

W. E. GARDNER & G. A. ISRAELSON.

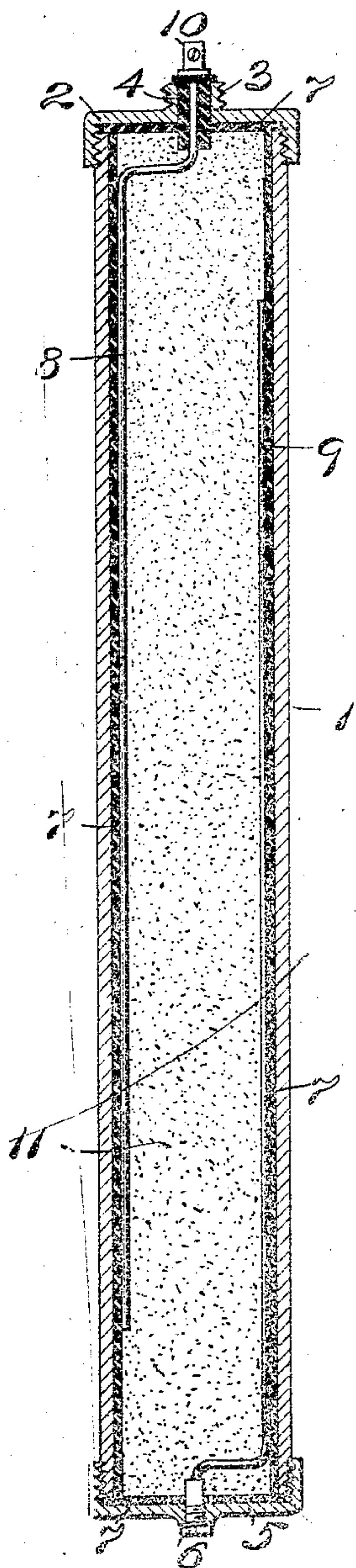
OIL WELL HEATER.

APPLICATION FILED APR. 2, 1909.

945,321.

Patented Jan. 4, 1910.

FIG. I.



Witnesses

Frederick W. Peters,
W. F. Simms;

FIG. II.

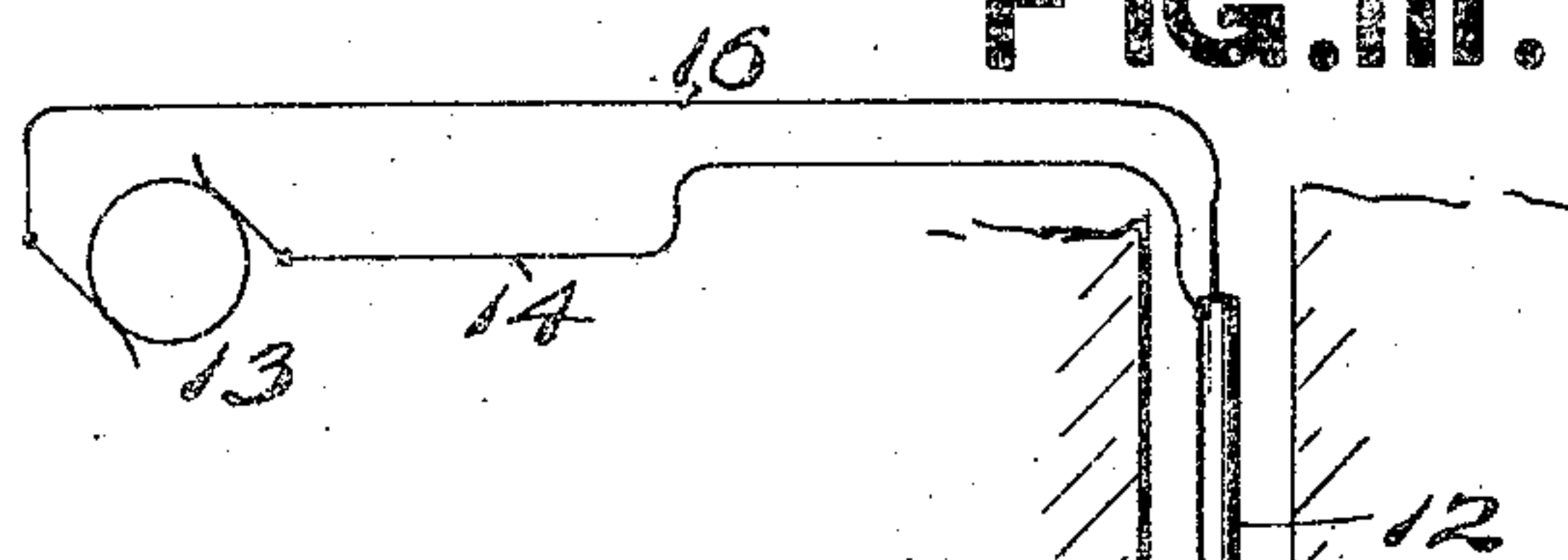


FIG. II.

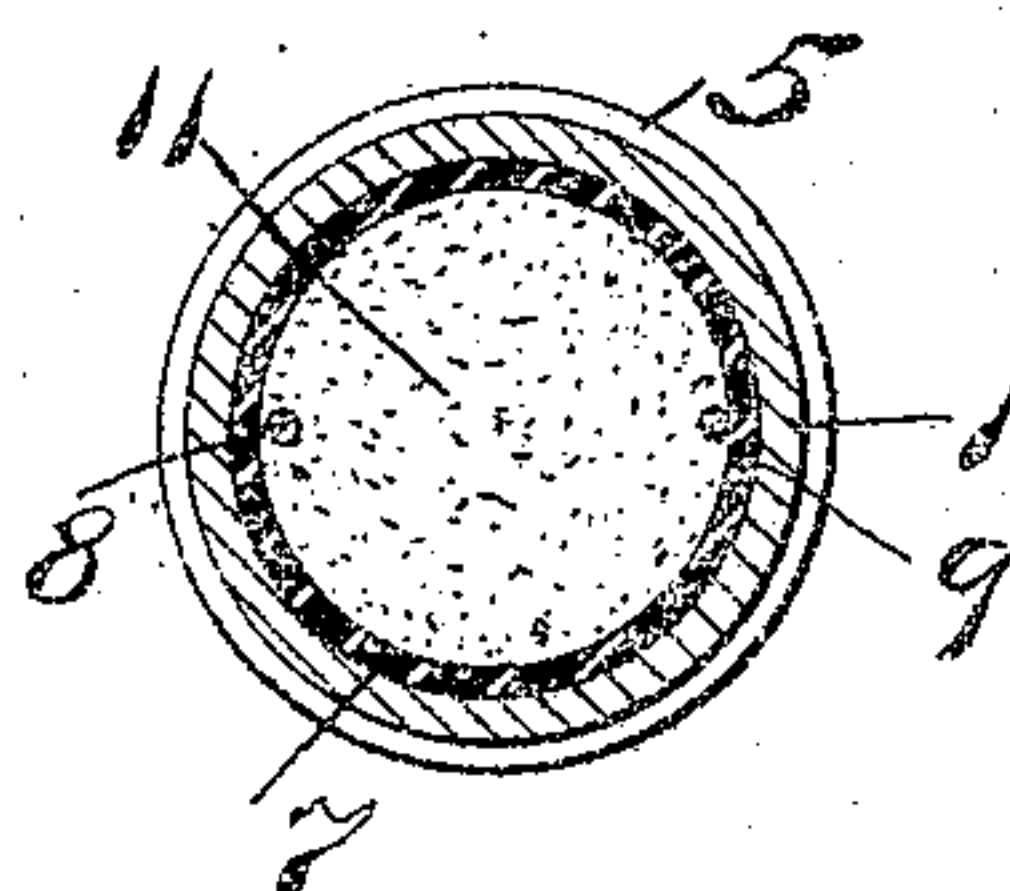
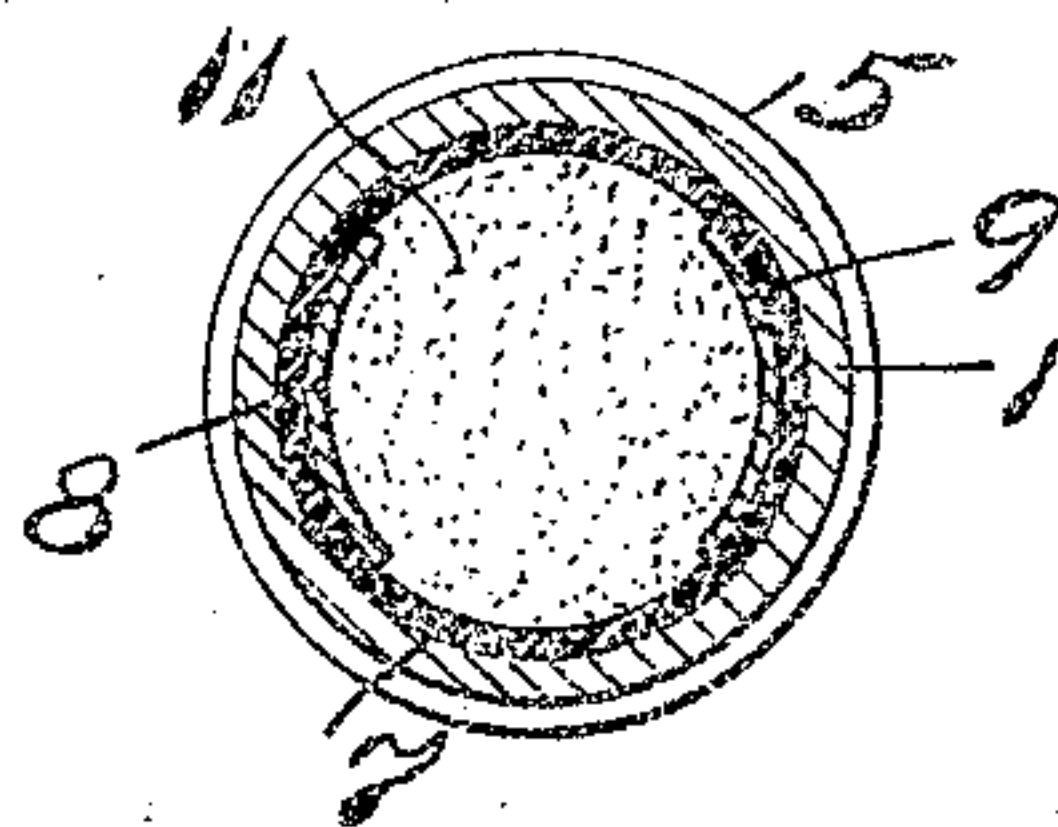


FIG. IV.



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UNITED STATES PATENT OFFICE.

WILLIAM E. GARDNER AND GUSTAVE A. ISRAELSON, OF PITTSBURG, PENNSYLVANIA.

OIL-WELL HEATER.

945,321.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed April 2, 1909. Serial No. 487,537.

To all whom it may concern:

Be it known that we, WILLIAM E. GARDNER and GUSTAVE A. ISRAELSON, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Well Heaters; and we do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention has for its object the provision of a simple and practical electrically heated device, adapted to be placed and operated in oil wells for the purpose of heating the lower section of the well and thereby dissolve the paraffin and other obstructive matter which fills up and becomes hardened in the fissures and interstices in the oil bearing strata of rock and sand, the removal of which matter occasions the well to again become productive of oil.

In the accompanying drawings, forming a part of this specification, we have illustrated our invention in several ways as well as its application to a well, in which drawings,

Figure I, is a longitudinal sectional view through the heater. Fig. II, is a transverse sectional view through the same. Fig. III, is a longitudinal sectional view of a portion of a well showing the application of our improved heater thereto, and Fig. IV, is a transverse sectional view through the heater showing the electrodes of segmental form in cross-section, in all of said views similar detail parts of the structure are designated by numerals of like character.

The structure disclosed comprises a tubular member 1 having a cap 2 secured to its upper end, which is provided with an externally threaded boss 3 into which is fitted an insulator 4, the lower end of said member being closed by a cap 5 having a metal plug 6 secured therein, said tubular member and attending heads being formed of metal and lined with an insulating medium 7 of any suitable material. Arranged within said closed tubular member is a pair of spaced electrodes 8 and 9, oppositely disposed against or in close proximity to the insulating lining thereof, one of which extends

from a point near the bottom up to and through the aforesaid insulator 4 in the upper head and connects to a terminal 10, the other electrode extending downwardly from a point near the top and connects with the aforesaid plug 6 in the lower head, care being taken that the space between the points where the electrodes enter and terminate be greater than the distance transversely.

The interior of the tubular member is filled with a suitable pulverized or granular high resistance medium 11 which extends from end to end engaging the electrodes throughout their length.

In practice, the heater is attached to the pump line 12 by threadably connecting the same to the aforesaid boss 3 of the upper head, the upper end of said line being connected to one of the brushes of a generator 13 by a wire 14 and the terminal 10 is connected to a wire 16 leading to the other brush of the generator. When connections are made it is lowered into the well and the current is passed between the electrodes, through the medium of the pulverized or granular material, and as said material is of high resistive properties and offers the shortest path to the current, heat is generated by the current in its passage therethrough from one electrode to the other, which heat is transmitted through the device to the surrounding walls of the well, thereby dissolving the paraffin and other matter and causing it to pass out of the fissures into the well where it can be removed with the oil. The heater can be raised and lowered slowly over the entire surface of the oil bearing strata, in which instance the wire sand line (not shown) may be attached to the heater instead of the pump line and placed in circuit with the generator.

By extending the spaced electrodes longitudinally of the interior the path of the current transversely from one to the other, through the high resisting medium, is made comparatively shorter than were it longitudinally or from end to end, with the result that the heat is more evenly as well as quickly distributed in the heater, besides the device is sealed and impervious to moisture.

Having thus shown and described our invention, what we claim and desire to secure by Letters Patent, is:

1. An electric heater for oil wells, comprising a sealed metallic chamber having its interior covered with an insulating medium,

- a pair of spaced electrodes extending longitudinally of and within said chamber, and a pulverized high-resistance medium filling the interior of said chamber and adapted to form
- 5 a transverse passage between the electrodes, substantially as described.
2. An electric heater for oil wells, comprising a sealed metallic chamber having its interior covered with an insulating medium,
- 10 a pair of spaced electrodes extending longitudinally of and within said chamber from end to end, one of said electrodes being in circuit with the cylinder and the other insulated

therefrom, and a pulverized high resistance medium filling the interior of said chamber, and adapted to form a transverse passage between the electrodes, substantially as described.

In testimony whereof, we affix our signatures, in presence of two witnesses.

WILLIAM E. GARDNER.
GUSTAVE A. ISRAELSON.

Witnesses:

A. R. ROBISON,
R. S. HARRISON.