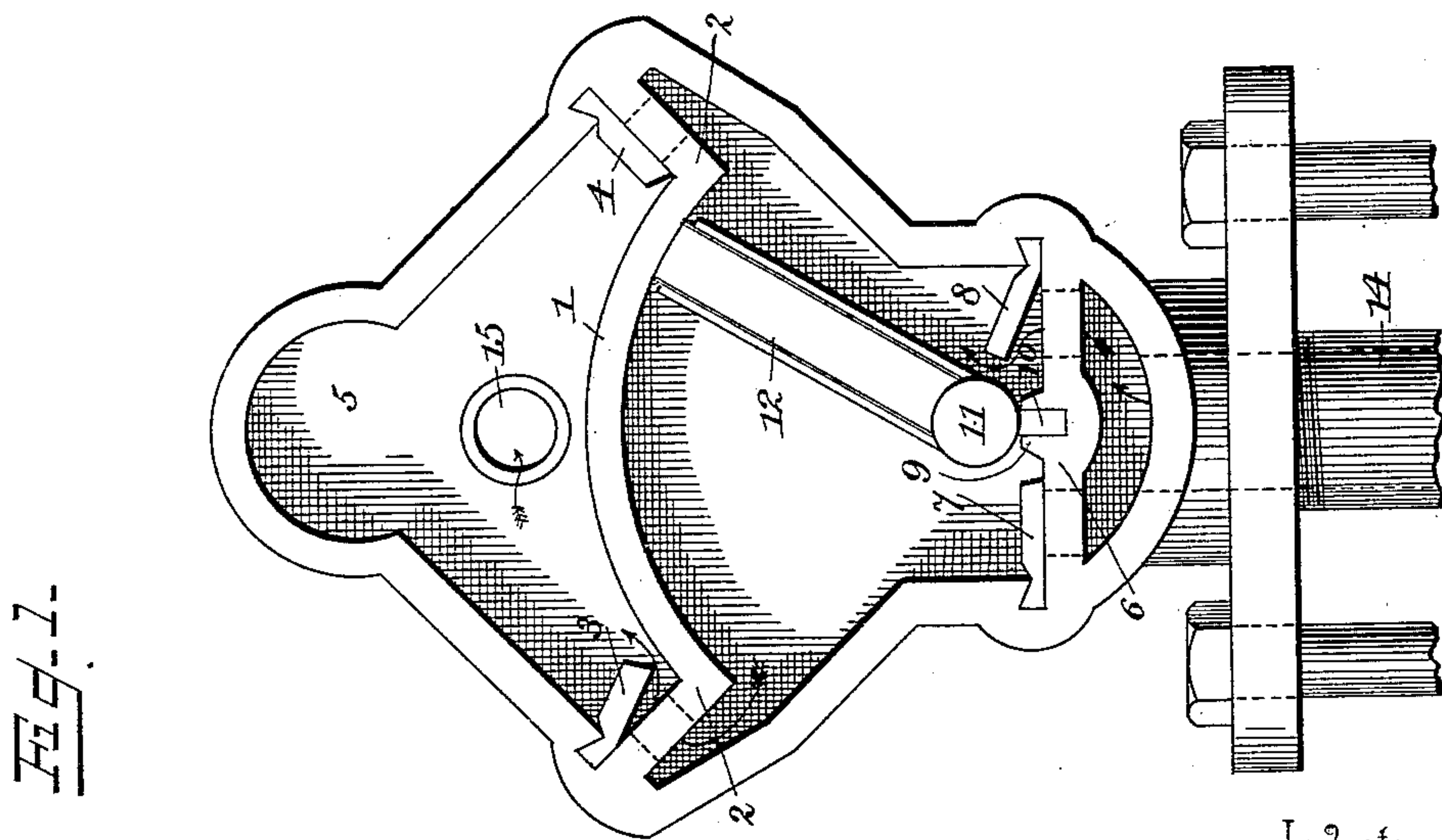
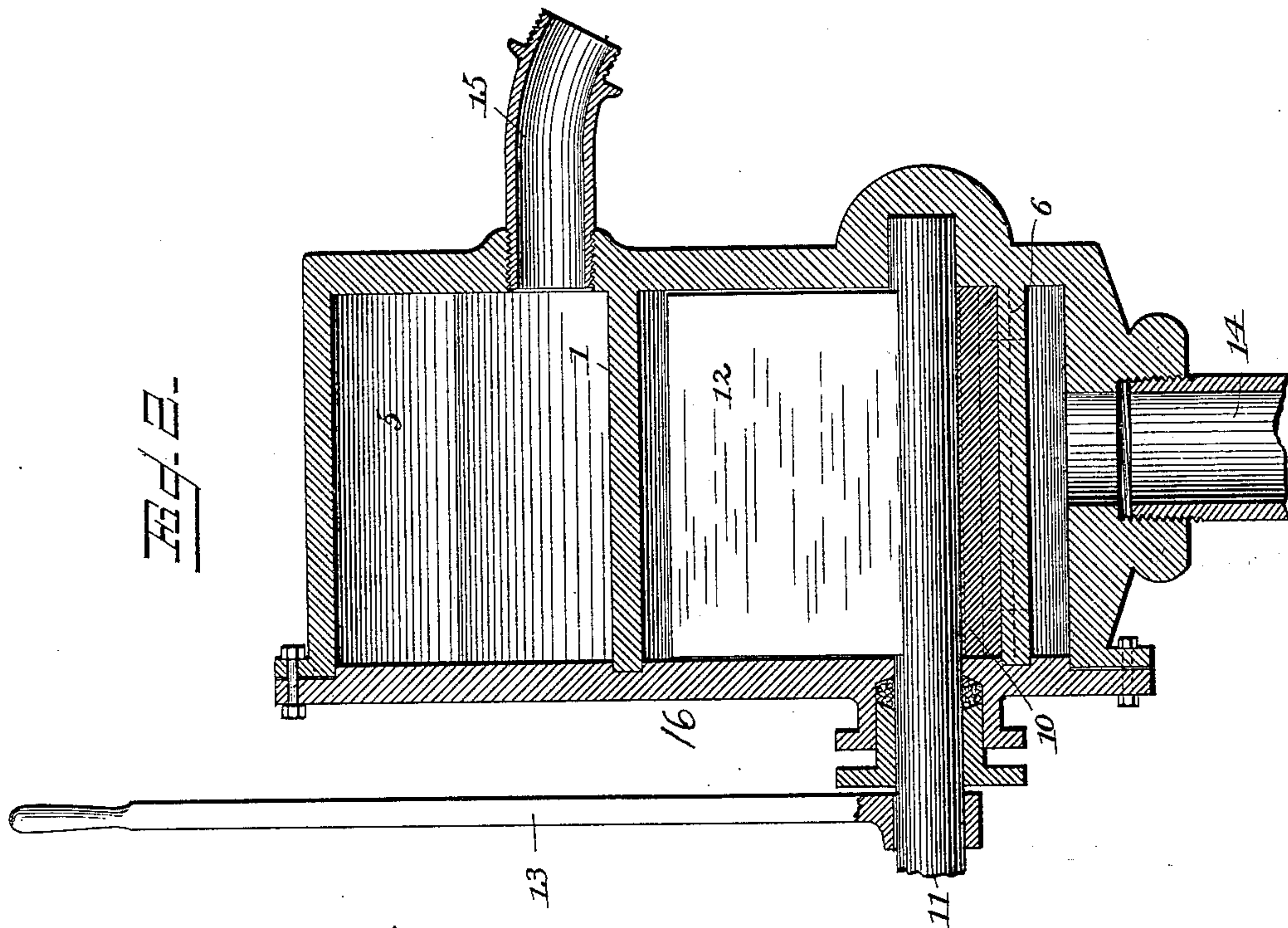


(No Model.)

C. G. WHITE.
PUMP.

No. 602,492.

Patented Apr. 19, 1898.



Inventor

Witnesses

Chas W. Curand
V. B. Hillyard.

By His Attorneys,

Charles G. White

Chas. Snow Geo.

UNITED STATES PATENT OFFICE.

CHARLES G. WHITE, OF WOODLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF
TO J. F. HINK, OF SAME PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 602,492, dated April 19, 1898.

Application filed April 2, 1897. Serial No. 630,436. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. WHITE, a citizen of the United States, residing at Woodland, in the county of Yolo and State of California, have invented a new and useful Pump, of which the following is a specification.

This invention relates to that class of pumps or engines embodying in their structure an oscillating piston operating in a casing between a set of four valves, two controlling induction-ports and the remaining two governing eduction-ports, whereby a continuous stream of water or fluid is secured.

The present invention aims to improve the general construction, whereby the piston in its operation is prevented from rapidly grinding out or wearing away the seat over which it sweeps in its oscillatory movements, and whereby a tight joint is maintained for a greater period of time than is possible by similar constructions for a like purpose, and whereby the pump is maintained at its full capacity for a much longer period.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is an elevation of a pump constructed in accordance with this invention, the near side of the casing being omitted to disclose the internal construction and relative arrangement of the parts. Fig. 2 is a vertical central transverse section thereof.

Corresponding and like parts are referred to in the following description and indicated in both views of the drawings by the same reference characters.

The casing in side elevation is expanded at a point intermediate of its top and bottom, and the upper and lower portions are contracted and are separated by a diaphragm 1 of arcuate form intermediate of its ends and having its terminal portions upwardly de-

flected and divergent and connected at their extremities with the upper converging walls of the casing. The deflected terminals 2 of the diaphragm are formed with openings, which are closed by valves 3 and 4 and by means of which communication is established between the upper and lower portions of the casing formed by the intermediate diaphragm.

The upper converging walls are united by means of a crown-piece or dome which incloses and forms an air-space 5, which contains a sufficient amount of air to insure a steady and uniform stream when the pump is in operation. The arcuate portion 1 of the intermediate diaphragm is concavo-convex, whereby chambers are formed at its extremities to receive any foreign matter which will readily escape through the valve-controlled openings when the pump is in operation, the escape of such matter being facilitated by having the valves 3 and 4 opening inwardly and upwardly from their lower edges.

A horizontal diaphragm 6 is located near the lower end of the casing and is provided near its ends with openings controlled by valves 7 and 8 and midway of its end with a raised portion 9, grooved to receive a packing 10, by means of which a water-tight joint is had between a rock-shaft 11 and the lower portion or diaphragm 6 of the casing. The oscillating piston 12 is attached at its lower end to the rock-shaft 11, and its upper end travels over the lower or concaved surface of the intermediate diaphragm 1, said shaft 11 being oscillated in any convenient way and by means of a lever 13, secured to an end thereof.

The water or other liquid enters the casing by way of the inlet 14 and escapes through the outlet 15, the latter being above the intermediate diaphragm 1, and the inlet at the lower end of the casing and below the horizontal diaphragm 6. The several valves are of the flap type and are secured at one edge to the casing by being slipped into wedge-shaped grooves formed therein, as indicated. The perimetral portion of the casing and one end thereof are integrally formed, as clearly indicated in Fig. 2, and the open side is closed by a removable end or head 16, which is bolted or fastened thereto in any of the ways com-

monly resorted to for attaching heads to cylinders and casings in the construction of engines, pumping machinery, &c.

The lower or concaved surface of the arcuate portion of the intermediate diaphragm 1 is concentric with the axis of the rock-shaft 11. Hence a tight joint is maintained between it and the free end of the piston at all stages of movement of the latter, and by having the parts relatively disposed, as shown, sand, gravel, and like matter cannot lodge upon the active or concave portion of the intermediate diaphragm and cause a grinding and wearing away thereof during the sweeping movements of the piston thereover. Again, by having the raised portion 9, sand and like matter are not liable to come between the packing 10 and the rock-shaft 11 and cause the rapid wearing away of these parts. Any matter tending to accumulate in the lower portion of the casing upon either side of the elevated portion 9 will readily escape through the openings controlled by the valves 7 and 8. Thus it will be seen that the pump is constructed with especial reference to clearing itself automatically of any sand or foreign substance entering and lodging therein, whereby the life and usefulness of the pump are prolonged and repairs not frequently required, and the operating parts easily accessible by simply removing the head or end 16.

The pump does not differ materially in operation from those of the class represented thereby, and as the piston is oscillated the induction-valves 7 and 8 alternately open and close and the eduction-valves 3 and 4 correspondingly open and close, whereby the water or fluid drawn in through the inlet 14 escapes through the outlet 15 in a practically contin-

uous and unbroken stream, which is uniform by reason of the air-space 5 serving as an air-drum commonly provided in double-acting pumps.

Having thus described the invention, what is claimed as new is—

A pump constructed substantially as shown and described, comprising a casing having its sides converging from an intermediate point toward its ends, a crown connecting the upper converging ends and forming an air-dome, an arcuate diaphragm having its end portions inclining upwardly and outwardly and joined to the sides at their point of convergence, inwardly and upwardly opening valves for controlling openings in the said inclined end portions of the diaphragm, a straight diaphragm connecting the lower converging sides, and having a central raised portion provided with a packing, upwardly and outwardly opening valves controlling openings in the ends of the horizontal diaphragm, a rock-shaft journaled in the heads of the casing and having its lower portion forming a tight joint with the said packing, and a straight piston projecting from the rock-shaft and having its free end constructed to work over and against the concave side of the arcuate diaphragm, the casing having an inlet below the straight diaphragm and an outlet above the arcuate diaphragm and below the air-dome, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES G. WHITE.

Witnesses:

CHARLES D. SIMPSON,
A. N. GABLE.