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STEAMER FOR OIL WELLS.

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This invention relates to a steamer for oil wells and the like, and more particularly to an improvement upon the structure shown in my Patent #1,623,580.

The primary object of this invention is to provide a steamer for oil wells and the like by which the paraffin, which hardens upon the walls of the shot cavity or chamber, can be dissolved by the use of steam to increase the output of a well, which steamer comprises a tank, and a heating unit connected to said tank by a hollow rod, said unit consisting of a sealed tube electrically heated, a jacket enclosing said tube and a pipe connected to said tank, said surrounding said tube and carried by said jacket, said pipe having holes in the wall thereof adjacent said tube, whereby liquid in said tank enters said pipe, is sprayed through said holes onto said tube and is thereby converted into steam.

Other objects of this invention reside in the particular details of construction and arrangement set forth in the following specification, and in the drawings which form a part thereof, and in which

Fig. 1 is a side elevation partly in section of a steamer embodying this invention, in operating position in a well;

Fig. 2 is a side elevation of the upper end of said steamer; and

Figs. 3 and 4 are cross sections taken along the lines 3-3 and 4-4 of Figure 1.

In the drawings, the reference numeral 10 is employed to designate a steamer embodying one form of this invention, and comprising a heating unit 11 and a tank 12 connected by a hollow rod 13.

The tank 12 is provided at the top with a cover plate 14, the upper face of which is preferably concave. Through the plate 14 are cut a plurality of openings 15 for a purpose to be described later. Fixed in an annular groove 16 at the outer edge of the plate 14 is an expansion ring 17, similar to the ring shown in the copending application above mentioned. The plate 14 has an annular flange 18 cut away at its lower portion to provide a shoulder 19. The plate flange 18 enters the mouth of the tank with the shoulder 19 resting on the upper edge thereof. The plate may be fixed in the tank in any desired manner.

In the bottom of the tank 12 is an aperture 20 through which the rod 13 passes. The rod is externally threaded at 21 and the tank is secured thereto by nuts 22, 23 which also function to seal the aperture 20. The rod 13 also passes through an aperture 24 in the cover plate 14 and terminates in a loop 25, which can be made use of in raising or lowering the steamer.

The heating unit 11 comprises an electrically heated tube 30 enclosed by a jacket 31. Both the tube and the jacket are of metal, preferably of copper. The tube is sealed at the top by a plug 32 and at the bottom by a cap 33, which encloses and is preferably threaded securely to the lower end of the tube 30. Supported by the plug 32 and cap 33 are posts 34 around each of which is a continuous coil 35 of wire. The coils 35 meet in a cable 36, which passes through the conduit 37 to the outer surface of the loop 25.

The plug 32 is externally threaded at 38 to engage internal threads 39 at the mouth of the tube. The tube 30 preferably seats against a shoulder 40 on the plug 32, thus insuring the closure of the tube. Through the center of the plug 32 is formed a passage 41, into which the lower end of the rod 13 enters.

The rod is externally threaded to engage the passage 41 and to receive a nut 42, which clamps the jacket 31 down onto the plug 32. Thus the tube 30 is firmly fixed in place in the jacket 31, and the unit 11 is rigidly connected to the tank 12.

The jacket 31 is spaced from the tube 30 at the side and bottom and is provided with a plurality of perforations 43. In the space between the tube 30 and the jacket 31 is mounted a pipe 44, preferably spiral, and supported by the jacket. The pipe 44 is connected to the tank 12 through a hole 45 in the bottom thereof, sealed by a pair of nuts 46, 47. The upper end 48 of the pipe is bent in the form of a crook neck, so that it opens downwardly and functions as a siphon. In the walls of the pipe 44 between the tube 30 and jacket 31 are formed a series of holes 49, each on the side nearest the tube 30.

An oil well, in which this invention is particularly intended to be used, includes a drilled hole 50 and a shot cavity or chamber 51, from the walls of which flows the oil. One of the constituents of the oil, particularly(671,793),(966,996)
cutting the output of the well. It is well known that steam will melt the hardened paraffin and thus free the passages in the ground, so that the oil can flow into the chamber 51.

A steam or embodying this invention is lowered through the hole 50 by means of a cable attached to the loop 25 until the heating unit 11 is within the chamber 51. The tank 12 remains in the hole 50 and the expansion rings 17 bear against the wall of the hole, thus sealing the chamber 51.

The heating coils 35 are now energized and water is poured directly into the mouth of the hole 50. This water falls onto the plate 14 and enters the tank 12 through the openings 15. When the tank is filled sufficiently to cover the end 49 of the pipe 44, the water flows through the pipe into the unit 11, and travels through the coil in the space between the tube 30 and jacket 31. The water in the pipe 44 escapes through the holes 49 and strikes against the tube 30, which is heated by the coils 35. The water is then transformed into steam and escaping from the unit 11 through the perforations 43 fills the chamber 51 and attacks the paraffin on the walls thereof. This treatment can be continued as long as desired.

By reason of the crook neck 48 any dirt that may be in the tank 12 will remain there and not pass into the pipe 44. A sump or catch basin 52 may be provided at the bottom of the tank in which the dirt and so forth may collect. A valve 53 permits drainage of the tank whenever desired.

It will be noted that the tube 30 is completely sealed so that the heating coils 35 therein cannot be attacked or in any way affected by any water, oil or other liquid that may be in the chamber 51. Moreover, such liquid will be heated by the steam generated by the heating unit 11, and also by its contact with the tube. If desired, advantage can be taken of this fact to use the steamer simply as a source of heat, and generate steam by boiling the liquid. The rings 17 will, of course, confine the steam in the chamber so that it will attack the paraffin on the walls thereof.

Although this invention has been described for use in oil wells to remove paraffin from the walls thereof, this use was selected simply for the purpose of illustration, since the device could be used in wells other than oil wells and will attack not only paraffin but any other meltable material that may impede or prevent the output of the well.

While one embodiment only of this invention has been shown and described, applicant is not limited thereto, since it is obvious that other embodiments can be made without departing from the spirit and scope of this invention as set forth in the following claims.

Having thus set forth my invention, what I claim as new and for which I desire protection by Letters Patent is:

1. A steamer for oil wells and the like, comprising a tank, a cover plate therefor having openings therein, a heating unit, a rod connecting said tank and unit, a coil in said unit having holes therein, and connected to said tank, a source of heat in said unit, an expansion ring on said tank which contacts with the wall of said well and seals the same, whereby water poured into the well will enter said tank through said openings, pass into said coil in said heating unit, and escaping therefrom through said holes, be transformed into steam by said source of heat.

2. In a steamer for oil wells and the like, 85 a heating unit comprising a tube sealed at both ends, means for heating said tube, a jacket surrounding said tube, and a coil carried by said jacket adjacent said tube.

3. In a steamer for oil wells and the like, 90 a heating unit comprising a tube sealed at both ends, means for heating said tube, a jacket surrounding said tube, a coil carried by said jacket adjacent said tube, and means for supplying water to said coil, said coil having holes therein by which the water supplied thereto is sprayed against said tube, and transformed into steam.

4. In a steamer for oil wells and the like, 100 a heating unit comprising a tube sealed at both ends, means for heating said tube, a jacket surrounding said tube, a coil carried by said jacket adjacent said tube, and means for supplying water to said coil, said coil having holes therein by which the water supplied thereto is sprayed against said tube, and transformed into steam, said jacket having perforations therein, through which said steam can escape from said unit.

5. In a steamer for oil wells and the like, 110 a heating unit comprising a tube sealed at both ends, electrical means for heating said tube, a jacket surrounding said tube, and a coil carried by said jacket adjacent said tube.

6. In a steamer for oil wells and the like, a heating unit comprising a tube sealed at both ends, electrical means for heating said tube, a jacket surrounding said tube, a coil carried by said jacket adjacent said tube, and means for supplying water to said coil, said coil having holes therein by which the water supplied thereto is sprayed against said tube, and transformed into steam.

7. In a steamer for oil wells and the like, 125 a heating unit comprising a tube sealed at both ends, electrical means for heating said tube, a jacket surrounding said tube, a coil carried by said jacket adjacent said tube, and means for supplying water to said coil.
said coil having holes therein by which the water supplied thereto is sprayed against said tube, and transformed into steam, said jackets having perforations therein, through which said steam can escape from said unit.

8. In a steamer for oil wells and the like, a heating unit comprising a tube sealed at both ends, electrically heated coils in said tube, a jacket enclosing said tube, a pipe surrounding said tube, carried by said jacket and having a plurality of holes therein on the side adjacent said tube, a tank, a hollow rod to which said tank and said heating unit are attached, said rod entering said tube, an electric cable passed through said rod and connected to said coils, said pipe opening into said tank, whereby liquid in said tank enters said pipe and is discharged therefrom onto said tube through the holes in said pipe.

In testimony whereof I have affixed my signature.

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