

SPECIFICATIONS FOR PUMPS

General.—Reciprocating and power driven pumps should be specified as to make, size, working water and steam pressures, piston speed, temperature of water to be handled, electric motor characteristics, and to insure economy in production, such standard practices as subsequently indicated.

The kind of drive should be specified for power driven pumps.

Centrifugal and rotary pumps should be specified as to make, type,

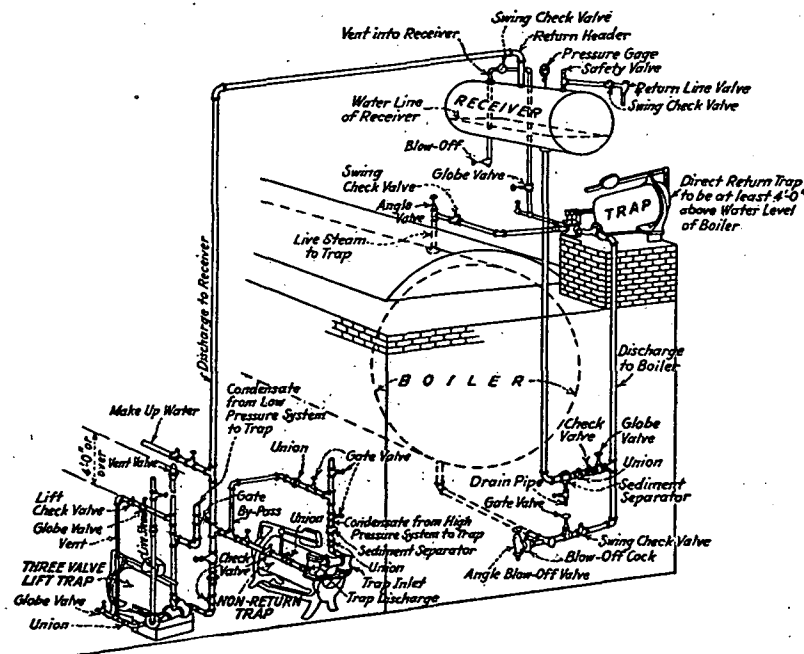


FIG. 9. TRAPS AND RECEIVER FOR RETURNING CONDENSATE FROM HIGH AND LOW PRESSURE SYSTEMS TO A BOILER

capacity, temperature of water to be handled, speed and motor characteristics including the following:

(1) Name of motor manufacturer, (2) manufacturers rated horsepower, (3) the maximum temperature rise (deg. C.) for any part of the motor above the temperature of the surrounding air, (4) full speed in revolutions per minute, (5) current characteristics, (6) whether the motor is to be 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:

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.

Screw or Propeller Pump.—A centrifugal pump having a screw type impeller. May be axial flow or combined axial and radial flow type.

FITTINGS OF PUMPS

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

Standard Fitted Steam or Power Pumps (Symbol S. F.).—Steel piston rods, iron liquid pistons or plungers, bronze or rubber liquid valves, bronze liquid valve seats, guards and springs, liquid cylinders iron or steel. Piston pattern pumps have bronze lined liquid cylinders. Plunger pattern pumps, iron cylinders and plunger glands (not bushed), steel cylinders, and plunger glands (bronze bushed).

Bronze Fitted Steam or Power Pumps (Symbol B. F.).—Bronze piston rods (except end packed plunger pattern) iron liquid pistons or plungers, bronze or rubber liquid valves, bronze liquid valve seats, guards and springs, liquid cylinders iron or steel; piston pattern pumps have bronze lined liquid cylinders, plunger pattern pumps have bronze bushed plunger glands and throats.

Full Bronze Fitted Steam or Power Pumps (Symbol F. B. F.).—Bronze piston rods (except end packed plunger pattern) bronze liquid pistons or plungers, bronze or rubber liquid valves, bronze liquid valve seats, guards and springs, liquid cylinders iron or steel. Piston pattern pumps have bronze lined liquid cylinders, plunger pattern pumps have bronze bushed plunger glands and throats.

Acid Resisting Pump (Symbol A. R.).—All parts of the pump in direct contact with the liquid pumped are to be constructed of such materials as will offer the maximum resistance to the corrosive action of the liquid.

All Bronze Pump (Symbol A. B.).—All parts of the pump coming in direct contact with the liquid pumped are to be made of bronze.