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Fig. 1.

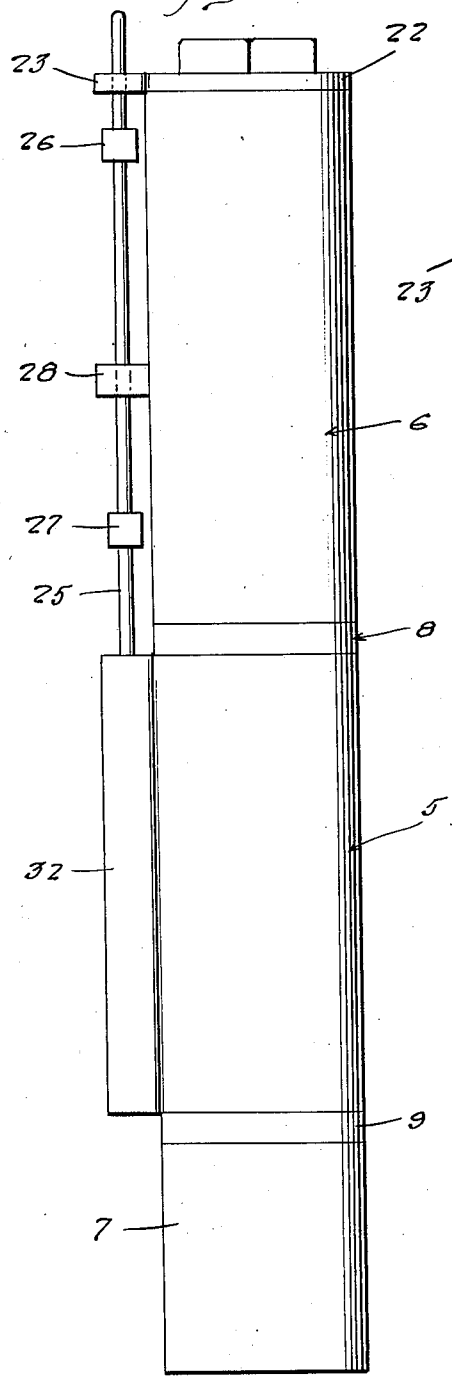


Fig. 15.

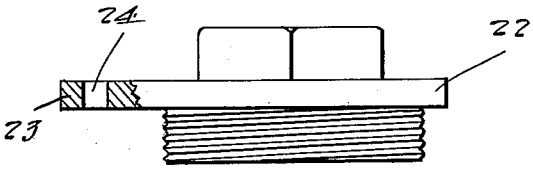
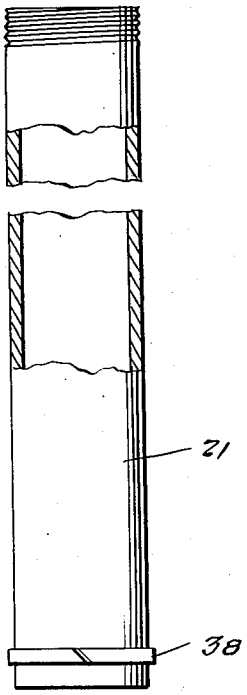


Fig. 14.



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Fig. 2.

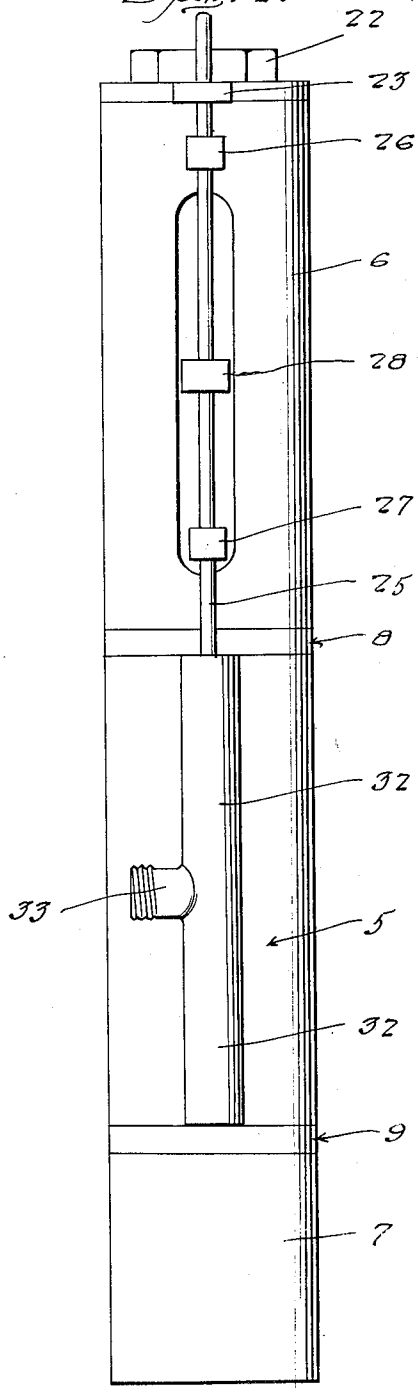
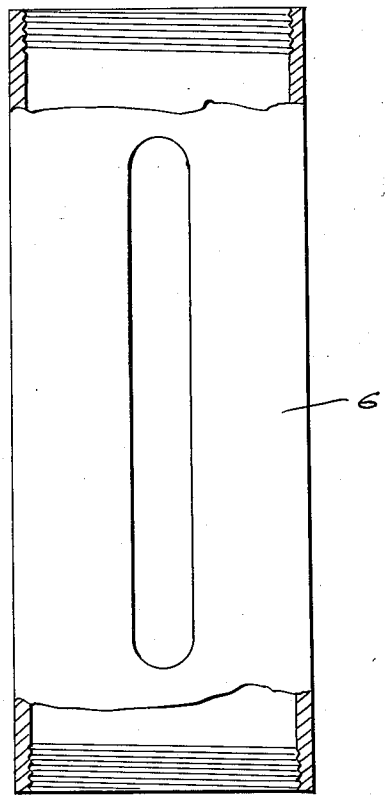


Fig. 11.



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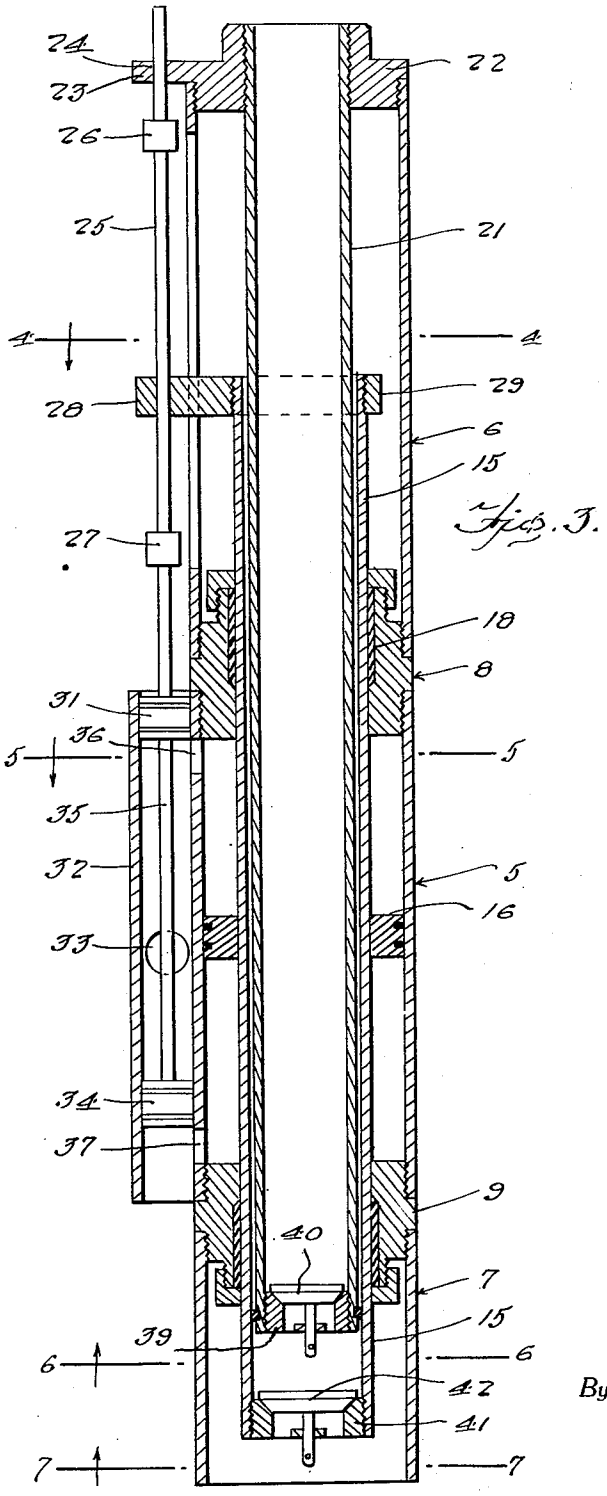
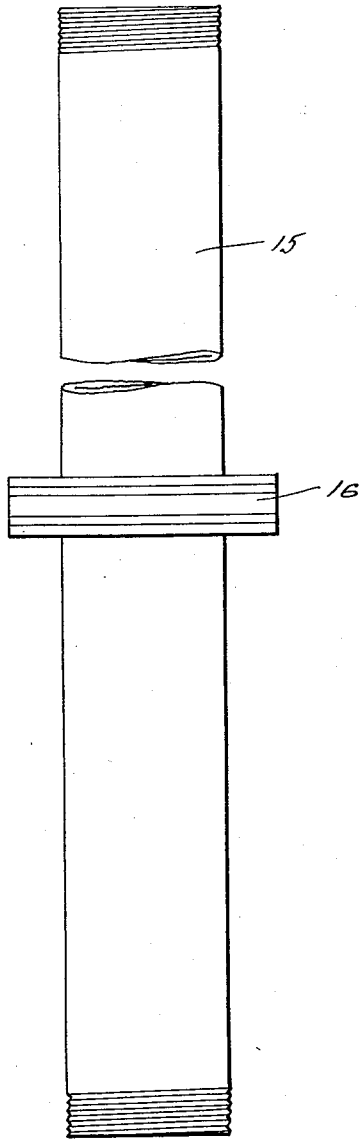


Fig. 3.

Fig. 9.



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Fig. 4.

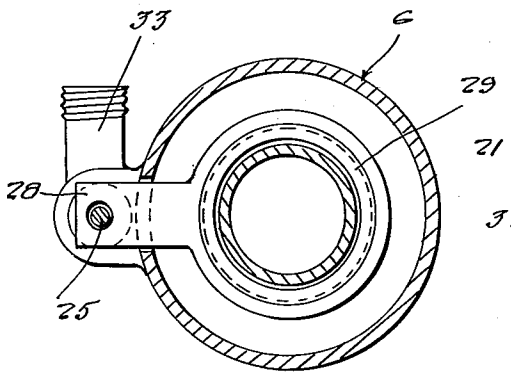


Fig. 5.

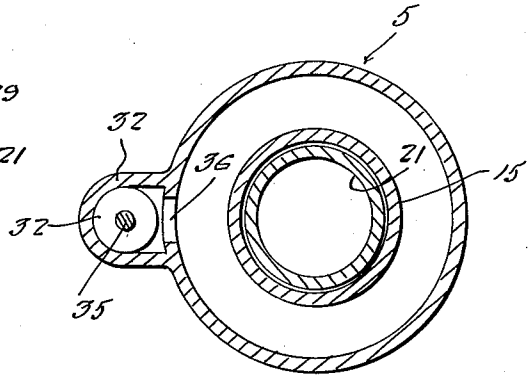


Fig. 10.

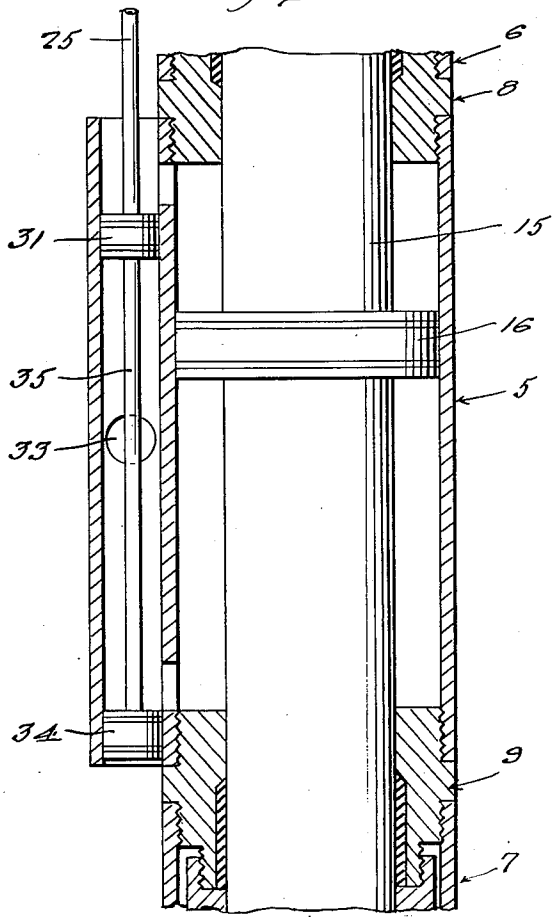


Fig. 13.

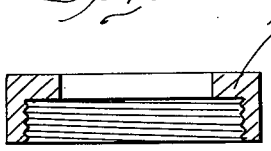
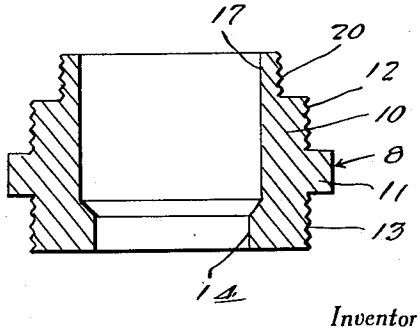


Fig. 12.



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Fig. 6.

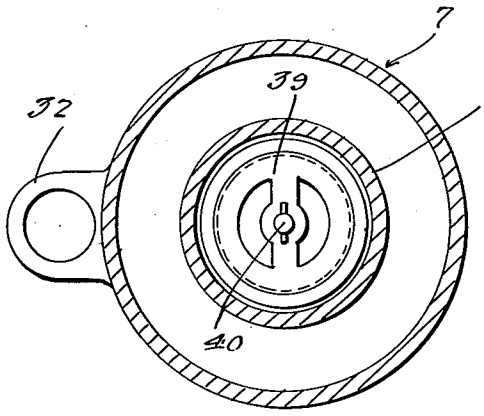


Fig. 7.

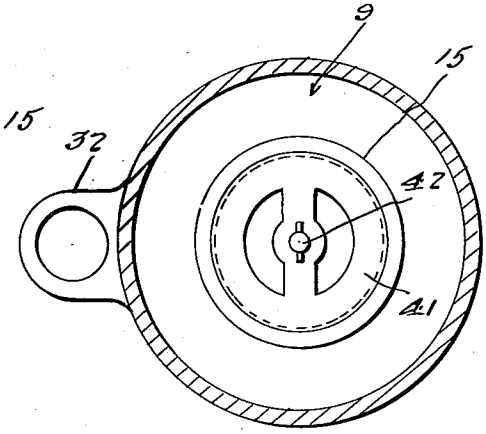
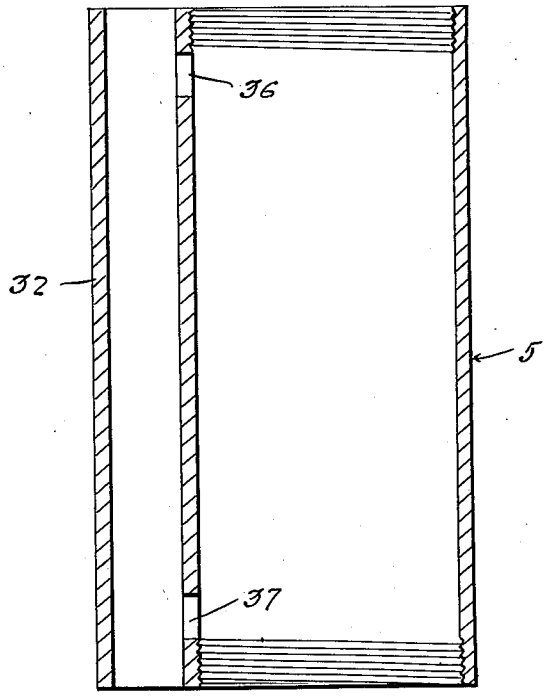


Fig. 8.



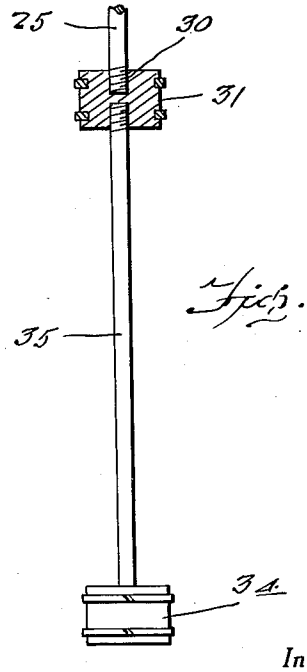


Fig. 16.

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UNITED STATES PATENT OFFICE

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David J. Reiss, Houston, Tex.

Application July 6, 1937, Serial No. 152,160

2 Claims. (Cl. 103—46)

This invention appertains to new and useful improvements in well pumps and more particularly to a pump of the fluid pressure type whereby fluid can be lifted from wells in a cheap and efficient manner.

The principal object of the invention is to provide a fluid pressure operated pump which is of simple construction and not susceptible to the ready development of defects.

Another important object of the invention is to provide a pump which is positive acting, wherein mechanical details are reduced to a minimum.

These and various other important objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawings:—

Figure 1 represents a side elevational view of the assembly.

Figure 2 is a side elevational view of the assembly looking directly toward the supply valve.

Figure 3 is a longitudinal sectional view.

Figure 4 is a horizontal sectional view on the line 4—4 of Figure 3.

Figure 5 is a horizontal sectional view on the line 5—5 of Figure 3.

Figure 6 is a horizontal sectional view on the line 6—6 of Figure 3.

Figure 7 is a horizontal sectional view on the line 7—7 of Figure 3.

Figure 8 is a longitudinal sectional view through the intermediate section of the assembly.

Figure 9 is a side elevational view of the piston assembly.

Figure 10 is a fragmentary longitudinal sectional view through the intermediate section of the assembly with the mechanical parts shown.

Figure 11 is a fragmentary side elevational view of the upper section of the assembly with details removed.

Figure 12 is a sectional view through one of the couplings.

Figure 13 is a sectional view through the packing flange cap of one of the couplings.

Figure 14 is a fragmentary side elevational view of the stationary barrel.

Figure 15 is a side elevational view, partly in section showing the guide head of the stationary barrel.

Figure 16 is a side elevational view, partly in section showing the valve means.

Referring to the drawings wherein like numerals designate like parts, it can be seen that the assembly is made up of the intermediate section generally referred to by the numeral 5, the upper section 6 and the lower section 7. Couplings generally referred to by numerals 8 and 9 are provided at the ends of the intermediate section 5 for connecting the ends thereto.

Each of these couplings consists of a cylindrical body 10 having a circumferentially disposed shoulder 11 for interposition between the corresponding shell sections and also provided with the threaded portions 12—13 for engagement into the adjacent shell sections, each of these couplings having the bore 14 for receiving the piston sleeve 15 on which the piston head 16 is located and also with the counterbore 17 defining a pocket for the packing material 18. This with the internally threaded cap 19 engaged over the reduced threaded portion 20 defines a packing gland at each of the couplings for the said piston tube 15. This piston tube is disposed around the stationary tube 21 which has its upper end threadedly engaged into the header 22 at the upper end of the section 6. This header 22 being provided with a laterally disposed leg 23 having the opening 24 therein for receiving the trip rod 25 which is provided with the trip collars 26—27 thereon at opposite sides of the laterally disposed arm 28 which projects from the collar 29 on the upper end of the piston tube 15. This arm 28 has an opening therein for receiving the trip rod 25, the lower end of the trip rod 25 being threadedly engaged as at 30 into the upper valve piston 31. This piston operates in the valve shell 32 which extends longitudinally of the intermediate section 5 and has the inlet 33 at its mid-point. Also operative in the piston shell 32 is the valve piston 34 and these pistons 31—34 are connected by the rod 35.

The upper and lower ends of the valve shell 32 communicate with the interior of the section 5 through ports 36—37, below and above the couplings 8—9, respectively, and at opposite sides of the piston head 16 of the traveling piston shell 15, which operates in the section 5.

It can be seen in Figures 3 and 14, that the stationary tube 21 has a packing ring 38 at its lower end against which the piston tube 15 rides. A valve seat 39 is provided in the lower end of the stationary tube 21 and against this is seatable the valve 40.

The lower end of the piston tube 15 has the removable seat 41 therein and with this is engageable the valve 42.

It can be seen, that as air or gas under pressure is admitted to the valve shell 32, the valve piston 31 will be lifted so as to uncover the port 36. Fluid will exert its force against the piston head

16 in a downward direction, forcing the piston tube 15 downwardly so as to lower the valve 42 into the fluid of the well. Obviously, as the lower end of the tube 15 is forced downwardly into the fluid of the well it will open, admitting the fluid to be elevated into the lower portion thereof.

Reverse operation of the valve structure will cause the admitted fluid to enter under the piston head 16 and raise the piston tube 15 which, of course, results in the closing of the valve 42 and the opening of the valve 40 as the fluid in the lower portion of the tube 15 rises into the stationary tube 21. As the first cycle begins to repeat and the tube 15 lowers, the valve 40 will close dropping fluid in the stationary shell 21, as the lower valve 42 opens to admit fluid of the well into the lower portion of the piston tube 15.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

What is claimed is:—

1. A well pump comprising a stationary tube provided with a check valve in the lower portion thereof, a piston tube slidably disposed on the stationary tube and having its lower end depending below the valved end of the stationary tube, the lower end of the piston tube provided with a check valve therein, a chamber surrounding the said piston tube, a piston head on the piston tube operative in the said chamber, and a fluid pressure control for the said piston head, said control consisting of a valve shell on the side of the chamber having ports communicating the interior of the shell with the interior of the chamber at opposite sides of the piston head, and valve pistons operative in the said shell.

2. A well pump comprising a stationary tube provided with a check valve in the lower portion thereof, a piston tube slidably disposed on the stationary tube and having its lower end depending below the valved end of the stationary tube, the lower end of the piston tube provided with a check valve therein, a chamber surrounding the said piston tube, a piston head on the piston tube operative in the said chamber, and a fluid pressure control for the said piston head, said control consisting of a valve shell on the side of the chamber having ports communicating the interior of the shell with the interior of the chamber at opposite sides of the piston head, and valve pistons operative in the said shell, and trip means between the valve pistons and the piston tube whereby the piston tube operates to set the said valve pistons.

DAVID J. REISS.