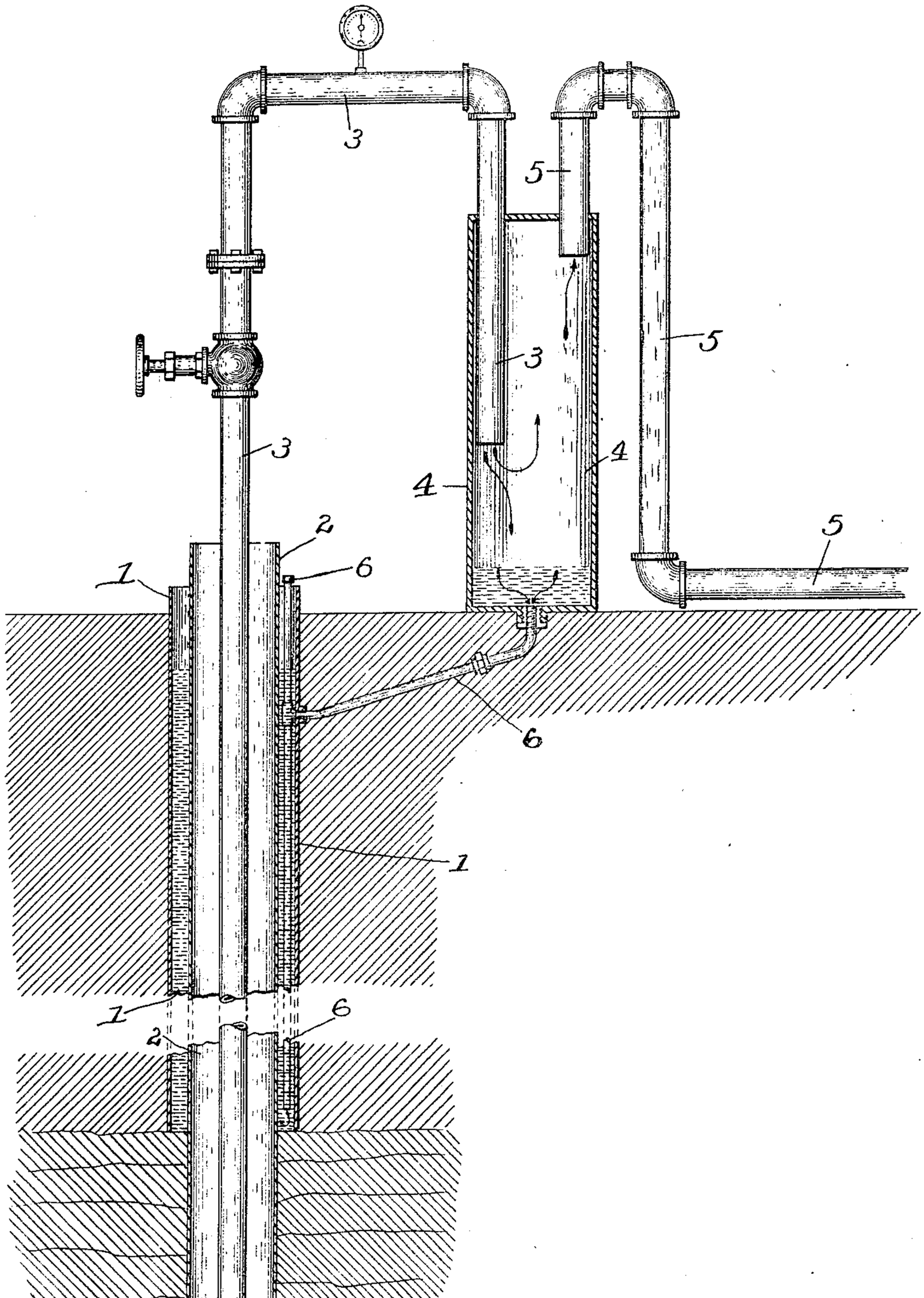
No. 681,369. Patented Aug. 27, 1901.

# F. P. NOURSE.

## GAS, OIL, AND WATER SEPARATOR.

(Application filed Apr. 23, 1901.)

(No Model.)




WITNESSES:

C. S. Frye.

T. H. Corwin

INVENTOR

Frank P. Nourse,

BY

Chester J. Bradford,

ATTORNEY

# UNITED STATES PATENT OFFICE.

FRANK P. NOURSE, OF ALEXANDRIA, INDIANA, ASSIGNOR TO HARRY V. OTTO, OF SAME PLACE.

## GAS, OIL, AND WATER SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 681,369, dated August 27, 1901.

Application filed April 23, 1901. Serial No. 57,046. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK P. NOURSE, a citizen of the United States, residing at Alexandria, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Gas, Oil, and Water Separators, of which the following is a specification.

The object of my said invention is to provide a means whereby water or oil and water will be automatically separated from natural gas as it flows from a well.

The essential feature consists of a water-seal by means of which the escape of gas is prevented while permitting the water or water and oil to flow off. This is accomplished by means of a pipe leading from the bottom of the separating-tank to the space between the outer and inner well-casings and extending down in said space to a point sufficiently below the water-level so that the water-pressure will overcome the opposing pressure of the gas, as will be hereinafter more particularly described and claimed.

The accompanying drawing illustrates a well and immediately adjacent parts provided with my said invention.

The outer casing 1 extends down into the earth to the rock. The inner casing 2 extends substantially to the bottom of the well. The pipe 3 extends down into the well and is the pipe through which the gas emerges from the well, together with the water or water and oil driven out thereby. These are or may be all of the ordinary form and arrangement and need no further description.

The pipe 3 leads down into a separating-tank 4 to a suitable point therein, generally near its bottom. The gas-pipe 5 starts from near the top of the tank 4 and carries off the gas which has been separated from the liquid. The liquid-discharge pipe 6 is connected to the separating-tank 4 at or near the bottom of said tank and leads thence to the space between the outer and inner casings 1 and 2 and thence downwardly into the water which is contained in said space to a sufficient depth therein, so that the water-pressure will exceed the pressure of the gas in the tank, and thus prevent the escape of gas through said liquid-discharge pipe 6 and compel it to pass off through the gas-pipe 5. I have found by experiment that the appropriate distance to which the lower end of the discharge-pipe 6 should be submerged is approximately two feet for every pound of gas-pressure—that is, where, for example, the gas-pressure is forty pounds per square inch the lower open end of the discharge-pipe should be submerged approximately eighty feet. By the arrangement described, as will be readily seen, the gas will be separated from the liquid and caused to pass off through the gas-pipe 5, while the liquid will pass through the pipe 6 into the space between the outer and inner casings of the well.

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

The combination with a gas-well having the usual outer and inner casings and gas-discharging pipe, of a separating-tank into which said pipe leads, a gas-pipe through which the gas may pass off from said tank, and a liquid-discharging pipe connected to the bottom of said separating-tank and leading thence between the outer and inner well-casings and down into said space a distance sufficiently below the water-line therein that the water-pressure will exceed the gas-pressure and thus prevent the escape of gas through said liquid-discharging pipe, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 16th day of April, A. D. 1901.

FRANK P. NOURSE. [L. S.]

Witnesses:

CHESTER BRADFORD,

S. H. COLVIN.