

No. 661,874.

Patented Nov. 13, 1900.

W. HULL.
DOUBLE CYLINDER PUMP.

(Application filed May 15, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

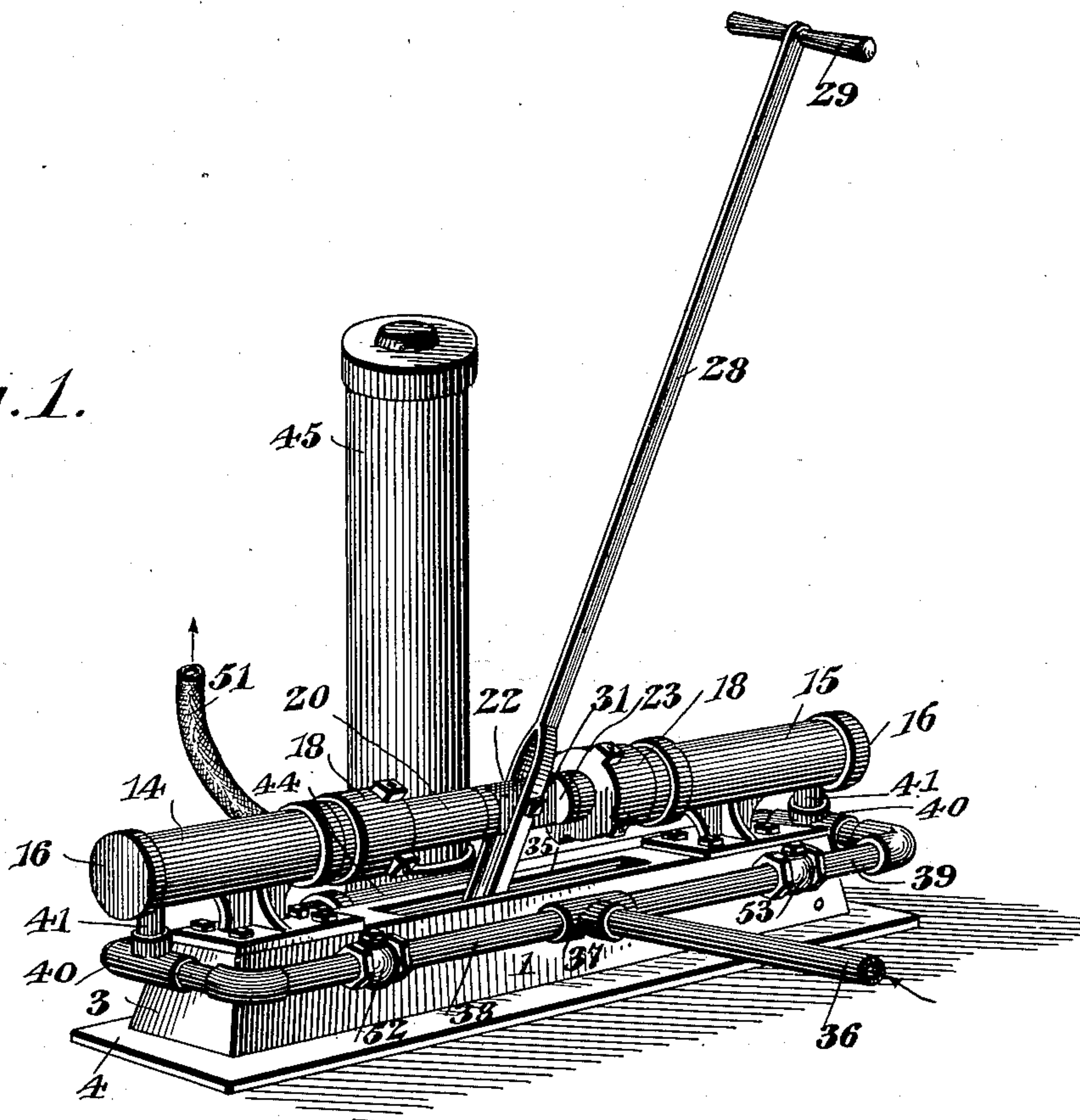
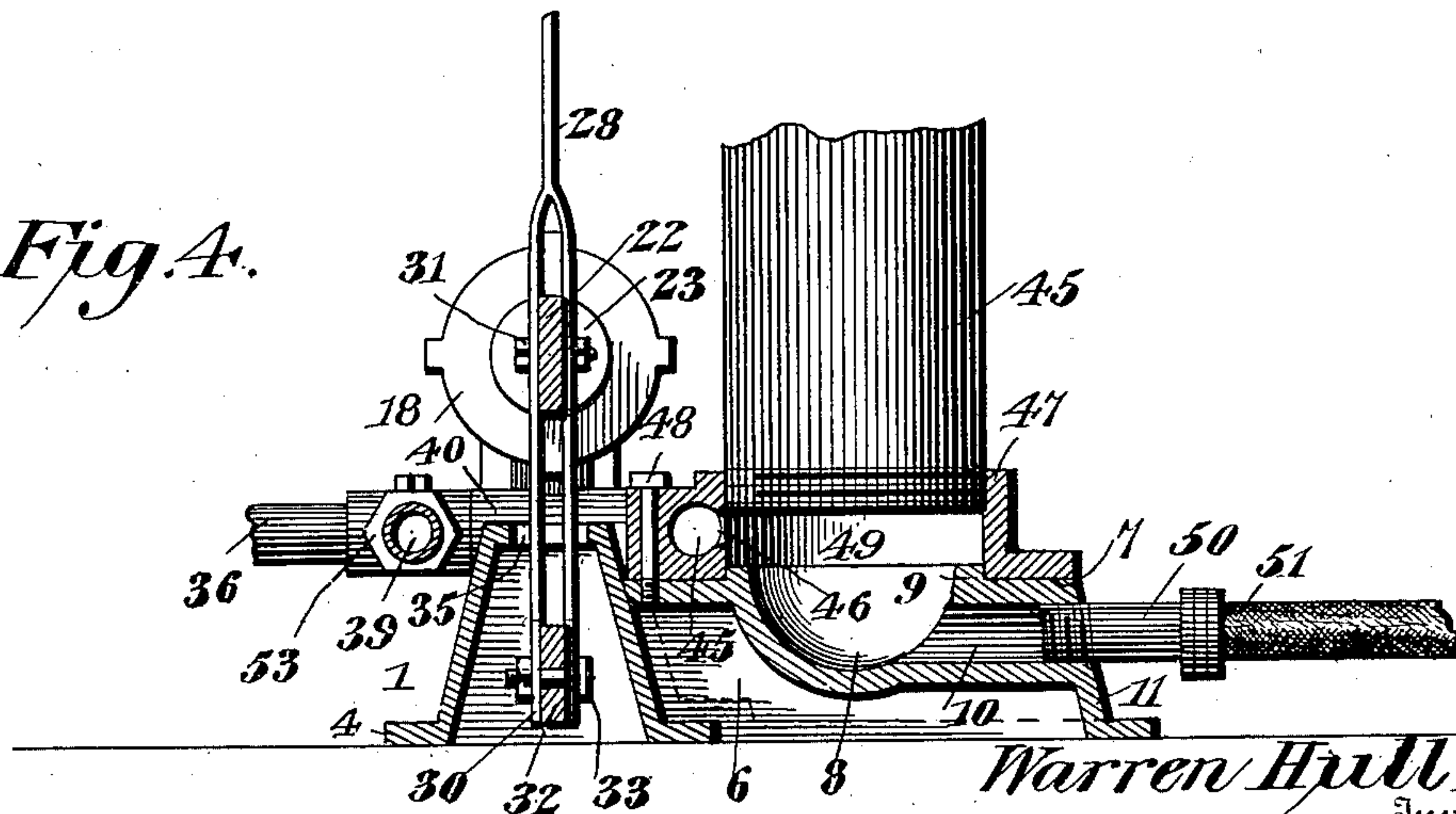


Fig. 4.



Warren Hull.

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Fig. 2.

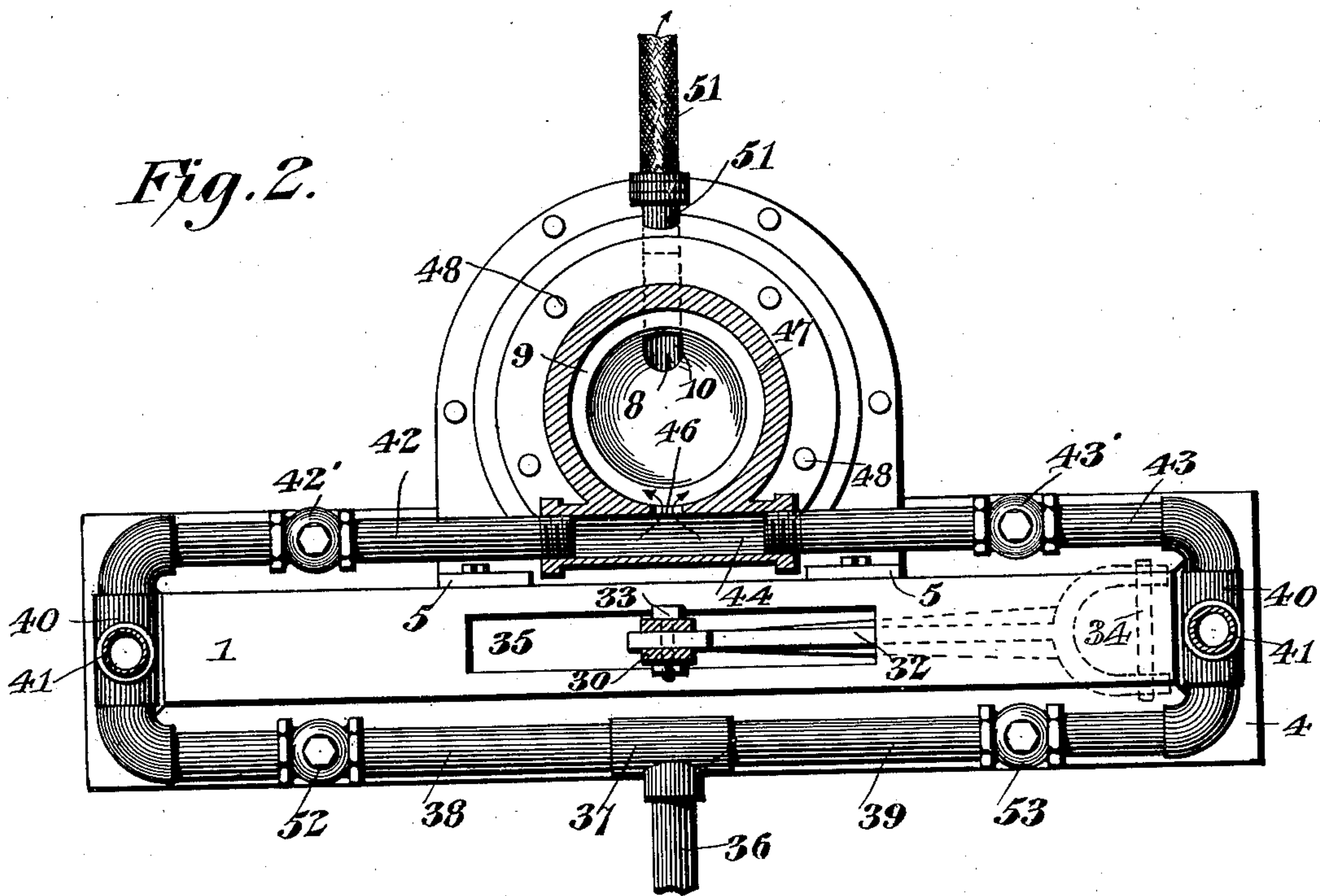
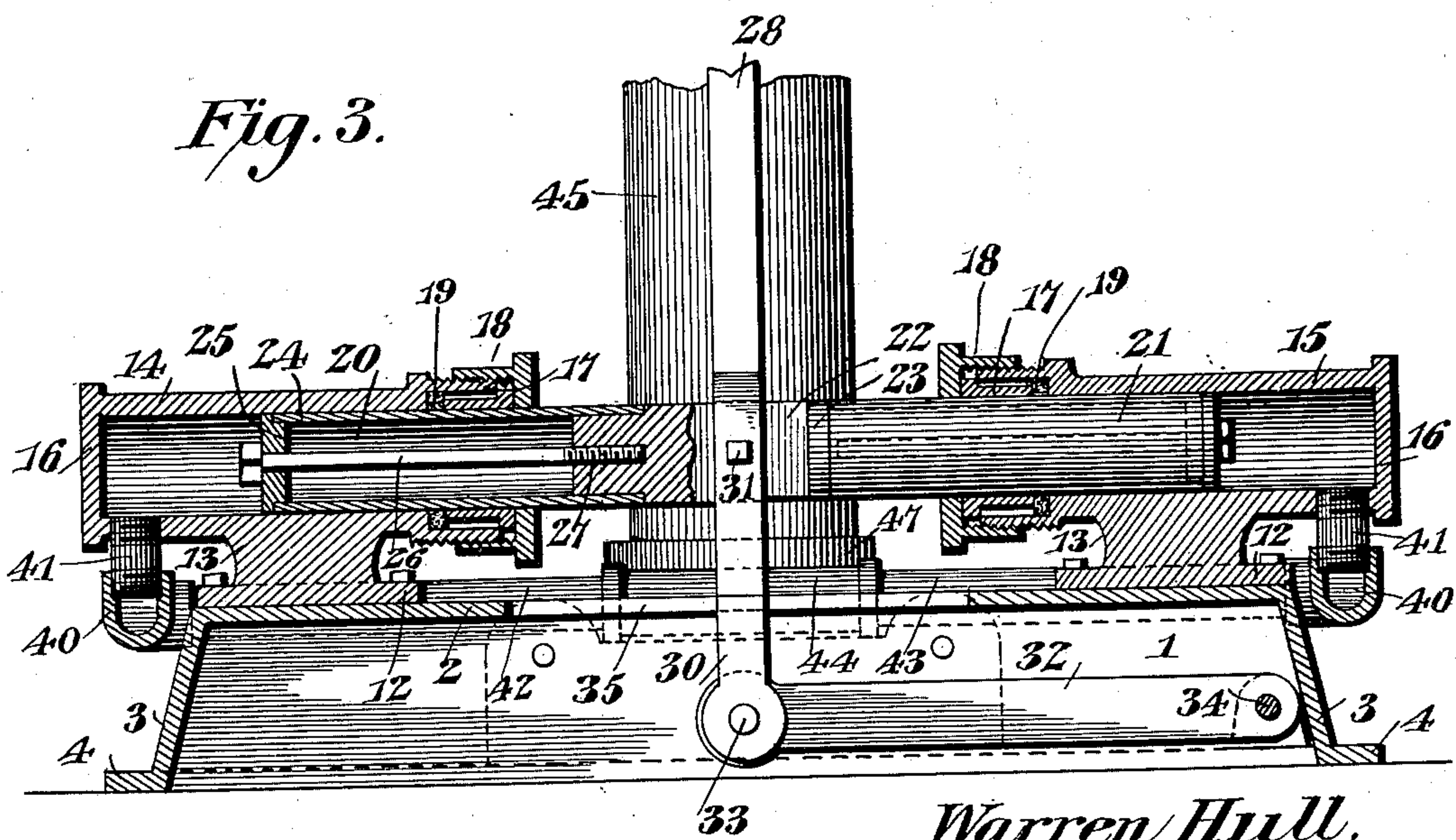


Fig. 3.



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UNITED STATES PATENT OFFICE.

WARREN HULL, OF GASPORT, NEW YORK, ASSIGNOR OF TWO-THIRDS TO
ARTHUR B. HULL AND JOHN C. HULL, OF SAME PLACE.

DOUBLE-CYLINDER PUMP.

SPECIFICATION forming part of Letters Patent No. 661,874, dated November 13, 1900.

Application filed May 15, 1900. Serial No. 16,779. (No model.)

To all whom it may concern:

Be it known that I, WARREN HULL, a citizen of the United States, residing at Gasport, in the county of Niagara and State of New York, have invented a new and useful Double-Cylinder Pump, of which the following is a specification.

My invention relates to improvements in double-cylinder pumps of that type wherein the pump-cylinders are mounted in alinement and within which reciprocate connected plungers operated by actuating mechanism common to both for the purpose of pumping liquid or other fluid.

One object in view is to construct and arrange the elements of the pump in a novel manner in order to reduce the cost of manufacture and the expense incidental to the continued operation of the pump by simplifying the construction and by aggrouping its parts in a manner to attain the greatest possible efficiency with a minimum liability to wear and derangement.

A further object of my invention is to produce a high-pressure pump capable of being operated with a minimum expenditure of power and designed more especially for spraying fruit-trees and the like or for any other purpose requiring a projected stream or spray of fluid under high pressure.

Still another object is to provide for the adjustment of the packing while the pump is operating and for the insertion of new packing and the thorough cleaning of the operative parts without necessity for disorganizing the pump structure.

To the accomplishment of these objects the invention consists in the construction and arrangement to be hereinafter fully described, illustrated in the accompanying drawings, and embraced within the scope of the appended claims.

In the drawings, Figure 1 is a perspective view of my pump complete. Fig. 2 is a horizontal sectional view thereof. Fig. 3 is a vertical longitudinal section, and Fig. 4 is a transverse sectional view showing the upper end of the equalizing chamber or dome broken away.

Referring to the numerals of reference employed to designate corresponding parts in the several views, 1 indicates a hollow base, shell,

or casting of elongated rectangular form and comprising a bed-plate 2, supported on the slightly-inclined walls 3, having a foot-flange 4, which rests upon the floor or other support and may be bolted thereto. To one side of this hollow base is bolted the bolt-flanges 5 of a hollow lateral base-section 6, having its upper face 7 located in a horizontal plane below the bed-plate 2 and provided at its center with a substantially semispherical depression 8, surrounded at its upper edge by an annular flange 9, and from the lower portion of which depression or cavity 8 is led a discharge-port 10, opening through the side wall 11 of the lateral casting 6 opposite the base 1. The elongated base 1 is designed for the support of the pump proper, and the lateral base-section is designed for the support of the equalizing-chamber, by means of which the pulsations of the pump are obliterated to secure a continuous stream when the pump is in operation. Upon the bed-plate, adjacent to the opposite ends of the base 1, are bolted the foot-flanges 12 of the integral cylinder-supporting webs 13, carrying the coaxial pump-cylinders 14 and 15, having their outer ends closed by the integral heads 16 and their inner ends counterbored for the reception of glands 17 and externally screw-threaded for the engagement of the internally-threaded stuffing-boxes 18, which boxes are screwed upon the cylinders for the purpose of urging the glands against suitable packings 19, the compression of which prevents leakage around the plungers 20 and 21. These plungers 20 and 21 are practically a single element, and I will therefore refer to that relatively rigid aggroupment of elements which comprehends these plungers as a "double-headed" plunger. This element, then, comprises what may be termed the "medial" plunger-shaft 22, which is a flat metal bar provided at its opposite ends with cylindrical enlargements 23, the extremities of which are reduced to fit into the opposed inner ends of the hollow plunger-sleeves 24, the outer end of each of which is closed by a head 25, retained in place by a comparatively long head-retaining bolt 26, passed through an axial opening in the head and having its inner extremity screwed into an axial recess 27, formed in the adjacent reduced end of the shanks. This construction

of the plunger is simple and inexpensive, and it provides for the ready replacement of the wearing-surfaces, as the removal of either of the plunger-sleeves may be quickly effected
 5 by the simple withdrawal of the bolt 26, which may be as quickly resecured to retain a new sleeve to compensate for the wear of the one displaced.

For the purpose of actuating the double-headed plunger to cause it to reciprocate with its opposite ends located in the cylinders I employ an oscillating pump rod or lever 28, having its upper end provided with a handle 29 or otherwise adapted for the application of
 10 power, and having its deflected lower end 30 straddling the shank 22, to which it is pivotally secured, as by the transverse bolt 31, and having the rise and fall of its lower extremity accommodated by what may be termed an
 15 "equalizing-arm" 32, pivoted, as indicated at 33, between the lower ends of the pump-rod bifurcations and extending horizontally within the hollow base to a point adjacent to one end thereof, where the bifurcated rear
 20 ends of the equalizing-arm are fulcrumed upon a transverse bolt 34, having its opposite ends retained in the side walls of the base 1. An elongated slot 35 is provided in the bed-plate for the passage of the lower end of the lever
 25 28, which, as stated, is connected to the swinging arm 32 and the plunger, respectively, above and below the bed-plate.

36 indicates the liquid-supply pipe, communicating through a three-way fitting 37
 30 with the oppositely-extending induction-pipes 38 and 39, extending in opposite directions parallel with the adjacent side plate of the base 1 to the opposite ends of the base, where said pipes communicate with the three-way
 35 fittings 40, the central port of each of which communicates through a pendent nipple 41 with the outer end of the adjacent cylinder, at the under side thereof. From the ends of the fittings 40, opposite the induction-pipes
 40 38 and 39, are led the eduction-pipes 42 and 43, screwed at their contiguous inner ends into the opposite extremities of the tangentially-disposed fitting 44 of the equalizing-chamber 45, with which the fitting communi-
 45 cates through a port 46. The fitting 44 is formed in the base-block 47 of the expansion-chamber 45, the block being seated upon the upper surface of the lateral casting or base and bolted thereto, as by bolts 48, with the
 50 annular flange 9 fitting snugly into the opening 49 of the block, which is internally screw-threaded for the reception of the threaded lower end of the equalizing-chamber 45, which it supports. The coupling-nipple 50 is screwed
 55 into the discharge-port 10 to effect the connection of a flexible pipe or other conduit 51, through which the water is forced to the point of use.

52 and 53 indicate check-valves located in
 60 each of the induction-pipes 38 and 39 for the purpose of preventing the back flow of the liquid after it has been drawn from the induc-

tion-pipes into the cylinders, and 42' and 43' indicate similar check-valves located in the eduction-pipes 42 and 43 to prevent the fluid
 70 from being drawn back into the cylinders.

The operation of my pump is as follows: The oscillation of the pump-rod 28 by the application of power to its upper end effects the reciprocation of the double-headed plunger,
 75 the heads of which are located within the cylinders, and draws the liquid into the cylinders from the liquid-induction pipes 38 and 39 and forces it from the cylinders through the eduction-pipes 42 and 43, fitting 44, and
 80 port 46 to the interior of the expansion or equalizing chamber 45, which serves to obliterate the pulsation of the pump and to permit the discharge of the liquid through the
 85 discharge-port 10 and pipe 51 in a continuous stream. By reason of the employment of the swinging arm or equalizer 32 it is possible to dispense with any loose connections between the pump lever and plunger or between the
 90 lever and the part to which it is pivoted below the plunger, inasmuch as the rise and fall of the lower end of the lever incidental to its oscillation from the bolt 31 as a fulcrum will be accommodated by the vibration of the
 95 equalizer 32 upon the pivot 34.

From the foregoing it will be evident that my pump is so constructed that all of its parts may be easily cast and assembled in a manner to permit of their easy disassociation for the purpose of facilitating repair; but while
 100 the present embodiment of my invention appears at this time to be preferable I do not desire to limit myself to the structural details defined, but reserve the right to change, modify, and vary such details within the scope of
 105 the protection prayed.

What I claim is—

1. In a pump, the combination with a base whose top constitutes a bed-plate, of a pair of coaxial cylinders carried thereby, a double-headed plunger movable within the cylinders,
 110 a hollow lateral base extension bolted to one side of the base and having a discharge-port, a hollow base-block surmounting the extension, an equalizing-chamber surmounting the
 115 base-block, eduction-pipes leading from the cylinders to the base-block, and induction-pipes leading to the cylinders.

2. In a pump, the combination with a hollow base, whose top constitutes a bed-plate,
 120 of a pair of coaxial cylinders provided with a foot-plate bolted to the bed-plate, a double-headed plunger movable within the cylinders, means for actuating said plunger, a hollow lateral base extension bolted to one side of
 125 the base and having its top surface located in a lower plane than the bed-plate, said lateral base extension being provided with a cavity in communication with a discharge-port, an annular flange surrounding the cavity, a base-block seated upon the lateral base
 130 extension and surrounding the annular flange, an equalizing-chamber screwed into the base-block directly over the cavity in the base ex-

tension, eduction-pipes leading from the cylinders to the base-block, and valve-controlled induction-pipes leading to said cylinders.

3. The combination with a hollow base, the top of which constitutes a bed-plate, of a pair of coaxial cylinders having foot-plates bolted to the bed-plate of the base, a double-headed plunger movable in the cylinders, a pump-lever pivoted below the base and having a pivotal connection with the plunger, a lateral base extension bolted to the base and having a cavity in communication with a discharge-port and surrounded by an annular flange, a base-block bolted upon the face of the base extension, an equalizing-chamber screwed into the base-block above the cavity and base extension, a nipple depending from the end of each cylinder, a supply-pipe, valve-controlled induction-pipes communicating with the supply-pipe and the nipples, and liquid-eduction pipes communicating with the nipples and with the interior of the base-block of the equalizing-chamber.

4. In a pump, the combination with a base whose top constitutes a bed-plate, of a pair of coaxial cylinders mounted on the base, a double-headed plunger movable within the cylinders, a base extension at one side of the base and having a discharge-port, a base-block surmounting the extension and provided with oppositely-disposed pipe-couplings, an expansion-chamber surmounting the base-block, and induction and eduction pipes surrounding the base and having common connection at their end portions with the contiguous portions of the cylinders, the induction-pipes being connected to a suitable supply-pipe and the eduction-pipes being connected to the couplings of the base-block.

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

WARREN HULL.

Witnesses:

J. D. NORTHROP,
M. A. MESLER.