

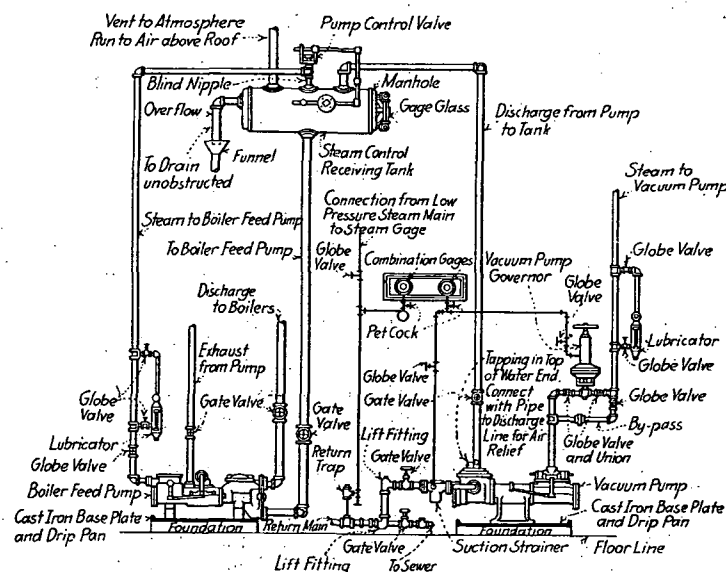


FIG. 7. METHOD OF CONNECTING VACUUM PUMP, BOILER-FEED PUMP AND STEAM-CONTROL RECEIVING TANK

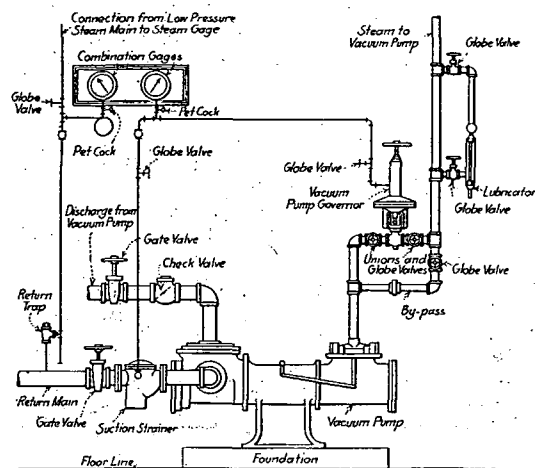


FIG. 8. METHOD OF MAKING CONNECTION TO STEAM-OPERATED VACUUM PUMP

air pressure plus the column of mixed air and water in the pump discharge to the tank constitute the total head against which the pump must act. Fig. 5 shows a hydro-pneumatic separating tank as well as a freely vented separating tank, for alternate use as conditions require.

Where the pressure in the heater, boiler, etc., varies materially from time to time and where it is desired to save energy by diminishing the head against which the pump shall work, a hydro-pneumatic type tank may be used, instead of a plain tank set at a higher elevation, to overcome the peak pressure in the boiler or heater.

Table 15 gives the size of plain and hydro-pneumatic tanks for air separating purposes and also those for storage of returns. In the latter case the tanks are based upon storing the quantities of water which will be discharged during five minutes at the basis of hourly rates given in the first column.

When the head on the delivery side of steam driven vacuum return pumps exceeds 15 lb. per square inch the condensate should be delivered to a vented receiver located close to the level of the vacuum pump outlet. This receiver should be connected to a separate steam or power driven water pump capable of delivering against the maximum head and should be controlled by a throttle valve or motor control, actuated by some suitable means, from the water line in the receiving tank.

Typical vacuum pump connections for several different conditions of service, are shown by Figs. 6, 7 and 8.

LIFTS

In vacuum heating systems where condensation is to be raised to a higher level it should be accomplished by means of lift fittings.

Lifts of 6 ft. or over should be made in steps rather than in one rise or through drag lift (consisting of long upwardly-inclined pipes.) In any case the pipes between the lifts should grade downward toward the pump.

TABLE 15. SIZES OF PLAIN AND HYDRO-PNEUMATIC SEPARATING TANKS

CONDENSATION POUNDS PER HOUR	FOR AIR SEPARATION ONLY		FOR AIR SEPARATION AND WATER STORAGE	
	Diameter Inches	Length Inches	Diameter Inches	Length Inches
4,000	12	24	24	36
6,000	12	36	24	48
8,000	18	30	24	72
10,000	18	48	30	48
16,000	24	48	30	60
24,000	30	48	36	60
	24	72	36	72
34,000	36	60	36	96
	36	72	42	72
45,000	42	60	42	96
	36	96	---	---
60,000	42	72	48	72
	42	96	48	96