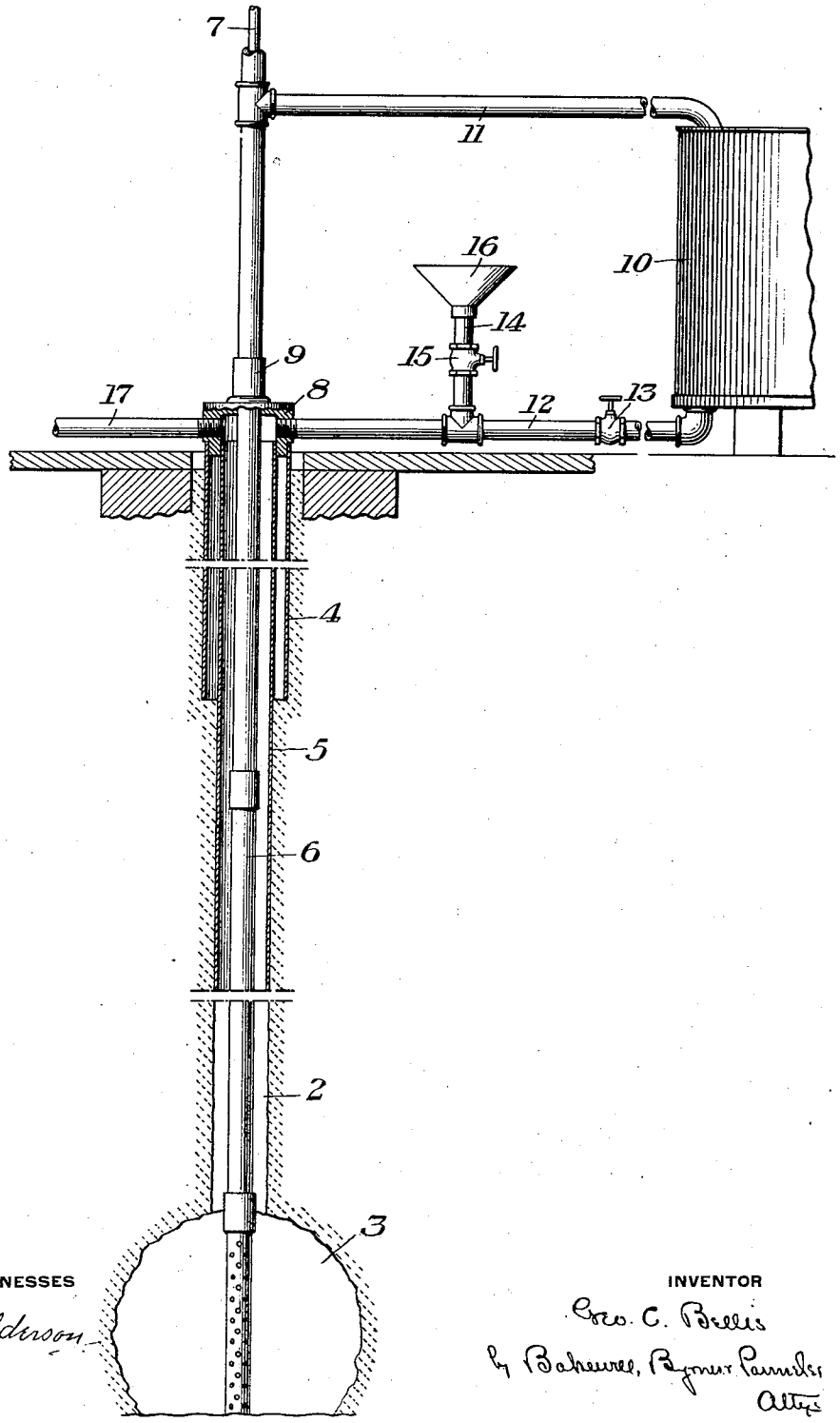
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METHOD OF CLEANING OIL WELLS.

APPLICATION FILED MAR. 13, 1919.

1,382,337. Patented June 21, 1921.




WITNESSES

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# UNITED STATES PATENT OFFICE.

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## METHOD OF CLEANING OIL-WELLS.

1,382,337. Specification of Letters Patent. Patented June 21, 1921.

Application filed March 13, 1919. Serial No. 282,479.

*To all whom it may concern:*

Be it known that I, GEORGE C. BELLIS, a citizen of the United States, residing at Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Methods of Cleaning Oil-Wells, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

This invention relates to the method of removing the incrustation of wax, etc., from oil wells and pumps in oil wells.

The object of my invention is to provide a simple and efficient method whereby the incrustation can readily be freed from the pores of the well and from the pump and removed by means of the pump.

It is well known to those familiar with the art, that a large number of oil wells after they have been pumped for a certain length of time become clogged by the paraffin wax and other heavy matter in the oil, so that the flow of oil gradually diminishes, which is caused by the clogging up of the pores of the well, which clogging up holds back the flow of oil to the well.

I have discovered that this incrustation can readily be removed by pouring a solvent into the well, and afterward flowing oil, water or any suitable liquid on the top of the solvent to force the solvent against the walls of the well to loosen the wax. After the solvent has been run into the well, I permit the solvent to stand a predetermined length of time and then pump the solvent, together with the freed material, from the well.

The precise nature of my invention will be best understood by reference to the accompanying drawing, which will now be described, it being premised, however, that various changes may be made without departing from the spirit and scope of my invention as defined in the appended claims.

In the drawing I have illustrated somewhat diagrammatically in side elevation and partially in section, an oil well, an oil receiving tank, together with a pump within the well.

In this drawing the reference character 2 designates the wall of the well and 3 the cavity at the bottom thereof. 4 is the outer or large casing, 5 the well casing, and 6 the pump tubing or barrel having the usual sucker rod 7 therein, which is actuated in the usual manner for pumping the oil from the well. The upper end of the well casing 5 is sealed by means of the usual casing head 8, and surrounds the pump tubing 6. The casing head 8 is provided with the usual stuffing box 9 which surrounds the tubing 6 and forms a gas tight joint at the upper end of the well. 10 is the oil tank to which the oil is pumped from the well and delivered through the pipe 11, and 12 is a pipe connecting the lower end of the tank 10 with the casing head 8, so that oil may be delivered from the tank 10 to the well on the outside of the tubing 6. This pipe 12 is provided with a valve 13 and a branch pipe 14 having a valve 15 therein. Connected to the upper end of the pipe 14 is a funnel 16 for the purpose hereinafter described. 17 is a gas off-take pipe connected to the casing head 8 for conveying the gas from the well to any suitable source.

When it is desired to clean the well the valve 13 is retained in its closed position and the valve 15 is opened. A suitable amount of solvent is then poured into the funnel 16 and the solvent will flow to the bottom of the well on the outside of the pump tubing 6, and immediately after the solvent has been poured into the well the valve 12 is closed and the valve 13 is opened to permit a sufficient quantity of oil to flow on the top of the solvent to act as a head to force the solvent against the walls of the well and the wall of the cavity 3. After a sufficient amount of oil has passed to the well to form the proper head, the valve 13 is closed. The material is left standing in the well for a predetermined length of time, say forty-eight hours, or a sufficient length of time to loosen the wax and other incrustation.

After the incrustation has been loosened the pump is set into motion and all freed incrustation, together with the oil and solvent, are pumped into the tank, and after the material has been pumped from the well the valve 13 is again opened to permit the combined solvent and oil to again rush into the well to rinse any freed particles from the walls of the well, which is again pumped back into the tank.

I have found in practice that one application of a solvent is sufficient to remove the incrustation from the majority of wells,

but if one application does not sufficiently clear the well, two or more applications as above described may be used.

I have also discovered that the application of this solvent to the well does not only remove the incrustation of wax, etc., from the walls of the well and the cavity but also cleans the pump tubing and the sucker rod.

By means of the above method I am enabled to remove the incrustation from the well and pump without disconnecting any of the parts of the apparatus.

In some cases, however, I have found it advantageous to remove the sucker rod from the pump tubing, and pour the solvent into the well through the interior of the pump tubing, and then pouring the proper amount of material on the top of the solvent to form a sufficient head to force the solvent against the walls of the well and cavity, and after the material has been left in the well a sufficient length of time to perform its function, the sucker rod is again inserted and the material pumped from the well.

I have found that a suitable solvent can be made from the following formula:

92% sodium hydroxid by weight.
2% sodium carbonate by weight.
2% sodium chlorid by weight.
2% sodium sulfate by weight.
2% of tungstite by weight.

I take one hundred pounds of the above materials and mix it dry, and then add approximately fifty gallons of water to the material and after the material has been thoroughly dissolved it is ready to be used in the manner above described.

I desire it to be distinctly understood that the proportions of the above formula may be varied, and that some of the ingredients may be omitted, but have discovered that when a solvent of this character is used that it is essential that the solvent contain at least sodium hydroxid and sodium carbonate mixed with the water.

I have also discovered that I can flow water on top of the solvent to act as a head for driving the solvent into the pores of the well but I prefer to use oil, as the oil does not readily mix with the solvent and remains on the top thereof.

It will readily be understood by those familiar with the art that the amount of solvent required depends on the size of the cavity at the bottom of the well, while the number of applications required are dependent upon the condition of the well.

The advantages of my invention result from the provision of a method for cleaning wells, whereby I am enabled to readily and clearly remove the incrustation from the pores of the well and from the pump without the use of appliances other than those already in the well, and without firing the well to tear up the walls of the cavity.

I claim:

1. The method of cleaning oil wells comprising pouring a solution containing a caustic alkali free from acid into the well, permitting it to remain as an alkali within the well for a sufficient time to loosen the oil impeding deposits formed on the walls thereof, and then pumping the solution together with the loosened material from the well, substantially as described.

2. The method of cleaning oil wells, comprising pouring an alkaline solution free from acid and containing sodium hydroxid and sodium carbonate into the well, maintaining the solution within the well as an alkaline solution, and permitting it to remain within the well for a sufficient time to loosen the oil impeding deposits from the walls thereof, and then pumping the solution together with the loosened material from the well, substantially as described.

3. The method of cleaning oil wells, comprising pouring a solvent free from acid into the well, adding thereto a quantity of liquid of such specific gravity that it will form a separate stratum above the solvent, constituting a head for forcing the same into the pores of the well, permitting the solvent and head to remain in the well for a sufficient time to loosen the oil impeding deposits from the walls thereof, and then pumping the solution and the loosened material from the well, substantially as described.

4. The method of cleaning oil wells, consisting of pouring a solution free from acid and containing a caustic alkali into the well, maintaining the solution within the well as an alkaline solution, adding thereto a liquid forming a head for forcing the solution into the pores of the well, permitting the solution and head to remain within the well for a sufficient time to loosen the oil impeding deposits formed on the walls thereof, and then pumping the solution and the loosened material together with the liquid forming the head from the well, substantially as described.

In testimony whereof, I have hereunto set my hand.

GEORGE C. BELLIS.