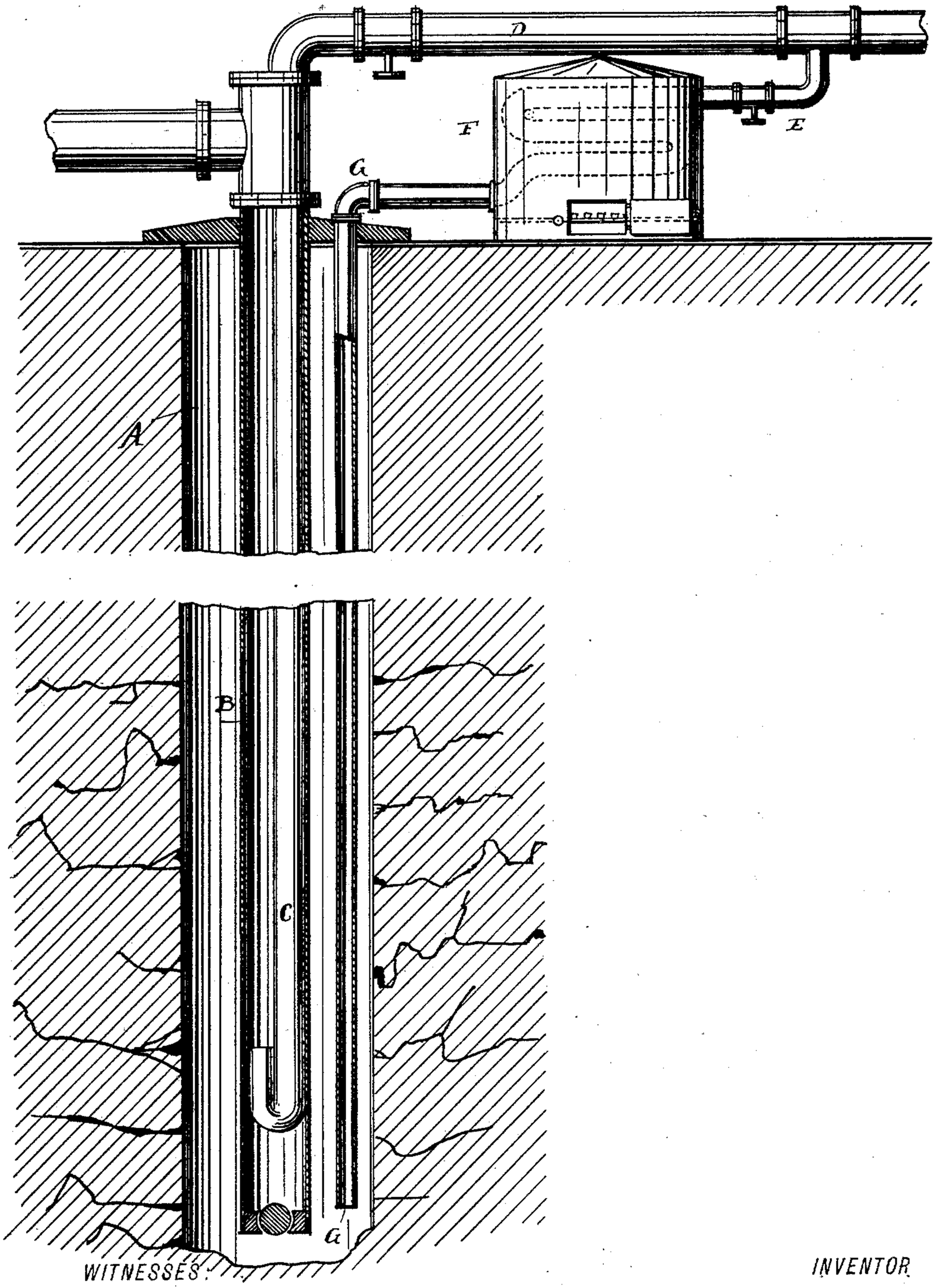
(No Model.)

W. O. ROBBINS.

APPARATUS FOR TREATING PETROLEUM WELLS.

No. 468,365. Patented Feb. 9, 1892.



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APPARATUS FOR TREATING PETROLEUM-WELLS.

SPECIFICATION forming part of Letters Patent No. 468,365, dated February 9, 1892.

Application filed February 14, 1891. Serial No. 381,432. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. ROBBINS, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Treating Petroleum-Wells, of which the following is a specification.

It is well known that petroleum-wells, after having been used a greater or less length of time, become sealed by the accumulation of paraffine, which separates from the petroleum and completely seals and closes the fine fissures and crevices through which the oil passes through the rock to the well-hole. Attempts have been made to remedy this and to unseal the well by exploding torpedoes at the bottom of the well-hole; but this process is only effective for a short time, as it does not remove the paraffine from the crevices and fissures in which the same has accumulated, but merely opens new crevices and fissures. Superheated steam has also been used for this purpose; but it was not effective, for the reason that the steam, coming in contact with the cold rock, condensed very rapidly, and, as water has no affinity for the paraffine, it caused the same to congeal, whereby the fissures were closed all the more tightly by the paraffine, and the fissures a greater distance from the well-hole were not affected in the least.

The object of my invention is to provide a new and improved method of treating oil wells in such a manner as to open all the fissures and crevices sealed by paraffine entirely, so as to cause a copious flow of oil, which improved method is cheap, requires a very simple plant, and operates very rapidly, and, furthermore, can be applied at any time without in the least interfering for any material length of time with the operation of the well.

The invention consists in forcing compressed hot air into the oil-well for the purpose of melting the paraffine and like substances in the crevices and fissures of the rock around the well-hole.

In the accompanying drawing a vertical transverse sectional view of an oil-well is shown provided with my improved device for unsealing the same.

In the well-hole A the stand-pipe B is arranged, in which the oil is brought to the surface either by means of pumps or by means of a compressed-air pipe C, into which compressed air is forced through the pipe D. The method of bringing the oil to the surface has nothing to do with my invention, as my invention can be applied on all wells independently of the oil-elevating device. The pipe E, through which the compressed air can be forced from any suitable compressor or storage-tank, passes in the form of a coil or serpentine through a closed chamber F, which can be suitably heated by means of a fire, petroleum-burner, and natural gas, or any other means. From said chamber F the pipe G leads down to the bottom of the well. The compressed air, by passing through the coil or serpentine pipe in the chamber F, is heated to a very high degree and is ejected at the lower end of the pipe G, at a temperature of from 200° or more, into the well. The hot compressed air rapidly fills the well-hole, which must be suitably closed at the top to prevent the escape of hot air, and melts the paraffine in the cracks, crevices, and fissures, as a temperature of about 109° to 149° is required for thus melting the paraffine. The melted paraffine then flows to the bottom of the well, and as the cracks, crevices, and fissures near the well-hole are open the compressed air passes into them and penetrates deeper into the rock, serving to melt the paraffine a greater distance from the well-hole. By forcing the compressed hot air into the oil-well for a greater length of time all the fissures, cracks, and crevices for an area of a considerable radius around the well-hole can be unsealed, thus permitting the petroleum to flow into the well-hole.

The hot air has an affinity for the petroleum and under no circumstances can cause the congealing of the same, as steam does, even if the same is superheated to the highest possible degree.

The hot air can be forced into the well at any desired pressure, as, in fact, there is practically no limit to the pressure to which the air can be subjected, and likewise, by providing a sufficient length of heated surface for the pipe, the air can be heated to any desired degree of heat.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

The combination, with an oil-elevating pipe extending to the bottom of an oil-well and provided at its lower end with a check-valve, of a pipe for compressed air, extending to near the bottom of the oil-elevating pipe and provided at its lower end with an upwardly-extending part, a branch pipe connected with said compressed-air pipe and also extending to the bottom of the well outside of the oil-elevating pipe, and a heater through which part of said branch pipe extends to heat the air passing through said branch pipe, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILLIAM O. ROBBINS.

Witnesses:

OSCAR F. GUNZ,

JOHN A. STRALEY.