Nov. 2, 1937. G. A. LOWREY 2,097,629

PUMP

Filed March 24, 1934

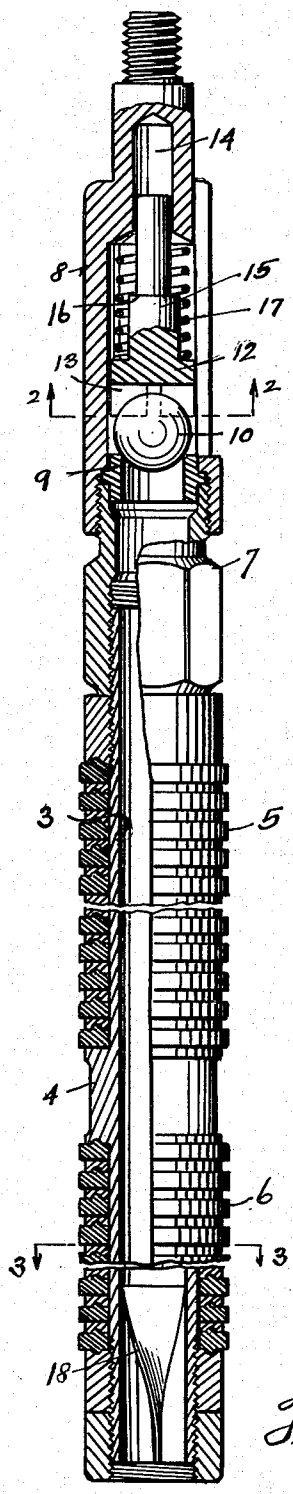


Fig. 1.

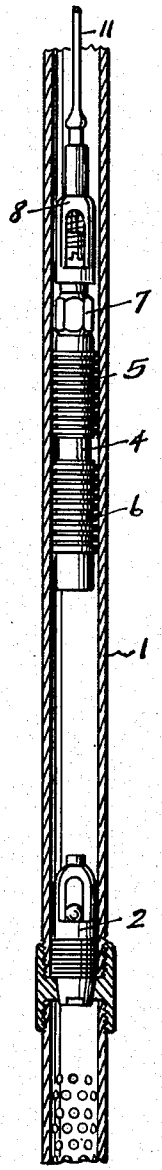


Fig. 4.

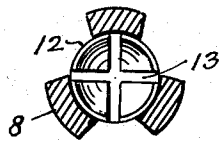


Fig. 2.

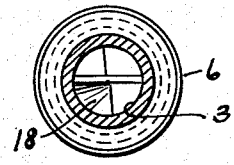


Fig. 3.

Inventor
George A. Lowrey

By Hardway & Cottrell
Attorneys

Patented Nov. 2, 1937

2,097,629

UNITED STATES PATENT OFFICE

2,097,629

PUMP

George A. Lowrey, Pelly, Tex., assignor to Hall and Lowrey, Incorporated, Goose Creek, Tex., a corporation of Texas

Application March 24, 1934, Serial No. 717,251

1 Claim. (Cl. 103—225)

This invention relates to a pump.

An object of the invention is to provide in a pump, a novel type of traveling valve mechanism comprising a tubular body having a valve for controlling the flow of fluid through the body with novel means for imparting a whirling movement to the fluid whereby the valve may be gradually rotated during its operation and a partial rotation back and forth imparted to the body as the valve mechanism is reciprocated in the working barrel.

Another object of the invention is to provide in a traveling valve mechanism, a valve actuator arranged to cushion the opening movement of the valve, to limit such opening movement and to guide the valve during the closing movement thereof.

The subject matter of this application forms a continuation in part, of the abandoned application on Pump, filed August 27, 1932, under Serial No. 630,622.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation, and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawing, wherein:—

Figure 1 shows a side view of the traveling valve mechanism shown partly in section.

Figure 2 shows a cross sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 1, and

Figure 4 shows a vertical sectional view of the pump working barrel showing the standing valve and the traveling valve mechanism mounted thereon.

In the drawing the numeral 1 designates a pump working barrel at the lower end of which there is mounted the upwardly opening standing valve 2. Above this standing valve the traveling valve mechanism is located in the working barrel. This traveling valve mechanism comprises a tubular body 3, which preferably has an intermediate enlarged section 4 with upper and lower series of packing rings 5, 6 above and beneath said enlarged section 4. However any suitable type of packing rings may be employed. Screwed on to the upper end of the body 3 there is a tubular nipple 7 and a valve cage 8 is connected on to the nipple. Clamped on to the upper end of the nipple 7 there is an annular valve seat 9 which is controlled by the upwardly opening ball valve 10 which is confined by said cage. The upper end of the cage 8 is reduced and outwardly threaded, forming a connection for the sucker rod 11 through which the traveling valve mechanism may be reciprocated.

Fitted within the cage 8 above the valve 10 there is a valve actuator 12 which is approximately circular as shown in Figure 2 and whose under side is concave to fit the valve 10. The under side of the actuator has the cross channels 13 which admit fluid above the valve so as to prevent the formation of a vacuum between the valve and actuator.

The reduced upper end of the cage has a cylinder 14 and the actuator 12 has an upstanding stem 15 whose upper end is reduced and fitted loosely in said cylinder. The reduction of the upper end of the stem forms the annular stop 16 to limit the upward movement of the actuator. Surrounding the stem 15 and interposed between the valve actuator 12 and the lower end of the cylinder 14 there is a coil spring 17.

Within the lower end of the body 3 there is the spiraled vane 18 as shown in Figures 1 and 3. Upon down stroke the valve 2 will be closed and the fluid above it will pass upwardly through the body 3 and will lift the valve 10. The stem 15 will be cushioned in its upward movement by the fluid in the cylinder 14 to the end that the valve 10 will be lifted only the required distance to accommodate the required fluid being pumped. Upon upstroke of the valve mechanism the actuator 12 assisted by the spring 17 will guide the valve 10 directly and quickly onto its seat so that there will be no back flow or leakage of the fluid after it has once passed above the valve 10.

The fluid flowing upwardly through the body 3 will have a whirling motion imparted to it by the vane 18 and this will cause a partial turning movement of the valve 10 with each upward movement of the valve, causing the valve to wear uniformly and washing away any sand that might collect about the valve and seat.

The resistance of the fluid through which the vane 18 travels will also cause a partial turning movement of the traveling valve mechanism as said valve mechanism moves downward, placing the sucker rod 11 under a tortional strain and upon upward movement of the traveling valve mechanism the torsion of the sucker rod will cause the traveling valve mechanism to partially rotate in the other direction so that said traveling valve mechanism will partially rotate back and forth as said traveling valve mechanism is reciprocated, thus causing a uniform wear on the working barrel and preventing the scoring thereof.

The drawing and description disclose what is

now considered to be a preferred form of the invention, by way of illustration only, while the broad principle of the invention will be defined by the appended claim.

What I claim is:

In a pump having a working barrel, a traveling valve mechanism in the barrel comprising an elongated tubular body having an approximately uniform liquid passageway therethrough, a sucker rod to which the body is attached and by which the body may be reciprocated, an upwardly opening valve in the upper end of the body controlling the flow of liquid upwardly through the body, guide means for controlling said valve comprising a plunger, the upper end of said plunger being reduced, in diameter, and the lower end of which is formed to fit over said valve, a channel across said lower end, a coil spring about said plunger, a cylinder in the upper end of the traveling valve in which the upper end of the plunger works, a stop on said plunger, limiting the upward movement thereof a plurality of inlets at the lower end of said passageway forming a vane having spiralled walls and forming the only obstruction in the passageway.

GEORGE A. LOWREY.