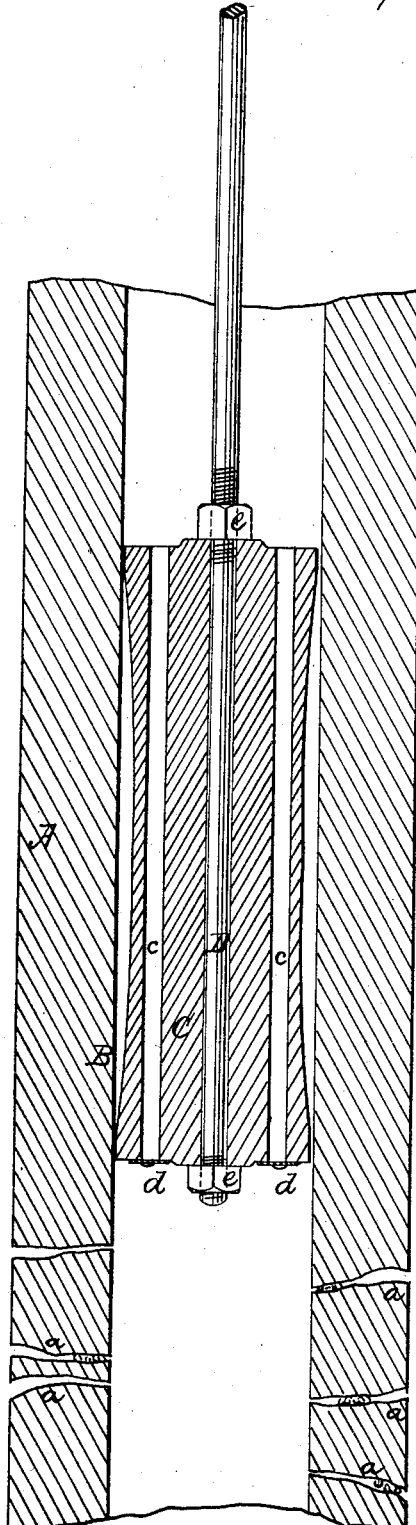


I. Relf.

Oil Pump.

N^o 49,922.

Patented Sep. 12, 1865.



Witnesses
M. M. Livingston
C. L. Copliff

Inventor
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UNITED STATES PATENT OFFICE.

ISAAC RELF, OF MINA, NEW YORK.

IMPROVEMENT IN EXPELLING OIL FROM THE VEINS OF WELLS.

Specification forming part of Letters Patent No. 49,922, dated September 12, 1865.

To all whom it may concern:

Be it known that I, ISAAC RELF, of Mina, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Opening the Veins of Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to fully understand and use the same, reference being had to the accompanying drawing, forming a part of this specification.

The drawing, consisting of only one figure, represents the device which is the subject of this application.

This invention has for its object opening the veins and crevices of oil-wells by forcing the water and other liquids which are in the well into the said veins and crevices, and thereby removing the obstructions thereout, so as to permit the gases and oil to resume their flow into the well.

Wells of petroleum or rock-oil have up to this time exhibited the phenomenon of running freely of their own accord, or else yielding large quantities when the pump is applied, for a considerable period of time, some continuing to yield large quantities of oil for more than two years, when, as a general thing, they begin to fail, and soon become entirely dry, or yield so little as no longer to pay the expense of pumping. Several explanations have been offered by way of accounting for this phenomenon in oil-wells, and that which seems to be the most reasonable, and to agree the most nearly with the nature and properties of the oil and the character of the rocks from which it flows, is that a residuum of the oil or paraffine gradually fills and obstructs the veins and crevices which are intersected by a well and prevents the flow of oil, or even of gas, through them. When an abandoned well suddenly begins to flow again spontaneously it is supposed that the pressure through the veins and crevices has been sufficient to remove these obstructions. When a newly-made well does not yield any oil with the aid of the pump, or yields it in small quantities, the same theorists suppose that its veins and crevices have become clogged with the pulverized rock produced by the drill, which acts like a hammer

upon the mass and forces it laterally into the veins and crevices, thereby choking the well throughout its whole extent. This action of the drill will attend those which are hollow, and which are designed to take up the rock as fast as it is cut, but not in so great a degree as those drills which are solid.

These explanations of the reasons why some wells cease to flow and why some newly-made wells remain dry from the first seem to me to be reasonable; and my invention has for its object to clear such supposed obstructions from the wells, whether they consist of paraffine or other residuum of the oil, or of a deposit of any other character, or in accretions of the debris and dust of the rock forced into the veins and crevices by the action of the drill.

B represents the lower part of a well, whose sides are shown seamed with the supposed veins and crevices in the rock, as seen at *a*.

C is a plunger or piston, made of wood in this example of my invention, say one foot long, more or less, and which may be well protected on its lower end by iron or other metal; but I have shown it without any such protection.

D is a rod which passes centrally through it, and upon which the piston is secured by nuts *e e* above and below. The piston has two or more passages cut through it, which are closed at bottom by valves *d*, which open downward.

The rod D may be of wood or of metal, but I prefer wood because of its lightness; and it may be made in sections of fifteen feet in length united by screw-couplings or otherwise.

Having removed the well-tube from the well, I lower the piston C into it until it reaches the water or other fluid in the well. The top of the rod D must project above the surface of the earth a sufficient distance to receive a cap, which is to be made strong enough to sustain heavy blows from a maul, or from the monkey of a pile-driver. The rod D, where it projects above the surface, should be held between suitable guides, so that the blows upon its cap may be delivered in a vertical direction.

I have not shown a cap on the top of the rod, nor any devices for striking it with a maul or other means, since such devices can be easily

made by skillful mechanics without any particular description being here given, and I do not claim anything in them specially.

The effect of the blows delivered on the top of the rod will be to force the water in the well into its veins and crevices, and so open them for the flow of oil from the surrounding rock.

The piston C is of greater diameter at its top and bottom than along its sides between its ends, so as to enable it to be moved within the well with little friction. Its diameter at its ends is to be such as to enable it almost to fill the well it is to be used in. Wells are drilled of varying diameters, and the pistons will vary in diameter with the diameters of the wells, and as their sides are smooth they will permit the easy movements of the piston within them.

When it is desired to raise the piston from the well the water above it will pass down through the passages *c* and through their valves *d*, and thus relieve the piston and rod of the weight of the water above it. The effect of a blow upon the rod will be much greater, and be more likely to cause the disruption and displacement of the obstructions which close the veins, than a steady pressure.

A decided difference will be perceived between the means employed for opening the crevices and the common operation of the piston or force pump. In the latter instance the pressure is gradual and steady; but in the mode herein claimed the concussion or blows, owing to the non-elasticity of the water in the wells, are communicated with all their sharpness to the obstructions which are lodged in the crevices, and the same are thereby dislodged and the crevices quickly opened. The pressure which would be applied were the piston moved in the ordinary manner would not effect the result.

I claim as new and desire to secure by Letters Patent—

Forcing the liquid in an oil or other well into the veins and crevices thereof by means of blows and concussions, as and for the purposes described.

ISAAC RELF.

Witnesses:

M. M. LIVINGSTON,
JAMES P. HALL.