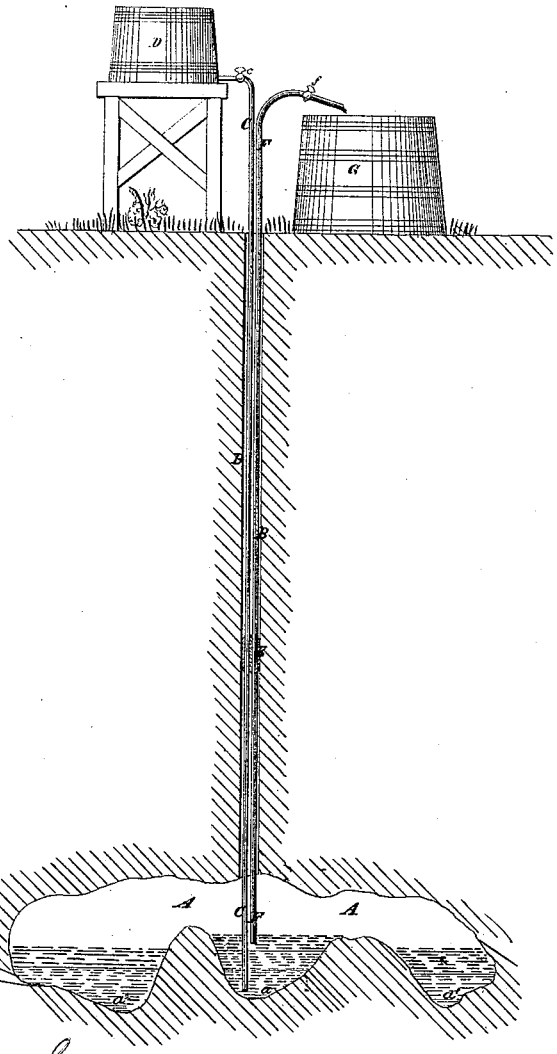
O. Rotton,

Oil Pump,

No. 52,209. Patented Jan. 23, 1866.



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OTTO ROTTON, M. D., OF BROOKLYN, NEW YORK.

IMPROVEMENT IN OBTAINING OIL FROM WELLS.

Specification forming part of Letters Patent No. **52,209**, dated January 23, 1866.

To all whom it may concern:

Be it known that I, OTTO ROTTON, M. D., of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Mode of Obtaining Oil from Wells; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which represents a vertical section of an oil-well and an elevation of an apparatus employed in carrying out my invention.

My invention consists in an improved method of forcing up the oil from the natural basins or reservoirs in which it is collected in the earth by the pressure of a column of water of suitable height, or by the pressure of water produced by mechanical means. By the means hereinafter described I can extract the oil from the earth at less expense than by any means heretofore employed, and I believe I can render reproductive many wells which have been supposed to be exhausted, and therefore abandoned.

In the apparatus represented by the accompanying drawing the natural static pressure of a column of water of suitable height is employed to force up the oil.

A represents a natural reservoir, and B a vertical bore or Artesian well, by which said reservoir is tapped. C is a tube inserted into the bore B, connected at its upper end with an elevated water-tank, D, above the ground, and having its lower end dipping into the reservoir A, and F is another tube, also inserted through the bore B, its lower end dipping into the reservoir A, but not extending as far down as the said tube C, and its upper end, which is above ground, being bent over in goose-neck form to deliver the oil into a cistern, G, or other suitable receptacle at a lower elevation than the water-tank D.

The tubes C and F are fitted at a suitable distance from the mouth of the bore or well B, or at the said mouth, with a packing, E, which fits air and gas tight around the said tubes and to the bore of the well; yet both of said tubes should be so made, and the packing so applied that the tubes may be moved up and down, sliding within the packing. This is especially important in respect to the tube F, which, as will be seen from what follows, may be required to be elevated and depressed frequently. The tube C is furnished with a stop-cock, *c*, and the tube F with a stop-cock, *f*, both of said stop-cocks being above ground.

The oil, owing to its lesser specific gravity, will always float upon the water, where both exist in the same cavity or reservoir. It is manifest, therefore, that when water is forced down the tube C by hydrostatic or mechanical pressure any oil that may be in the reservoir A will be raised as the volume of water is increased in the reservoir, and that when the air or gas contained in the upper part of the reservoir receives from this cause a pressure nearly equal to the pressure of the column of water in the tube C and the tank D, the oil, or water, or oil and water together, will rise through the tube F, and overflow at its upper end. But in order to secure a flow of oil through said tube F its lower end must not be sunk below the body of oil floating on the water, as, in case it is, water only will rise through it; nor must it be raised above the upper surface of the oil in the reservoir, as in that case air and gas only will be discharged through it. But the lower end of said tube F must always have its opening in the body of oil floating on the water, and then oil only will be discharged through said tube. It is, therefore, indispensable to the effective working of this apparatus that said tube F be movable vertically, so that it can readily be adjusted to the varying altitude of the body of oil floating upon the water in the reservoir. Hence it is essential that said tube F be so made, and the packing E so applied, that said tube may be moved up and down, sliding within the packing. To this end care should be taken to have that portion of the tube F which is to move within the packing made perfectly cylindrical, smooth, and even. Suitable means must also be provided for raising and lowering said tube F at pleasure. This may be done by a rope passing over a pulley on the derrick and by a great variety of other mechanical devices or contrivances familiar to mechanics; but I do not confine myself to any particular means for this purpose.

The reservoir tapped by the well or bore may connect with other cavities or reservoirs

of different altitudes, or said reservoir may have within itself several basins, as represented by a a' a^2 in the drawing, in either of which cases the oil from all of said cavities or basins may be extracted by means of moving and adjusting said tube F to the proper depth to extract the oil from each in succession.

In the drawing the two basins a' and a^2 have their mouths at different levels, the mouth of a' being lower than the mouth of a^2. In this case it will be seen that, after all the oil has been extracted from the basin a, if the tube F is sufficiently raised and water is continued to be forced down through the tube C it will in due time run over into basin a', and raise the water in said basin until it will flow over into basin a, and the oil, if any, floating on its surface will be forced out of the tube F, if properly adjusted. In like manner a further introduction of water through the tube C will produce the same effect upon the oil in basin a^2. But without an adjustable discharge-tube it is manifest that the oil in basin a could only be extracted by these means.

The apparatus is set in operation by opening the stop-cocks c and f and keeping the tank D supplied with water. Before the stop-cock f is opened, however, the water should be let down the tube C to test the tightness of the packing E, and if found water and air-tight the stop-cock f may then be opened. If water flows up through said tube F it may be known that it has been sunk too low, and it should be elevated slowly and gradually until it begins to discharge oil. If air or gas only come up through said tube F it may be known that it has not been sunk low enough, and it must be slowly and gradually depressed until it begins to discharge oil. So, if in working the well, oil should cease to flow, and water rise through the tube F instead, said tube must be gradually raised, and if no more oil is obtained until air and gas begin to rise through it, it may be known that the oil in the particular basin or cavity last operated upon has been exhausted. In this case the tube F should be permitted to stand with its lower end a little above the surface of the water, discharging air and gas, while more water is introduced through the tube C, to force the oil out of other cavities or basins, as hereinbefore described. If the water raised by this means begins to flow again through said tube F the latter must be again slightly raised, and so the experiment must be repeated until the oil again begins to flow through said tube F.

Instead of the oil being forced up by the static pressure of a column of water in the tube C, it may be forced up by the pressure of a force-pump or other mechanical means applied to said tube, which would be equivalent to the static pressure of the column.

Having thus fully described my invention and the mode of carrying it into effect, I do not claim, broadly, the principle of forcing up oil from wells by the pressure of a column of water; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

An induction-pipe for introducing water into the well to force up the oil, either by the static pressure of the water in said pipe, or by pressure mechanically applied, in combination with a vertically-adjustable eduction-pipe for the discharge of oil from the well, substantially as and for the purpose herein set forth.

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Witnesses:

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