

W. L. HARDISON.
PETROLEUM WELL.

No. 171,615.

Patented Dec. 28, 1875.

Fig. 1.

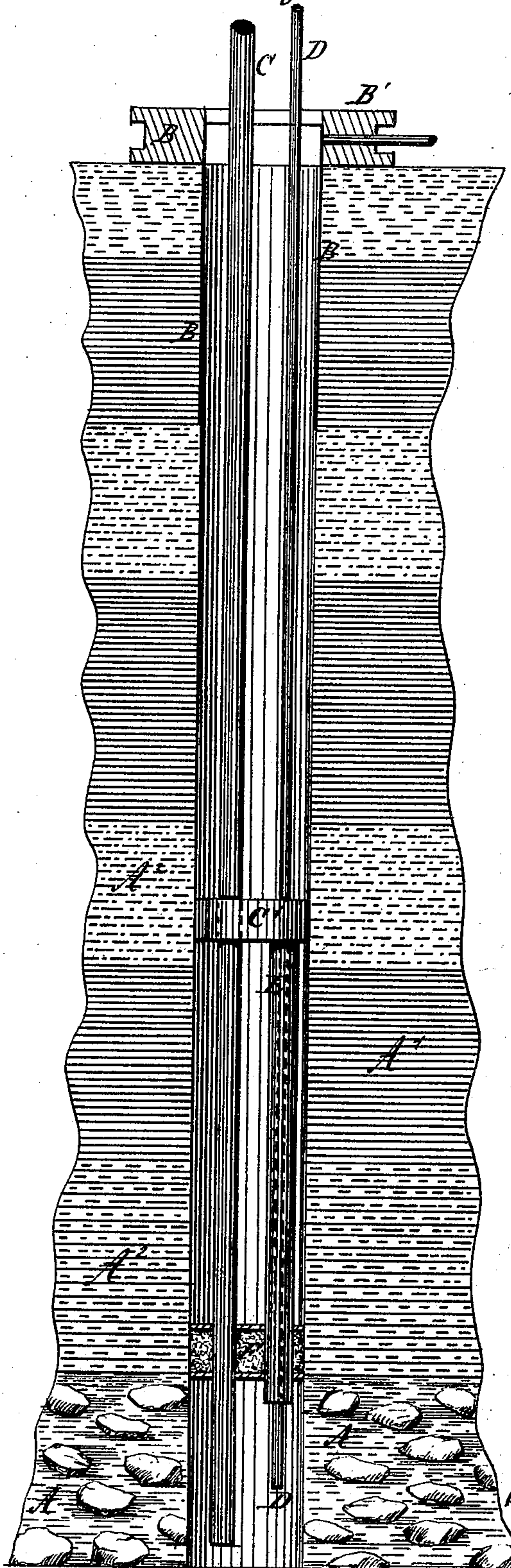


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

WALLACE L. HARDISON, OF ST. PETERSBURG, PENNSYLVANIA.

IMPROVEMENT IN PETROLEUM-WELLS.

Specification forming part of Letters Patent No. **171,615**, dated December 28, 1875; application filed November 19, 1875.

To all whom it may concern:

Be it known that I, WALLACE L. HARDISON, of St. Petersburg, in the county of Clarion and State of Pennsylvania, have invented certain new and useful Improvements in Petroleum-Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical section of a petroleum-well having my improvement applied thereto, and Fig. 2 is a detached view of the steam-pipe guiding-flange.

In another application for a patent for improvements in oil-wells, of even date herewith, I have shown and described tubes for protecting the steam-tube from contact with the salt-water which is frequently found in such wells, and for permitting the escape of the gas and the surplus steam from the well without the injury to the well which would ordinarily result from the action of the heat and moisture of the escaping steam upon the slate rock of the well. This invention is designed to reduce the cost which is involved in the application of such tubes.

A represents the oil-bearing rock, and A¹ A² A³ the upper strata of rock and soil. B is the casing, which usually extends to such depth as will exclude the fresh water. B' is the casing-cap. C is the pumping-tube, of any usual or approved construction, and provided with the ordinary pumping-rod and valves, which need not, therefore, be described. D is the steam-tube, extending to near the bottom of the well, care being taken to keep its lower end above such portion of dead-oil or water as cannot be readily removed by the pump. E is the supplementary or protecting tube, surrounding the steam-tube D, and either united to the packer F by a water-tight joint, or connected with the steam-tube D by a water-tight joint near the packer, or extending through the packer, as shown in the drawings.

The packer (represented at F) may be of any desired manufacture, and as this invention

does not relate to the packer, I propose to employ any one which will answer my purpose.

As the salt-water will rarely rise to within some hundreds of feet of the top of the well, I have invented a construction which enables me to dispense with such length of pipe as would otherwise be required to reach from the salt-water level to the top of the well. This salt-water level can be easily ascertained by proper soundings, and at this level, or at a short distance above this point, I attach a steam-tube guiding-flange, C', to the pumping-tube C. The flange need not be rigidly connected to the pumping-tube; in fact, I usually secure a collar or clamp to the pumping-tube below the flange, so that when the tube is withdrawn from the well the collar will bring the flange with it. It is provided with two holes—one, c, for the pumping-tube, and another, c', for the protecting-tube E. It is circular in form, and is dishing or concave, with its sides converging toward the protecting-pipe opening c'. Tube E is rigidly attached to the guide C', so that it (tube E) may be raised and lowered with the pumping-tube, and the distance at which these tubes C and E are placed apart may be governed by the kind of packer, if any, which is to be used with them, or by any other circumstance or feature of construction. The guiding-flange is, by preference, about one-quarter of an inch less in diameter than the bore of the well.

After the pumping-tube C and protecting-tube E, with packer F, have been placed in position, the steam-tube D may be introduced, and when it reaches the guiding-flange C' the converging sides of the flange will insure that the lower end of the steam-pipe enters the tube E without fail.

In operating my devices, the dead-oil or oil and water are pumped out through the pumping-tube C, in order that the discharge of steam may be unobstructed, as a small amount of either oil or water in the well will prevent any efficient use of the steam.

It will be seen that water which may accumulate above the packer F cannot come in contact with the steam tube D. It is further apparent that if steam be introduced through tube D into the lower part of the well, the

heat thereby produced will be confined below the packer, as the water above said packer will condense the steam which might otherwise pass up through tube E, and in case there be not enough water above the packer, a sufficient quantity to produce the desired result may be poured in from above.

One of the objects in making flange C' so much smaller than the bore of the well is to permit water to be poured into the well to surround tube E without having such water run into the tube.

By my construction the steam-tube may be withdrawn without disturbing the packer.

What I claim is—

1. The combination of the pumping-tube C, the steam-tube D, and the protecting-tube E, supported upon the pumping-tube, substantially as set forth.

2. The combination of the guiding-flange C' with the protecting-tube E, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WALLACE L. HARDISON.

Witnesses:

E. C. WEAVER,

H. H. DOUBLEDAY.