

No. 731,241.

PATENTED JUNE 16, 1903.

J. G. STEINER.
PUMPING SYSTEM.

APPLICATION FILED JUNE 7, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

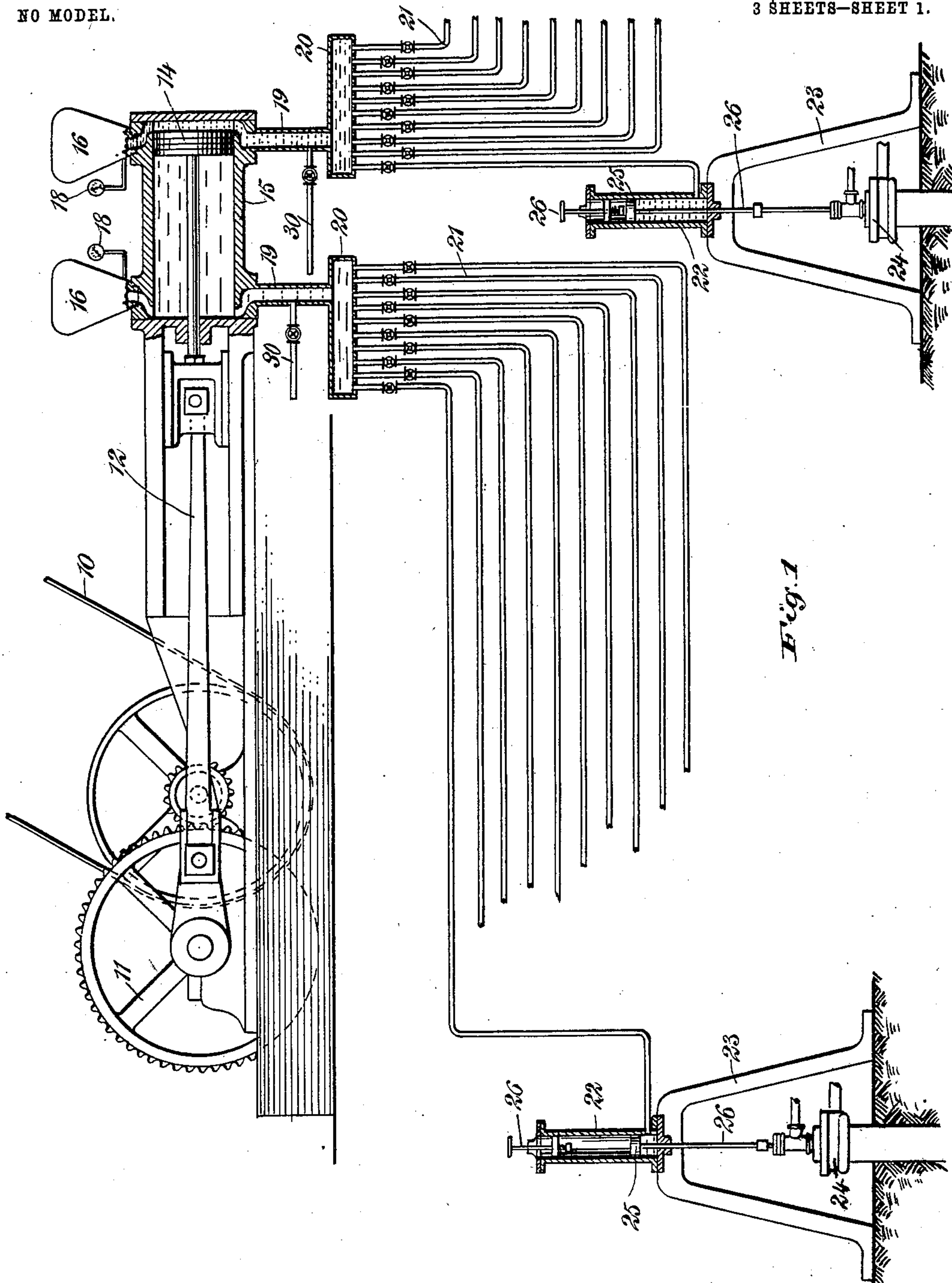


Fig. 1

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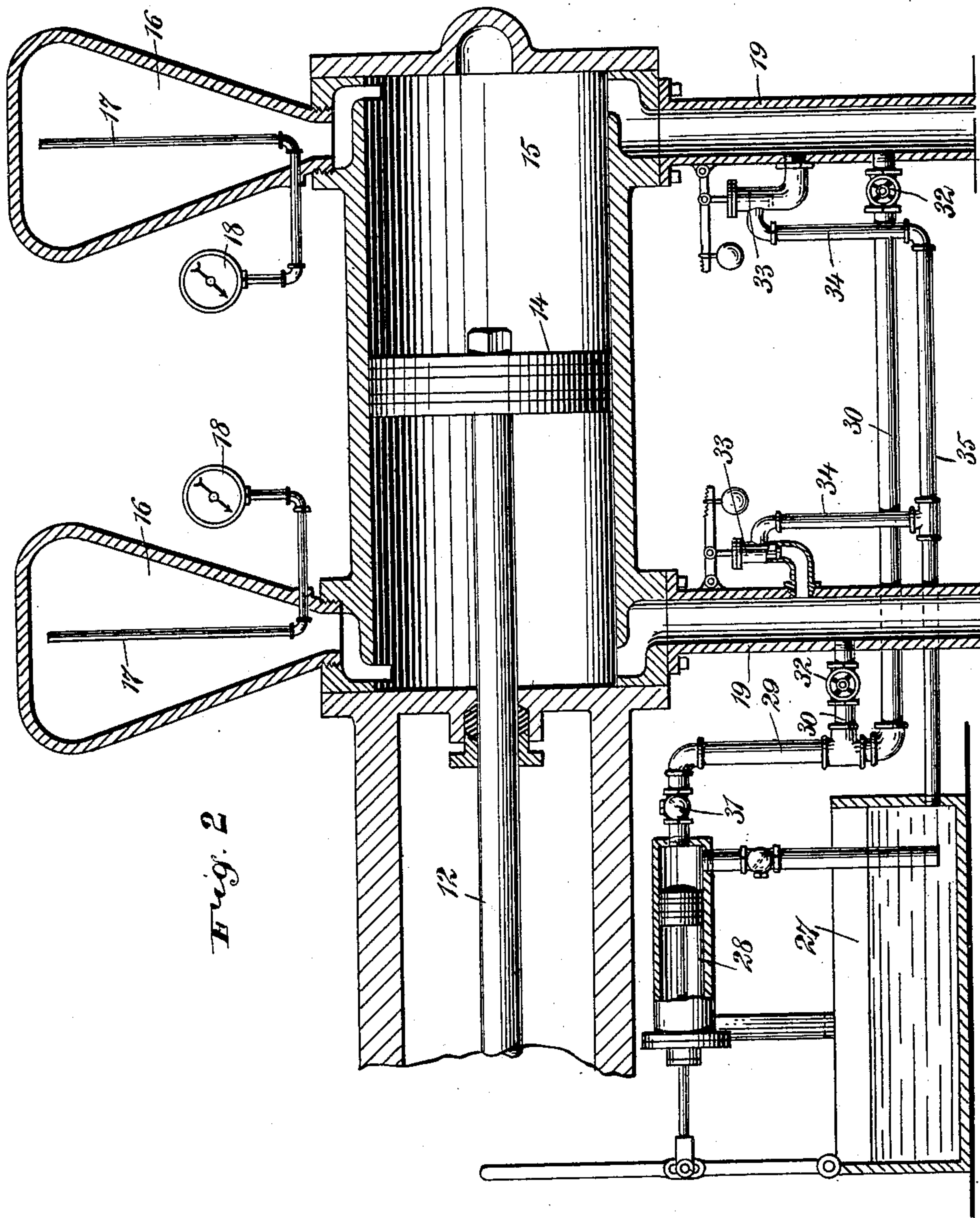


Fig. 2

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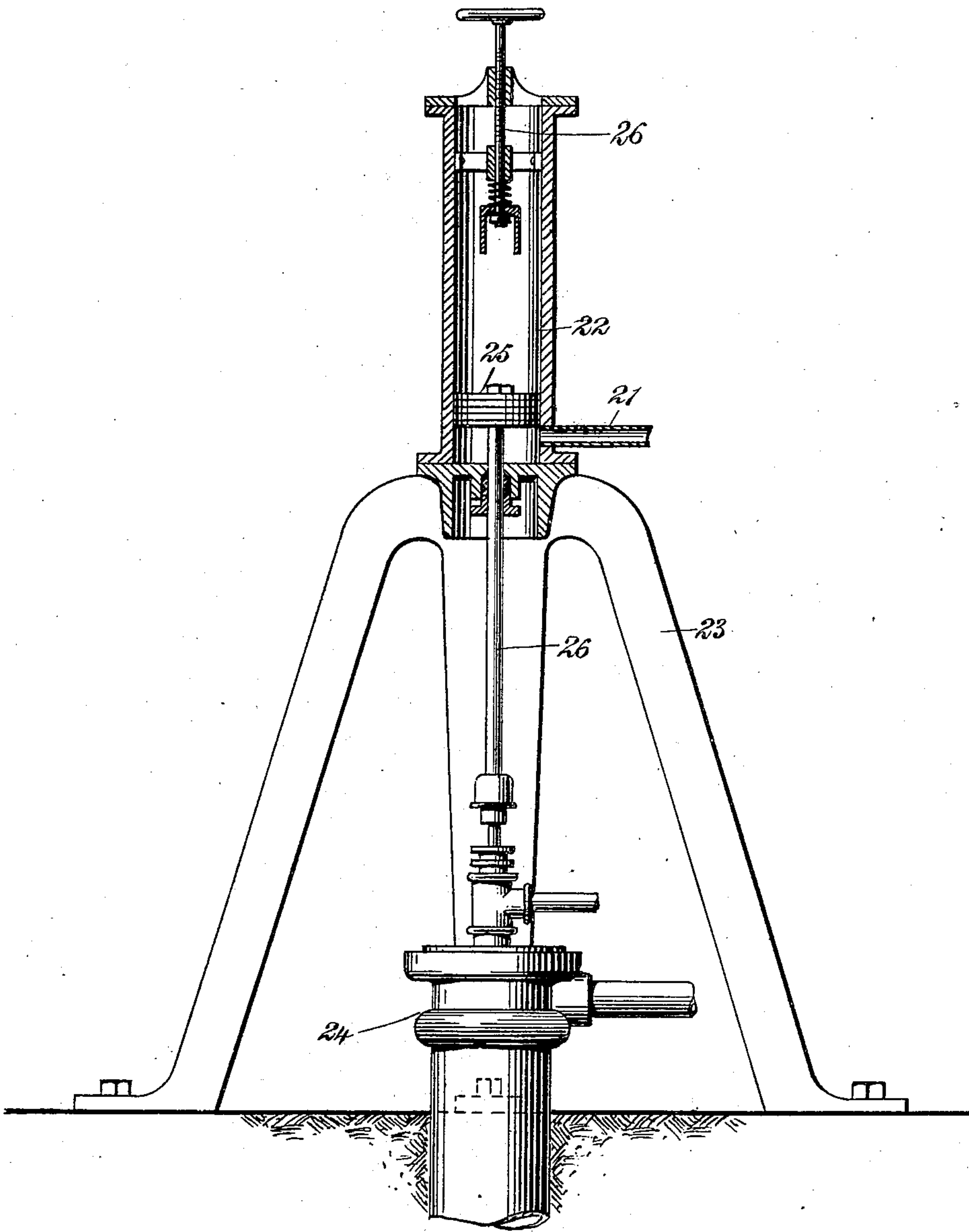
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NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

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Fig. 3

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UNITED STATES PATENT OFFICE.

JOHN G. STEINER, OF BLUFFTON, OHIO.

PUMPING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 731,241, dated June 16, 1903.

Application filed June 7, 1902. Serial No. 110,631. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. STEINER, a citizen of the United States, and a resident of Bluffton, in the county of Allen and State of Ohio, have invented a new and Improved Pumping System, of which the following is a full, clear, and exact description.

This invention relates to a system or apparatus for operating pumps and other machinery by fluid-pressure, the object being to transmit power from a central station to a plurality of pumps situated at different points, this power being transmitted by the fluid-pressure referred to.

The invention is particularly adaptable for operating the pumps of oil-wells, and one of the leading features of the invention is the dividing of the series of pumps to be operated into two groups and connecting these groups with the respective ends of a cylinder, in which works a piston to force the fluid. When the piston moves toward one end, the fluid is forced to the pumps connected with said end and these pumps are operated. Meanwhile the pumps connected with the other end are falling by gravity, and thus creating a certain pressure back of the piston which assists the action thereof. By this arrangement I am enabled to utilize the gravity of the sucker-rods, and thus operate the pumps economically.

This specification is an exact description of one example of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a diagrammatic view of the invention, certain parts being shown in section and others in elevation. Fig. 2 is an enlarged sectional elevation of the pump for creating and directing the fluid-pressure, and Fig. 3 is an enlarged sectional view of the means connected with the oil-well pumps to operate the sucker-rods thereof.

10 indicates a belt or other means for transmitting power to a gearing 11 to drive, by means of the connecting-rod 12, a piston 14, this piston working in a pump-cylinder 15. The cylinder 15 and the piston 14 constitute the pump for creating and directing the fluid-

pressure. At each end of the cylinder 15 air-receivers 16 are located, said receivers communicating with the cylinder and each containing a pipe 17, which extends from the upper portion thereof downward to the bottom and outward from the receiver, the outer ends carrying pressure-gages 18, so that the pressure within the receivers may be observed when desired. Pipes 19 pass from each end of the cylinder 15 downward to pipe-headers 20. These pipe-headers are two in number, and each has a series of tubes 21 connected therewith. The tubes 21 pass, respectively, to the lower portions of cylinders 22, mounted on tripods 23 directly over the casing-heads 24 of the oil-well. In these cylinders 22 pistons 25 are arranged, and said pistons are connected by rods 26 with the sucker-rods of the well. The pistons 25 lie above the pipes 21, so that pressure entering by said pipes will raise the pistons. The upper end of each cylinder 22 is open to the atmosphere, and at this point in each cylinder is located an adjustable means 26 for limiting the upward movement of the pistons.

Now it will be apparent that as the piston 14 of the main pump moves back and forth it will cause the fluid to flow under pressure first through one series of pipes 21 and then through the other. Oil or water may be employed in these pipes, and of the two oil is preferable. When the fluid flows into the cylinders 22 of one series of pipes 21, the pistons 25 of this series are raised. Meanwhile the pistons 25 of the other series are falling under the action of the weight of the sucker-rod, and this causes a return pressure behind the piston 14, thus assisting the action thereof. The piston 14 then returns and the fluid-pressure is sent through the other series of pipes, reversing the action above explained.

As shown in Fig. 2, 27 indicates a tank or other source containing the liquid used in the cylinders and pipes. 28 indicates a hand-pump for forcing this liquid from the tank 27 by way of a pipe 29 and its branches 30 into the respective pipes 19. The pipe 29 is provided with a check-valve 31, preventing a flow back to the pump 28, and hand-valves 32 are provided to open and close the branches 30. 33 indicates safety-valves, which are connected with the pipes 19 and which when

opened place these pipes 19 in communication with branch pipes 34 of a pipe 35, which leads back into the tank 27. By means of the pump 28 and its connections the apparatus may be filled with fluid, and should the pressure in the apparatus become excessive at any time the valves 33 will open and admit the excess back into the tank 27. The air-receivers 16 are adapted to have the air compressed thereinto under the action of the piston 14 and this compressed air then expanded to assist the movement of the liquid, as will be readily understood.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A pumping system, comprising the combination of a cylinder having two ports in each end thereof, a piston reciprocable in the cylinder, means for driving the piston, an air-receiver communicating with one of the ports at each end of the cylinder, two pipe-headers in connection with the other ports respectively at the ends of the cylinder, a plurality of pipes passing from said headers, and fluid-operated devices in connection with the pipes, said pipes being approximately equally divided between the headers.

2. In a pumping system, the combination of a cylinder, a piston therein, means for driv-

ing the piston, a pipe passing from each end of the cylinder at opposite sides of the cylinder, a pipe-header in connection with each pipe, pipes extending from the headers, a fluid-operated device in connection with each of said pipes, a source of liquid, a pump communicating therewith, a feed-pipe passing from the pumps and communicating with both of the pipes from the cylinder, overflow-pipes also communicating with said pipes from the cylinder and passing back to the source of liquid, and safety-valves normally closing the overflow-pipes.

3. A pumping system, comprising the combination of a cylinder having a port in each end thereof, a piston reciprocable in the cylinder, means for driving the piston, two pipe-headers respectively in connection with the said ports of the cylinder, a plurality of pipes passing from said headers and being approximately equally divided between them, fluid-operated devices in connection with the pipes, and means for supplying fluid to said system.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN G. STEINER.

Witnesses:

FREDERICK TRIBLEHORN,
OTIS E. GOBLE.