

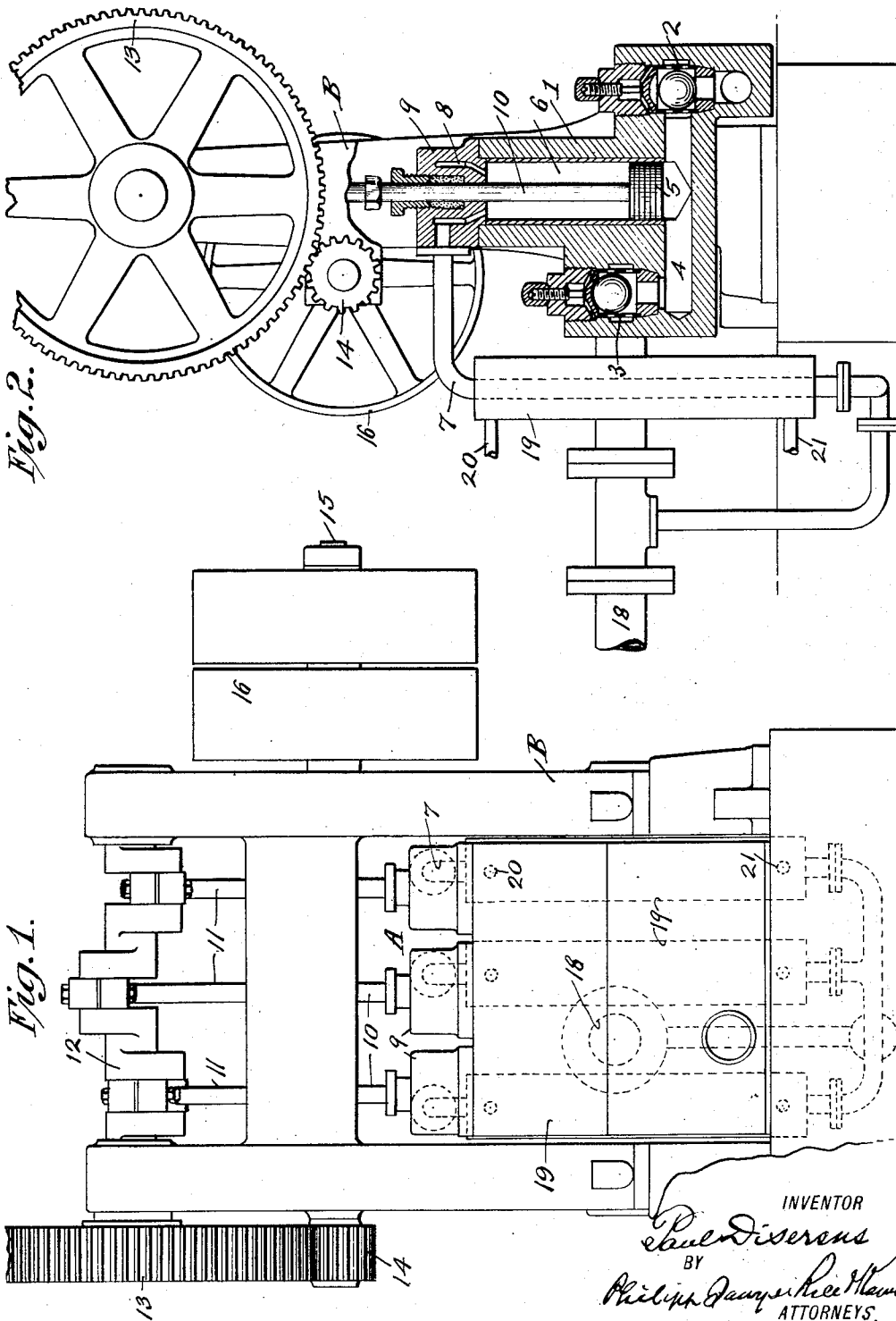
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P. DISERENS

PUMP

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INVENTOR

Paul Diserens
BY
Philip James Rice Handy
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

PAUL DISERENS, OF NEW YORK, N. Y., ASSIGNOR TO WORTHINGTON PUMP & MACHINERY CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA.

PUMP.

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To all whom it may concern:

Be it known that I, PAUL DISERENS, a citizen of the United States, residing at New York city, county of Kings, and State of New York, have invented certain new and useful Improvements in Pumps, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to improvements in pumps.

The invention aims especially to provide a simple, cheap and durable high pressure pump which may be used with advantage in handling hot liquids, such, for example, as are encountered in the production of gasoline from heavier petroleum products in modern cracking processes. Briefly stated, the present pump comprises a novel arrangement for preventing the working parts of the pump, with the exception of the valve service, from contact with hot liquid, with efficient means for protecting the plunger rod stuffing box packing and cooling that part of the plunger rod which on the out-strokes is exposed to the atmosphere, thereby greatly prolonging the continuous operation of the pump and avoiding danger of fire caused by flashing of the oil adhering to the plunger rod.

For a full understanding of the invention, a detailed description of a construction embodying the invention in a preferred form will now be given in connection with the accompanying drawings forming a part of this specification, and the features forming the invention then be specifically pointed out in the claims.

In the drawings—

40 Figure 1 is a side elevation of the improved pump, and

Figure 2 is an end elevation, partly in section, looking toward the left in Fig. 1.

Referring now to the drawings, the pump shown by way of illustration is of the triplex type, comprising a battery of three pumps A mounted in any suitable manner in a frame-work B. The piston rods 10 are operated through suitable cross-heads (not shown) and crank rods 11 secured to shaft 12, the cranks being set at 120° with respect to each other as usual in pumps of this type. The shaft 12 is actuated by a gear wheel 13 driven by pinion 14 mounted on shaft 15 extending through the frame, such shaft be-

ing driven in any suitable manner, or as shown by a belt-driven pulley 16 of the usual fast and loose type.

Referring now to Fig. 2, it will be noted that each of the pumps A is single-acting and comprises a cylinder 1, suction valve 2, discharge valve 3, and a pulsation chamber connecting these elements. The valve bodies preferably and as shown are of the ball type, with the usual guards or cages to prevent displacement. In order that the pump may be efficient under the high pressures incident to use in modern oil cracking processes, it is preferable that a solid metal pump body of the usual well-known type be used, as in this type of pump the plunger bores, pulsation chamber, valve bores, and the suction and discharge chamber and passage are all formed in a single block of forged steel.

In order that the piston rods 10 of the triplex pump shown, and the stuffing boxes for such rods, may be effectively cooled and protected from contact with the hot liquid being pumped, each pump bore 1 is made of such length as to provide a substantial clearance on what has heretofore been known as the dead side of the plunger. These clearances, for the purposes of the present description, will be termed surge chambers, indicated at 6, and, as shown, connected by pipes 7, to the discharge line at any desired point. Preferably, the connection to the cylinder bores is by way of annular chambers 8 surrounding the packing for the plunger rods in such stuffing boxes, which latter are otherwise of usual construction and mounted in the cylinder heads 9. It will be seen that make-up liquid will be supplied from the discharge line 18 through pipes 7 to the surge chambers 6. While the pipes 7 may be connected to either the suction or discharge side of the pump, preferably and as shown such pipes are connected by a single conduit which is tapped into the discharge line 18, and this connection preferably will be made in the discharge line at a point sufficiently distant from the pumping elements to maintain cool liquid in the surge chambers and prevent injury to the stuffing box packing and cool the plunger rods. As shown, the pipes 7 extend downwardly and connect with a T-coupling or the like, which may be supplied by the conduit leading to the discharge line 18. This arrangement insures a proper amount of

comparatively cool liquid being maintained in the surge chambers, which is surged back and forth between the different chambers of the triplex pump shown as the plungers make their suction and discharge strokes, the connection to the discharge line, above described, providing only for the supply of make-up liquid to maintain the body of liquid in the surge system under discharge pressure. While a pump of the general type shown is preferable, in that it secures the desired surging action between the surge chambers above described, it will be understood that a single pump cylinder may be used, in which case the surging action of the liquid would be from a surge chamber on the dead side of the plunger through the connection thereto to the discharge line or other suitable point. In either of the above arrangements, however, it is preferable to employ a cooler of any suitable or well-known type, which may be located either in the surge chambers, or, as shown at 19, positioned on the pipes 7, the cooling medium being supplied to the coolers at 20 and discharged at 21.

From the foregoing it will be seen that not only will the stuffing box packing of the pumps be protected from contact with the hot liquid being pumped, but the parts of the plunger rods which are exposed to the atmosphere on the outstrokes of the plunger rods will be cooled, so that danger of the oil adhering thereto flashing on contact with the atmosphere and causing fire is avoided. It will be noted further that with a construction like that shown and described, the pressure back of the plungers, or in the surge chambers 6, is substantially the same as on the opposite sides of the plungers, so that practically no leakage past the plungers will occur during the discharge strokes of the plungers, while during the suction strokes there will be the discharge pressure of the liquid in the surge chambers above the plungers and the suction pressure in the pulsation chambers, so that if any leakage does occur during this part of the cycle it will be only the cool liquid from the surge chambers, and this, of course, will pass into the hot pulsation chambers.

It will be understood that various changes may be made in the construction and arrangement of parts shown and described, while still retaining the invention defined by the claims.

What is claimed is:

1. A pump for hot liquids, comprising a plunger bore, a single-acting plunger arranged to work in said bore and actuating means for said plunger, a surge chamber on the dead side of the plunger, and a connection to the pump arranged to maintain cool liquid in said chamber.

2. A pump for hot liquids, comprising a plunger bore, a single-acting plunger arranged to work in said bore and actuating means for said plunger, a surge chamber on the dead side of the plunger, a connection to the pump arranged to maintain liquid in said chamber, and means for cooling the liquid supplied to said chamber.

3. A pump for hot liquids, comprising a plunger bore, a single-acting plunger arranged to work in said bore and actuating means for said plunger, a surge chamber on the dead side of the plunger, and a connection to the discharge line of the pump arranged to maintain cool liquid in said chamber.

4. A pump for hot liquids, comprising a plunger bore, a single-acting plunger arranged to work in said bore and actuating means for said plunger, a surge chamber between the plunger rod stuffing box and the dead side of the plunger, a connection between the discharge line of the pump and said chamber arranged to supply liquid to the latter, and means for cooling the liquid supplied to said chamber.

5. A pump for hot liquids, comprising a plunger bore, a single-acting plunger arranged to work in said bore and actuating means for said plunger, a surge chamber on the dead side of the plunger, a connection arranged to supply liquid from the pump to said chamber, and a cooler on said connection.

In testimony whereof, I have hereunto set my hand.

PAUL DISERENS.