March 31, 1953 A. P. RUTH 2,633,081

PUMPING EQUIPMENT

Filed Aug. 23, 1948

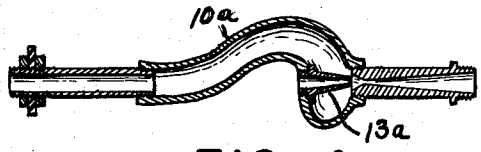
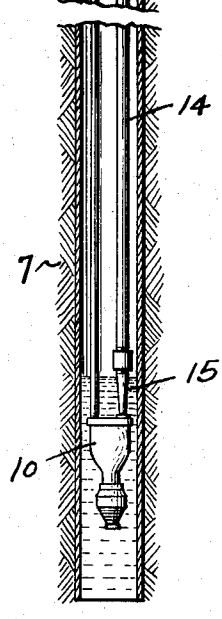


FIG. 4

FIG. 1



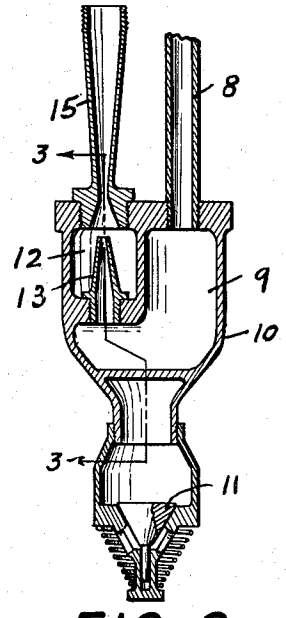


FIG. 2

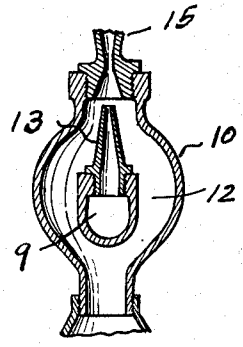


FIG. 3

INVENTOR.
Arthur P. Ruth

BY

E. V. Hardway.
ATTORNEY

Patented Mar. 31, 1953 2,633,081

UNITED STATES PATENT OFFICE

2,633,081

PUMPING EQUIPMENT

Arthur P. Ruth, Houston, Tex.

Application August 23, 1948, Serial No. 45,665

3 Claims. (Cl. 103—5)

1

This invention relates to pumping equipment.

An object of the invention is to provide equipment of the character described specially designed for pumping liquid from a well.

It is another object of the present invention to provide equipment of the character described including a pressure tank in combination with a suction pump and a discharge line leading from the well and connected with the pump through which the liquid is drawn from the well with an injector arranged to utilize the pressure liquid in the tank to accelerate the flow of liquid from the well through said discharge line into the tank.

In one embodiment of the invention there is also included a pressure line leading from the pressure tank and connected into the injector in the well.

In another embodiment of the invention the injector is located in the tank and is connected into said discharge line.

Other objects and advantages will be apparent from the following specification which is illustrated in the accompanying drawings, wherein:

Figure 1 is an elevation, partly in section, of one embodiment of the invention.

Figure 2 is an enlarged, sectional view of the injector and the associated pressure line and discharge line.

Figure 3 is a fragmentary, sectional view taken on the line 3—3 of Figure 2, and

Figure 4 is a sectional view of the injector which may be incorporated into the pump intake pipe within the pressure tank.

Referring now more particularly to the drawings wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a pressure tank and located near the bottom of the tank and mounted in the wall of the tank there is a suction pump 2 which may be driven in any preferred manner as by means of an electric motor 3. This motor is connected to a suitable source of electrical supply through the electrical conductor 4 which is equipped with a conventional type of pressure switch 5 which is opened, to stop the motor, when the pressure of the liquid in the tank reaches a predetermined pressure.

The tank 1 is provided with a service outlet pipe 6 which may be controlled by a suitable conventional valve.

The numeral 7 designates, generally, the well to be pumped.

In the embodiment illustrated in Figure 1 there is a pressure line 8 leading from the tank 1 down into the well. The lower end of this line may be

2

connected into the chamber 9 of an ejector 10. The lower end of the ejector is provided with an inwardly opening back pressure valve 11.

The ejector 10 is provided with an intake ejector chamber 12 and in this chamber there is an ejector nozzle 13 whose lower end is in communication with the chamber 9.

The numeral 14 designates a discharge line whose lower end is formed into the discharge nozzle 15 which is in alignment with the ejector nozzle 13.

From the foregoing with pressure built up in the tank 1 said pressure will be exerted through the line 8 into the chamber 9 and will discharge liquid through the ejector nozzle 13 to accelerate the inlet of liquid from the well into the ejector and thence through the discharge line 14.

As hereinbefore stated the pump 2 is a suction type pump. The upper end of the discharge line 14 enters the pressure tank 1 opposite said pump and the pump is equipped with a suction pipe 16 which has a slip joint connection, indicated at 16', with the opposing end of the discharge line 14 and is sealed therewith. This particular connection between the discharge line 14 and the suction line 16 is merely for the purpose of convenience in installation and dismemberment.

The pump 2 will draw the liquid from the well through the discharge line 14 and discharge said liquid through the pump outlets, as 17, into the tank and as the tank pressure is built up the pressure of the liquid through the line 8 will operate the injector in the well and will assist the flow of liquid from the well through the line 14 into the tank.

In one form of the invention the pressure line 8 and the injector 10 may be dispensed with and the type of injector 10a, shown in Figure 4, may be substituted for the suction line 16. The liquid, under pressure, in the tank 1 will thus be injected through the injector nozzle 13a and the pressure in the tank 1 thus added to the suction generated by the pump 2 will accelerate the flow of liquid from the well through the discharge line 14.

What I claim is:

1. Pumping equipment comprising, a pressure tank, a suction pump removably mounted in a wall of the tank and having a discharge outlet and a suction inlet within the tank, a discharge line leading from a well and extending through the wall of the tank opposite said pump, a suction pipe connected into the inlet of the pump and having a slidable connection with the discharge line in the tank and through which liquid

may be drawn into the pump and discharged through said outlet into the tank to build up pressure in the tank, an injector arranged to deliver liquid from the well into the discharge line and a pressure line leading from the tank and connected to the injector to augment the flow of liquid from the well into the discharge line.

2. Pumping equipment comprising, a pressure tank, a suction pump removably mounted in a wall of the tank and having a discharge outlet and a suction inlet within the tank, a discharge line leading from a well and extending into the tank with its discharge end opposite the pump, a suction pipe connected into the inlet of the pump and having its inlet end removably positioned in the discharge end of said discharge line whereby liquid may be drawn into the pump and discharged through said outlet into the tank to build up pressure in the tank, an injector arranged to deliver liquid from the well into the discharge line and a pressure line leading from the tank and connected to the injector, said injector also having an opening through which liquid may flow from the well into the injector and a back pressure valve positioned to control the inlet of liquid through said opening from the well into the injector.

3. Pumping equipment comprising, a pressure tank, a pump removably mounted on a wall of the tank and extending into the tank and having a suction inlet and a discharge outlet port within the tank, a well discharge line leading from a well and extending through the wall of the tank

opposite the pump, a suction pipe connected into the pump intake and having a slidable connection with said discharge line and through which liquid may be drawn into the pump and discharged through said outlet port into the tank to build up pressure in the tank, an injector in the well having a discharge outlet in communication with the discharge line and an inlet in communication with said pressure line to direct liquid, under pressure, from within the tank into said discharge line, said injector also having an inlet opening in communication with the well, and a back pressure valve positioned to allow the inflow of liquid through said opening into the injector from the well but to prevent the back flow of such liquid.

ARTHUR P. RUTH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,528,412	Fletcher	Mar. 3, 1935
2,172,057	Burks	Sept. 5, 1939
2,257,507	Mann	Sept. 30, 1941
2,403,555	Ruth	July 9, 1946
2,403,556	Ruth	July 9, 1946
2,452,874	Shallenberg	Nov. 2, 1948

FOREIGN PATENTS

Number	Country	Date
255,291	Italy	Oct. 15, 1927