

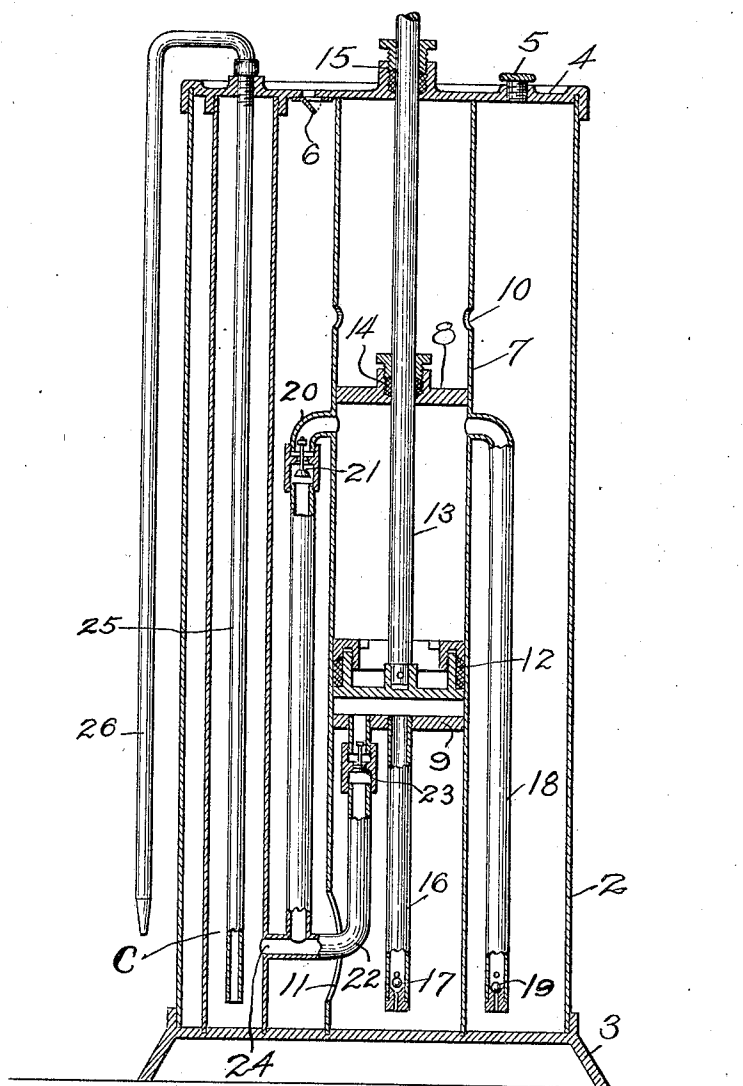
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G. T. PEARSONS

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SYRINGE

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UNITED STATES PATENT OFFICE.

GEORGE T. PEARSONS, OF NEW YORK, N. Y.

SYRINGE.

Application filed April 21, 1920. Serial No. 375,463.

To all whom it may concern:

Be it known that I, GEORGE T. PEARSONS, a citizen of the United States, and a resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Syringes, of which the following is a specification.

This invention relates to apparatus of the syringe type in which liquid is discharged from a reservoir by the actuation of a reciprocable piston cylinder pump in which the liquid is drawn from the reservoir upon each inward and outward movement of the piston.

It is the principal object of the invention to provide apparatus of this character in which the liquid as it is drawn from the reservoir upon each inward and outward movement of the piston is discharged into a casing or chamber with which the outlet of the reservoir is in communication, said chamber or casing containing air which is compressed to place the liquid as it is discharged therinto by the pumping mechanism under pressure and serve to eject the liquid from said chamber.

In the drawing accompanying and forming a part of this specification I have shown in sectional side elevation apparatus embodying my invention.

In the embodiment of my invention shown in the drawing there is provided a reservoir comprising a cylindrical body portion 2 having a closure at one end to constitute the bottom and arranged to support the reservoir in vertical position, the other end having a closure 4 arranged with a filler opening closed by a removable plug or cap 5, said end also being provided with an air inlet valve 6 operable to permit of the entrance of air into said reservoir to displace the liquid as it is discharged from the reservoir.

The pump mechanism comprises a cylinder 7 extending from the top to the bottom of the reservoir, the piston chamber proper being formed by partitions 8, 9 located substantially equidistantly from the top and bottom of the reservoir, the portion of the cylinder above the partition 8 being connected to the reservoir by ports or openings 10, and the portion below the partition 9 by a perforation or opening 11. A piston 12 provided with suitable packing is reciprocable in the cylinder or piston cham-

ber and operates to separate the piston chamber into two compartments, one at the forward end and the other at the rear end of the piston. The piston is carried by a rod 13 passing through a stuffing box 14 in the partition 8 and a stuffing box 15 in the top of the reservoir and having an operating handle at the outer end to manipulate the piston. The compartment at the forward end of the piston is connected to the reservoir by a pipe 16 extending from the lower end of the piston chamber to the bottom of the reservoir and having a valve 17 opening inward to and closing outward from the piston chamber. The compartment of the piston chamber at the rear end of the piston is connected to the reservoir by a pipe 18 extending to adjacent the bottom of the reservoir and also being provided with an inwardly opening and outwardly closing valve 19.

The liquid is drawn from the reservoir alternately to the compartments of the piston chamber at opposite sides of the piston during the reciprocation of the piston through pipes 16, 18 and is alternately discharged from said compartments through a pipe 20 connected to a port leading from the compartment at the rear of the piston, said pipe having a check valve 21 closing into and opening outward from the piston chamber, and the liquid is discharged from the compartment in front of the piston through a pipe 22 in communication with said compartment, said pipe having a check valve 23 closing into and opening outwardly from the piston chamber.

The liquid is discharged through the pipes 20, 22 to the casing or chamber C containing air and consisting of a tube extending from the top to the bottom of the reservoir, the pipe 22 being connected to the lower end of said chamber, as at 24, and the pipe 20 having connection with the pipe 22 adjacent the connection of said latter pipe with the air chamber C. The discharge outlet of the reservoir leads from the chamber C in the form of a tube 25 extending from the top of the reservoir to a point below the connection of the pipe 22 with the chamber C, and has a flexible hose 26 connected thereto provided with a discharge nozzle.

In operation as the piston is reciprocated liquid is drawn from the reservoir alternately to the compartments of the piston chamber at opposite sides of the piston and

alternately discharged from said compartments into the air chamber C compressing the air therein and such compressed air operating to eject the liquid from the air chamber through the pipe 25.

Having thus described my invention, I claim:

1. The combination of a reservoir; a chamber in the reservoir connected at opposite ends with the reservoir; a piston in said chamber; an air compression chamber in the reservoir extending between opposite ends thereof; an outlet tube for the liquid in the reservoir engaging in said air chamber having an outlet from one end to said chamber and the inlet end of the tube extending to adjacent the opposite end of the chamber; and means to connect the opposite ends of the piston chamber adjacent the inlet end of the outlet tube therein with the air chamber for the purpose specified.

2. The combination with a reservoir to contain liquid, of an air chamber extending from end to end of the reservoir; an outlet tube for the reservoir engaging in said air chamber having an outlet from one end of the chamber and the inlet adjacent the opposite end of the chamber; a cylinder in the reservoir; ports in the cylinder adjacent opposite ends connected to the reservoir adjacent one end thereof; a valve for each of said ports opening into and closing outward from the cylinder to control said ports; ports in the cylinder adjacent opposite ends connected to the air chamber adjacent the inlet end of the outlet tube therein; a valve for each of said ports closing into and opening outward from the cylinder to control said outlet ports; and a piston to reciprocate in the cylinder for the purpose specified.

3. The combination with a reservoir to

contain liquid, of an air compression chamber in the reservoir extending from the top to the bottom of the reservoir; an outlet tube for the reservoir leading from the top of the reservoir and extending to the bottom of the air chamber; a cylinder in the reservoir; suction inlets from the bottom of the reservoir to opposite ends of the cylinder; valve controlled outlets from opposite ends of the cylinder connecting to the air compression chamber adjacent the lower end thereof; and a piston to reciprocate in the cylinder for the purpose specified.

4. The combination with a reservoir to contain liquid, of an air compression chamber in the reservoir extending from the top to the bottom of the reservoir; an outlet tube for the reservoir extending from the top to adjacent the bottom of the air compression chamber; a cylinder in the reservoir in parallel relation to the air compression chamber; a piston to reciprocate in said cylinder and separating the cylinder into a pair of chambers one at opposite sides of the piston; an inlet port to each of said chambers from the reservoir; tubes connected to said inlet ports extending to adjacent the bottom of the reservoir; a suction valve in each of said tubes; an outlet port from each of said cylinder chambers at opposite ends of the piston; tubes connecting the outlets with the air chamber at a point above the inlet end of the outlet tube; and a valve for each of said outlet tubes of the chambers operable during the reciprocation of the piston to control the discharge of the liquid from the cylinder chambers into the air compression chamber.

Signed at the city of New York, in the county of New York, and State of New York, this 16th day of April, 1920.

GEO. T. PEARSONS.