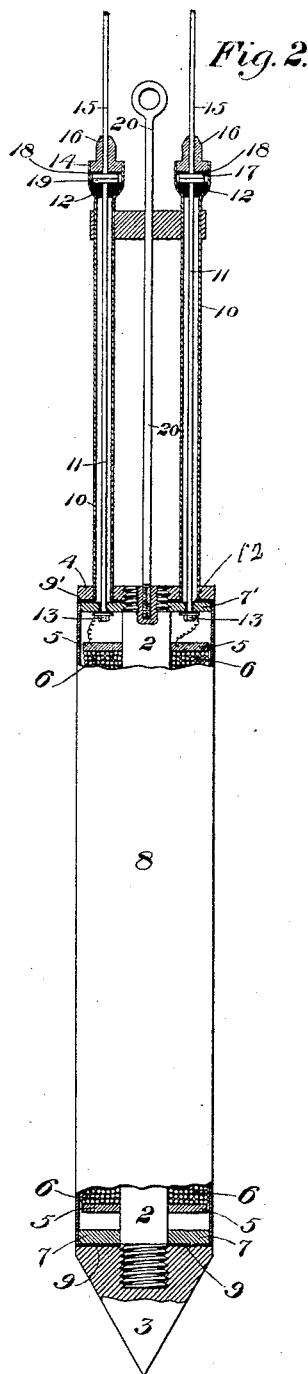
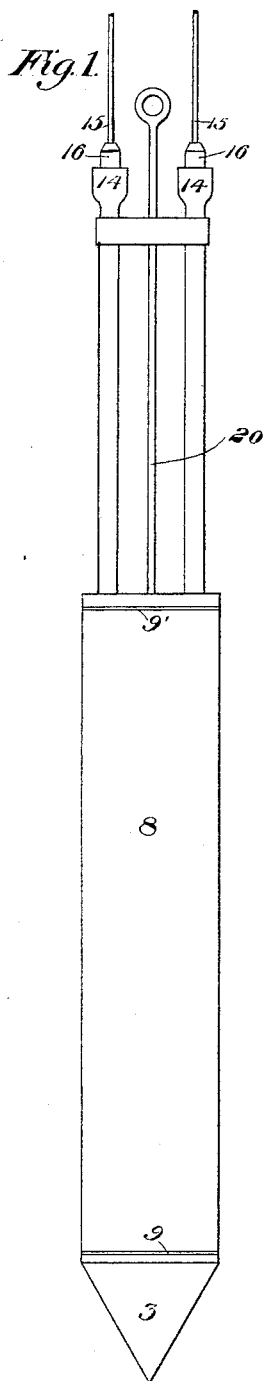


(No Model.)

J. S. LUCOCK.  
OIL WELL HEATER.

No. 522,737.

Patented July 10, 1894.



WITNESSES

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INVENTOR

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# UNITED STATES PATENT OFFICE.

JOHN S. LUCOCK, OF BELLEVUE, PENNSYLVANIA.

## OIL-WELL HEATER.

SPECIFICATION forming part of Letters Patent No. 522,737, dated July 10, 1894.

Application filed April 28, 1893. Serial No. 472,261. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN S. LUCOCK, of Bellevue, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Oil-Well Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved heater; and Fig. 2 is a similar view, partly broken away.

My invention relates to that class of electrical heaters employed for melting solidified masses of paraffine in oil-wells, and is designed to improve their construction and enlarge their heating capacity.

In the drawings, 2 indicates a metal core to whose lower end is secured a pointed metal cap 3, while to its upper end a metal ring 4 is fastened by a screw-thread connection.

Between two non-metallic annular plates 5, 5', carried by the core, is wound a coil of wire 6, which is suitably insulated from the core, and each convolution of which is insulated from the adjoining convolutions.

Carried upon two annular non-metallic disks 7, 7', secured to the core, is an outer thin metal tube 8, the ends of the tube being insulated from the plate 4, and the cap 3 by interposed thin disks 9, 9', of non-conducting material.

Passing through holes in the disks 4, and 9', are metallic tubes 10, within which are contained the conductors 11, whose upper and lower ends pass through insulators 12, and to the lower ends of the conductors are screwed nuts 13, which serve to retain them in proper position, and furnish a connection for the ends of the primary winding 6.

To the upper ends of the tubes 10 are secured cup-shaped enlargements 14, through whose open ends pass the insulated conducting wires 15 held in place by the surrounding caps 16. The wires terminate in the metallic heads or buttons 17, insulated by thin disks 18, from the caps or nuts 16, which force these heads into contact with similar heads 19 upon the upper ends of the conductors 11.

20 is the supporting rod by which the case is lowered into the well.

This heater is connected with an alternat-

ing or intermittent current generator, and when this current is passed through the coil 6, the core 2, being subjected to rapid reversals of polarity, will become highly heated. The outer tube 8 being also a portion of the magnetic field will be subject to the same rapid changes of polarity, and on this account will become heated. Moreover, as this tube is at the same time a secondary circuit, a current of electricity will be generated within it by induction, and the tube being of small cross-section, and the induced current of low voltage and high ampèreage, this current also will heat the tube, since the current is in excess of its carrying capacity. The heating effect may be further increased by using in the primary coil 6, a wire of such size that it will heat with the passage of the primary current.

If desired, a secondary coil of wire, so calculated as to generate a current larger than its carrying capacity, may be wound over the first coil, forming a closed short circuit which will become heated by the passage of the current through the primary coil. I prefer, however, to use the tube, since apart from the heating effect of the induced current, it is heated by the rapid reversals of magnetization and, moreover, furnishes a better path for the lines of magnetic force.

The advantages of the invention will be apparent to those skilled in the art. A greater heat is produced by reason of the use of the alternating current and the double heating effects in the core and tube. The conductors being properly insulated and inclosed in the tubes, burning out of the insulation is prevented, and the packing devices prevent water or other substances from entering the case. Short circuiting of the outer tube is prevented by the end insulating disks 9.

Many variations in the form and arrangement of the parts may be made without departure from my invention as defined in the following claims. For example, the construction may be modified so as to be adapted to be attached to the lower end of a pump-barrel, the central core being hollow to permit of the oil being pumped through the inside of the heater.

I claim—

1. An oil-well heater comprising a coil of

wire connected with an alternate current generator, and a secondary closed circuit surrounding the coil; substantially as described.

2. An oil-well heater comprising a metal case containing a heating coil, conductors inclosed within tubes attached to the upper end of the case, said conductors having buttons at their upper ends, and wires having similar buttons contacting therewith; substantially as described.

3. An oil-well heater comprising a core having a coil of insulated wire wound thereon, a

metal tube surrounding the wire and completely insulated from the cover and other parts, and an alternate or intermittent current generator connected to said wire; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN S. LUCOCK.

Witnesses:

W. B. CORWIN,  
H. M. CORWIN.