver properly connected for automatically feeding a boiler from a system of returns delivering the condensate to the receiver.

*Oil traps* are used for draining the oil and condensate from oil separators, muffler tanks, etc., and are usually of the float type.

*Air traps* are used for relieving the air from steam heating systems, hot-water heating systems, domestic hot-water systems, etc. For steam heating systems where air and water are to be passed and steam retained they are of the thermostatic type. Where air is to be passed and steam

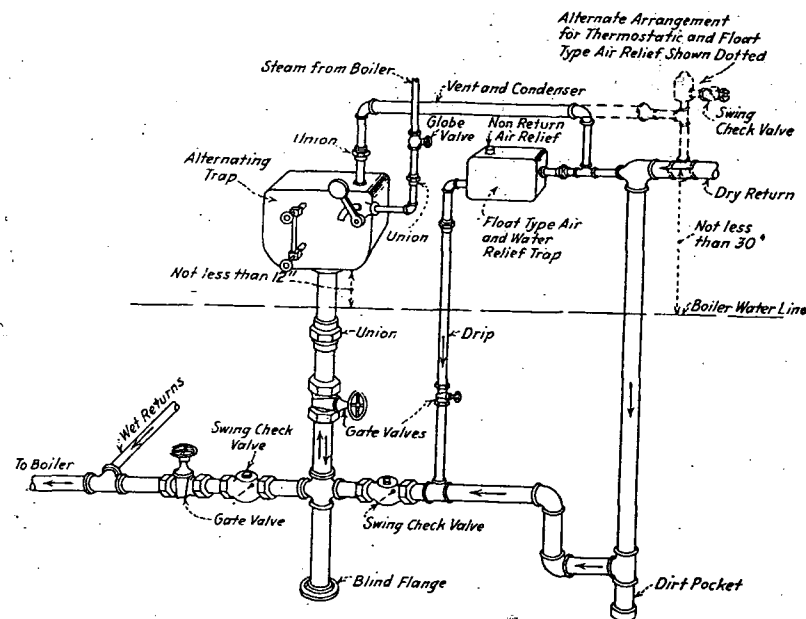


FIG. 11. ALTERNATING RECEIVER ON LOW PRESSURE HEATING RETURNS

and water retained they are of the combination thermostatic and float type. For water systems where air is to be passed and water retained they are of the float type.

*Alternating receiver type traps* are used for returning the condensate to boilers or for lifting condensate from a lower to a higher level. They are generally of the two-valve type with one valve in the steam supply and one valve in the vent. The action of the float opens the vent and closes the steam supply while the trap is filling by gravity and closes the vent and opens the steam supply while the trap is discharging. The steam from the vent may be connected back into the return system to the trap to prevent the waste of heat. This type of trap requires a swinging check on each side to prevent the backing up of the discharge from the return system while the trap is discharging or into the trap while