(No Model.)

T. W. YOUNG.

ELECTRIC HEATER.

No. 524,881. Patented Aug. 21, 1894.

Fig. 1.

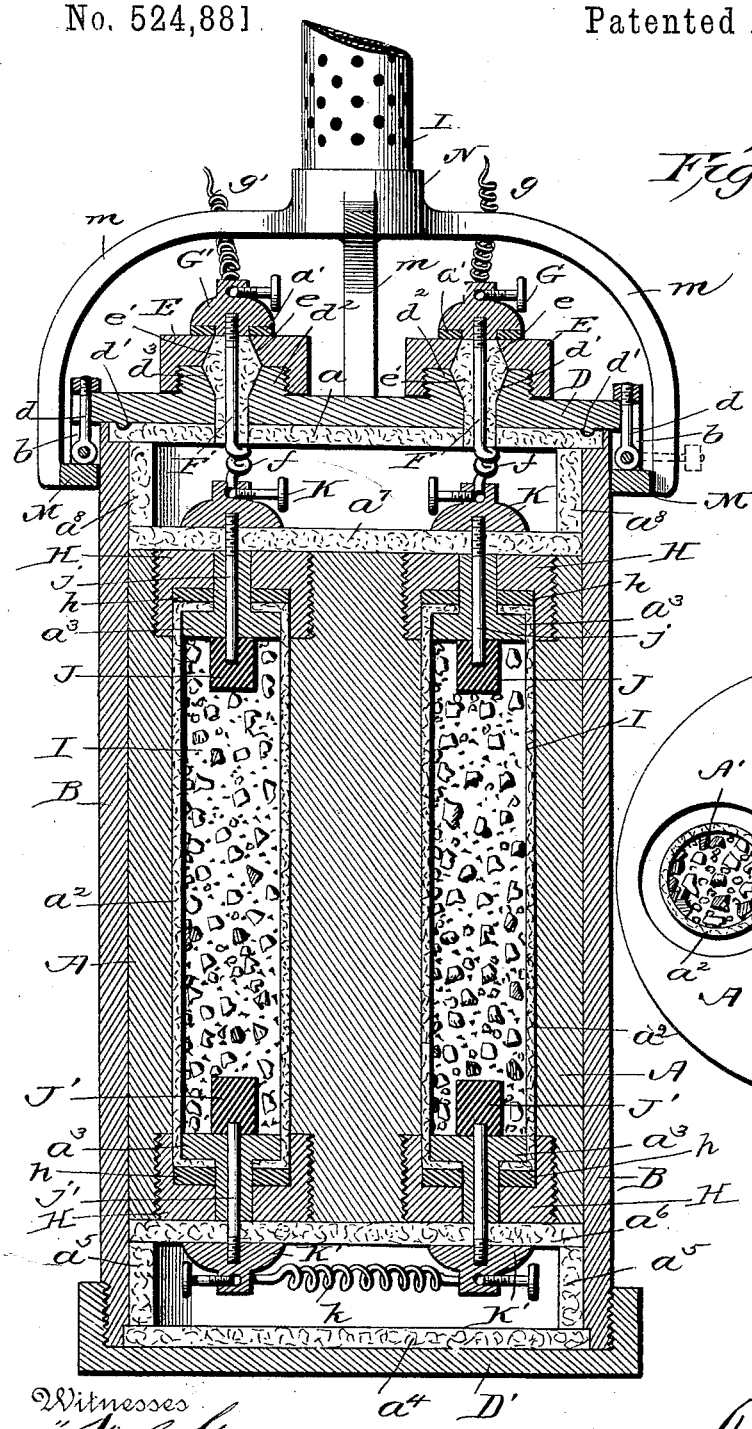
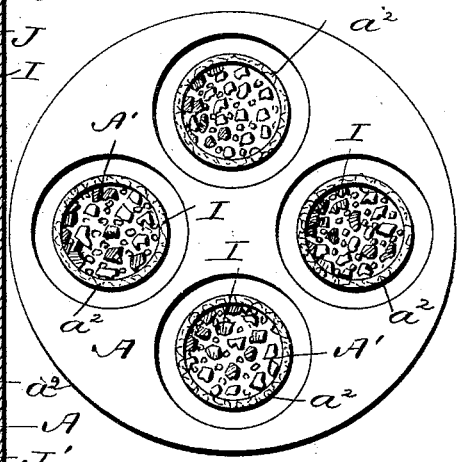


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

TAPLEY W. YOUNG, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO DAVID R. McKEE, TRUSTEE, OF SAME PLACE.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 524,881, dated August 21, 1894.

Application filed October 6, 1893. Serial No. 487,355. (No model.)

To all whom it may concern:

Be it known that I, TAPLEY W. YOUNG, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to an electric heater for oil-wells designed to melt the hardened paraffine in the fissures of the rock, thereby removing the chief source of obstruction to the flow of the oil.

The improvement consists, essentially, of the novel features which will be hereinafter more fully described and claimed, and which are shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of a heater embodying my invention, showing it attached to the lower end of the oil delivery-pipe. Fig. 2 is a top plan view of the heating-core.

The core A and its electrical heating devices are inclosed within a case B of non-oxidizable material, as brass or copper, which has heads D and D′ of similar material. The head D′ is flanged and screws on the lower end of the casing B. The head D is fastened to the upper end of the case in any desired manner, preferably by pivoted bolts *d*, which are pivoted to an outer flange *b* at the upper end of the case, and which work in grooves in the said flange and edge of the head. An annular rib *d′* on the inner face of the head D enters the insulation *a*, which is preferably asbestos, and compresses the same near the edge to obtain a water-tight joint. Raised portions d^2 on the outer face of the head D are externally threaded to receive screw-caps E, and have outwardly-flanged openings d^3. The caps E have inwardly-flanged openings *e* corresponding to the openings d^3. An insulating plug *e′* has a double conical head to enter the inversely-flared openings *e* and d^3, and is sufficiently long to extend through the head D and the insulation *a*. The plug *e′*, of asbestos or other electrical non-conducting material, is apertured to permit the passage of the conductor F, on the upper end of which is screwed a binding-post G, to which the terminal of the conductor *g* is attached in the usual manner. The inner end of the binding-post is reduced and receives an insulating washer *a′*.

The heating-core A is an approximately cylindrical block, having bores A′, in which the resistant material I, as broken carbon, is placed. There may be as many of these bores A′ as desired, four being shown, and they will be enlarged at the ends, the enlarged portions being internally threaded to receive recessed screw-plugs H, which close the ends of the bores and retain the resistant substance I in place. These bores A′ are lined by asbestos tubes a^2, which have their ends bent over insulating plugs a^3, the ends of the insulating plugs being reduced and passed through metal plugs H. A metal washer *h* surrounds the reduced end of the plug a^3 and is held between the bent end of the tube a^2 and the inner wall of the recessed plug H.

The electrodes J and J′, at the opposite ends of the bores A′, are connected respectively, by conductors *j* and *j′*, with the binding-posts K and K′, the latter being screwed on the ends of the said conductors which pass through the plugs a^3. The electrodes J and J′ are carbon blocks, which are fused to the conductors *j* and *j′* to obtain positive connection. Should the core have but two bores, the lower set of binding-posts K′ and K′ will be electrically connected by a suitable conductor, as *k;* but in case there are four bores, as shown in Fig. 2, two of the upper binding-posts will be likewise connected.

In assembling the parts, the lower head D′ is secured in place on the case, an insulating disk a^4 protecting the inner side of the head. A band a^5, of insulating material, is placed on the disk a^4, and receives and supports an insulating disk a^6. The heating-core is placed on the disk a^6, and is protected on top by an insulating disk a^7, which receives an insulating band a^8, touching the insulating disk *a* at its top edge. It will be observed that an insulating chamber is provided at each end of the case, between the heads thereof and the ends of the heating-core, in which chambers are located the binding-posts K and K′ and their electrical connections. These chambers

serve as housings for the electrical connections *k*, and prevent them, in the vibrations of the apparatus, from coming into contact with any metallic surface and thus short-circuiting the current, these vibrations occuring when the heater has raised the temperature of the surrounding fluid to a high point. The binding-posts G′ will be connected with one pole of a suitable source of electrical energy by means of the conductor *g′*. The other binding-post G is connected with the other pole of the current-generator by means of the conductor *g*. The binding-post G′ is electrically connected with the binding-post K by the conductor F′, which, as well as the conductor F, has a short coil *f* near its lower end, these coils being designed to permit the necessary elongation of the conductors while screwing down the binding-posts G and G′.

The different insulations *a*, *a′*, &c., are preferably formed of asbestos or mineral wool, to stand the heat to which the device is subjected in efficient service.

The electrodes, screw-plugs, and binding-posts at the ends of the bores A′ will be similarly disposed and connected with the core, and will be placed in position prior to the insertion of the core within the case.

The heater is designed to be attached to the lower end of the delivery-pipe L by a suitable attachment, which, as shown, consists of a ring M, to come under the flange *b* of the case, converging arms *m*, and a threaded socket N, the latter screwing on the lower end of the said pipe L.

The heater occupies the lowest position in the well, and may be operated continuously or at such intervals and times as may be necessary.

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

1. An electric heater comprising a water-tight case having an insulated chamber at each end, a metal core having insulated bores packed with a suitable resistant material arranged within the case, between the insulated chambers, binding-posts located in said chambers, electrical conductors attached to said binding-posts and extending within the core, electrodes attached to said conductors, electrical connections between the bores in the core, and means for passing a current of electricity to the binding-posts.

2. An electric heater comprising a water-tight metal case having an insulated chamber at each end, a metal core having insulated bores packed with a suitable resistant material arranged within the case, between the insulated chambers, binding-posts located in said chambers, electrical conductors attached to said binding-posts and extending within the core, electrodes attached to said conductors, electrical connections between the bores in the core, insulated electrical conductors attached to the binding-posts in one of the insulated chambers and extending through the upper head of the case, binding-posts attached to the upper end of said insulated conductors, and means for passing a current of electricity to the latter binding-posts.

3. In an apparatus for increasing the flow of oil in oil-wells, the combination, with the well-pipe, of an electric heater attached to the lower end of said pipe, said heater comprising a water-tight metal case having an insulated chamber at each end, a metal core having insulated bores packed with a suitable resistant material arranged within the case, between the insulated chambers, binding-posts located in said chambers, electrical conductors attached to said binding-posts and extending within the core, electrodes attached to said conductors, electrical connections between the bores in the core, insulated electrical conductors attached to the binding-posts in one of the insulated chambers and extending through the upper head of the case, binding-posts attached to the upper end of said insulated conductors, and means for passing a current of electricity to the latter binding-posts.

In testimony whereof I affix my signature in presence of two witnesses.

TAPLEY W. YOUNG.

Witnesses:
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G. W. BALLOCH.