P. SWENSON.

HYDRAULIC PUMP.

APPLICATION FILED SEPT. 17, 1917.

1,296,875.

Patented Mar. 11, 1919.

2 SHEETS—SHEET 1.

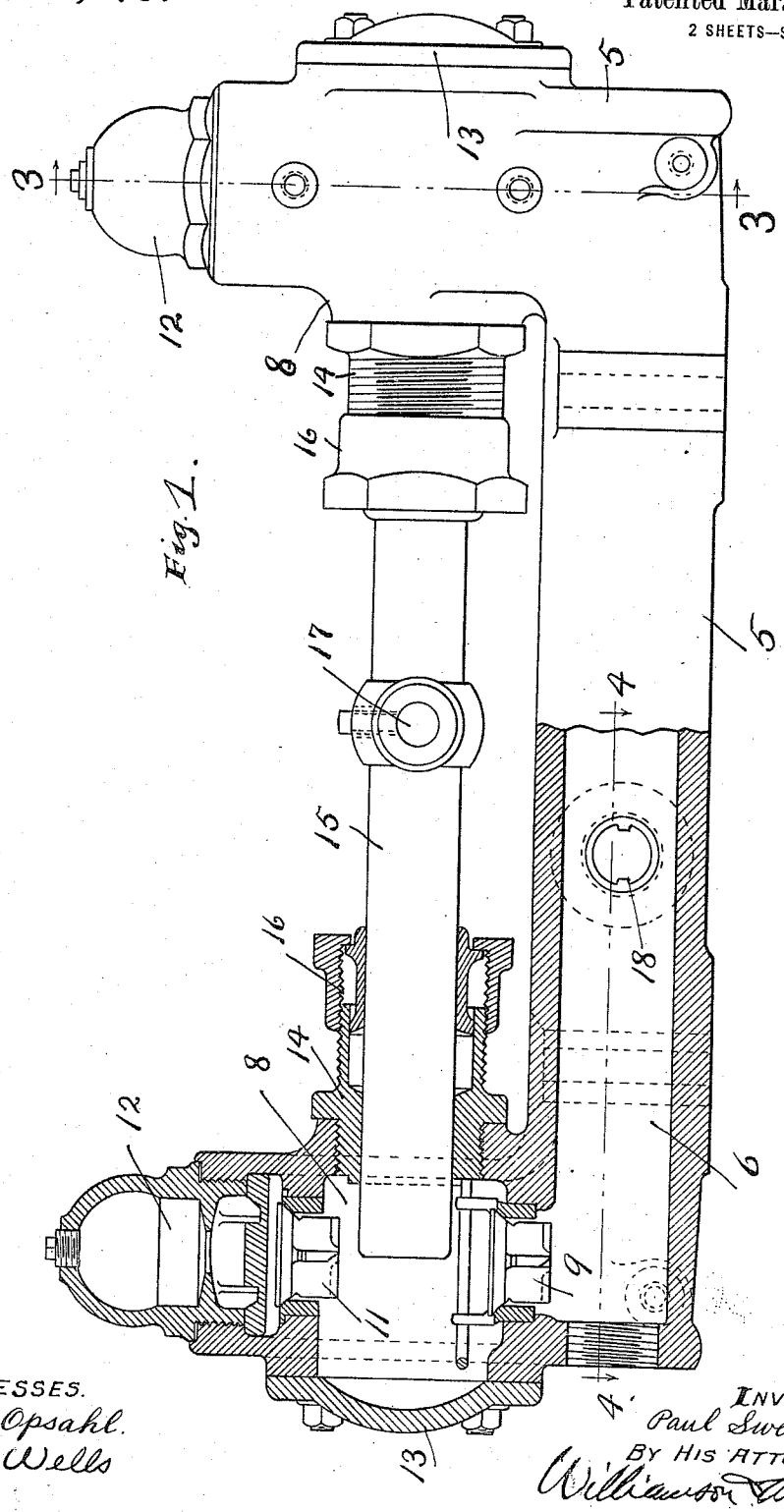


Fig. 1.

WITNESSES.

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2 SHEETS—SHEET 2.

Fig. 2.

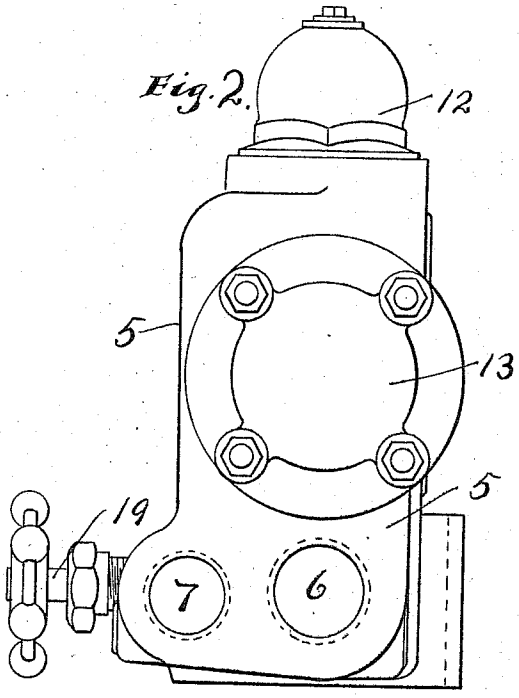


Fig. 3.

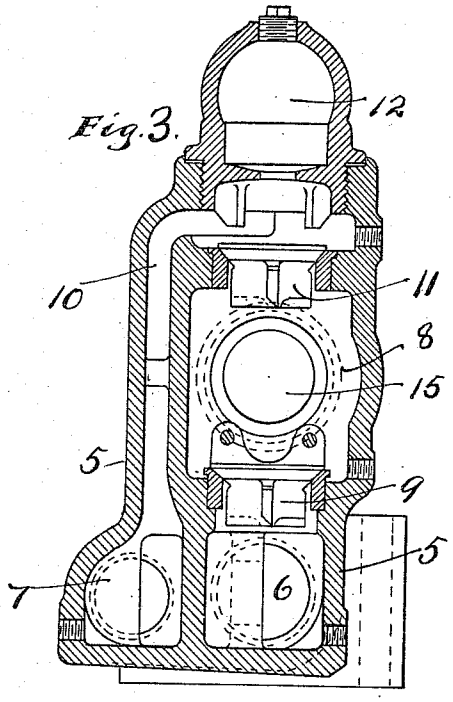
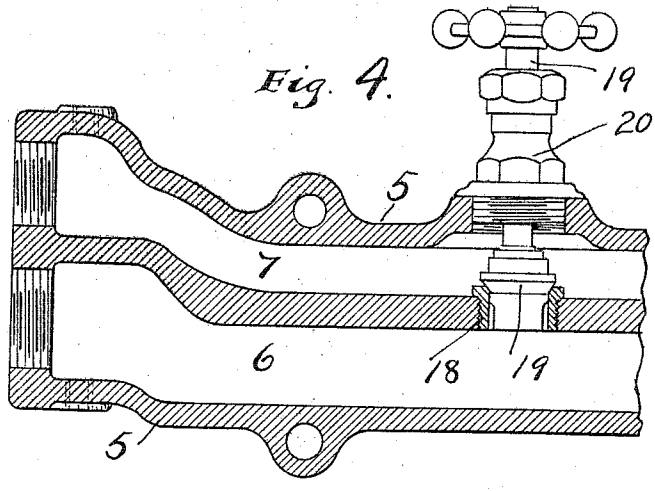


Fig. 4.



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UNITED STATES PATENT OFFICE.

PAUL SWENSON, OF WEST MINNEAPOLIS, MINNESOTA.

HYDRAULIC PUMP.

1,296,875. Specification of Letters Patent. **Patented Mar. 11, 1919.**

Application filed September 17, 1917. Serial No. 191,730.

To all whom it may concern:

Be it known that I, PAUL SWENSON, a citizen of the United States, residing at West Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Hydraulic Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved hydraulic pump; and to such ends, generally stated, the invention consists of the novel construction and combination of parts hereinafter described and defined in the claims.

Particularly, the invention has for its object to provide a simple and efficient double-acting reciprocating pump in which the greatest possible number of parts are incorporated in a single casting, and in which the various parts may be made and assembled at a minimum of cost, and which, when assembled, form a strong, durable and efficient self-contained pump.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a view partly in side elevation and partly in vertical section showing the improved pump;

Fig. 2 is an end elevation of the pump;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a section on the line 4—4 of Fig. 1, some parts being broken away.

The main body casting 5 of the pump is formed with two long conduits 6 and 7 that preferably run from end to end thereof, and are threaded to receive the conducting pipes not shown. The conduit 6 is the intake conduit and the conduit 7 is the discharge conduit. The said conduits are located, side by side, and are approximately parallel, one to the other.

At its end, the body casting is formed with cylinder chambers 8, which, at their bottoms are in communication with the ends of intake conduit 6 through ports normally closed by gravity seated intake check valves 9. At their tops, said cylinder chambers 8 are in communication with the upper extremities of long discharge passages 10, through ports normally closed by gravity seated discharge check valves 11. The said discharge passages 10 are formed in integral parts of the body casting 5, and at their lower extremities lead to the outer end portions of the discharge conduit 7. The extreme upper ends of said discharge passages 10 are in constant communication with closed air bulbs 12 formed in small dome-like castings shown as screwed into the upper end portions of the body casting 5. These air bulbs 12 afford air cushions to prevent "water hammer".

The outer ends of the cylinder chambers 8 are shown as closed by small cylinder heads 13 bolted, or otherwise, rigidly secured with water-tight joints, to the end portions of the body casting. Bushings 14 are screwed into the inner or facing seats of the cylinder chambers 8, and these bushings 14 are axially alined, so that a double-ended piston in the form of a large cylindrical rod or plunger 15, is arranged to reciprocate endwise therethrough. Joints between the bushings 14 and piston 15 are made tight by suitable glands 16. The piston 15 is adapted to be reciprocated in any suitable way, as for example, through an oscillating lever or link, not shown, but which would be attached to trunnions 17 applied to the central portion of the said piston, as shown in Fig. 1.

Normally, there is no direct communication between the intake conduit 6 and discharge 7, but provision is made whereby the one may be opened into the other. For this purpose, the web between the two conduits is shown as provided with a valve seating bushing 18 that is normally closed by a plunger valve 19, the stem of which has the customary threaded engagement with a hub 20 shown as screwed into the outer wall of the conduit 7, as best shown in Fig. 4. There may be one or more of these normally closed valves 19. When the said valve 19 is open, the pump will be short circuited within itself, that is, water pumped from the intake conduit 6 will be pumped into the conudit 7 and thence directly back into the said intake conduit, so that the same water will be pumped over and over again, thus allowing the pump to run without discharging water or putting the parts under excessive hydraulic pressure.

The operation of the pump is obvious. Under receding or outward movement of the piston, water will be drawn from the in-

take conduit 6 into that particular cylinder chamber 8 from which the piston is receding, and under inward, or reverse movement of the said piston, water will be forced from the said cylinder chamber, out through the corresponding passage 10 into the discharge conduit 7. Of course, the intake and discharge from the two cylinder chambers will take place in alternate order so that there will be a continuous pumping action. Obviously, the body casting with the intake and discharge conduits and passages all formed therein, may be made at much less cost than a structure made up of a multiplicity of parts, such as castings and pipes, or manifolds separately formed and then assembled. Also, the complete pump will have less exposed parts, will be neat in appearance, and occupy less space than a multi-part assembled structure for doing the same work.

What I claim is:

1. A duplex pump comprising a tubular body casting having two long approximately parallel conduits, one for affording an intake conduit and the other a discharge conduit, the said conduits being separated by a single integral wall, the said casting, at its ends having integral cylinder chambers, inlet valves between said chambers and intake conduit and outlet valves between said cylinders and discharge conduit, a rod affording a double-ended piston with its ends working in said cylinder chambers, and means for reciprocating said piston.

2. A duplex pump comprising a tubular body casting having two long approximately parallel conduits, one for affording an intake conduit and the other a discharge conduit, the said conduits being separated by a single integral wall, the said casting, at its ends having integral cylinder chambers, inlet valves between said chambers and intake conduit and outlet valves between said cylinders and discharge conduit, a rod affording a double-ended piston with its ends working in said cylinder chambers, and means for reciprocating said piston the said dividing web having a short circuiting port and a valve for opening and closing said port.

In testimony whereof I affix my signature in presence of two witnesses.

PAUL SWENSON.

Witnesses:
E. F. CODDINGTON,
M. S. GAULT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."