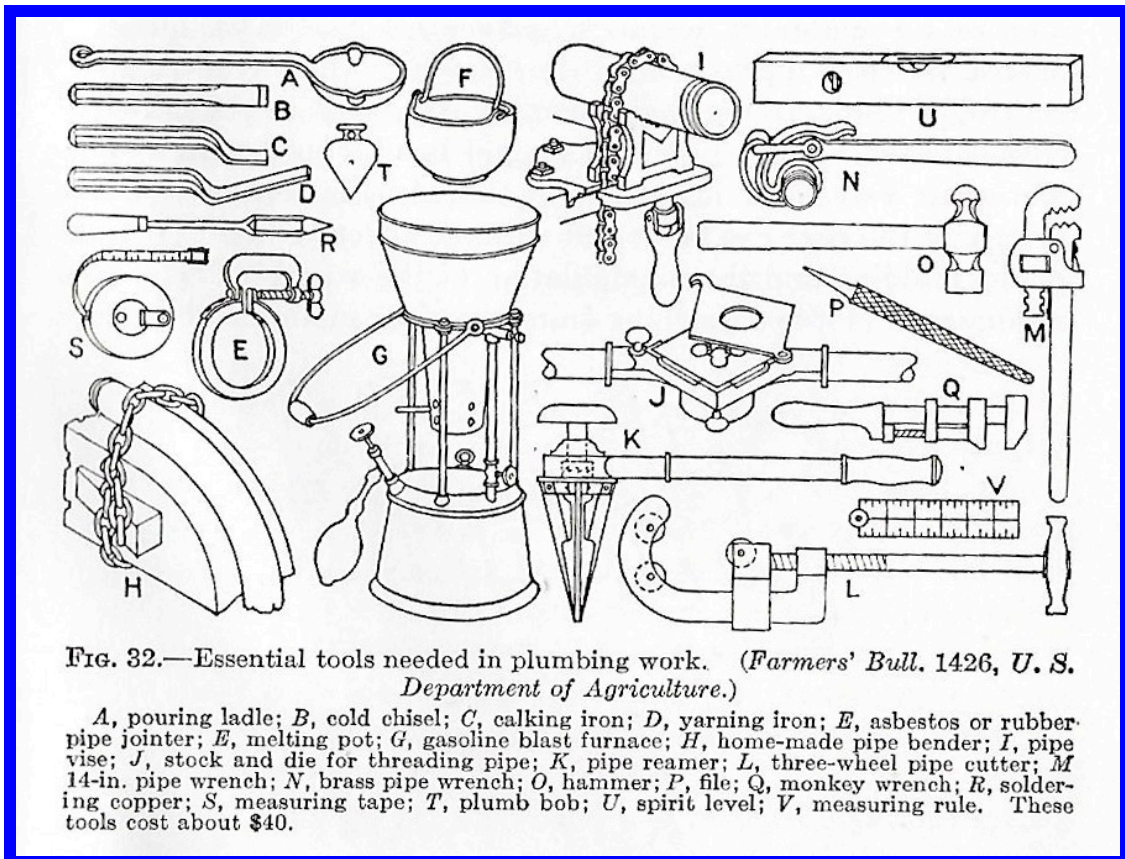


PLUMBING & SANITATION FROM EARLIEST TIMES

Early Text Books



PLUMBING

BY

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University of Illinois*

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PLUMBING

CHAPTER I

THE ELEMENTS OF PLUMBING

1. The Plumber.—The advance in the scale of ideals with regard to plumbing has been so great that the design, installation, and maintenance of pipes and fixtures is no longer the work of the handy man, the lead worker, or the jack-of-all-trades. A plumber, to deserve the title and to receive the respect of his associates, must be trained in the art of his trade and the manipulation of his tools. He must have knowledge of the natural physical laws affecting the materials he uses and the installations he makes, legislation affecting plumbing, and business methods and procedure. In brief he must be a mechanic, a physicist, an architect, an engineer, a builder, and a business man.

2. The Purpose of Plumbing.—A plumbing system is installed in a dwelling or other building for the primary purpose of convenience and comfort. The supply pipes of the system bring a wholesome water supply and the drainage pipes carry off the used water. Sanitation and health as well as convenience and comfort, are served, and, because of the possible damages to health resulting from impure water and improper drainage, care and knowledge must be exercised in the installation of plumbing.

A wholesome water is supplied to most buildings by the municipality. The quality of the water is under the supervision of the local and state health authorities. The waste water is discharged into the common sewers where it is also cared for by governmental agencies. Where the public water supply is not wholesome or no public water supply is available or where no common sewers are available, private filtration of water and attention to proper sewage disposal become necessary and the plumber is called upon for information, equipment, and service in these matters.

CHAPTER III

WATER-SUPPLY PUMPS AND STORAGE TANKS

22. Power Used for Small Pumps.—Power for the small pumps used for private water supplies is developed by hand, windmill, hydraulic energy, gasoline, gas, and sometimes hot air. Steam and compressed air are seldom used in very small supplies. Electricity is frequently used for the transmission of power and the operation of pumps

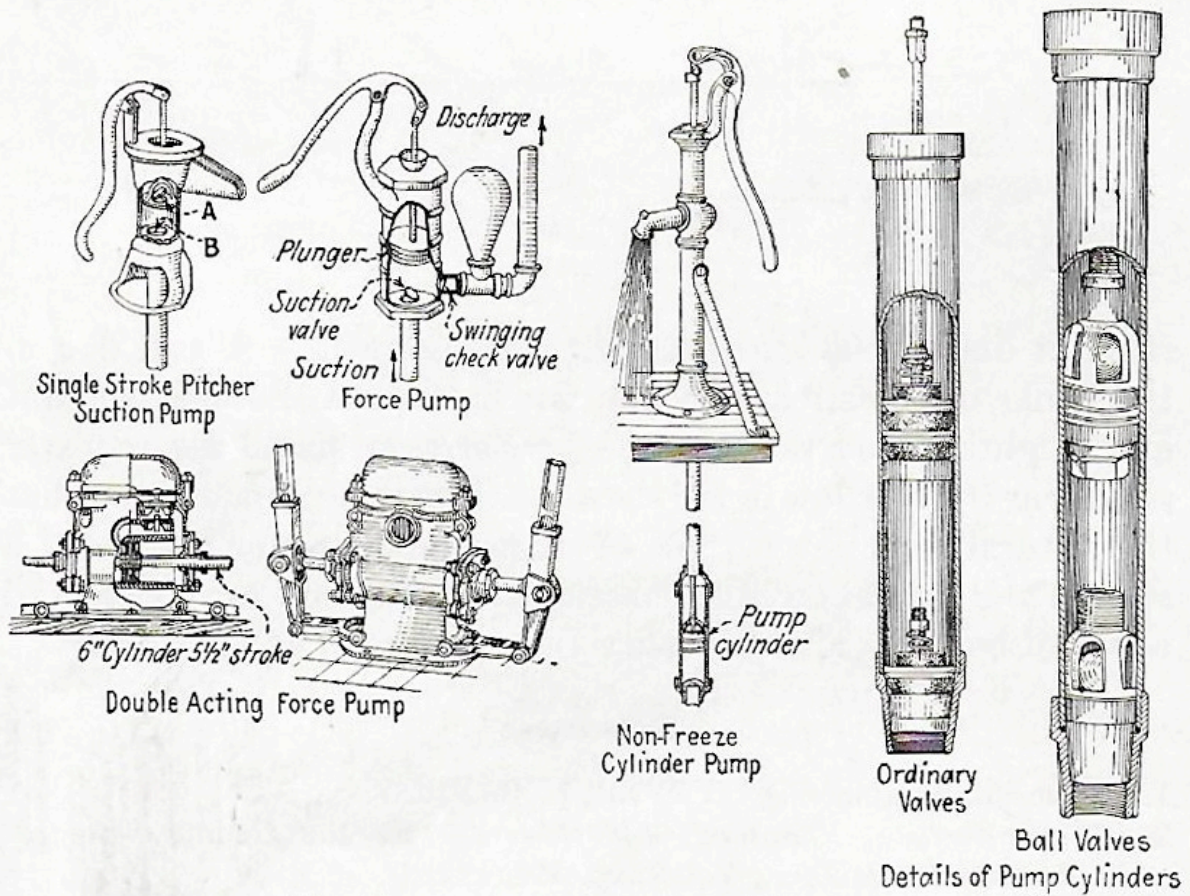
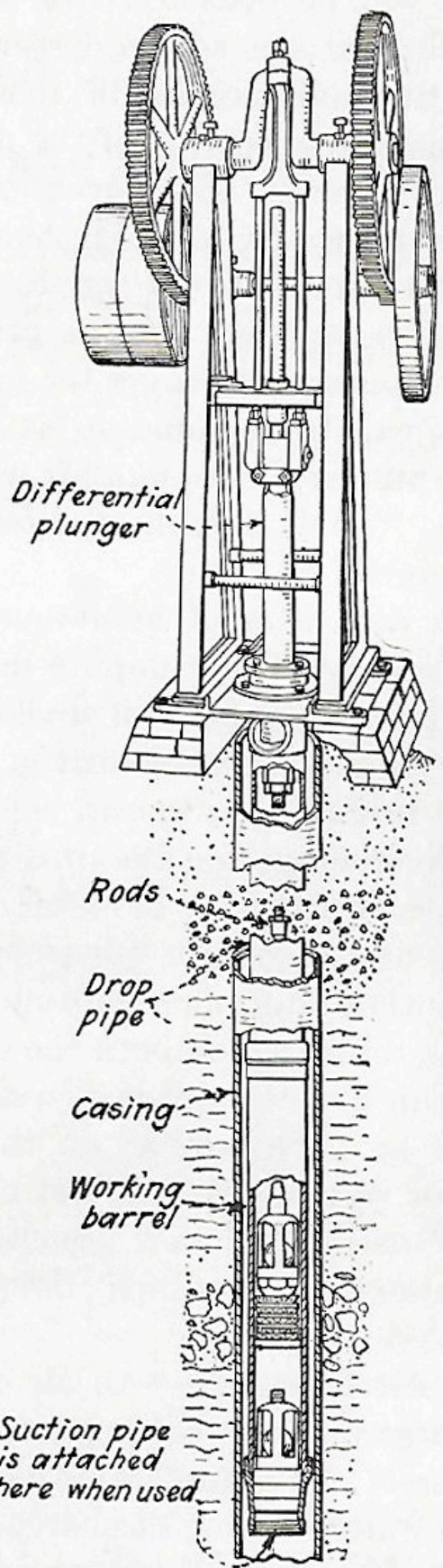
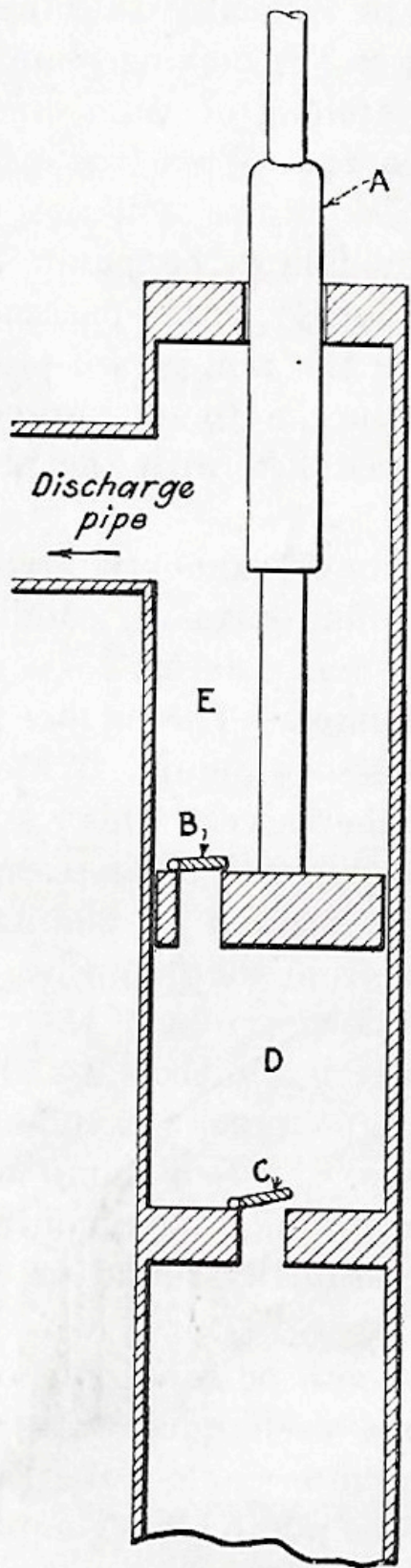


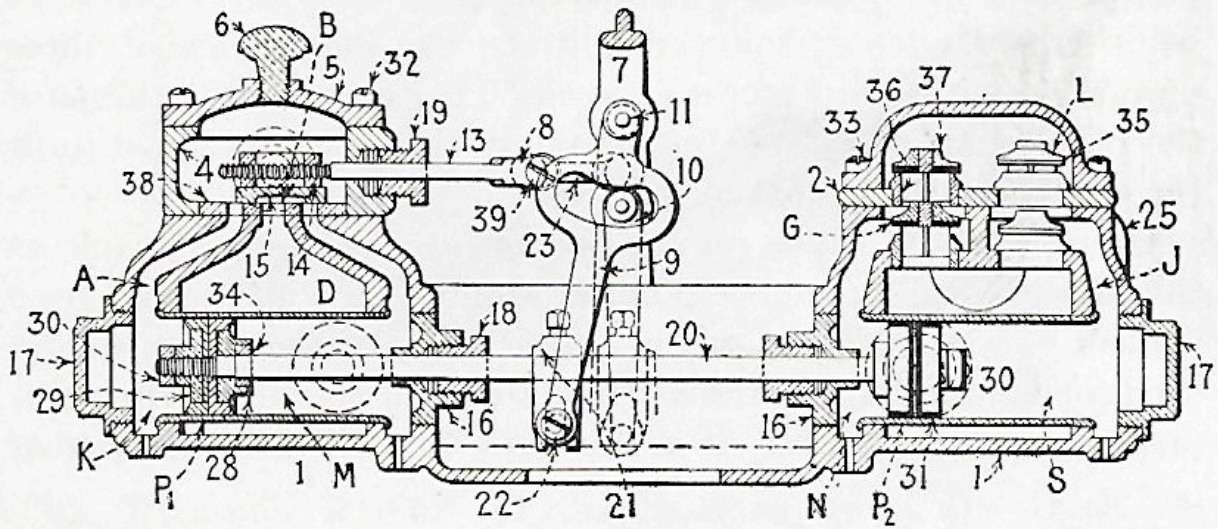
FIG. 12.—Types of hand-operated pumps



Diagrammatic section through differential plunger pump.

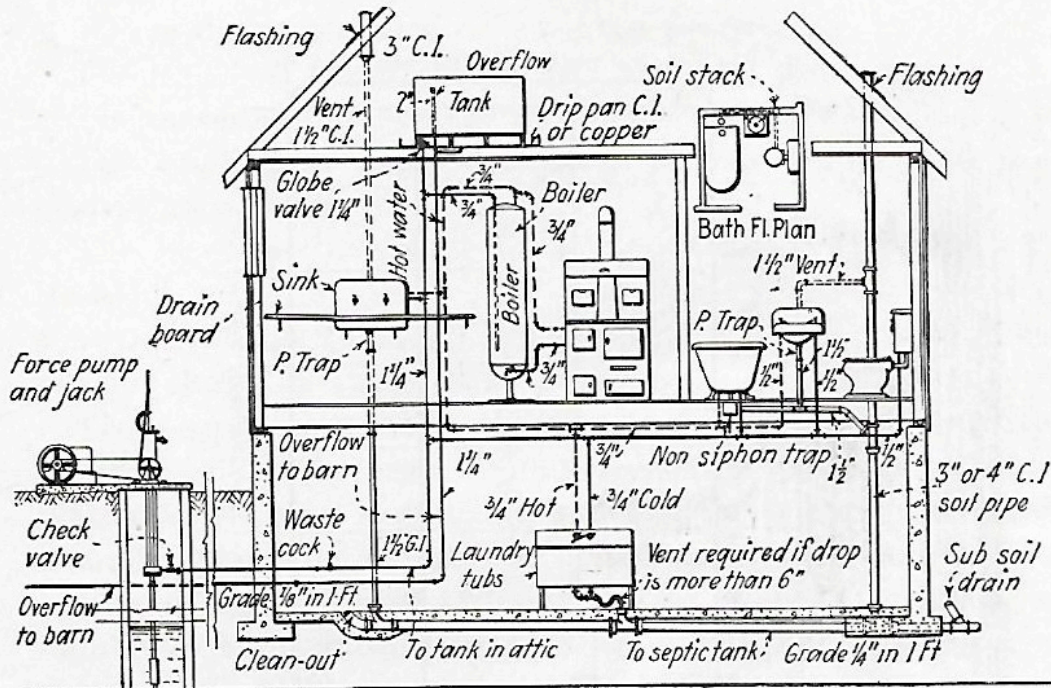
Section through deep well and differential plunger pump head. (American Well Works.)

FIG. 13.—Differential plunger pump.



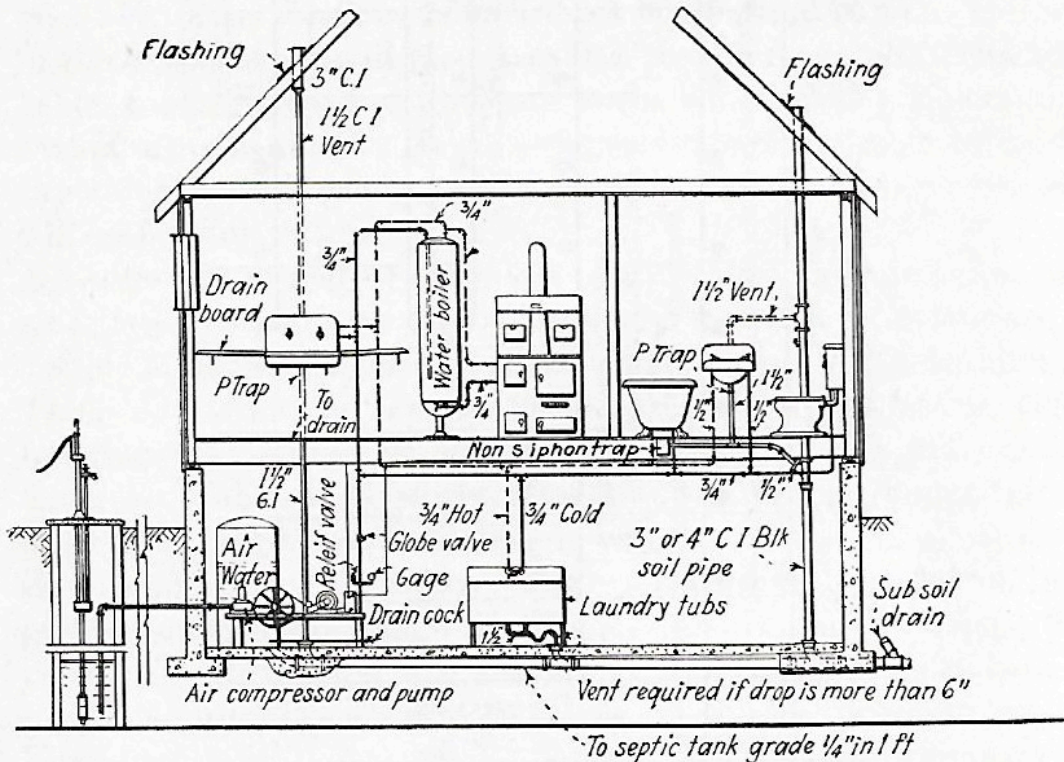
No.	Name of Piece	No.	Name of Piece	No.	Name of Piece
1.	Cylinders, brass-lined	15.	Slide valve	27.	Bracket
2.	Pump-valve plate	16.	Inside cylinder head	28.	Inside piston follower
3.	Pump-valve cap	17.	Outside cylinder head	29.	Outside piston follower
4.	Engine-valve chest	18.	Piston-rod stuffing-box nut	30.	Piston-rod nut
5.	Engine-valve chest cover	19.	Valve-rod stuffing-box nut	31.	Piston-cup leather
6.	Oil plug	20.	Piston rod	32.	Screw for engine-valve chest
7.	Rock-shaft arch	21.	Cross-head	33.	Screw for pump-valve cover
8.	Valve-rod jaw	22.	Shoulder screw for cross-head	34.	Cushion (rubber)
9.	Rock shaft (long lever)	23.	Valve-rod link	35.	Pump-valve leather
10.	Rock shaft (short lever)	24.	Drain cock	36.	Pump-valve seat
11.	Rock-shaft arbor	26.	Drip pan	37.	Pump valve complete
12.	Rock-shaft arbor screw			38.	Slide-valve seat
13.	Valve rod			39.	Screw for valve-rod link
14.	Valve-rod nut				

FIG. 16.—Section through a hydraulically driven duplex pump. (*The Geo. N. Roberts Co.*)



Water level not over 22' below pump cylinder

A Gravity Water System & Complete Plumbing Equipment (A)



A Hydropneumatic Water System & Complete Plumbing Equipment (B)

FIG. 28.—Water-supply pipe arrangements for a residence. (Circ. 303, Agr. College, Univ. of Ill.)

In Fig. B the pump and well can be replaced by a service pipe to the public supply. Note the pressure-relief valve.

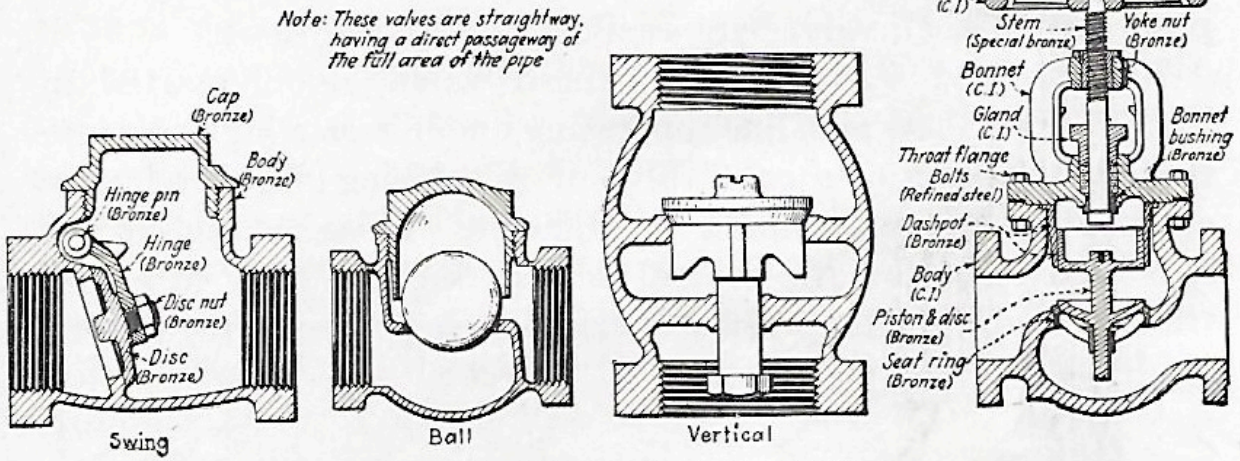


FIG. 54.—Types of check valves.

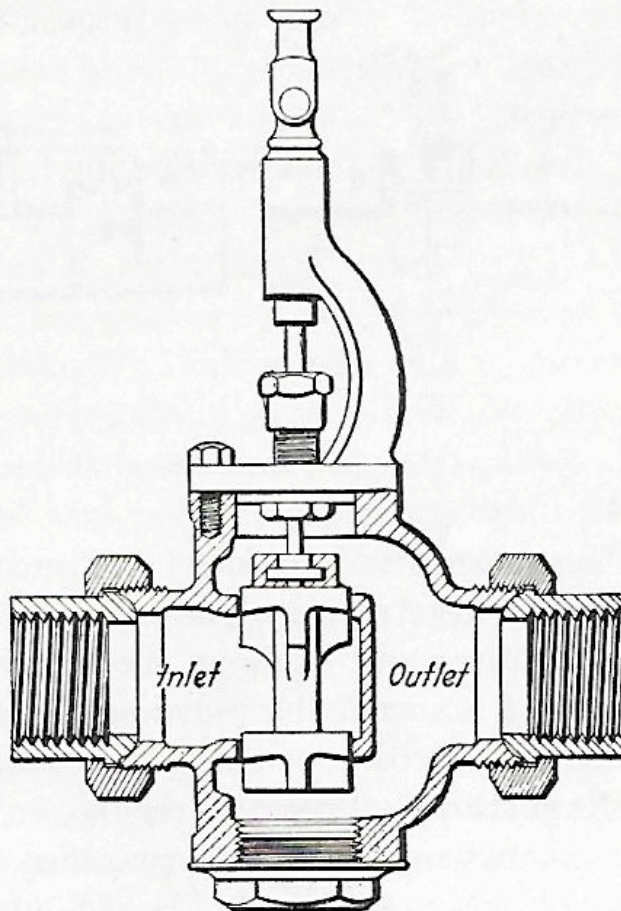


FIG. 55.—Section through a balanced valve. (Mason Regulator Co.)

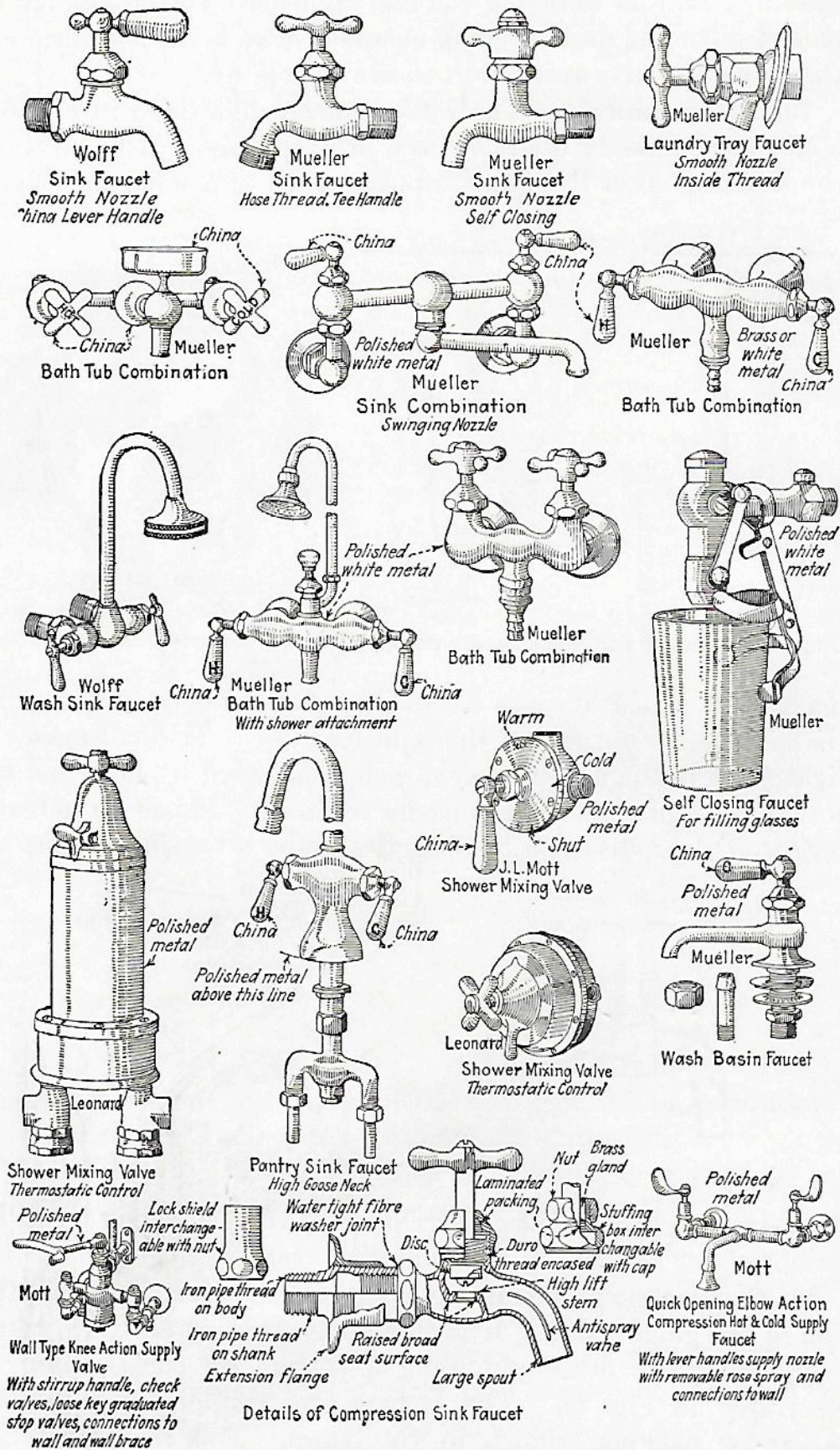


FIG. 66.—Types of faucets and shower-bath mixing valves.

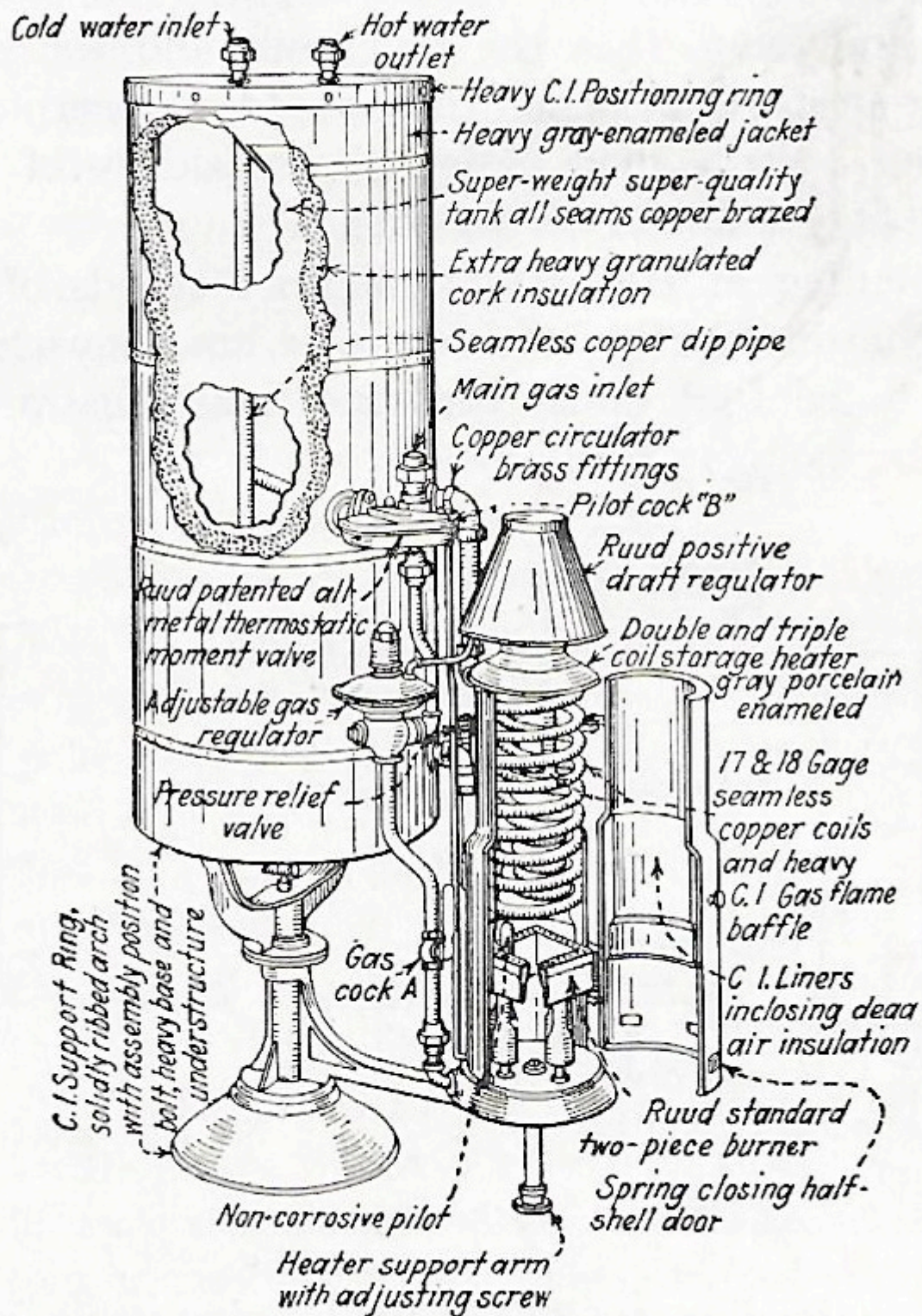


FIG. 72.—Ruud gas water heater.

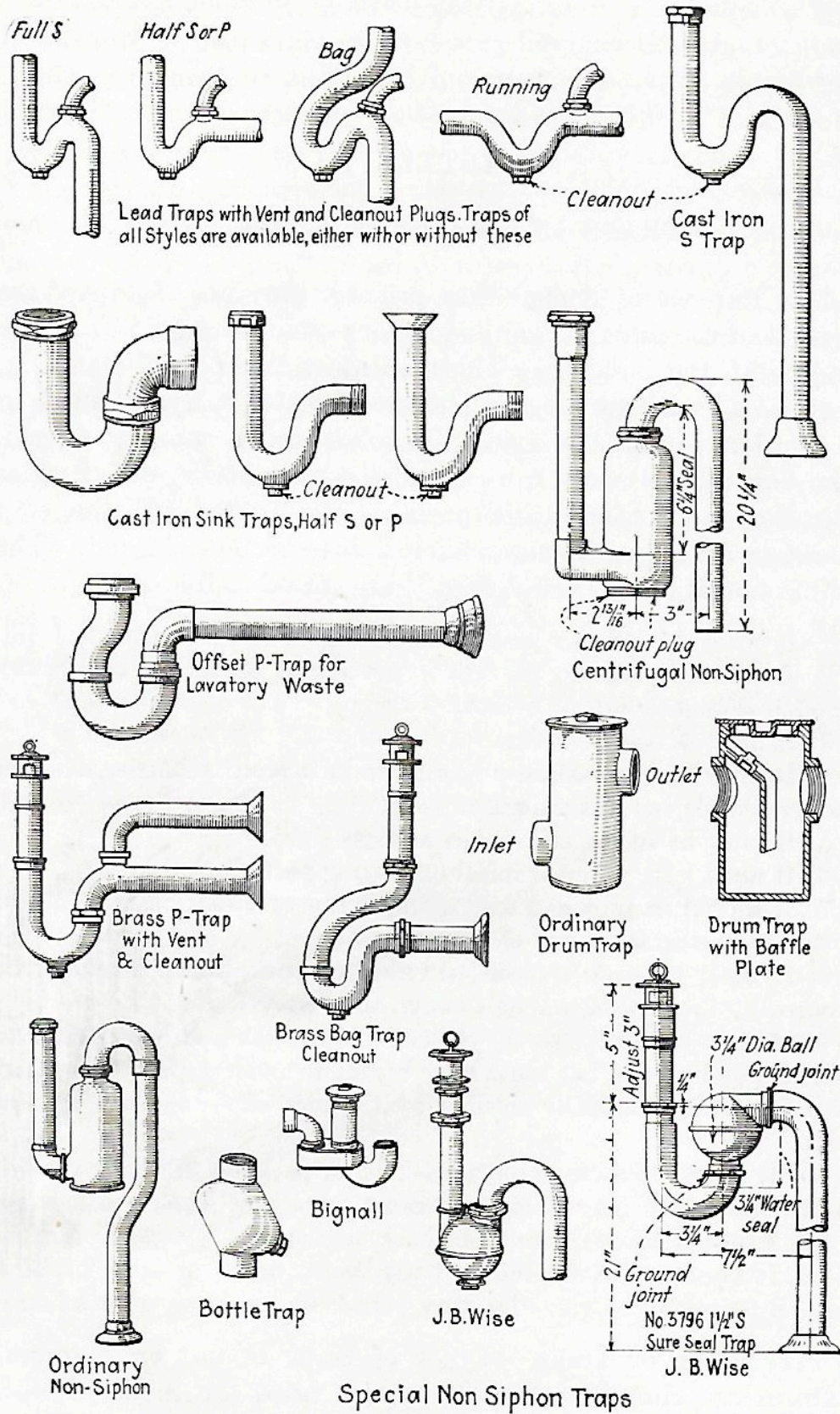


FIG. 81.—Types of traps used on plumbing fixtures. For bell traps, ball traps, etc., see Figs. 150 and 151.

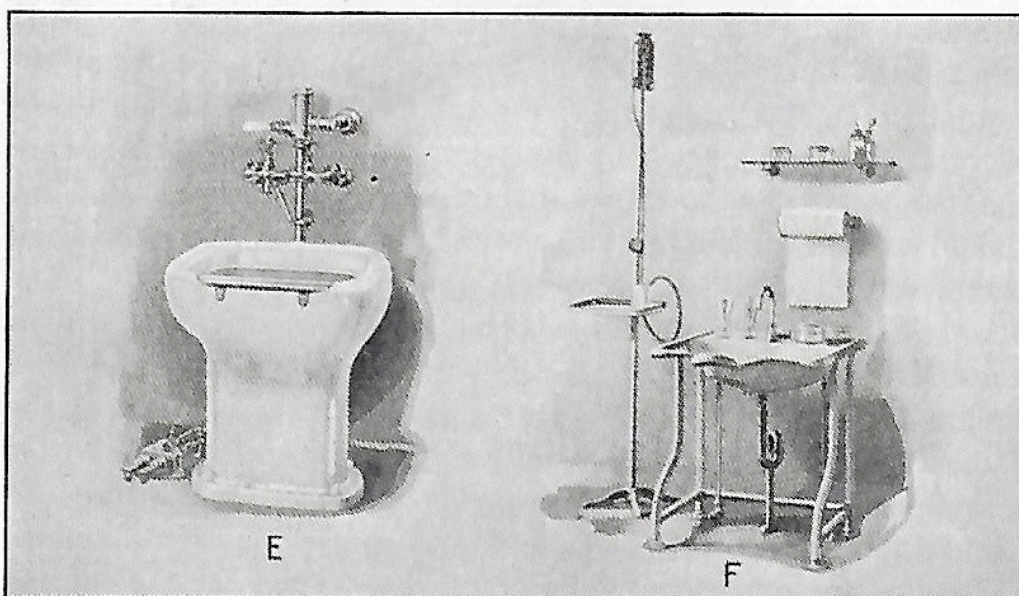
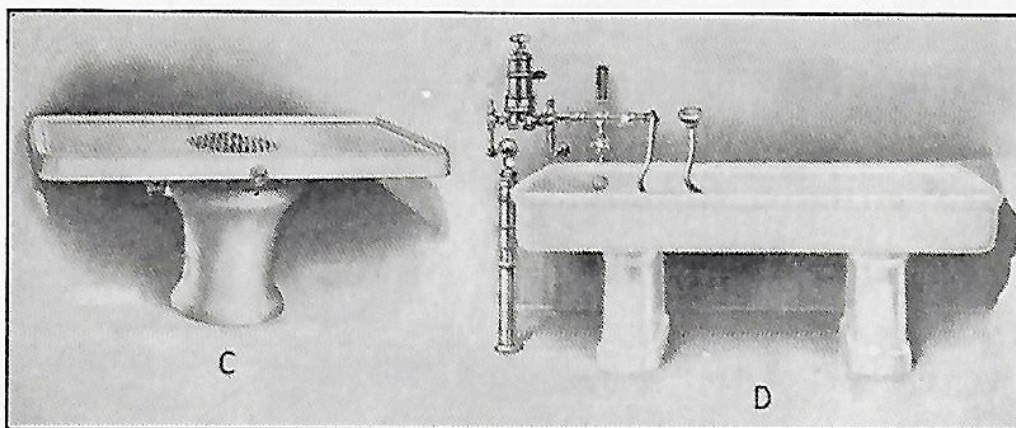
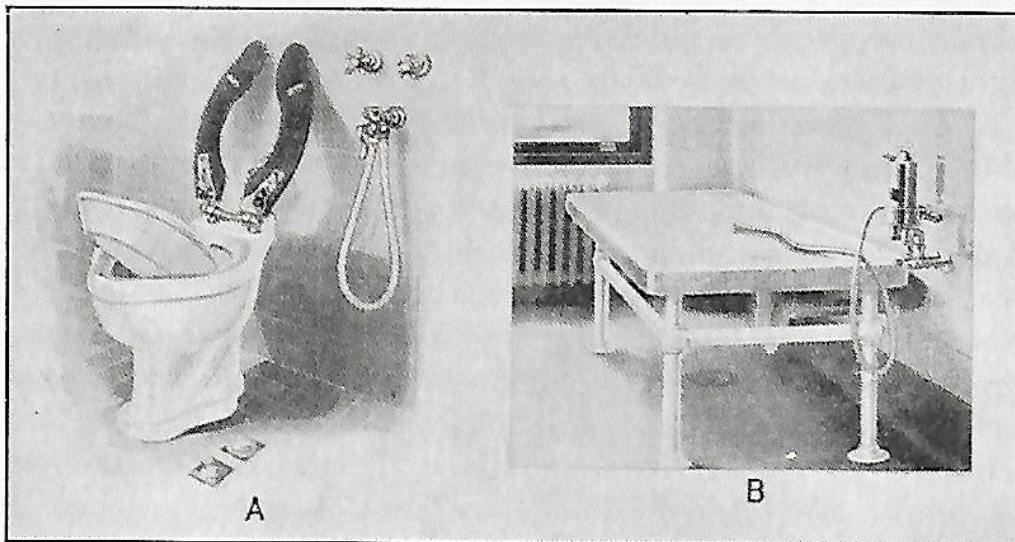
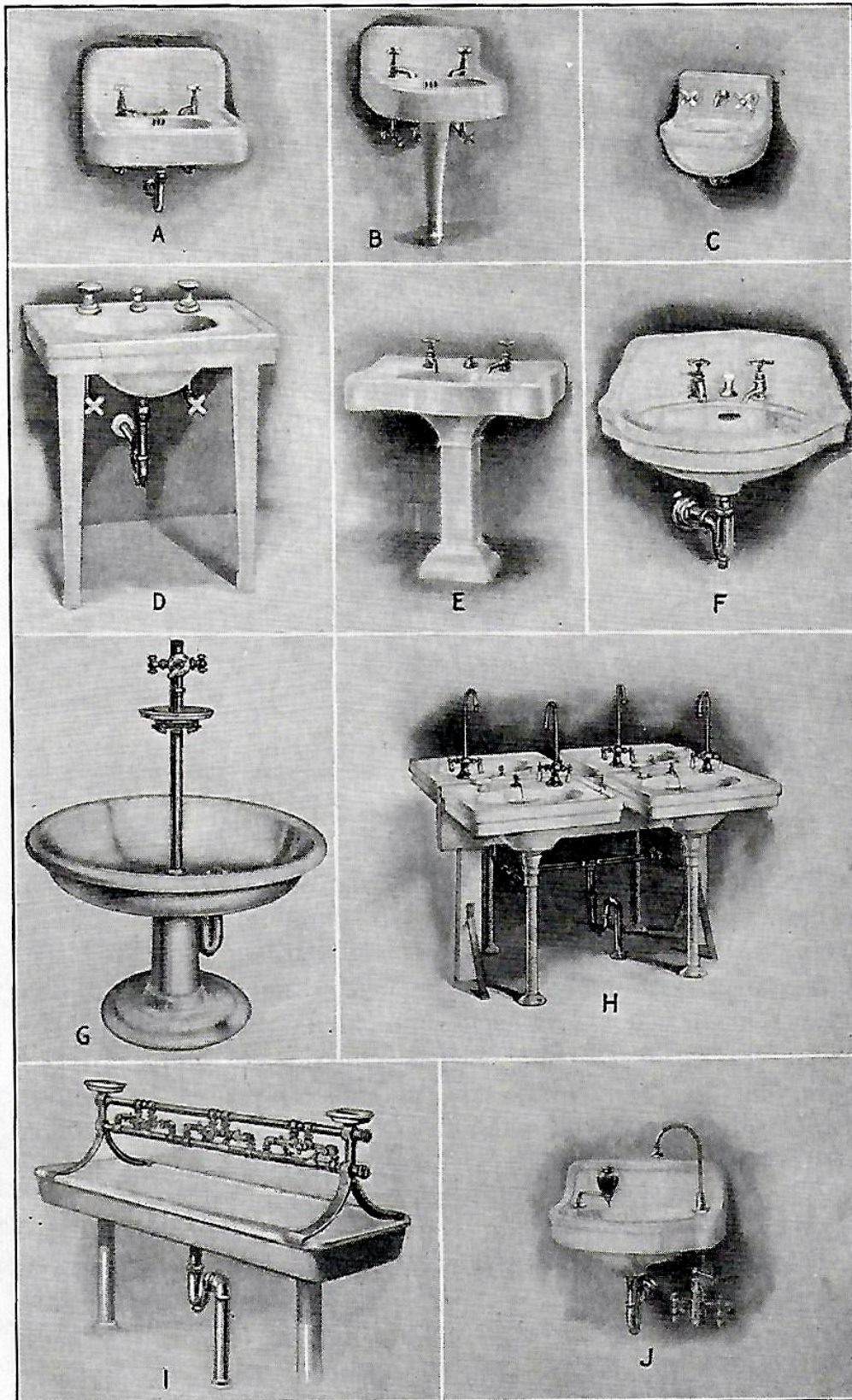
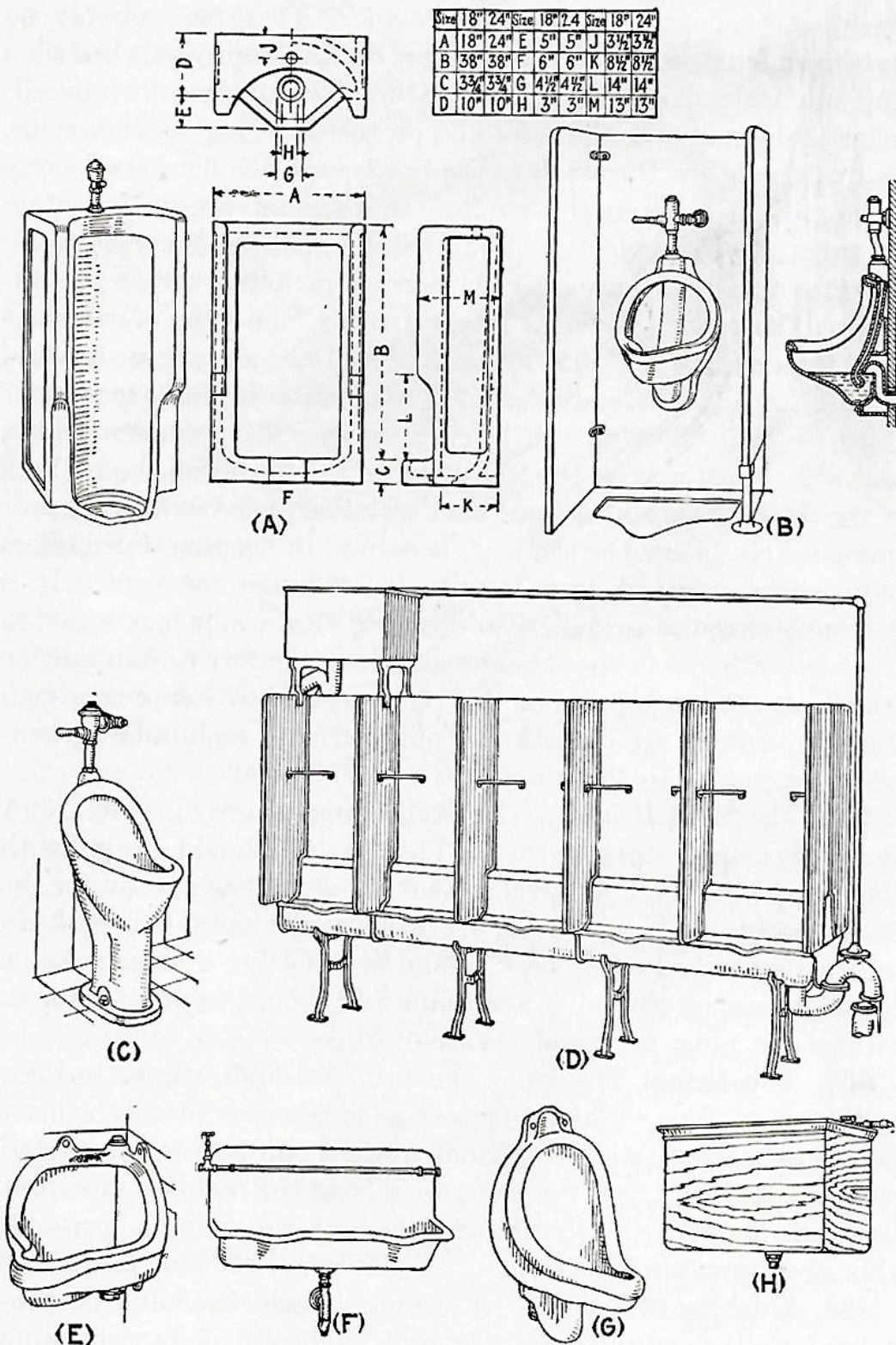


FIG. 149.—Special types of hospital fixtures. (Courtesy J. L. Mott Company.)



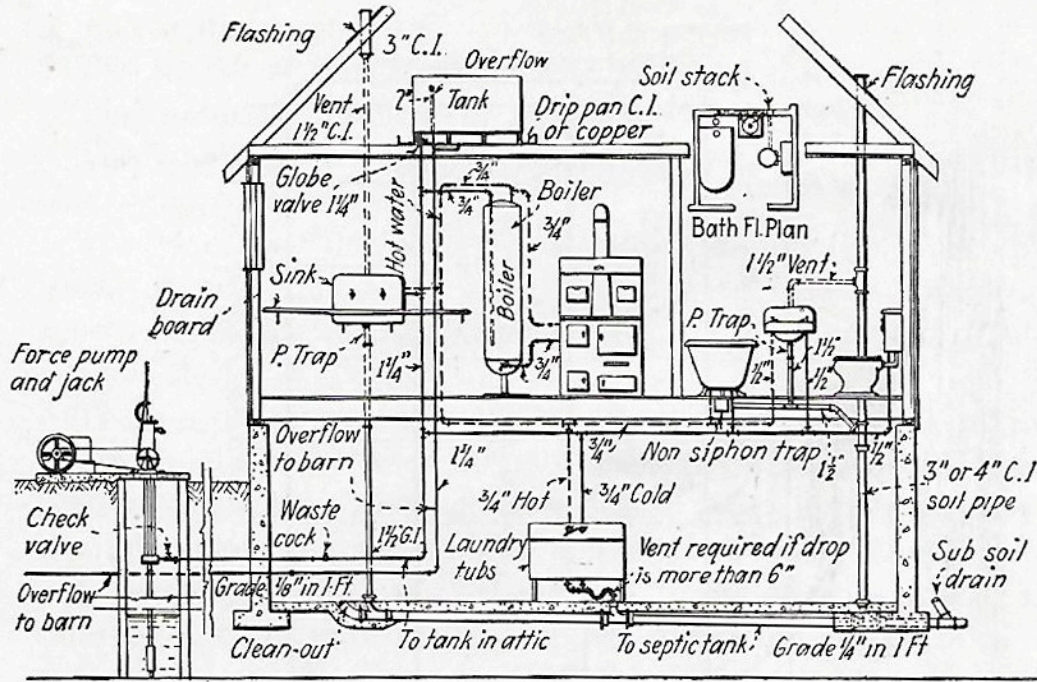
(A) Wall type. (Kohler.) (B) Single leg. (Kohler.) (C) Dental lavatory. (Mott.) (D) Two legs. (Sanitary Earthenware Specialty Company.) (E) Pedestal. (Richmond Radiator Company.) (F) Corner type. (Sanitary Earthenware Specialty Company.) (G) Circular lavatory for industrial plant. (Ebinger Sanitary Manufacturing Company.) (H) Factory type. (Mott.) (I) Barracks type. One trap. (Chicago Potteries.) (J) Surgical lavatory. Knee-action faucet. (Mott.)

FIG. 153.—Types of lavatories.



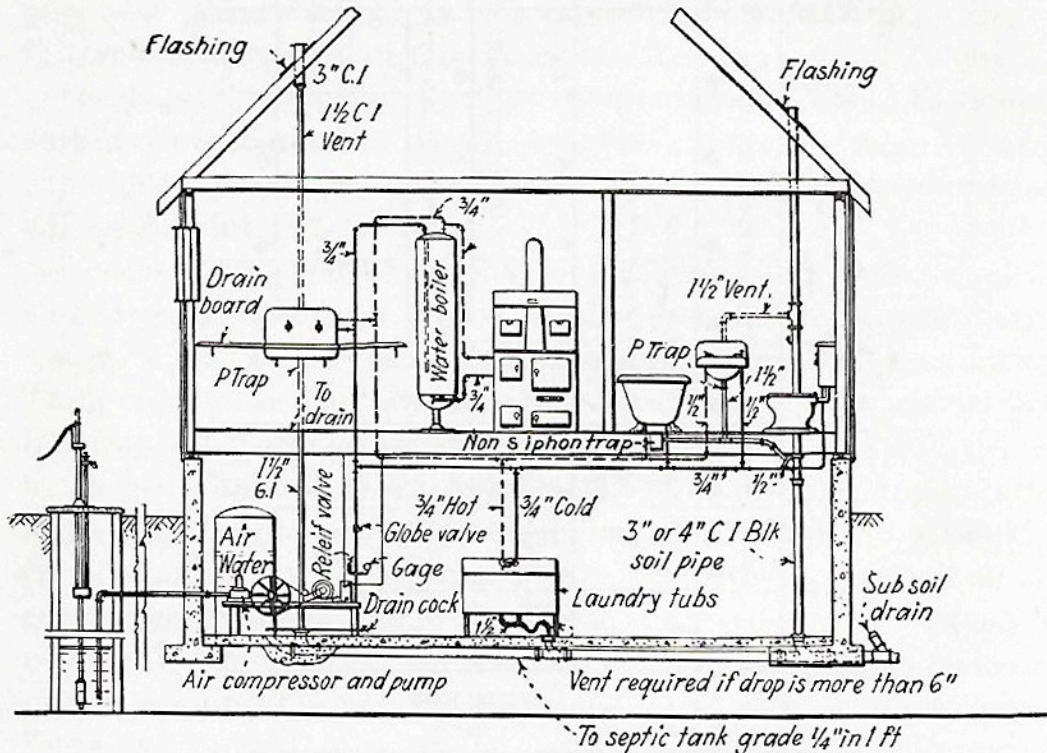
- (A) Stall urinal. (*Woodbridge Ceramic Company.*)
- (B) Wall urinal showing two types of stall walls. (*Mott.*)
- (C) Pedestal urinal with flush valve and siphon jet. (*Trenton Potteries Company.*)
- (D) Trough urinal with stalls. (*Mott.*)
- (E) Corner urinal, wall type. (*Trenton Potteries Company.*)
- (F) Trough urinal. (*Kohler.*)
- (G) Wall urinal with integral trap. (*Camden Pottery Company.*)
- (H) Automatic flushing tank. (*Becker Manufacturing Company.*)

FIG. 159.—Types of urinals.



Water level not over 22' below pump cylinder

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A Hydropneumatic Water System & Complete Plumbing Equipment (B)

FIG. 28.—Water-supply pipe arrangements for a residence. (Circ. 303, Agr. College, Univ. of Ill.)

In Fig. B the pump and well can be replaced by a service pipe to the public supply. Note the pressure-relief valve.

DOMESTIC SANITARY ENGINEERING AND PLUMBING

DEALING WITH DOMESTIC WATER SUPPLIES,
PUMP & HYDRAULIC RAM WORK, HYDRAULICS,
SANITARY WORK, HEATING BY LOW PRESSURE,
HOT WATER, & EXTERNAL PLUMBING WORK

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THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE, GLASGOW



WITH 277 ILLUSTRATIONS

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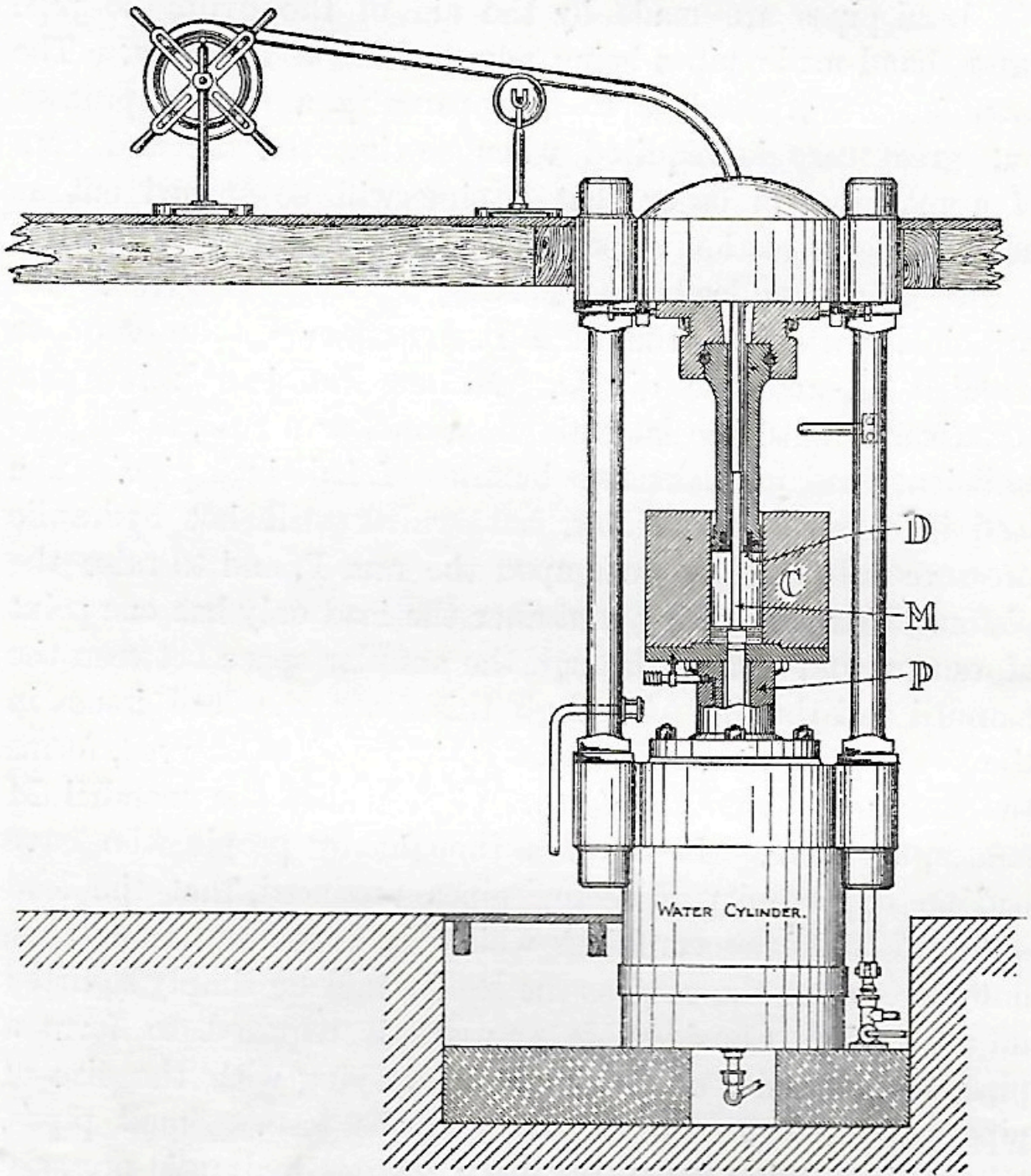


FIG. 1.—Machine for making lead pipe.

LEAD ROLLING MILL.

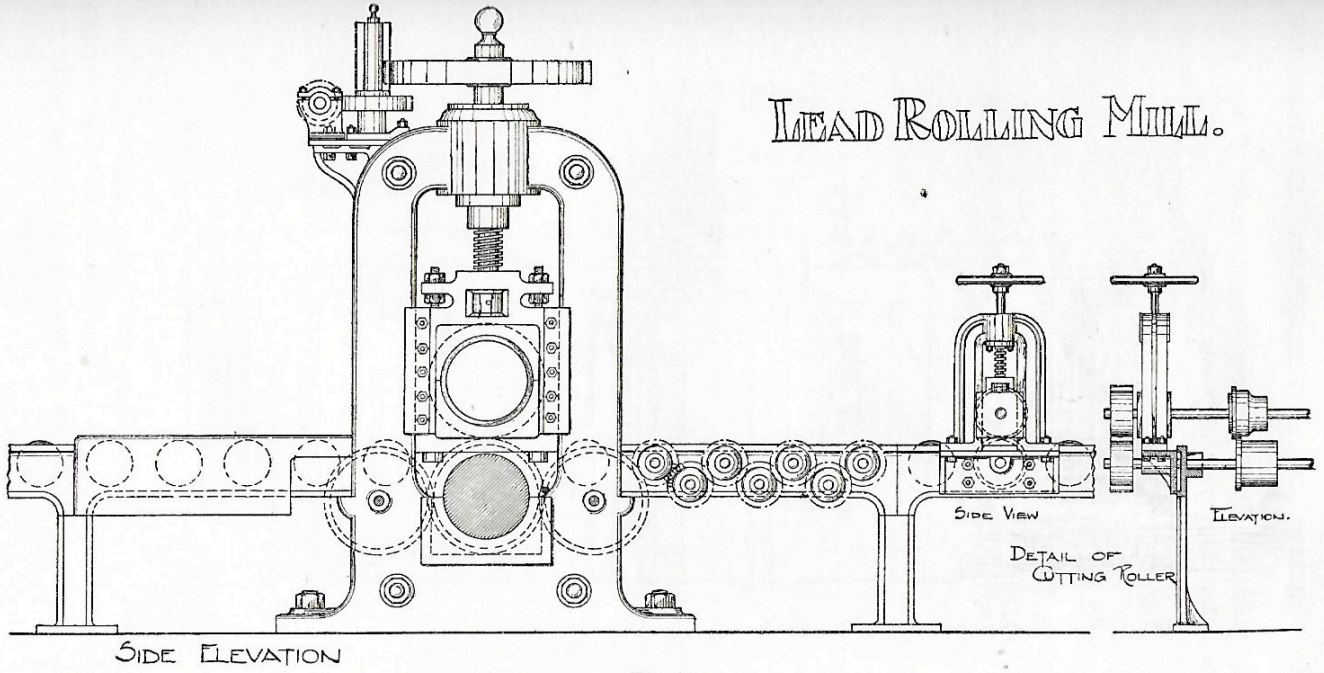
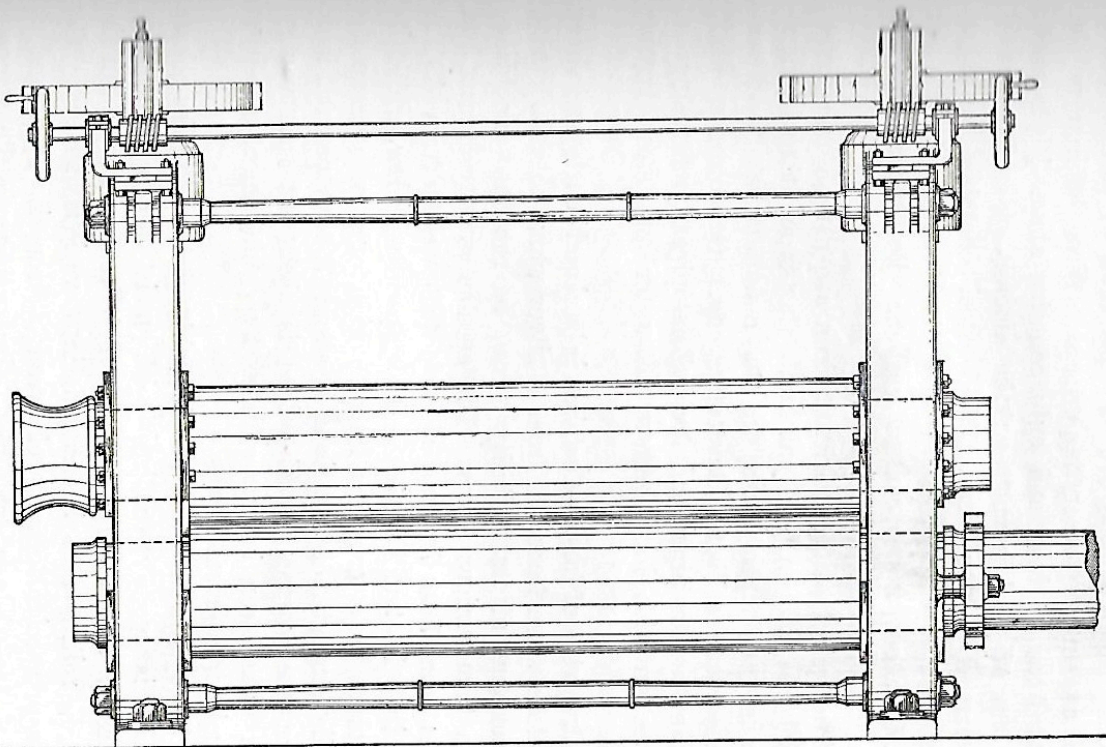
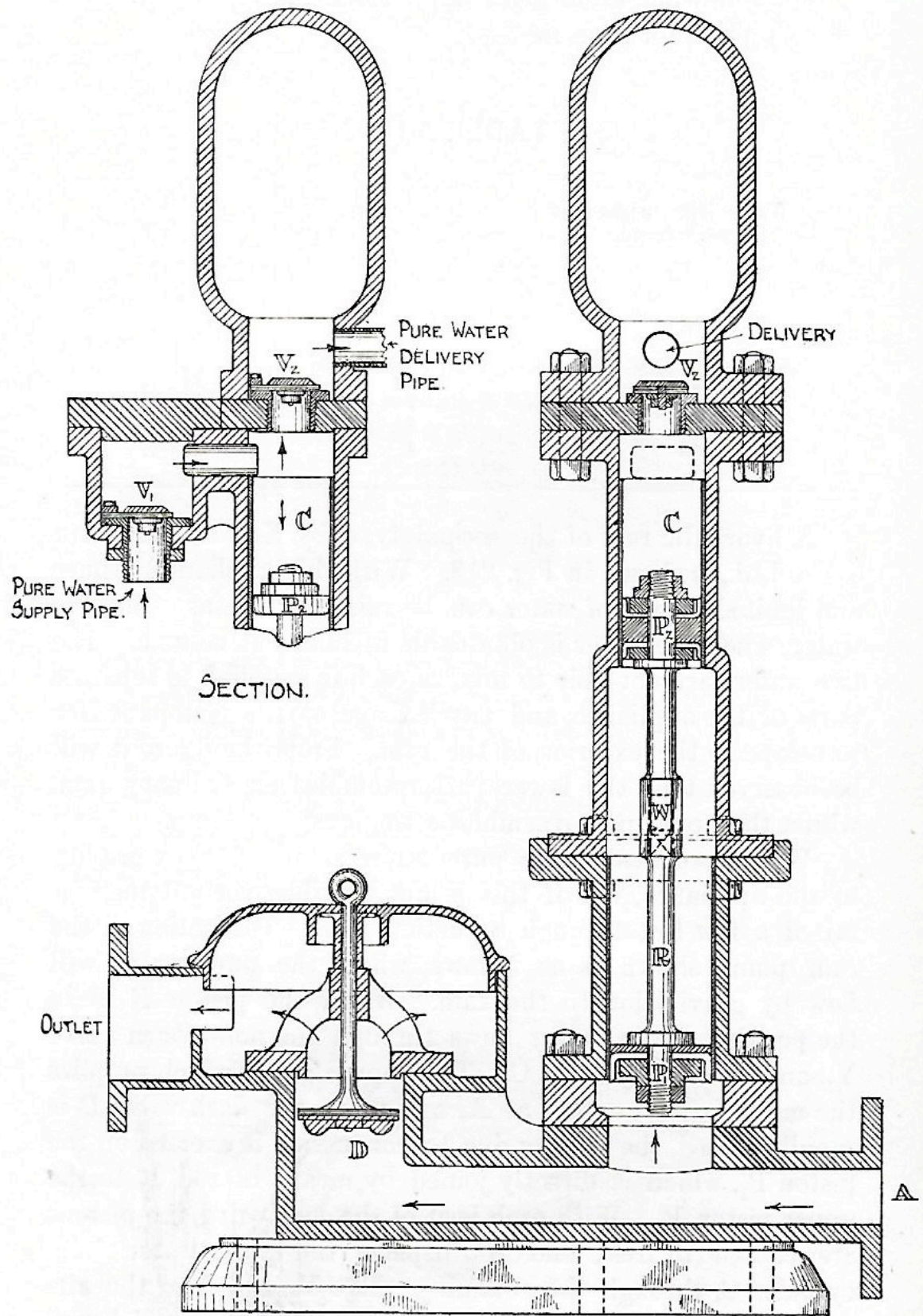


FIG. 2.



FRONT ELEVATION.

FIG. 2b.—Front view of cast-iron rollers of Rolling Mill.



SECTION.

FIG. 213.—Keith and Blackman's hydraulic ram pump.