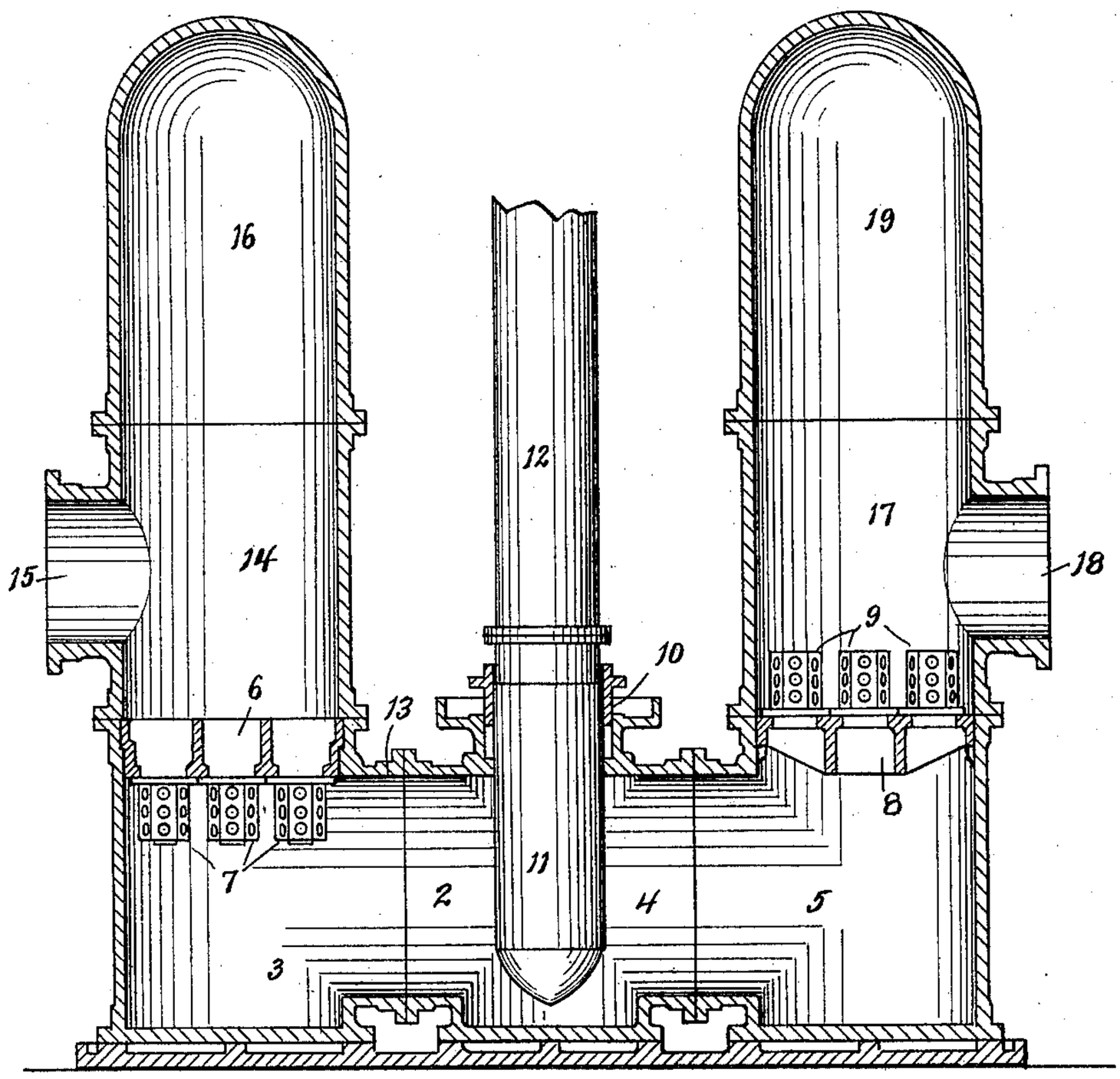
No. 736,443. PATENTED AUG. 18, 1903.

C. J. PRINTZ.

PUMPING ENGINE.

APPLICATION FILED OCT. 17, 1902.

NO MODEL.



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No. 736,443. Patented August 18, 1903.

UNITED STATES PATENT OFFICE.

CARL J. PRINTZ, OF MILWAUKEE, WISCONSIN.

PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 736,443, dated August 18, 1903.

Application filed October 17, 1902. Serial No. 127,717. (No model.)

To all whom it may concern:

Be it known that I, CARL J. PRINTZ, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Pumping-Engines, of which the following is a description, reference being had to the accompanying drawing, which is a part of this specification.

This invention relates to improvements in pumping-engines.

Pumping-engines as heretofore constructed (I refer more especially to those used for pumping large volumes of water for the supply of cities and for numerous other purposes) are open to some serious objections, which are due in a measure to shallow basements or cramped spaces in which the pumping portions of the engines have to be located.

In the pumping-engines now in common use the suction-valves are located above the intake or the inlet-chamber, and this, I believe, is a serious objection, for the reason that more or less air is mingled with the water which enters the inlet, and when the suction-valves are located above the inlet-chamber it follows that the water passing into the plunger-chamber, which will be from the upper portion of the water in the inlet-chamber, will, owing to the fact that air in said water tends to rise in the inlet-chamber, have more or less air mingled therewith, and this is especially so when pumping from Artesian wells or pumping sewage. The fluid passing through most of the pumping-engines of the usual types has a more or less circuitous route to travel between the inlet and the discharge ports. Many of said pumping-engines are so constructed that an air-cushion is possible in the plunger-chamber. In other types of pumping-engines the air-cushion in connection with the inlet-chamber is connected therewith through a more or less restricted passage, and this renders the air-cushion lazy and inefficient.

The object of this invention is to produce a pumping-engine which will be free from the objections common to the pumping-engines as heretofore constructed.

A further object of this invention is to produce a single-acting pumping-engine in which the suction-valves are located below the inlet-chamber to insure that the water which passes from the inlet-chamber to the plunger-chamber will be taken from that portion of the water within the inlet-chamber which is freest from air, and this water will be the bottom portion of the water in the inlet-chamber.

A still further object of this invention is to produce a pumping-engine which will present no pockets or spaces in the plunger-chamber in which air can accumulate to form an air-cushion, and thus produce a water-hammer.

A still further object of this invention is to produce a pumping-engine having an air-cushion chamber for the intake communicating with the inlet-chamber by a substantially unrestricted channel or passage and so located that the air from the water in the inlet-chamber may readily pass into it.

A still further object of this invention is to produce a pumping-engine which will be relatively small in height, which will have an active air-cushion for the inlet, in which it will be practically impossible for air to pass into the plunger-chamber, in which air which does pass to the plunger-chamber can find no lodgment there, and which will be simple in construction and comparatively cheap to manufacture.

The above and other objects I attain by means of a pumping-engine the elements of which are constructed and arranged as will be hereinafter described in the specification and illustrated in the drawing presented herewith.

The figure of the drawing is a central sectional elevation of the pumping portion of a pumping-engine embodying this invention.

The engine proper and all of that portion thereof for operating the pump are herein omitted, as they form no portion of this invention.

In the drawing, which represents a practical embodiment of this invention, the pump portion of the engine consists of a plunger-chamber 2, preferably formed of three castings 3, 4, and 5, of suitable shape and bolted or otherwise secured together in any suitable manner. Suitably supported within the upper portion of casting 3 is a valve-plate 6, and secured to said plate and depending therefrom are a plurality of suitable suction-valves

7. Suitably supported in the upper portion of casting 5 is a valve-plate 8, extending above and secured to which are a plurality of discharge-valves 9. The valves 7 and 9 may be of any suitable construction or design and in themselves do not form a portion of this invention. Formed in the top of the central section 4 of the plunger-chamber is a suitable stuffing-gland 10, and located within said gland is a pump-plunger 11, adapted, by means of a plunger-rod 12, connected to the engine portion of the pump, to be reciprocated. The upper line 13 or the top of the interior of the plunger-chamber, it will be seen, is straight across from end to end or, in other words, horizontal, whereby no air which enters the plunger-chamber is allowed to remain; but the air which does enter said chamber will pass on out through the discharge-valves 9. The upper line of the plunger-chamber may, if desired, incline up toward the discharge-valves, so that any air which enters the plunger-chamber may travel from it more easily.

Secured to the top of end section 3 of the plunger-chamber is an inlet-chamber 14, and this inlet-chamber is provided with an intake-port 15. Secured to the top of inlet-chamber 14, and preferably directly in line therewith, is an inlet air-cushion chamber 16.

The inlet air-cushion chamber, if desired, may be attached to the inlet-pipe before it enters the inlet-chamber by an unrestricted channel; but the preferable location, however, is directly above the inlet-chamber, as shown in the drawing.

Secured to the top of the end section 5 of the plunger-chamber is a discharge-chamber 17, which is provided with an outlet-port 18, and secured to the top of the discharge-chamber is a discharge air-cushion chamber 19.

The inlet, the discharge, and the plunger chambers may, if desired, be equipped with suitable and proper manholes, and the inlet air-cushion chamber and the discharge air-cushion chamber may be equipped with suitable gage-glasses and valves for snifting the superfluous air from them.

It will be seen that while the pump is in operation and water is admitted to the inlet-chamber air from said water will not only be allowed to easily rise therefrom to the inlet air-cushion chamber; but the inlet air-cushion chamber 16 being in direct communication with the inlet-chamber 14 through an unrestricted passage will form an active air-cushion for the incoming fluid. The water passing through intake-valves 7 is drawn from the lower portion of the water in the inlet-chamber, and as this water is that which has the least amount of air mingled with it it will be seen that comparatively little air will be drawn into the plunger-chamber, and with my construction it will be impossible for the plunger-chamber to be filled with froth or foam, as is commonly the case in the pumping-engines as heretofore constructed. The air which does pass to the plunger-chamber will immediately flow out through the discharge-valves 9 and rise in the discharge-chamber and pass into air-cushion chamber 19, from which when it grows excessive it may be snifted.

It will be understood that the particular manner in which the several portions of this device are shown as being formed is suggestive only. If desired, the contour and formation of the several portions may be varied. The air-cushion chambers may be formed integral with the chambers below them, the valve-plates may be formed integral with the walls of the chambers in which they are located, the valve-plates may be inclined at any desired angle to the horizontal, and numerous other changes may be made without departing from the spirit of my invention.

What I claim as my invention is—

1. In a pumping-engine, a plunger-chamber, an inlet cushion-chamber located above the plunger-chamber, inlet-valves between the inlet-chamber and the plunger-chamber, and an inlet-port leading into said inlet-chamber.

2. In a single-acting pumping-engine, a plunger-chamber, an inlet cushion-chamber located above the plunger-chamber, inlet-valves between the inlet-chamber and the plunger-chamber, and an inlet-port leading into said plunger-chamber above said inlet-valves.

3. In a single-acting pumping-engine, a plunger-chamber, an inlet cushion-chamber located above the plunger-chamber, inlet-valves located between the inlet and plunger chambers, a discharge-chamber located above the upper line of the plunger-chamber, and discharge-valves located between the discharge and plunger chambers.

4. In a pumping-engine, a plunger-chamber, an inlet cushion-chamber located above the plunger-chamber, inlet-valves located between the inlet and plunger chambers, an intake-port leading into said inlet-chamber above said valves, a discharge-chamber located above the plunger-chamber, and discharge-valves located between the discharge and plunger chambers.

5. In a pumping-engine, a plunger-chamber, an inlet-chamber, inlet-valves at the bottom of the inlet-chamber and between the inlet and plunger chambers, an inlet-port leading into said inlet-chamber, an inlet air-cushion chamber communicating with said inlet-port through a substantially unrestricted passage, a discharge-chamber located above the plunger-chamber, a discharge air-cushion chamber in communication with said discharge-chamber, and discharge-valves located between said discharge-chamber and said plunger-chamber above the upper line of said plunger-chamber.

6. In a pumping-engine, a plunger-chamber, an inlet-chamber, inlet-valves at the bottom of the inlet-chamber and between said in-

let-chamber and said plunger-chamber, an inlet air-cushion chamber in direct communication through an unrestricted passage with said inlet-chamber, an inlet-port leading into said inlet-chamber, a discharge-chamber, valves interposed between said discharge and plunger chambers, an outlet-port leading from said discharge-chamber and a discharge air-cushion chamber in direct communication through an unrestricted passage with said discharge-chamber.

7. In a single-acting pumping-engine, a plunger-chamber, an inlet-chamber located above the upper line of said plunger-chamber, a valve-support between the plunger and inlet chambers, a plurality of valves depending from said support into the plunger-chamber, and an inlet-port leading into said inlet-chamber above said valves.

8. In a single-acting pumping-engine, a plunger-chamber, an inlet-chamber located above the plunger-chamber, a valve-support between the plunger and inlet chambers, a plurality of valves depending from said support into the plunger-chamber, a discharge-chamber located above the plunger-chamber, and discharge-valves located between the discharge and plunger chambers.

9. In a pumping-engine, a plunger-chamber, an inlet-chamber, a valve-support between the plunger and inlet chambers, a plurality of valves depending from said support into the plunger-chamber, an inlet-port leading into said inlet-chamber above said valves, an inlet air-cushion chamber communicating with said inlet-port through a substantially unrestricted passage, a discharge-chamber located above the upper line of the plunger-chamber, a discharge air-cushion chamber in communication with said discharge-chamber, and discharge-valves located between said discharge-chamber and said plunger-chamber above the upper line of said plunger-chamber.

10. In a pumping-engine, a plunger-chamber, an inlet-chamber located above the upper line of said plunger-chamber, a valve-support between the plunger and inlet chambers, a plurality of valves depending from said support into the plunger-chamber, an inlet air-cushion chamber in direct communication through an unrestricted passage with said inlet-chamber, an inlet-port leading into said inlet-chamber, a discharge-chamber, valves interposed between said discharge and plunger chambers, an outlet-port leading from said discharge-chamber and a discharge air-cushion chamber in direct communication through an unrestricted passage with said discharge-chamber.

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

CARL J. PRINTZ.

Witnesses:
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