

(No Model.)

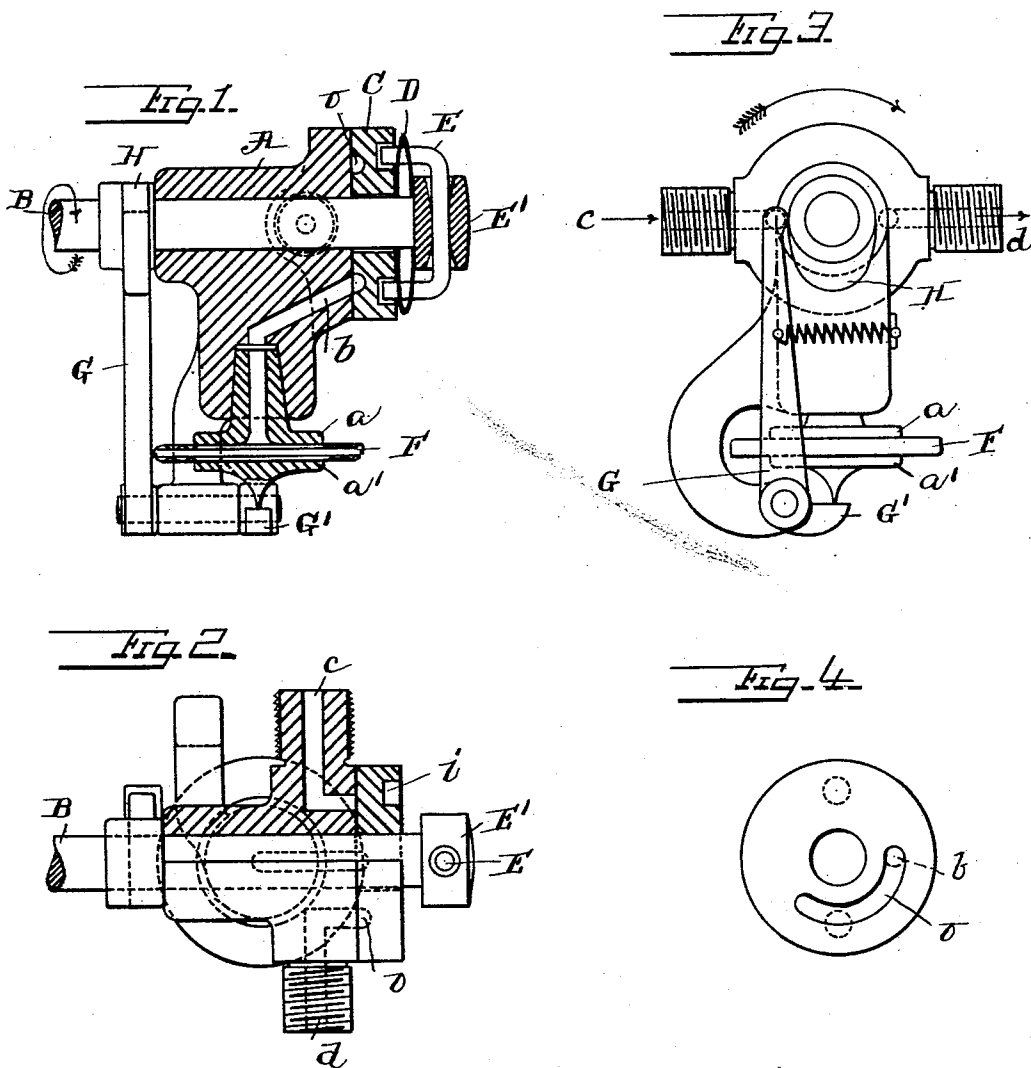
2 Sheets—Sheet 1.

E. CAPITAINE.

PUMP FOR RAISING AND MEASURING LIQUIDS.

No. 573,641.

Patented Dec. 22, 1896.



WITNESSES:

Jesse B. Heller,
Joshua Pusey

INVENTOR:

Emil Capitaine
by M. V. Hutton

ATTORNEY.

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2 Sheets—Sheet 2.

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Fig. 5.

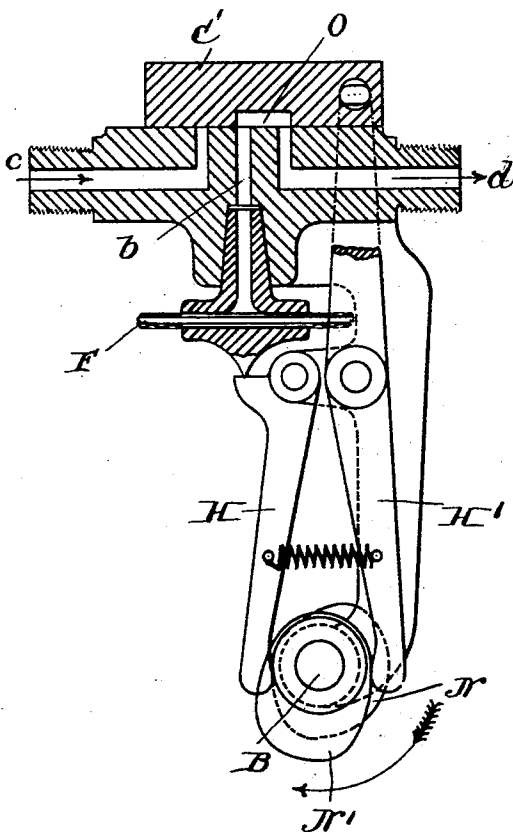
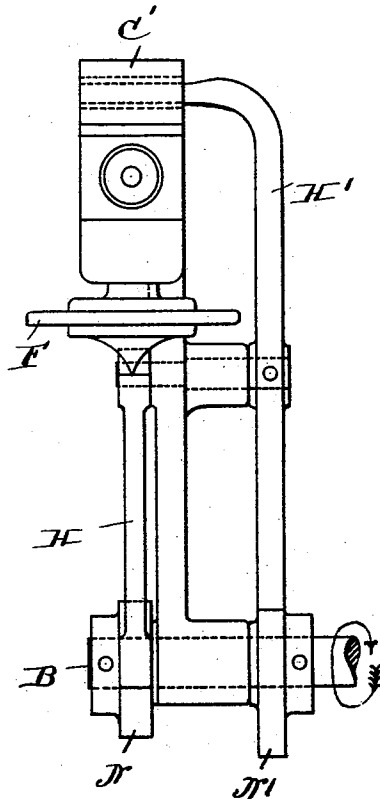


Fig. 6.



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EMIL CAPITAINÉ, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO
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PUMP FOR RAISING AND MEASURING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 573,641, dated December 22, 1896.

Application filed May 22, 1896. Serial No. 592,590. (No model.)

To all whom it may concern:

Be it known that I, EMIL CAPITAINÉ, a citizen of the German Empire, and a resident of Frankfort-on-the-Main, Germany, have invented and produced a new and original Pump for Raising Liquids in Small Quantities, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention has relation to pumps adapted both to measuring and delivering small quantities of liquids, and is applicable more particularly to oil-pumps forming part of petroleum engines or motors.

My improvements in pumps of that character have for their object, first, to produce greater certainty of operation and result in delivering an exact predetermined quantity of oil at each discharge-stroke under varying conditions of speed and lift, and, secondly, to provide mechanical devices in substitution for the usual piston, whereby stuffing-boxes and packings are dispensed with, which in the present usual constructions become leaky and dirty and render the pump, and consequently the motor, uncertain in action. This mechanical construction and its novel features will be now fully described, and referred to in the claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section of a pump embodying my invention. Fig. 2 is a plan view, partly in section and partly in dotted lines, intended more particularly to show the inlet and outlet passages and their arrangement relatively to the suction mechanism. Fig. 3 is a rear end view illustrating the driving mechanism. Fig. 4 is a plan of the inner face of the spring-controlled disk valve, showing the grooved passage-way, and also showing in dotted lines certain holes on the outer face of the valve or disk. Fig. 5, Sheet 2, is a view, partly in section and partly in elevation, showing a modification of the device; and Fig. 6 is a side elevation thereof.

The metallic body of the pump is indicated at A, and it is longitudinally recessed to admit the shaft B, which is journaled in said recess. On the free end of this shaft is loosely mounted a disk valve C, the coinciding faces of the disk and of the body A being ground

true to form an air-tight joint between them, and the disk is held with an even pressure against the face of the body A by means of a spring D, interposed between the disk C and a nut or head E', with which the free end of the shaft is supplied, said nut being drilled out to admit the passage of a clamp E, the ends of which fit loosely into holes *i* on the outer face of the disk, so that when the shaft B is rotated the disk will be carried with it, while the construction shown and described will always enable the disk to receive the full pressure from the spring to keep the ground joint between it and the face of the body A a true air-tight bearing.

On the inner face of the disk valve C is an arc-shaped groove *o*, which under conditions hereinafter to be mentioned will register with the inlet and outlet openings *c d* of the pump. These openings are shown in the plan view, Fig. 2, (which, for the purpose before mentioned, is partly in section and with the spring D and clamp E removed.)

The metallic body A is also bored out to supply a channel *b*, (see Fig. 1,) communicating with the passage *o* when the parts are in position to discharge, and this passage *o* begins at the head or end of a nipple *a*, which has a face carrying a flat plate F', which, arranged opposite another similar plate, also marked F, constitutes, with a proper rubber or other suitable annular connection between them, a diaphragm, (or the diaphragm may be composed of two thin springy plates soldered together at the annular edges thereof,) the lower plate being mounted in a proper support *a'*, which is actuated by a bell-crank G and G', which is actuated by the cam H, mounted on the driving-shaft B.

The operation of the device is as follows: A rotation of the driving-shaft B causes the groove *o* to register with the end of the inlet-channel *c*, while at the same time the diaphragm-plates are separated and create a suction which pumps the liquid into the aforesaid passages provided therefor, while a further turn of the driving-shaft causes an advancement in rotation of the disk valve C, which closes the inlet-port *c* and brings said groove into register with the outlet-port, while the passage *b* still remains in register

long enough for the cam H to cause a return movement of the diaphragm-plates toward each other and thus operating to discharge the received quantity of fluid through the outlet *d*.

In Sheet 2 of the drawings is shown a modified form of the invention, which is the same in all essential particulars as the device shown on Sheet 1, Figs. 1 to 4, and differs therefrom only in the substitution of a reciprocating slide-valve C' in place of the rotating disk valve C, (shown in Fig. 1 of Sheet 1,) and in order to properly operate the slide-valve to effectuate the purposes desired a separate and additional lever-arm H' is mounted upon a separate and additional cam N', both it and the cam N, which actuates the diaphragm, being mounted upon the driving-shaft B, and from this description, in connection with the drawings, Figs. 5 and 6, the mode of operation of the modification of the device will be fully understood.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A pump for delivering measured quantities of fluid, comprising a valve, with means to actuate the same, said valve being provided with a grooved passage-way, inlet and outlet passages with which said grooved passage-way of the valve will register, a diaphragm, with means to actuate the same, a passage-way in the body of the pump between the diaphragm and the grooved valve-passage, and cam mechanism mounted on the driving mechanism and arranged to alter-

nately distend and contract said diaphragm in proper order of time relatively to the movement of the said valve, substantially as specified.

2. A pump for measuring and delivering small quantities of liquid, comprising the pump-body A provided with passages *c d*, a valve having a grooved passage-way *o* adapted to register therewith, a shaft B adapted to actuate the valve, a diaphragm F and passage-way *b* communicating therewith, and cam mechanism mounted on the driving-shaft and arranged to actuate said diaphragm in proper order of time relatively to the movement of the valve, substantially as specified.

3. A pump for measuring and delivering small quantities of liquid, comprising a pump-body provided with inlet and outlet passages, a valve having a passage-way therein adapted to be brought to register with the said inlet and outlet passages, by proper movement, a diaphragm, a passage-way leading from said diaphragm to the said valve and adapted to be brought into communication with the passage-way thereof, and means for operating said valve and diaphragm in proper order of time relatively to each other, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL CAPITAINÉ.

Witnesses:

DEAN MASON,
JEAN GRUND.