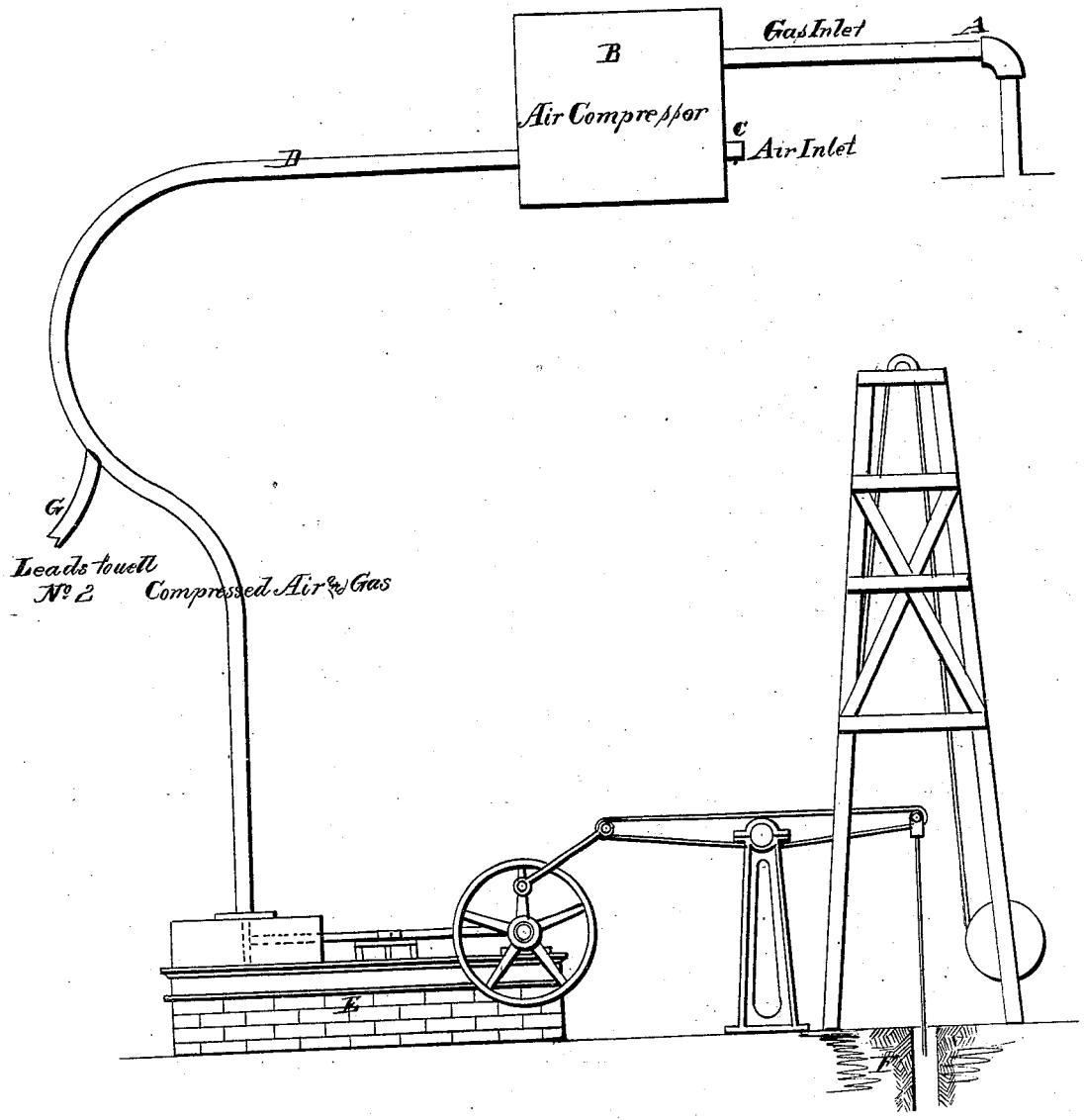
M. J. SEYMOUR.

Drilling and Pumping Oil-Wells by Compressed Air and Petroleum Gas.

No. 205,811. Patented July 9, 1878.



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IMPROVEMENT IN DRILLING AND PUMPING OIL-WELLS BY COMPRESSED AIR AND PETROLEUM GAS.

Specification forming part of Letters Patent No. **205,811**, dated July 9, 1878; application filed May 10, 1878.

To all whom it may concern:

Be it known that I, MARVIN J. SEYMOUR, of Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Drilling and Pumping Oil-Wells by Compressed Air and Petroleum Gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in drilling and pumping oil-wells by compressed air and petroleum gas.

Many oil-wells are located in sections of oil-bearing country where it is exceedingly difficult and very expensive to transport wood or coal to the wells for the purpose of generating steam to serve as motive power in drilling and pumping the wells. Owing to the limited supply of oil obtained from many pumping-wells, they are often abandoned as non-paying wells, the expenses of procuring the oil exceeding the income derived from the sale of the oil produced. Many wells are pumped by "heads," or only about one hour in twelve, and, as the steam is often conducted through long lines of pipes, there is a large loss of power, owing to the condensation of steam in the pipes during the intervals occurring between working-hours. Another source of delay and expense arises from the freezing of water of condensation within the pipes, resulting in the bursting of the pipes and consequent loss thereby. Again, the annual loss occasioned by fires arising from the close proximity of fire to the oil-tanks materially enhances the risk and danger of operating the wells by the method now resorted to. In many instances wells are drilled which produce large quantities of gas and no oil, the gas being valueless unless utilized in generating steam; and often that cannot be done to advantage on account of the great distance between such gas-well and the nearest oil-wells, and consequently such gas-wells are valueless, and are abandoned.

The object of my invention is to utilize the gas issuing from gas-flowing wells, or wood or coal, or water power situated distant from the place where the power is to be applied, by generating the power at the place of supply, and then transmitting the power to the point where it is desired to be applied, the same being accomplished by means of air-compressors, connecting-pipes, and compressed-air engines.

It is well known that in many instances the gas issues from oil-wells with great force, not infrequently indicating a pressure of one hundred and fifty pounds to the square inch. This gas can be utilized in connection with my invention, as hereinafter described; or the gas employed in the said process may be pumped from the wells. In order to render this gas, when compressed, very elastic and more capable of exerting a strong force in returning to its original volume at the place of applied power, I unite or commingle with it in the air-compressor a suitable volume of air, which latter, by its well-known elasticity, imparts to the resulting mixture of compressed-air gas the desired quality of elastic force.

The invention consists in pumping or drilling oil-wells by means of motive power obtained from compressed mixed air and gas, the gas being conducted into the air-compressors, and then discharged therefrom, together with the air, the two being thus united and compressed. The gas, intermingled with the air under such circumstance, is much more elastic in its character than is compressed gas when used singly, and the minute particles of petroleum in the gas act as a lubricant for the engine-cylinder.

It is this uniting of gas and air in compressed volume that constitutes my invention, since each of these two components qualifies the other and causes the resulting mixture to be especially adapted for the purpose in view. The air, by reason of its well-recognized elasticity, imparts this quality in suitable degree to the mixed volume, while the oily particles contained in the gas serve not only as a self-lubricant to the engine, but also lubricate the length of pipe intervening between the air-compressor and air-engine. This latter feature causes the connecting-pipes to readily transmit the current of compressed air and gas through them with as little fric-

tion as possible, and hence overcomes one of the main difficulties in conducting compressed air through pipes for any considerable distance.

Suitable air-compressors of any improved form of construction are located in close proximity to a gas-flowing well or supply of coal or water power, and from the air-compressors lead suitable lines of pipe to one or more oil-wells, which latter may be situated several miles distant from the compressors.

Each oil-well is furnished with a compressed-air engine, by means of which the compressed air, as it issues from the pipes, is utilized in transmitting power to drill or pump the well, as desired.

Connection is made between the air compressor or compressors and some near oil-well, and the gas from the latter is conducted therefrom through the connecting-main into the air-compressor. The gas is there intermingled with the air, and the two issue from out the same compressed and commingled. The respective proportions of gas and air thus introduced together in the air-compressor do not materially enter into the invention, as the same may be indefinitely varied, and the volume of each may be determined in any instance as desired.

This compressed-air gas is yielding in body, and further serves as a lubricant by reason of the petroleum contained therein, so that it of itself oils the cylinder of the compressed-air engine into which it is conducted.

As before indicated, the gas may be pumped from an oil-well into the gas-main, and through the latter into the air-compressor; or, in cases where the issuing volume of gas from a well is sufficiently strong and expansive, by means of the connecting-main, the gas will automatically force itself into the air-compressor.

Nearly the maximum amount of power of the compressed air diluted gas may be utilized, as little loss is occasioned by friction as the air is transmitted through the pipes. No appreciable loss is occasioned by condensation, and the power is always ready for use.

My invention will enable many wells now abandoned as non-paying to be worked with profit to the owners, as a single gas-flowing well will often suffice in furnishing sufficient heat to generate ample power to operate several wells situated several miles distant from the gas-well.

Again, this improved method of operating pumping-wells will render prospecting for oil much less hazardous and expensive than at present, as a large section of the country may be thoroughly and economically tested by transmitting the power to any desired locality from a single and common source of supply.

In the accompanying sheet of drawing, A represents a pipe for conducting the gas from a gas-flowing well to the compressor B. C is an air-induction pipe, to admit air to the compressor. D is a pipe or main for conducting the compressed air and gas to any suitable engine, E, for pumping an oil-well, F. Any number of branch pipes, G, may lead from the main conduit D to different wells, and thus allow power to be furnished, as desired, to several difierent wells.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

Compressed air and petroleum-gas for pumping and drilling oil-wells, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of May, 1878.

MARVIN J. SEYMOUR.

Witnesses:
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