

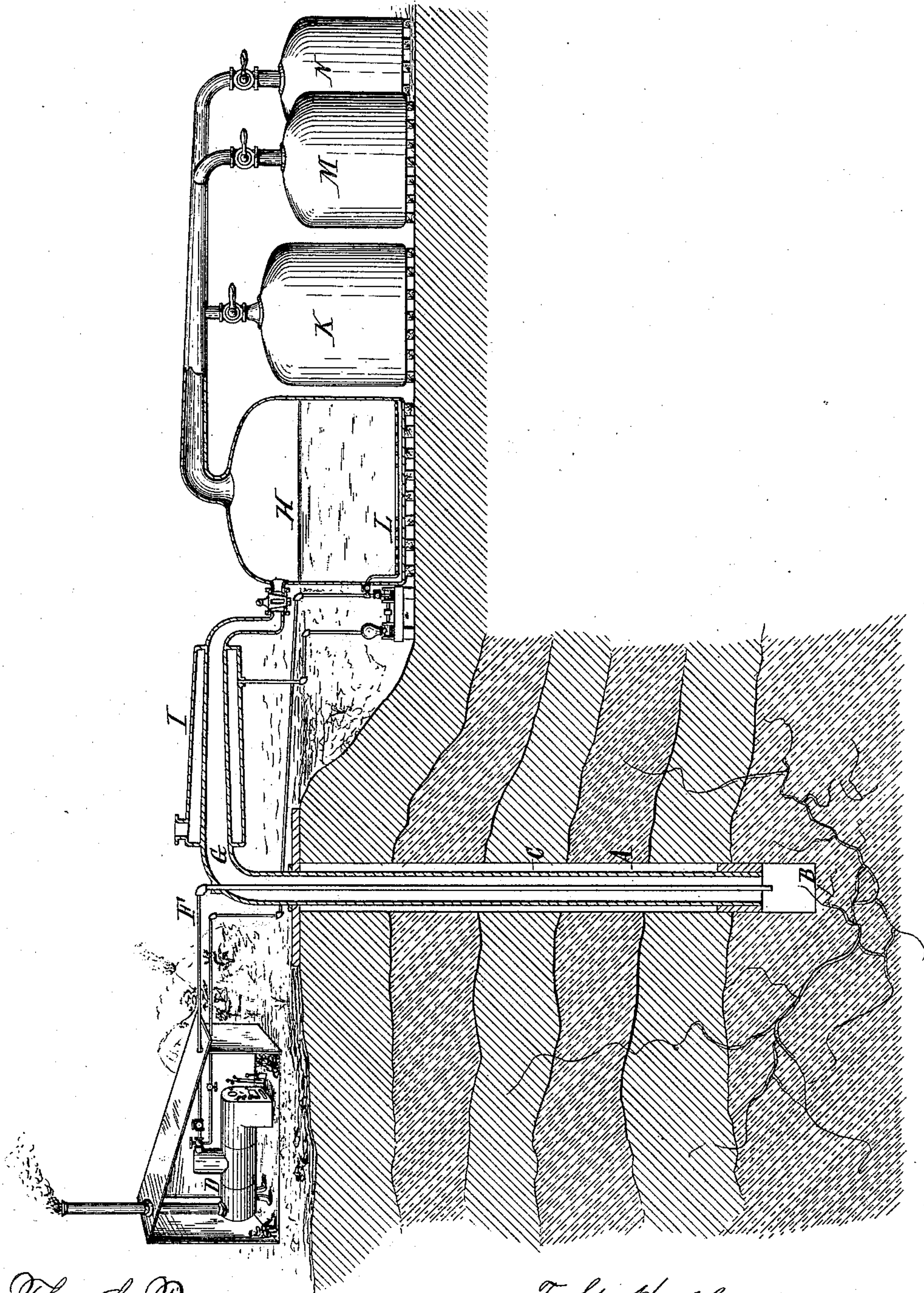
(No Model.)

T. G. HALL.

METHOD OF OBTAINING OIL FROM WELLS.

No. 345,586.

Patented July 13, 1886.



Theo. L. Popp.
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Witnesses.

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UNITED STATES PATENT OFFICE.

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METHOD OF OBTAINING OIL FROM WELLS.

SPECIFICATION forming part of Letters Patent No. 345,586, dated July 13, 1886.

Application filed March 27, 1883. Serial No. 89,649. (No model.)

To all whom it may concern:

Be it known that I, THURSTEN G. HALL, of Niagara Falls, in the county of Niagara and State of New York, have invented new and useful Improvements in Methods of Obtaining Oil from Wells, of which the following is a specification.

This invention relates to an improved method of refining oil in the wells, and to facilitate the discharge of the oil from the wells, and to separate the oil so produced according to the different gravities of the various hydrocarbon compounds of which the oil is composed.

My invention consists, to these ends, of the improved method which will be hereinafter fully described, and pointed out in the claims.

The accompanying drawing represents an apparatus which is used in practicing my invention.

A represents the oil-well; B, the stratum of oil-bearing rock; C, the casing inserted in the bore of the well; D, a steam-boiler; F, a steam-pipe leading from the boiler into the well, and terminating in the same in proximity to the oil-bearing rock; G, the discharge-pipe, which is connected with the upper end of the casing, and H a closed tank or receptacle which receives the oil from the discharge-pipe G.

The steam-boiler is constructed of a large number of small tubes or spheres made of the proper dimensions to stand a pressure of from one thousand to fifteen hundred pounds per square inch. I prefer to employ a pressure of about fifteen hundred pounds per square inch; but a lower pressure may be employed. The steam issues from the end of the steam-pipe F into the well opposite the seams in the oil-bearing rock, and becomes decomposed by coming in contact with the hydrocarbon compounds in the oil-bearing rock, the hydrogen of the steam combining with the paraffine and other heavy hydrocarbons, whereby the same are transformed into liquid or light oil and vapor, and the oxygen of the steam forming carbonic monoxide and dioxide with the carbon of the hydrogen carbons, which escape from the oil with the oil as gases, and which aid in driving the oil and vapor to the surface. The high pressure and temperature of the steam causes the steam to thoroughly permeate the pores and seams of the oil-bearing rock,

thereby opening the same and causing the oil to flow from all the surrounding parts of the rock into the well, in which it is forced upwardly by the pressure of the steam and of the vapors and gases which are generated by the steam in the well. The steam which is injected into the well is charged with a compound which has the effect of bleaching or refining the oil. I prefer a compound composed of eighty-eight parts of chloride of sodium, ten parts of flour of sulphur, and two parts of chloride of ammonium for this purpose; but other bleaching and refining compounds may be used, if desired. This compound may be employed either in a dry state or as a solution, and it may be injected into the steam-pipe by a suitable pump or by an aspirator, or it may be delivered into the well by a separate pipe. The bleached and refined oil is forced upwardly through the casing of the well by the action of the steam, vapor, and gases injected into and generated in the well, and delivered through the discharge-pipe G to the receiving-tank H. The discharge-pipe G is preferably surrounded by a water-jacket, I, which is provided with a water-supply at its lower end and a water-escape at its upper end, and through which water is caused to circulate for the purpose of cooling the oil and the vapor which pass through the discharge-pipe G. The latter may be made tapering from the well toward the receiving-tank H, to reduce the area or cross-section in the pipe gradually and in the same measure as the contents of the pipe become denser by cooling. The receiving-tank H is preferably provided with a steam-coil, L, whereby the oil contained therein is heated first to the proper temperature for driving off the naphtha and similar light hydrocarbons, which are collected in a receptacle, K. When this has been accomplished, the temperature is raised so as to drive off the illuminating-oil, which is collected in a receptacle, M. When this has been accomplished, the temperature is raised so as to drive off the heavy lubricating-oil, which is collected in a receptacle, N, when the residue is discharged from the receiving-tank H, and the latter prepared to receive another charge of oil. A suitable number of receiving-tanks are provided, so that the oil confined in the

well can be delivered into one tank while the distillation of the oil is being effected in another tank. The oil is in this manner reduced in a very simple way and made ready for the market at the well, whereby the cost of transporting and storing the crude oil is to a large extent avoided.

The herein-described method of obtaining oil from the well is especially applicable to old and abandoned wells which have ceased to produce oil in paying quantities, and my improved method will not only restore the productiveness of such wells, but also increase the yield of wells which are now operated by pumping. When steam is applied at a low pressure, the same result can be attained by decomposing the steam when it issues from the pipe by means of the electric spark or heated platinum wires. For this purpose a suitable generator of electricity—such as a dynamo-electric machine, for instance—is employed, and the conducting-wires are extended from the generator into the well and properly insulated and provided with the proper appliances for directing the dynamic spark through

the steam-jet, or they are provided with one or more common platinum wires arranged in the steam-jet in the well.

I claim as my invention—

1. The herein-described method of refining oil in the well, which consists in injecting into the well steam charged or impregnated with a bleaching or refining agent, substantially as set forth.

2. The herein-described method of refining oil in the well, which consists in applying a suitable bleaching or refining agent to the oil in the well, substantially as set forth.

3. The herein-described method of producing refined oil, which consists in injecting into the well steam charged with a bleaching or refining agent, and then separating the more volatile from the less volatile component hydrocarbon combinations by distillation, substantially as set forth.

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Witnesses:

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