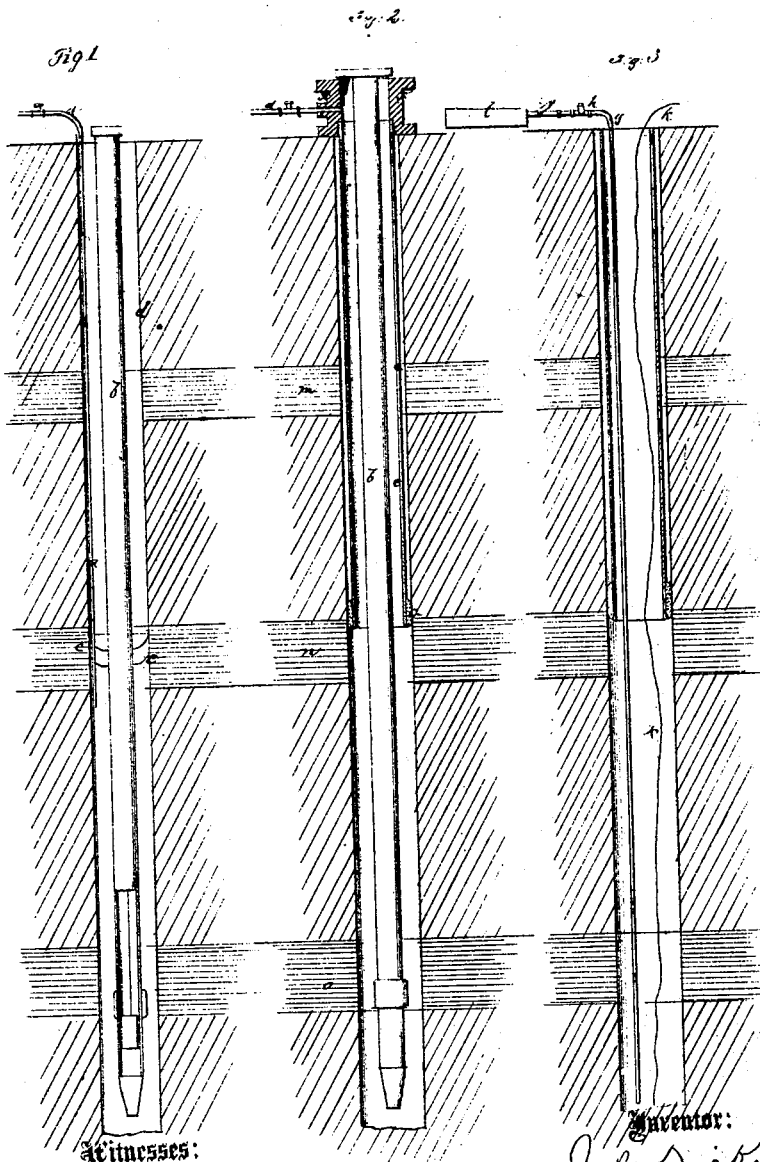


J. Dickey,

Removing Deposits from Oil Wells.

No. 106,793.

Patented Aug. 30. 1870.



Witnesses:

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JAMES DICKEY, OF VENANGO CITY, PENNSYLVANIA.

Letters Patent No. 106,793, dated August 30, 1870.

IMPROVEMENT IN REMOVING DEPOSITS FROM OIL-WELLS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, JAMES DICKEY, of Venango City, in the county of Venango and State of Pennsylvania, have invented a new and useful Improvement in Removing Paraffine Deposits from Oil-Wells and the Crevices of the Oil-Rock; 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 make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to a new and improved means of removing the paraffine and other combustible deposits from oil-wells and the crevices of the oil-bearing rock leading thereto; and

It consists in burning out the paraffine by means of oxygen or other combustible gas introduced through the well or otherwise, in pipes or by other means, and ignited in the presence of the paraffine, the said gas being introduced by pumps or otherwise; also, in effecting the removal, but in a more limited degree, by exploding the oxygen-gas together with the gas produced in the well.

Figure 1 is a sectional elevation of one arrangement of oil-wells in common use, showing one arrangement of means for introducing the oxygen-gas;

Figure 2 is a sectional elevation of a cased well, showing another means of introducing the oxygen-gas; and

Figure 3 is a sectional elevation of a cased well, with the pump-tube drawn out.

The crevices in the oil-bearing sand-rock become clogged from time to time by the paraffine deposited by the oil which adheres to the walls, also by the seed and other packing used around the well-tube, gradually choking them up. This is the main cause of the cessation of the production of oil in the wells, and it is on this account that the torpedoes are now used for breaking up the said rock and blowing off the paraffine deposit.

I have found by practical experiment that these paraffine and other combustible deposits may be rapidly and effectually consumed by the combustion of oxygen-gas in contact with it, leaving little or no residue, and I remove it in this way: introducing the gas to the top of the well and firing it thereat, when the well is cased it immediately ignites the deposit in the interior of the well-casing and burns downward, consuming it as the fire moves down, and the burning ceases when the paraffine is consumed. Or, when the well is not cased, I introduce the gas through the gas-escape pipes of the wells below the seed-bags or other packings placed around the pump-tube to prevent the surface water from filling the well, and ignite it in the said pipes at the top of the well, where it mixes with the gas escaping from the well; or I may conduct it

to the bottom in cased wells, if preferred, as may sometimes be required. From the bottom of the well the fire follows in like manner the crevices in the sand-rock, through which the oil flows to the well, penetrating to great distances, and as long as the oxygen-gas is supplied or while it encounters the paraffine deposit.

The fires in the well and the crevices are under all needful control by regulating and controlling the supply of the gas, and thereby all danger from the burning of the gas arising in the wells is avoided.

In the drawing—

A, fig. 1, represents the wall of a well not cased;

b is the pump-tube;

c, the seed-bag or packing between the pump-tube and the wall of the well to prevent the surface water from flowing down to the pump; and

d is the gas-escape tube commonly passing down below the packing for the reception of the gas produced in the well and conveyance of it to the fire of the steam-engine.

In this case the oxygen-gas would be introduced through this pipe d and ignited by a flame introduced at the top of the pipe D, through any suitable opening in it where the oxygen-gas comes in contact with the gas arising from the well in the said tube D, which flame will follow down the tube d, fed by the paraffine deposit therein.

Fig. 2 shows a "cased" well closed at the top, e being the case and f the cap at the top.

In such wells the gas-escape pipe a' is merely tapped in at the top, and the oxygen-gas would be introduced and fired thereat.

Fig. 3 shows a cased well open at the top, as they are sometimes used when it is not desirable to save the gas of the well, from which the tubing has been removed, and with a pipe, g, introduced for conveying the oxygen-gas to the bottom of the well.

This pipe is provided with cocks, h i, showing one arrangement for igniting the gases thereat, or it may be done at the bottom by a spark of electricity, conveyed by an insulated wire, K, let down from the top.

l represents a vessel charged with oxygen-gas and connected to the pipe g for supplying the gas to the wire.

m n o represent the upper, middle, and lower oil-rock respectively.

I am enabled in this manner to remove the paraffine deposits much more cheaply and effectually than can be done by blasting and breaking up the rock, as is now done by torpedoes, and which I have found, in many instances, not only to fail of removing the said deposits, but to materially injure the wells by wholly closing up the crevices, whereas my improved manner of operation cannot injure the well in any way.

I also propose to effect the removal of said deposit

or the detachment thereof from the walls of the wells and the crevices by explosions of the oxygen-gas and the gas of the wells when combined therein in sufficient quantities, the explosions being caused by electricity, as found most convenient.

I may also produce the necessary combustion for burning the paraffine gas, effect these explosions, by a combination of the oxygen of the air with the gas arising in the well, the air being forced in by means of pumps or blowing, and, in some cases, I propose to use the oxygen of air instead of the oxygen-gas prepared as above described, but I prefer to use the latter.

Having thus described my invention,

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

The herein-described method of removing the paraffine and other combustible deposits in oil-wells and the crevices tributary thereto, by means of the combustion of oxygen or other combustible gas or air introduced and burned in the presence of the said deposits, substantially as specified.

Also, the herein-described method of removing the paraffine deposits from the walls of the wells and the crevices tributary thereto, by explosions of oxygen-gas or air and the natural gas of the wells, produced substantially as specified.

JAMES DICKEY.

Witnesses:

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