

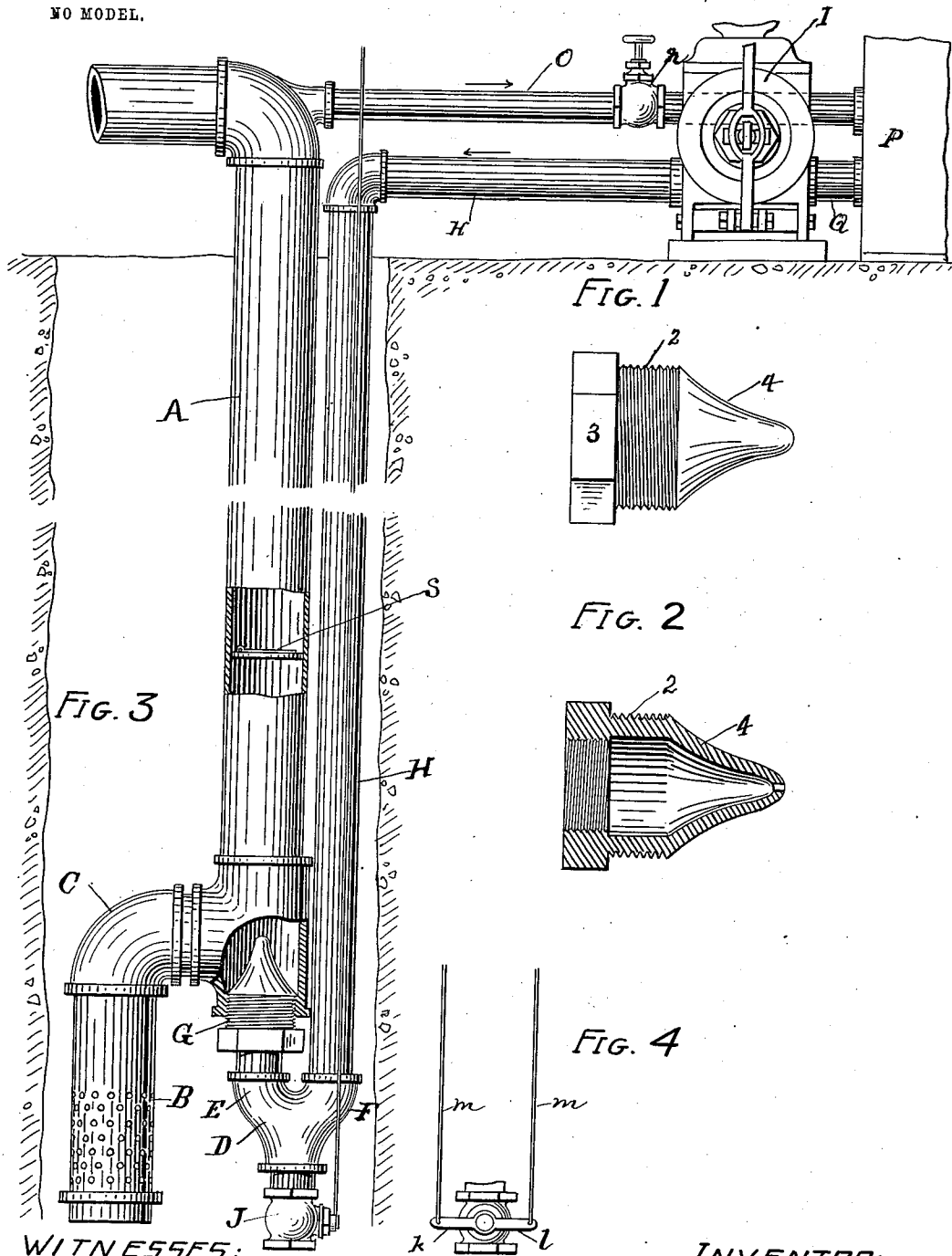
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PATENTED MAR. 24, 1903.

D. W. JONES.
PUMPING APPARATUS.

APPLICATION FILED APR. 14, 1902. RENEWED FEB. 24, 1903.

NO MODEL.



WITNESSES:
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UNITED STATES PATENT OFFICE.

DAVID W. JONES, OF SAN FRANCISCO, CALIFORNIA.

PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 723,676, dated March 24, 1903.

Application filed April 14, 1902. Renewed February 24, 1903. Serial No. 144,898. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. JONES, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Pumping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention relates to a pumping apparatus which is especially adapted for use in deep-bored wells of limited diameter—such, for instance, as the oil-wells which are now being sunk in different portions of the country where a great depth is required to be reached in order to tap the oil-bearing sands. Such wells require to be sunk to a depth of a thousand feet or more, and they are usually of small diameter and lined with a casing. My pump is adapted to be lowered inside this narrow casing and to be operated from the surface of the earth, all as hereinafter set forth and described.

Referring to the accompanying drawings, Figure 1 is a side elevation of my pumping apparatus, having a portion at the lower end of the main pipe broken away to show the injection-nozzle and a portion at mid-length broken away to show the check-valve. Fig. 2 is a side view of the injection-nozzle. Fig. 3 is a longitudinal section of the injection-nozzle, and Fig. 4 is a side view of the sediment-valve and the means for operating it.

Let A represent a pipe or tube which forms the main lift or discharge pipe of the apparatus. To one side of the pipe A, near its lower end, a perforated suction-pipe B is connected with the main pipe by means of an elbow C. This suction-pipe may extend to a distance below the lower end of the main pipe A within the limit of suction, as hereinafter described.

D is a casting having two branches E and F. This casting is mounted below the main pipe A, and the upper end of one of its branches E is connected with the lower end of the main pipe A by means of a nozzle-fitting G, (shown in Figs. 2 and 3,) while its other branch F is connected with the lower end of a pressure-pipe H, which extends up

alongside and parallel with the main pipe A. This latter pipe H extends above the surface of the ground and is connected with a force-pump I of any desired pattern. The interior of the casting D forms a chamber for the purpose hereinafter described, and its lower end is provided with a valve J, which can be opened or closed by means of two levers *kl* and two wires *mm*, which lead up alongside on pipe H to the surface.

The upper end of the main pipe A is connected by a pipe O with a tank P, while the tank is connected with the pump I by a pipe Q. This pipe O is shown in the drawings by the dotted lines where it passes behind the pump. A cock *r* in the length of this pipe serves to open and close its passage for the purpose hereinafter described. S is a check-valve in the main or upraise pipe A.

The injection-nozzle G is constructed so as to constitute an ordinary pipe-fitting. It consists of a short tubular section marked 2, having a polygonal nut 3 formed on one end and a short tapering nozzle 4 on its opposite end. The exterior of the section 2 is threaded, so as to screw into the end of a pipe, and the nut 3 is provided with interior screw-threads, so that a pipe can be screwed into it, as shown at the broken-away portion at the lower of the main pipe in Fig. 1. By constructing this injection-nozzle as an ordinary pipe-fitting it can be made in quantity of different sizes and sold in stock.

The suction and pipe attachments of this pumping apparatus can be made in compact form and of a dimension that will admit of them being lowered into a driven or bored well of narrow compass until they reach the bottom or level of the liquid in the well and proper pipe extensions connected with the pipes A and H to reach the surface and be connected with the pump I and tank P, respectively.

The pump I here shown is a hand-operated pump having a lever 4 fulcrumed at its lower end and marked 5. It draws its supply of liquid from the tank P through the short connecting-pipe Q, and it forces this liquid, be it oil or water, through the down-pipe H into the chamber in the casting D. Thence the liquid is forced upward through the branch E of the casting D and the injection-nozzle G

into the lower end of the main pipe A and forces the liquid contained in it upward to the surface. It is apparent that the pressure in the down-pipe H will balance the pressure in the main pipe A, so that any additional pressure induced by the action of pump I will cause an overflow from the upper end of the main pipe, and as the liquid is thereby set in motion a vacuum will be produced opposite the point where the suction-pipe connects with it, and a consequent upward movement of the liquid is induced through the suction-pipe, which is also raised and discharged through the main pipe. The tank P is supplied by a flow through the pipe O from the upper end of the main or discharge pipe, and this supply is regulated by the cock r. Any sediment that may settle in the chamber of casting D can be discharged when desired by opening the valve J by means of the wires m m and turning on the pump-pressure, if required, after which the valve should be closed. In the operation of this pump I can use steam or vapor instead of water in the pressure-pipe II.

This apparatus can be mainly constructed of ordinary pipes and fittings, such as can be found ready made on the market, and it will form an effectual pumping apparatus that can be adapted to one or more wells and operated by a single pump.

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

1. A pumping apparatus comprising a main or discharge pipe: a suction-pipe connected with the lower end of the main pipe: an injection-nozzle applied at the base of the main

or discharge pipe: a check-valve in the main pipe: a pipe parallel with the main pipe and connected at its upper end with a pump at the surface: a feed-pipe connecting the upper end of the main or discharge pipe with a tank and a pipe connecting the tank with the side of the pump opposite its force-pipe substantially as described.

2. In a pumping apparatus operated by a jet of water or vapor ejected from a nozzle into the main or discharge pipe, a tank connected with and supplied with liquid or vapor from the upper end of the discharge-pipe and a feed-pipe connecting said tank with the operating-pump by which the liquid or vapor is forced through the injection-nozzle substantially as described.

3. In a pumping apparatus operated by a jet of water or vapor ejected from a nozzle into the lower end of a main or discharge pipe: a casting at the lower end of the main pipe having two branches and whose interior forms a sediment-chamber: an injection-nozzle connected with one branch of the casting while its opposite branch is connected with the pressure-pipe, a valve in the lower end of the casting below the sediment-chamber and a two-armed lever connected with the valve and operated by wires leading to the surface for opening and closing the valve substantially as described.

In witness whereof I have hereunto signed my name this 7th day of April, A. D. 1902.

DAVID W. JONES.

Witnesses:

NORMAN M. GRISWOLD,
A. ASHDOWN.