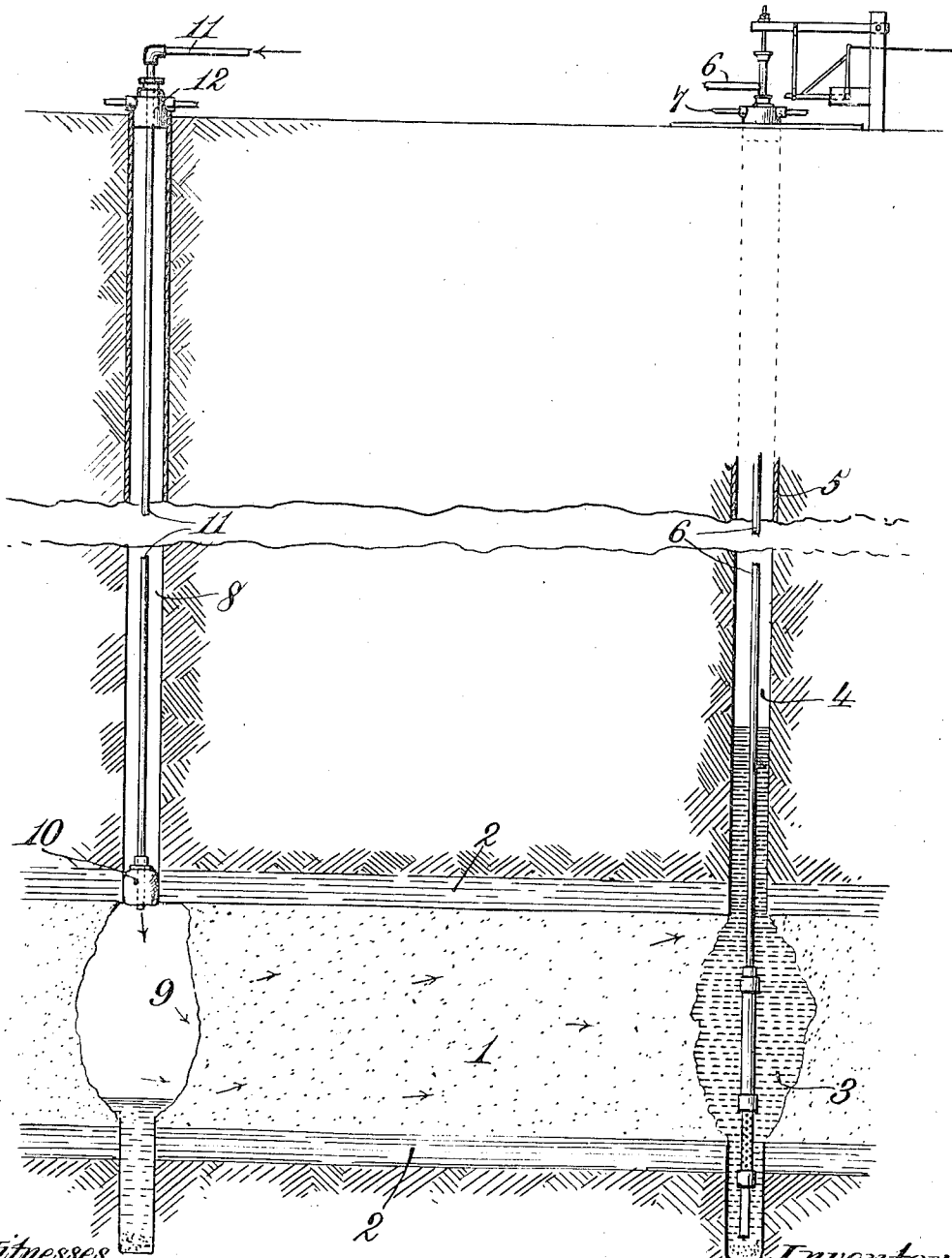


No. 825,745.

PATENTED JULY 10, 1906.

M. D. MITCHELL.
OIL FLUSHING SYSTEM.
APPLICATION FILED AUG. 4, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

MARK D. MITCHELL, OF FRANKLIN, PENNSYLVANIA.

OIL-FLUSHING SYSTEM.

No. 825,745.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed August 4, 1904. Serial No. 219,513.

To all whom it may concern:

Be it known that I, MARK D. MITCHELL, a citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented new and useful Improvements in Oil-Flushing Systems, of which the following is a specification.

This invention relates to a method for maintaining a supply of oil from an oil-bearing stratum within the pocket of a regularly-formed well, particularly in that class of wells wherein the supply is limited or the capacity of the well intermittently exhausted within certain times by reason of a slow feed or supply from the oil-bearing stratum.

In oil-wells having a limited flow an inactivity at intervals of the pumping mechanism is required, especially when the level of the oil in the pockets of such wells is below the intake means or terminal of the pumping mechanism.

The method embodying the features of the invention consists in supplying a driving medium under pressure to the oil-bearing stratum within an effective radius or proximity to one or more oil-well pockets. Advantage is taken of the confinement of the oil-bearing stratum under usual natural conditions between upper and lower strata of a dense nature to confine the pressure to the oil-bearing stratum to concentrate the effective driving and carrying influence of the pressure medium with respect to the oil-well pocket or pockets within the operative radius or proximity to the point of application of the pressure. This artificial pressure is to be understood as being entirely independent of any natural gas or other physical pressure; but this extraneous pressure may enter the pocket or pockets with the oil and outlet through the ordinary gas-escape means of the well or wells with which it coöperates. The advantage of applying this artificial pressure in the manner stated is that the oil in the productive stratum, which may under natural conditions have a slow exudation into a pocket or pockets within a given area of supply, is forced to feed the latter more expeditiously and maintain a constancy of oil-level within the pocket or pockets with material advantage in the output of one or more wells.

In the drawing a section is shown, illustrating an oil-stratum, a completed well, and means for applying pressure to the stratum

with respect to the pocket of the well. The oil-stratum 1 is confined, as usual, between dense strata 2, of slate or other material, and as in ordinary well drilling or forming operations a pocket 3 of a well 4 is formed within the said stratum 1. This well, as in ordinary constructions, will be equipped with a suitable casing 5, a pumping mechanism 6, operative from the surface by any suitable means, and a gas vent or outlet 7. A number of wells may be advantageously influenced by a single pressure-applying medium, and it is not to be understood that the invention is in any wise limited to the showing in the drawing, which is intended to convey solely the idea of a simplified application. In carrying out the method a hole 8 is bored through the earth down to the oil-stratum 1 and may terminate, as shown, in an enlargement or pocket 9 to render the pressure medium more effective with respect to the oil-bearing stratum. This hole 8 may be a well in adjacency to a number of other wells and may have the ordinary casing therein, or such hole may be specially prepared and equipped with a casing particularly adapted for the purpose. This variation will be dependent upon the necessities for practically establishing the method in relation to a well or a number of wells. In any event, however, a packer or occluder 10 is inserted in the upper dense stratum 2 at the upper terminal of the pocket 9, and in some instances a similar packer may be introduced at the bottom of the said pocket. The packer 10 has a pipe or conduit 11 connecting therewith and opening through the bottom of the same, the said pipe continuing upwardly through the hole or opening 8 or the well, as the case may be, and through an upper plug or closure 12. This pipe 11 may connect with a compressor or other suitable device, and in some instances the vent-pipe 7 may also be attached to the same compressor or that with which the pipe 11 connects or with a reservoir to effect an economical usage of the compressing medium. The compressing medium may consist of air, gas, or other fluid, to which may be imparted a force sufficient to overcome any laxity in the forceful operation desired in the pocket or chamber 9 by an extended or long conveyance to the hole or opening 8.

The pressure medium arriving in the pocket or chamber 9 will force the dormant

oil in the stratum 1 into the well pocket or pockets with which it is intended the method shall coöperate, and as the compressed air, gas, or other fluid permeates and passes through the stratum 1 the oil will either be forced ahead of the same into the well pocket or pockets to be benefited by the method or such oil will be carried with the pressure medium and both enter the well pocket or pockets, the oil being deposited in the latter and the pressure medium passing upwardly through the well or wells and back to a storage-reservoir or to a compressor, in accordance with the nature of the pressure medium and the instrumentalities employed to arrive at the forceful nature thereof desired. This application of a pressure medium to an oil-bearing stratum will be confined in its operation to said stratum owing to the packing feature heretofore set forth and the density of the strata 2, and the only outlets therefor will be through the oil-well pockets, and hence the oil must necessarily be driven thereby into said pockets, and consequently the oil in the pockets will be maintained at a more nearly uniform level and permit the pumps or pumping mechanism to continue to operate without cessation with a material advantage in the output of wells ordinarily having a slack flow and dependent on their supply upon gravitation or other natural operations. It will be understood that the force or driving nature of the pressure medium will be governed by the sup-

posed quantity of oil contained within the oil-bearing stratum. 35

Instead of the simplified means set forth for concentrating the pressure or oil-driving medium between the strata 2 and preventing escape of the same above the uppermost stratum 2 the pressure medium may be delivered by any other suitable means having occluding features or a concentrating organization with respect to the oil-bearing stratum. 40 45

Having thus described the invention, what is claimed as new is—

1. The method of accelerating the supply of oil to a pocket within an oil-bearing stratum, devoid of natural pressure consisting in applying and confining an artificial pressure medium with respect to the stratum at a distance from the pocket and causing such medium to permeate and pass through the stratum and escape through the pocket. 50 55

2. The herein-described method of maintaining a supply of oil in a pocket within an oil-bearing stratum devoid of a natural pressure, consisting in applying an artificial abnormal pressure to the said stratum in the direction of the pocket. 60

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MARK D. MITCHELL.

Witnesses:

GEO. W. REA,
JAMES L. NORRIS.