open, semi-enclosed or fully enclosed; (7) kind of starting and control equipment, *i.e.*, open or enclosed panels, manual or automatic controls.

There should also be included in the specifications such items as total head to be pumped against, including suction lift, friction head, velocity head and head against which the pump must discharge. The vacuum under which return pumps are required to operate and whether two or more units are to operate in parallel or separately.

TYPES OF PUMPS

The following definitions of the types of pumps, which are in accordance with the *Hydraulic Societies' Standards*, should be used:

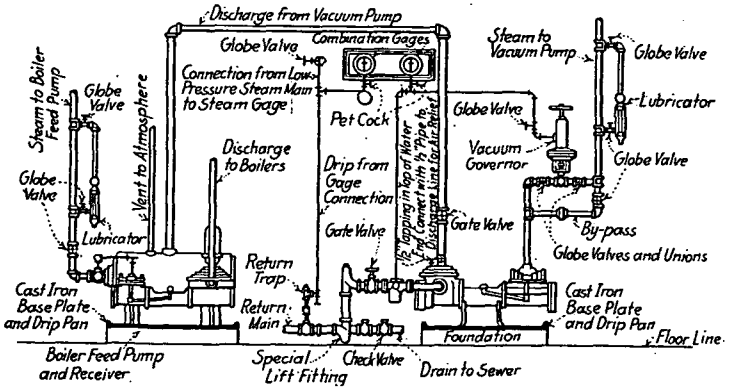


FIG. 4. METHOD OF CONNECTING VACUUM PUMP AND AUTOMATIC BOILER-FEED PUMP AND RECEIVER

Direct Acting Steam Pump.—A steam-driven reciprocating pump in which the steam piston is directly connected to the liquid piston or plunger through the piston rod.

Crank and Flywheel Pump.—A steam-driven reciprocating pump with crankshaft on which a flywheel is mounted for storing energy during the early part of the stroke and imparting this stored energy to the liquid piston or plunger during the latter part of the stroke, after the steam is cut off in the steam cylinder. The length of the stroke is determined by the throw of the main crank.

Single Steam Pump.—A steam-driven reciprocating pump having one liquid piston or its equivalent single or double acting plunger.

Duplex Steam Pump.—A steam-driven reciprocating pump having two liquid pistons or their equivalent single or double acting plungers.

Power Pump.—A reciprocating pump driven by power from an outside source applied to the crankshaft of the pump.

Single Power Pump.—A power-driven reciprocating pump having one liquid piston or its equivalent single or double acting plunger.

Duplex Power Pump.—A power-driven reciprocating pump having two liquid pistons or their equivalent single or double acting plungers.

Triplex Power Pump.—A power-driven reciprocating pump having three pistons or their equivalent single or double acting plungers.

Single Stage.—A centrifugal pump having one impeller.

Multi-Stage.—A centrifugal pump having two or more impellers acting in series in one casing.

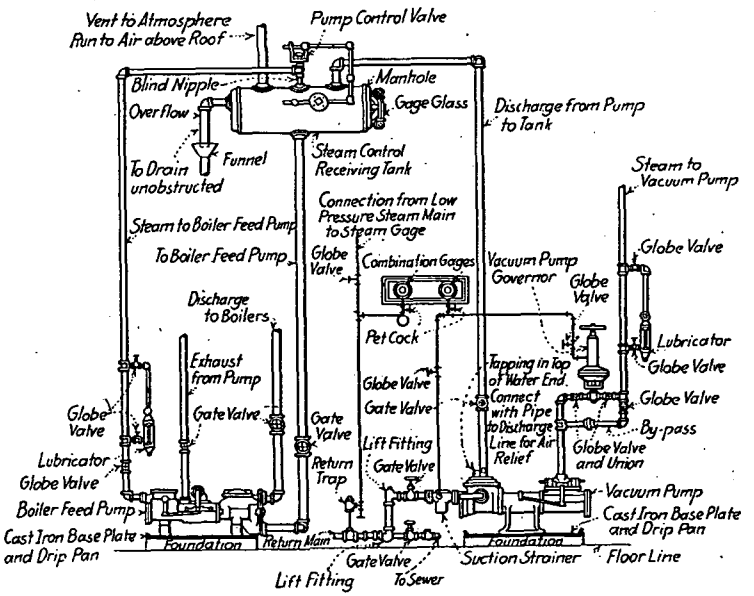


FIG. 5. METHOD OF CONNECTING VACUUM PUMP, BOILER-FEED PUMP AND STEAM-CONTROL RECEIVING TANK

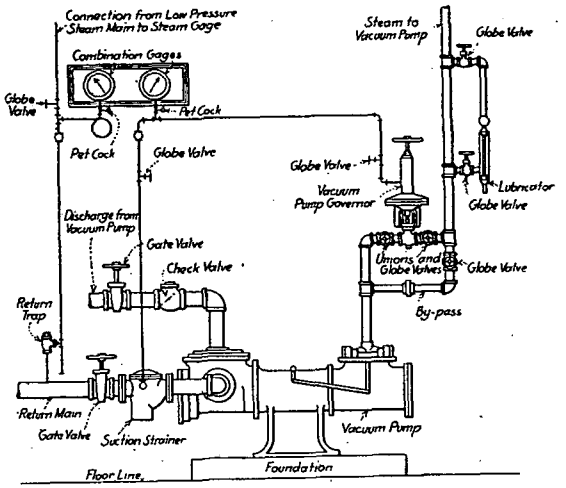


FIG. 6. METHOD OF MAKING CONNECTION TO STEAM-OPERATED VACUUM PUMP