July 28, 1931. R. E. LEE 1,816,260

METHOD OF REPRESSURING AND FLOWING OF WELLS

Filed April 5, 1930

Fig. 1

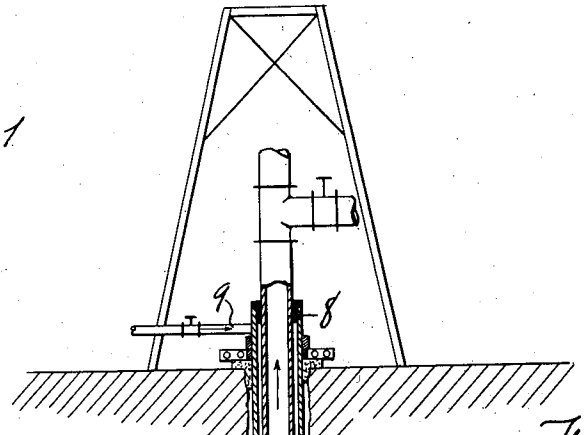
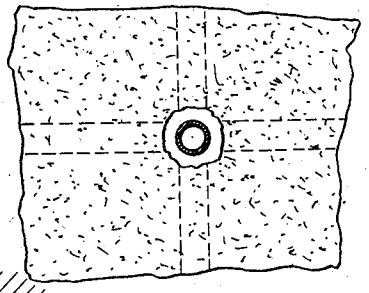
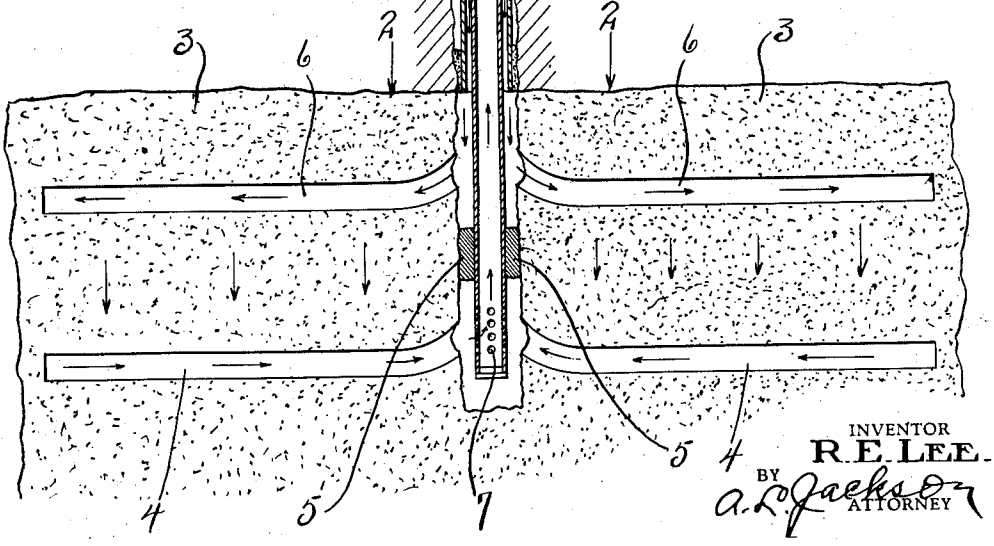


Fig. 2





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UNITED STATES PATENT OFFICE

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METHOD OF REPRESSURING AND FLOWING OF WELLS

Application filed April 5, 1930. Serial No. 441,916.

My invention relates to an improved method of repressuring and flowing oil, gas, water or combinations of these elements from an individual well drainage area; and the object is to provide an efficient method of repressuring and flowing from wells which have lateral or angular channels branching out from the main well hole to the outer areas of the producing reservoirs of such well. This method is contingent upon the fact that lateral or angular channels have been effected or drilled from the main well hole by the apparatus shown in my co-pending application Ser. No. 441,917, filed April 5, 1930, or by other apparatus or methods. Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application.

Fig. 1 is a vertical section of a well with a well casing which extends down to the producing reservoir.

Fig. 2 is a diagrammatic plan view, illustrating the positions of lateral or angular channels.

Similar characters of reference are used to indicate the same parts throughout the several views.

The drawings show a well provided with a casing 1 which extends down to the top or approximately to the top of the producing reservoir 3. A discharge pipe 2 is extended through the casing 1 down through the reservoir past the lower channels 4 in the reservoir 3. A packer 5 is attached to the discharge pipe 2 between the upper series of channels 6, and the lower channels 4 which serve as accumulators or sumps for discharging through perforations 7 into the discharge pipe 2. The annular space between the casing 1 and the discharge pipe 2 serves as a passage for the repressuring medium,—air or gas, under pressure. This medium or element is forced down between the casing 1 and discharge pipe 2 into the reservoir 3 and the channels 6. The packer 5 seals the passage in the reservoir and blocks further passage of the repressuring medium thereby forcing the same out in the channels 6. The repressuring medium, assisted by gravity, will force oil downwardly through the reservoir 3 into the sump channels 4, which in some cases will be sufficient to drive the liquid up and out of the discharge pipe 2. In all cases the pressure will be sufficient to force the liquids into the sump channels 4 and into the passage in the reservoir 3 and through the perforations 7 into the discharge pipe 2 from which the liquids may be pumped. The channels 4 and 6 may be lined or cased with perforated flexible metal tubing with either closed or open ends. In some cases the outer ends of the channels terminate in floating sands. There is decided advantage in super-heating the repressuring medium because it causes an increase in the fluidity of the oil in the reservoir and will enlarge the void spaces of the reservoir due to expansion and also dissolve all heavy viscous matter, such as paraffin and asphaltum, therefore clearing the perforations or voids in the reservoir which will also cause a freer and more positive circulation of the repressuring medium from channels 6 down through the reservoir 3 into sump channels 4 and through the perforations 7. The increased fluidity materially increases migration of the oil in the producing reservoir which is more easily driven ahead of the repressuring medium into sump channels 4.

The upper end of the casing 1 is sealed by a packing gland 8. This seals the annular space between the casing 1 and the discharge pipe 2 above the in-put or intake pipe 9. The casing 1 is clamped by any standard means of ordinary type at surface of the well, and the discharge pipe 2 is secured in place by the packing gland 8 and nut. Suitable valves are provided for the pipe 9 and for the discharge pipe 2 for giving proper control of the intake repressuring medium and the outlet for the liquid through pipe 2.

What I claim, is:—

1. The herein described method of repressuring and flowing liquids from the drainage area of wells which comprises providing a vertical channel and outwardly directed an-

gular or lateral channels from the vertical opening in the drainage area of the well and providing inwardly directed channels at a lower level and forcing a repressuring medium down between the well casing and the discharge pipe and through said angular or lateral channels and forcing liquids out of the drainage area through said inwardly directed channel to said vertical channel and out of the well.

2. The herein described method of repressuring and flowing liquids from the reservoir or drainage area of wells which comprises providing upper and lower angular or lateral channels from the opening in the reservoir or drainage area of the well and forcing a repressuring medium down between the well casing and discharge pipe and laterally through the upper channels and down to the lower channels for driving liquids from said reservoir out the discharge pipe.

3. The herein described method of repressuring and flowing liquids from the reservoir or drainage area of wells which comprises providing upper and lower angular or lateral channels from the opening in the reservoir or drainage area of the well, sealing the passage through said reservoir between said upper and lower channels, and forcing repressuring medium down between the well casing and the discharge pipe, out through said upper channels and down through said reservoir for driving liquids from said reservoir out through said lower channels and through the discharge pipe.

4. The herein described method of repressuring and flowing liquids from the reservoir or drainage area of wells which comprises providing upper and lower angular or lateral channels from the opening in the reservoir or drainage area of the well, sealing the passage through said reservoir about the discharge pipe between said upper and lower channels, and heating and forcing a repressuring medium down between the well casing and discharge pipe, out through said upper channels and down through said reservoir for driving liquids from said reservoir out through said lower channels and up through said discharge pipe.

In testimony whereof, I set my hand, this 1st day of April, 1930.

ROBERT EDWARD LEE.