

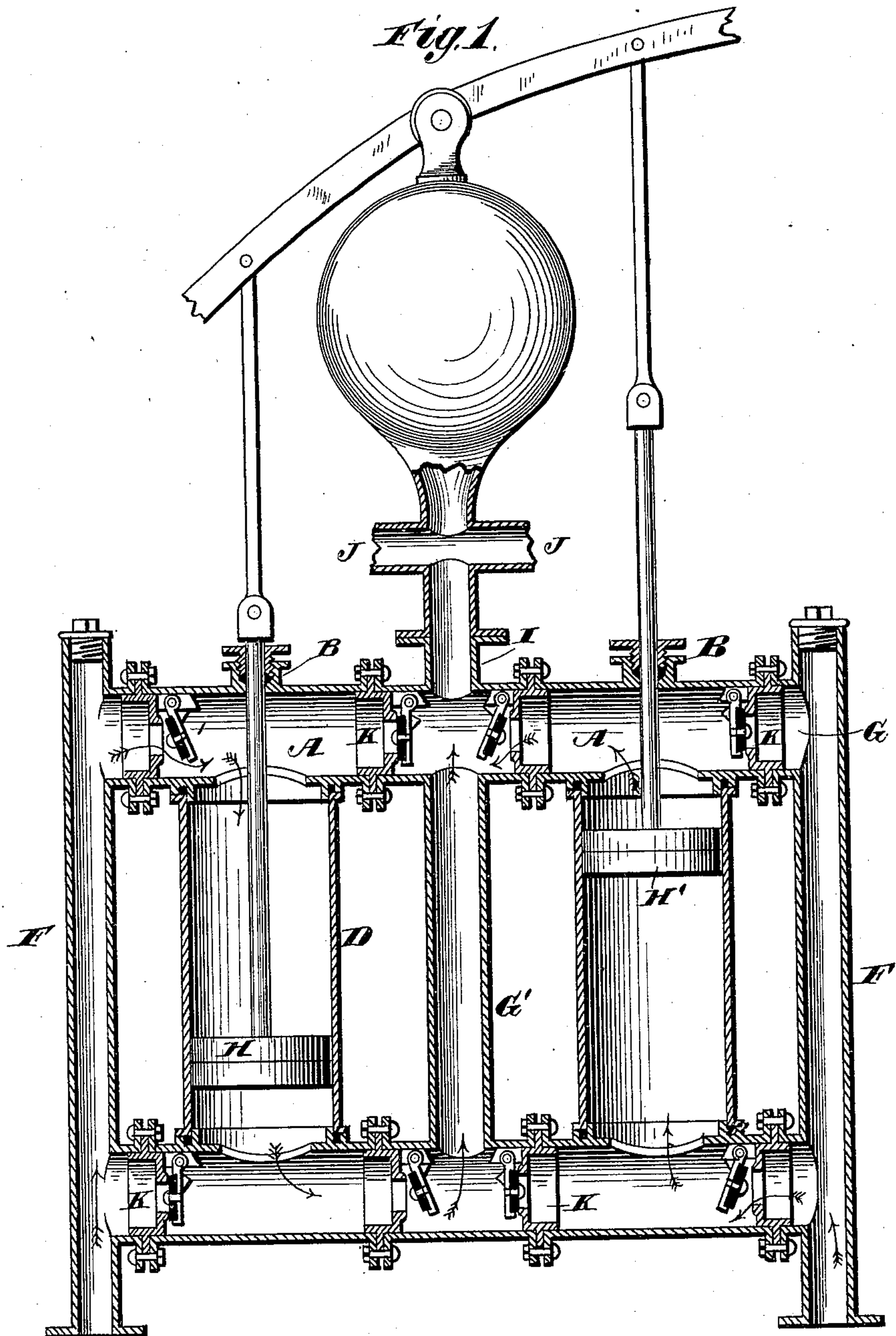
(No Model.)

3 Sheets—Sheet 1.

W. S. McLEOD.
PUMP.

No. 308,509.

Patented Nov. 25, 1884.



Witnesses.

Robert Everett.

J. A. Rutherford.

Inventor.

William S. McLeod.

By *James L. Norris.*
Atty.

(No Model.)

3 Sheets—Sheet 2.

W. S. McLEOD.
PUMP.

No. 308,509.

Patented Nov. 25, 1884.

Fig. 2.

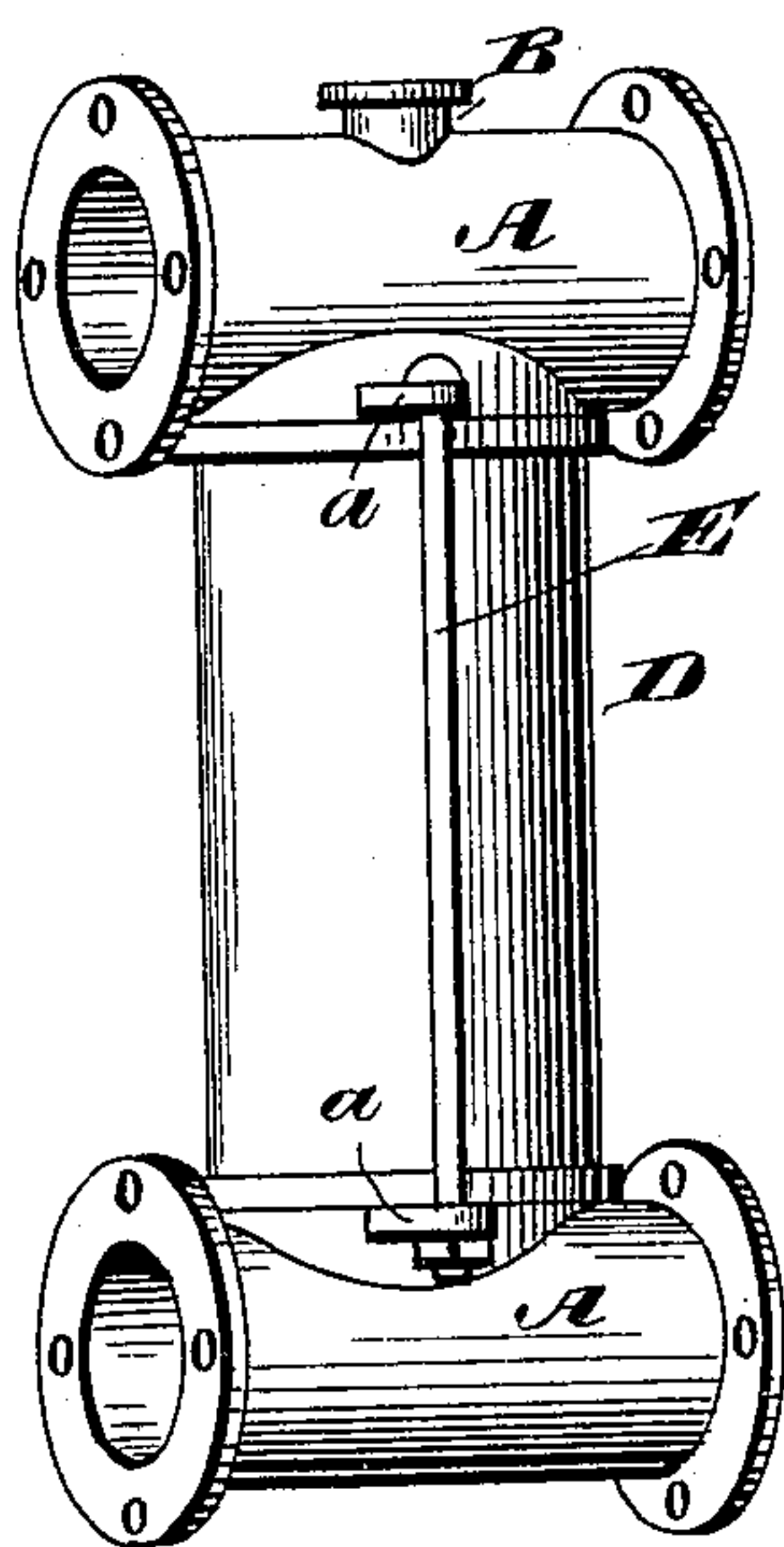


Fig. 3.

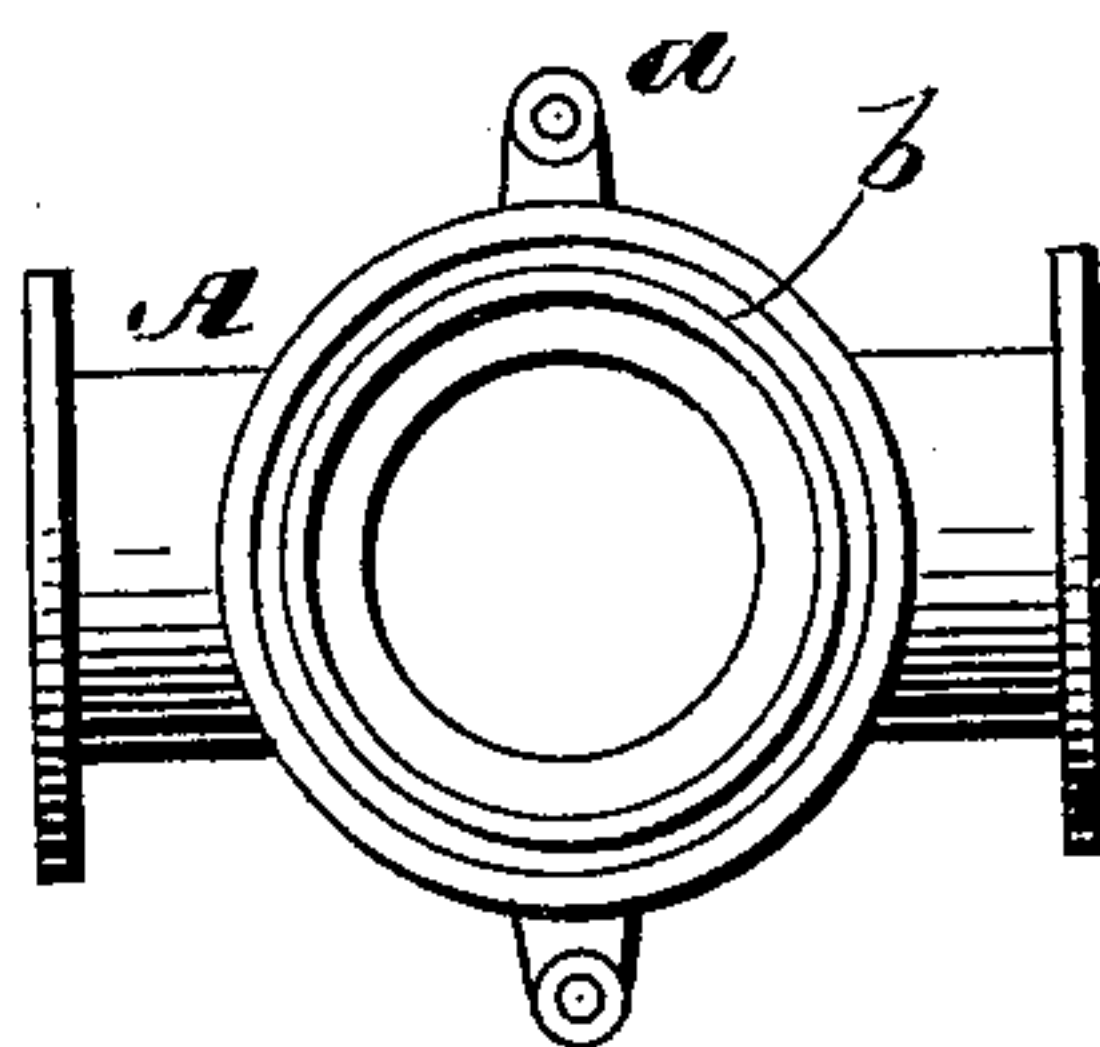
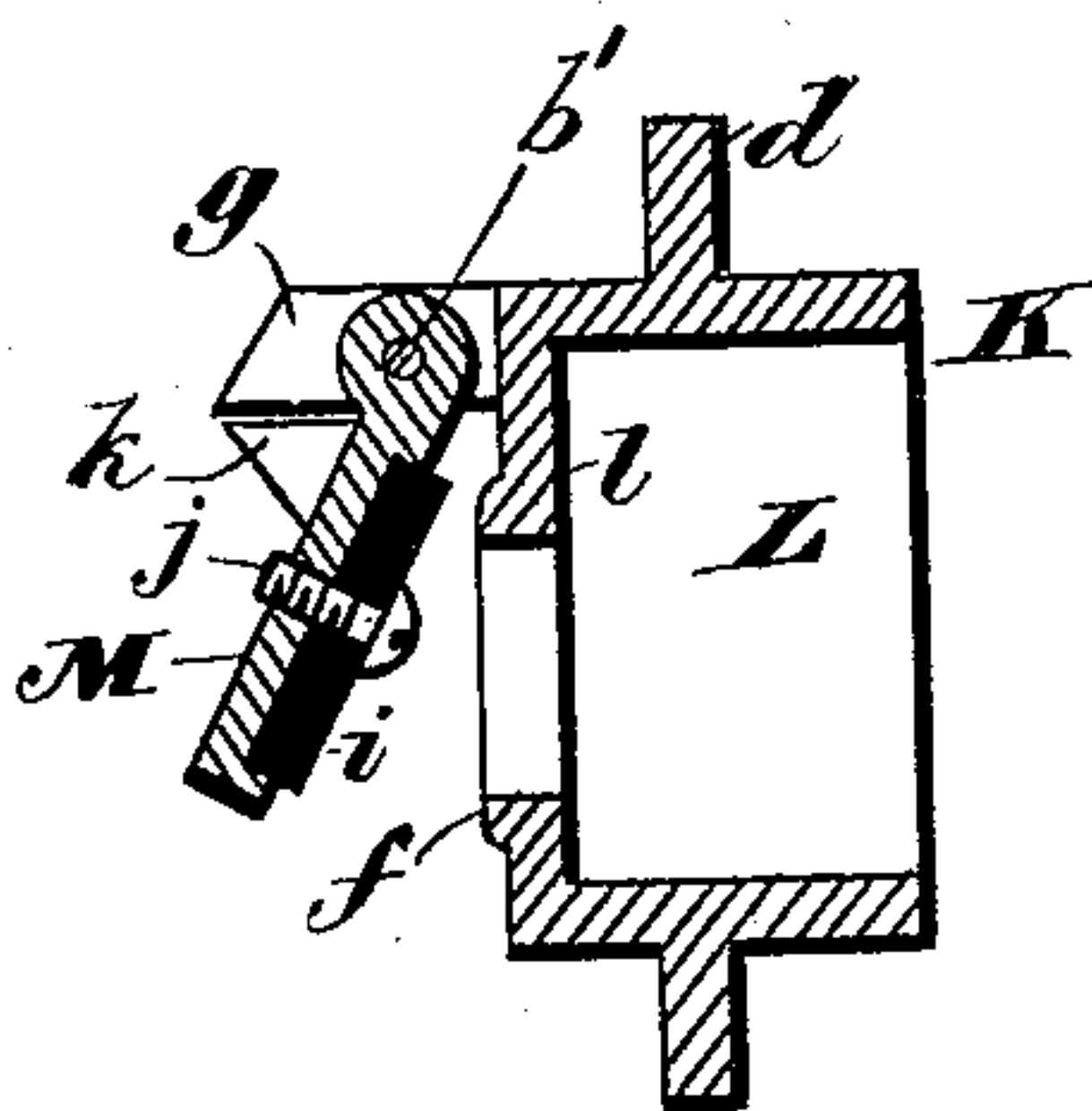


Fig. 4.



Witnesses.
Robert Everett,
J. A. Rutherford

Inventor,
William S. McLeod,
By James L. Norris,
Atty.

(No Model.)

3 Sheets—Sheet 3.

W. S. McLEOD.
PUMP.

No. 308,509.

Patented Nov. 25, 1884.

Fig. 5.

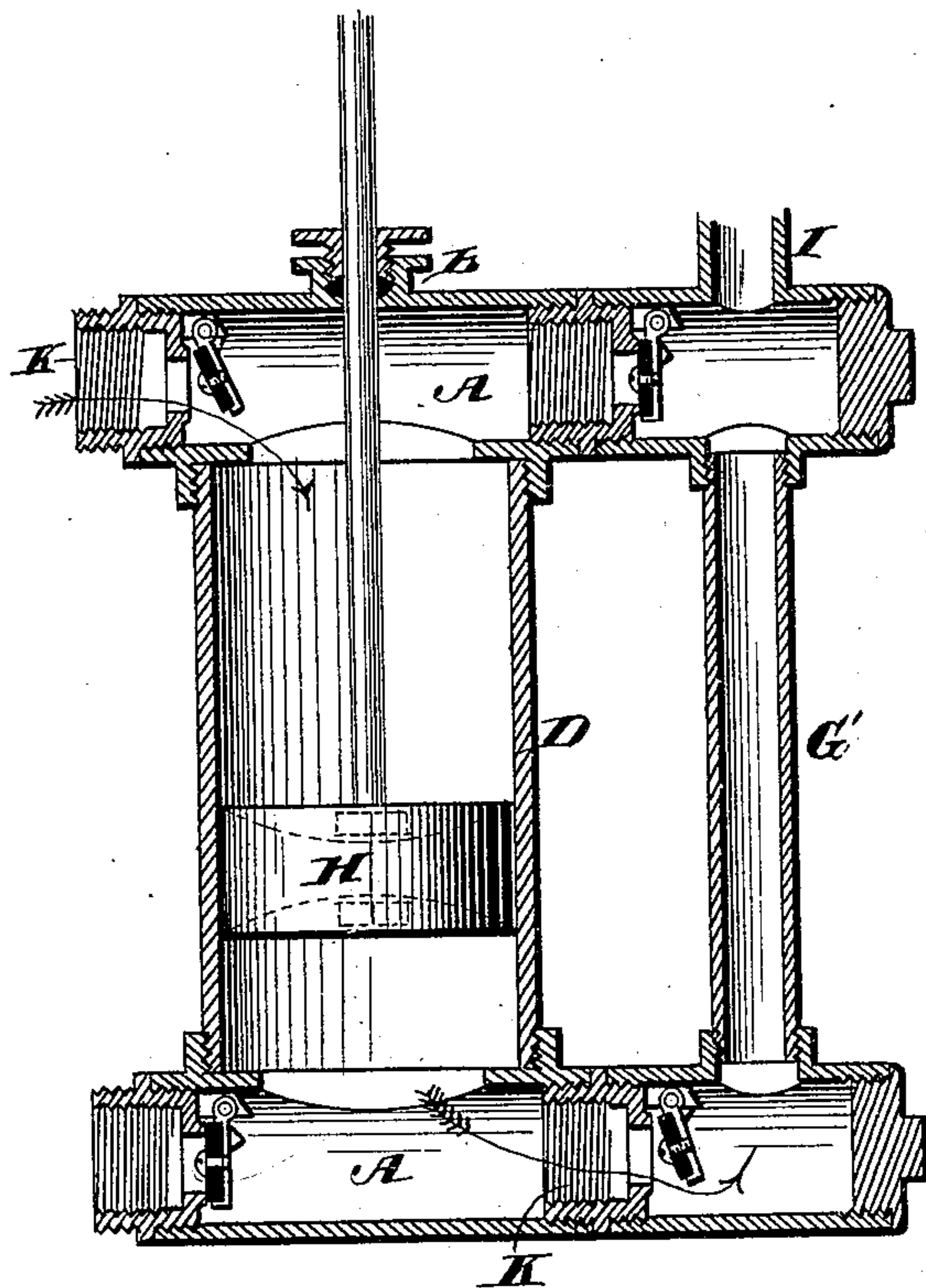
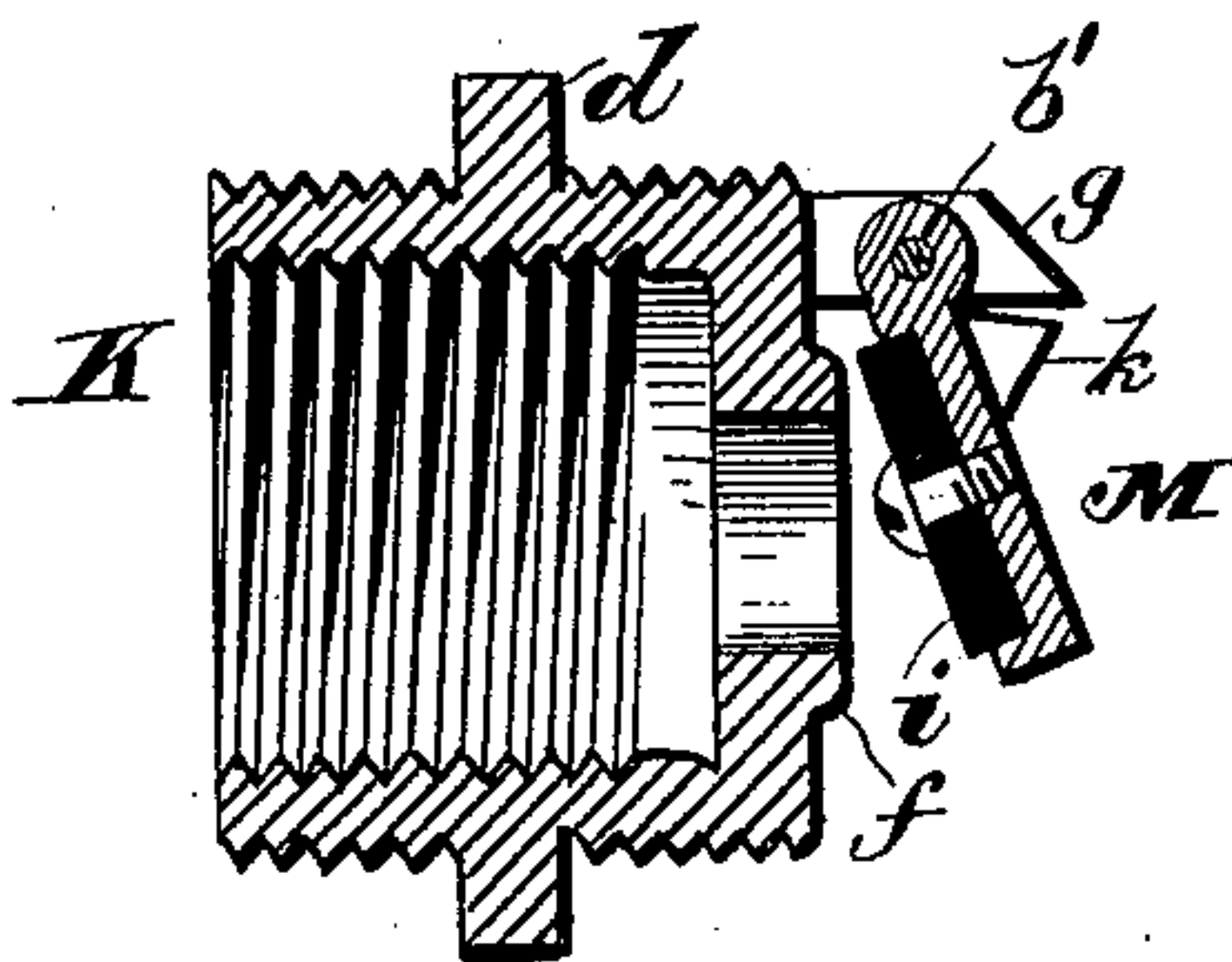


Fig. 6.



Witnesses

Robert Everett.

J. A. Rutherford

Inventor.

William S. McLeod.

By

James L. Norris.

Atty.

UNITED STATES PATENT OFFICE.

WILLIAM S. McLEOD, OF KINGSVILLE, ONTARIO, CANADA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 308,509, dated November 25, 1884.

Application filed September 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. McLEOD, a subject of the Queen of England, residing at Kingsville, in the county of Essex, Province
5 of Ontario and Dominion of Canada, have invented new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to improvements in
10 pumps, and has for its object to improve the construction of the cylinder-heads and induction and eduction pipes, whereby the parts are rendered simple and strong, and capable of being accurately joined together,
15 and readily attached to and detached from each other, and also to improve the construction and effective working of the valves.

The invention is clearly illustrated in the accompanying drawings, in which—

20 Figure 1 is a longitudinal section through a double-acting pump. Fig. 2 is a perspective of a piston-cylinder with the heads connected thereto. Fig. 3 is a bottom view of one of the cylinder-heads, showing the flanged plate
25 connected thereto. Fig. 4 is a detached view of the valve in vertical section. Fig. 5 is a vertical section of a single-cylinder double-acting submerged pump embodying my invention; and Fig. 6, a sectional view of valve
30 with right and left screw threads for its attachment to the cylinder-heads, as illustrated in Fig. 5.

In the said drawings, the letter A indicates the cylinder-head of cylindrical form, with a
35 stuffing-box, B, on its top, and an opening in the opposite side, with a flanged disk or plate around it, provided with perforated lugs *a*, forming a flat seat, as shown, and having a recess or groove, *b*, for the reception of the
40 end of piston-cylinder D, which is firmly held to and between the two heads by rods E, passed through the lugs *a*, and held in place by nuts on their threaded ends. The heads may be
45 made of any suitable metal, and the flanges and lugs will be formed integral therewith, and the piston-cylinder may be made of metal or glass and connected to the heads in any other suitable manner than that described. The induction and eduction pipes F will be

made separate from the other parts, and of 50 metal or other suitable material, with open ends closed by screw-caps, plugs, or other suitable stoppers, and formed with heads G, extending laterally from one side near both ends, into which heads the ends of the cylinder-heads will fit and be held by screw-bolts 55 or other means, and valve-joint formed by packing. The pipes will also be formed with perforated lugs for the passage of headed and nutted rods passing transversely from one 60 pipe to the other to hold them together. Instead of forming the pipes and their heads integral with each other they may be made separate and the ends of the pipes be threaded and the heads screwed thereon, in which 65 event the lugs for the tie-rods would be formed on the sides of the heads.

When the parts are constructed as described, they can be very quickly put together and taken apart, and form a simple yet strong 70 pump-cylinder.

The construction of the above parts will be the same whether a single or double cylinder force or suction pump be made out of them; but in the drawings I have represented a 75 double-cylinder force-pump, the above parts being used in duplicate, with an eduction-pipe, G', between the piston-cylinders, communicating with the interior of the cylinder-heads, and with a tight joint united to the exterior of 80 the heads. The form of this intermediate suction-pipe differs from the specially-described pipes F, one of which in a single-acting pump would serve, as is apparent, for the induction-pipe, and the other one for the 85 eduction-pipe. The construction of the intermediate pipe, G, however, is only such as a skilled mechanic would adopt to make it meet the requirements of its connections shown. 90

In Fig. 1 the upper ends of pipes F are represented as closed and the lower ends open, and the water as entering through the lower ends of the pipes and carried in the direction indicated by the arrows—that is, when the 95 piston H is forced down, the suction thus created opens the valve in the extreme left of the cylinder-head, and at the same time draws

up water through the pipe on the extreme left and carries it down into the piston-cylinder over the piston, the piston at the same time expelling the water that is below it in the cylinder, and forces it through the valve-opening in the lower head, and thence up through the central eduction-pipe, G', thence transversely through the upper cylinder-head into the pipe I above, and thence out through final delivery-pipes J to the point of delivery. While the piston H is being forced down, the piston H' is being lifted up, and draws water in through pipe F on the extreme right and up into the piston-cylinder below the piston, the piston at the same time expelling the water above it in the cylinder and forcing it out into the cylinder-head, and thence into pipe I, from whence it is carried out with the water from the opposite cylinders. When the action of the pistons is reversed, the operation is the reverse of that first described: the valves which in the first operation opened now close, and those which were closed now open. The valves are arranged as shown, each cylinder being provided with two valves above and two below, they being arranged in the cylinder-heads on opposite sides of the open ends of the piston-cylinders between the points of communication of the induction and eduction pipes with the ends of the cylinder-heads. If desirable, for any good reason, the lower ends of the pipes F may be closed and the upper ends opened for the induction of the water through the upper ends.

The valves, which are indicated by the letter K, are constructed as shown in detail in Fig. 4—that is to say, each is composed of a shell, L, which has on its exterior a transversely-set flange, d, and at one end an inwardly-extending flange, l, which may have a raised seat, f. Two ears, g, extend from the flanged end outwardly in the direction of the length of the shell, and between these ears, by a pin or pivot, b', a pallet, M, is hinged. The lower face of this pallet is recessed, and in the recess there is set a cushion, i, of gutta-percha, leather, or other suitable material, it being held therein by a screw, j, so that it can be readily removed and another substituted for it when it becomes worn out, and its function is to insure a close joint between the pallet and its seat, and also to prevent the seat from wearing out as quickly as it otherwise would.

To the top of the pallet, near its hinged end, there is secured a projection, k, preferably pointed and beveled on its rear face. Its function is to insure the falling and seating of the pallet, when the pressure which opens the pallet is relieved, by preventing it from being thrown to a perpendicular, which might cause it to rest in that position. The valve so constructed is placed within the cylinder-heads, with its external flange passing between the edges or flanges of the cylinder-heads and pipe-heads, which may be held by

a pin passed through the flange, or clamped by bolts passed through the flanges of the heads, as shown.

If desired, the external flange to the shell may be omitted and other means be adopted—for instance, by making a light and biting fit between the shell and the interior of the heads—for holding it in place; or the pin or pivot which hinges the pallet to the ears may be extended so as to bear tightly against the walls of the pipe in which the valve is placed.

The pistons are indicated by the letters H and H'.

The operation of the several parts will be understood from the foregoing description, and the connection of the parts to the parts of a single-cylinder acting pump will be apparent to the skilled mechanic without a detailed description and illustration thereof being here given; but in Fig. 5 I illustrate a single-cylinder double-acting submerged pump in which the screw-threaded valve is fitted.

The same letters of reference are used as for the corresponding parts in the double-cylinder pump.

The arrows indicate the course of the water when the piston is moved in one direction, and when it is moved in the opposite direction the other valves will open and the first set close.

In this single-cylinder pump I have illustrated as applied thereto a valve the same in all particulars as that already described, excepting that it has screw-threads externally and internally, (right and left hand,) so that it may be secured within the cylinder-heads by the threads instead of by bolts, as illustrated in Fig. 1. It will also be understood that the cylinder may be secured to the flanges of the heads by screwing the heads and cylinder together, the flanges to the heads being threaded and the ends of the cylinder right and left screw-threaded, as will be understood by the skilled mechanic.

Having thus described my invention, what I claim is—

1. The combination of the cylinder-heads, provided each with an opening on one side and a flanged plate, the cylinder fitting between the heads about the flanged plates, and the end pipes provided with laterally-extending heads connecting with the ends of the cylinder-heads, and means for binding the parts together, substantially as described.

2. The combination, with the cylinder-heads, of the valve composed of the shell set within the head and having a pallet provided with a projection on its top, hinged between ears extending from the end of the shell, which ears form a stop, as shown, for the projection on the pallet to strike against, substantially as described.

3. The valve composed of the shell having

an external flange, in combination with the pallet provided with a projection on its top and hinged to ears at one end of the shell, substantially as described.

- 5 4. The valve composed of the shell having the pallet hinged to ears at one end thereof, which ears form a stop, as shown, to the movement of the valve, substantially as described.

In testimony whereof I have hereunto set 10
my hand and seal in the presence of two sub-
scribing witnesses.

WILLIAM S. McLEOD. [L. S.]

Witnesses:

JASPER P. MOORE,
CHARLOTTE M. HAAK.