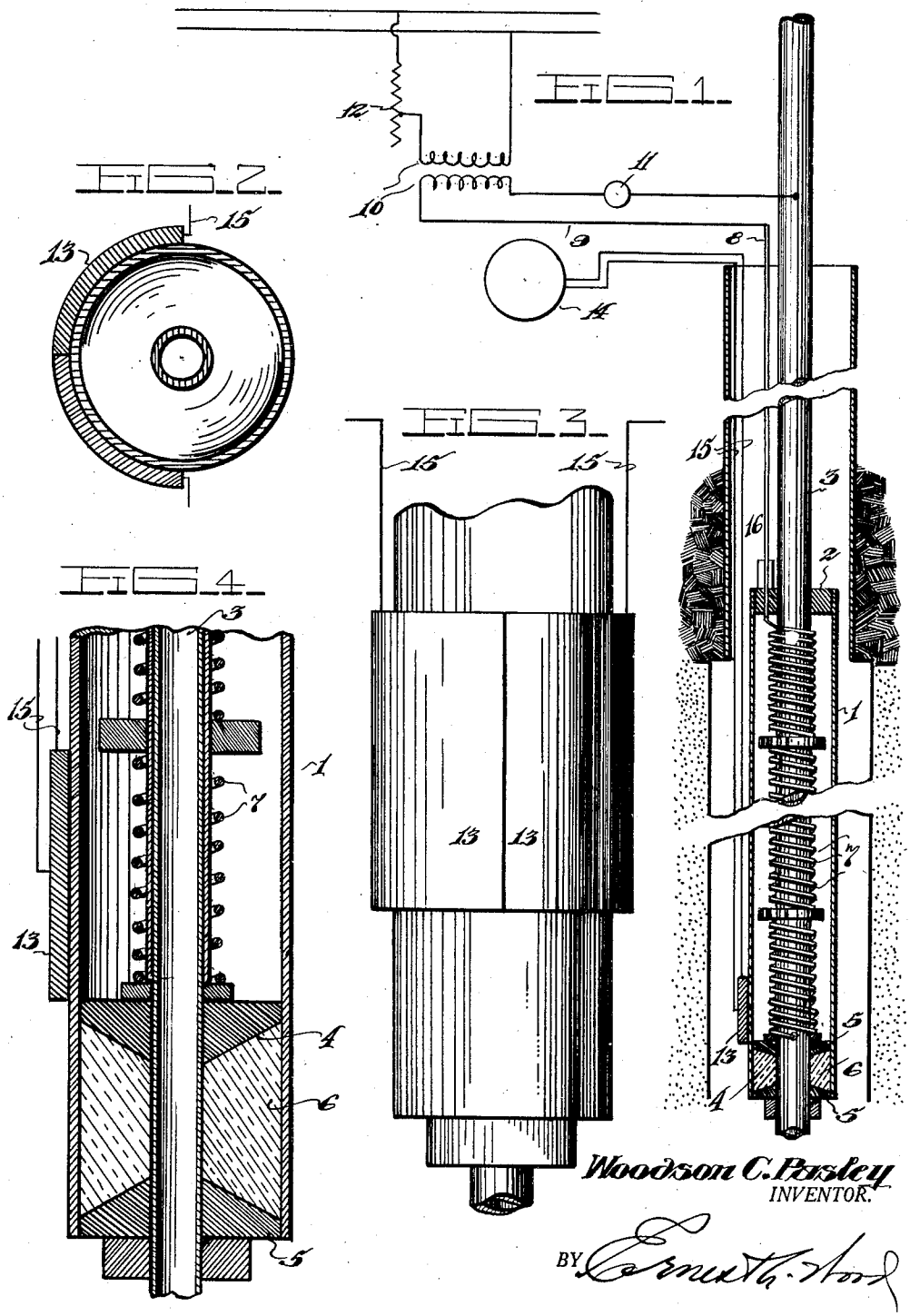
June 3, 1930. W. C. PASLEY 1,761,227

OIL WELL HEATER

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OIL-WELL HEATER

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This invention relates to heaters for oil wells and the like and more particularly to an apparatus for heating the subterranean minerals or fluids that have congealed or hardened by low temperature to bring them to the consistency necessary to allow them to flow freely and be pumped to the surface.

The principal object of the invention lies in the provision of a device for the purpose above mentioned having at its base an expansion joint preferably of a composition to allow for expansion of the heating unit under high temperature thereby eliminating breakage of the oil pipes and other elements of the equipment.

Another object of the invention resides in the provision of a means to indicate at all times the correct temperature of the heating device while in the well in order that the heat may be regulated by rheostatic control from the surface to prevent over heating the sands where the fluid is prevalent, as in some instances excess heating will cause the walls of the well to crystallize and harden and consequently will very often render the well nonproductive and useless.

Still another object of the invention is manifest in its simplicity of construction making it possible to produce a device of the character of extreme usefulness at a nominal cost.

Having thus recited the numerous objects and novel features of the invention, a further description may be had by reference to the appended drawings in which

Figure 1 is an elevational view in cross section of the invention within the confines of the oil well casing.

Figure 2 represents a top view in cross section taken on line 2—2 in Figure 3 showing the expansion joint in the base of the invention.

Figure 3 is an elevational view showing the thermocouple, and

Figure 4 is an elevational view in cross section showing the expansion joint in detail.

Paraffin deposits in the pores of the oil sands are common especially in oil wells that have been producing for some time and at certain stages in the accumulation of these deposits it is difficult to pump the oil to the surface, due to the congealed condition of the paraffin.

It is obvious, that means can be provided to melt these paraffin deposits and open the pores of the oil sand in order that the well can resume its normal production, and this purpose will be satisfactorily served by use of the invention herein described.

Heaters of the ordinary type when placed in use might cause serious damage to the other equipment and also to the well itself due to the expansion of metal when submitted to severe heat and to the crystallizing and hardening of the underground walls of an oil well under high temperature thereby rendering the oil well non-productive and useless. To those versed in the art, it is a well known fact that when oil is heated to approximately 300 degrees Fahrenheit it will carbonize and harden. It is, therefore the purpose of this invention to prevent this.

Proceeding more in detail with the description, reference is again made to the drawings and to the character 1 which indicates the barrel of the invention having an apertured head 2 through which the oil tubing 3 is passed extending downward through the expansion joint 4 which consists of two conical shaped castings 5 at the top and bottom of a circular band of heat conducting composition 6 preferably of rubber and metal clippings, which will absorb the necessary expansion which ordinarily accompanies severe heat.

A coil 7 wound with nichrome wire insulated with mica or other suitable insulation and being capable of sufficient resistance to produce heat commensurate with the amount of voltage passed through the coil is provided to surround the pipe 3 through the center of the barrel 1 and is grounded at the bottom of the barrel to the pipe 3 and connected at its upper end through cable 8 to wire 9 thence to the secondary winding of the transformer 10. The other end of transformer 10 being connected to the upper portion of the pipe 3 by a wire leading through an ammeter 11 thus completing the circuit through the transformer and heating unit by means of the pipe 3. The current flowing through the heating unit is controlled by a rheostat 12 connected

in series with the transformer 10 across the normal supply line, thus providing a means for varying the flow of current as desired.

Due to the necessity of preventing overheating of the heating coil 7 a thermocouple 13 consisting of semiconcaves of dissimilar metals such as a platinum-irridium combination, capable of generating a thermo-electric current, are attached by means of bolts or screws to the lower portion of the barrel 1 of the invention and are connected to the pyrometer 14 through the wires 15 and 16.

In operation the current is turned on and regulated through the transformer 10 and the heater coil 7 by the rheostat 12, the ammeter 11 registering the amount of amperage passing through the coil 7, and when a temperature of approximately 250 degrees Fahrenheit is indicated by the pyrometer 14 the current is reduced in order that this temperature can be maintained as long as desired.

It is not intended, however, to show in these specifications that it is necessary to maintain any predetermined degree of heat in all cases as climatic and soil conditions vary.

It is not intended to limit the invention as it is obvious that certain modifications in the above specification can be made and such modifications as are considered within the scope and meaning of the appended claim.

What is claimed is:—

In combination with a string of tubing in an oil well, a casing disposed about said tubing and spaced therefrom and having its upper end closed, a heating unit within said casing, an expansion unit within said casing beneath said heating unit, said expansion unit comprising a pair of spaced conically shaped collars engaging the circumferential wall of the tubing and casing, and heat insulating means disposed between said collars and engaging the circumferential wall of the tubing and casing and filling the space between said walls and said collars.

In testimony whereof I affix my signature.

WOODSON C. PASLEY.