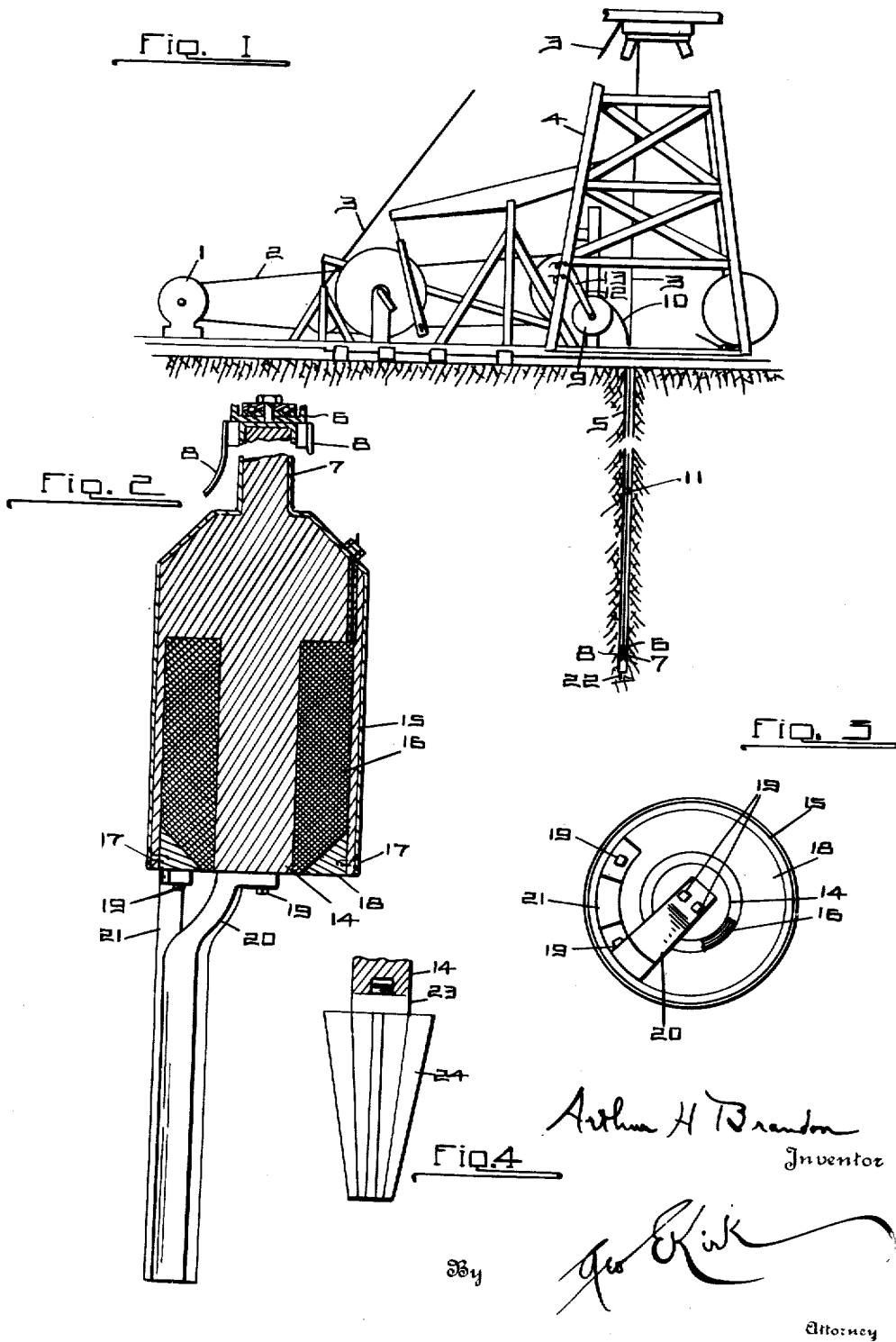


Dec. 26, 1922.

1,439,686.

A. H. BRANDON.
MAGNETIC FISHING TOOL FOR WELLS.
ORIGINAL FILED MAY 10, 1919.



UNITED STATES PATENT OFFICE.

ARTHUR H. BRANDON, OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DEEP WELL ENGINEERING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

MAGNETIC FISHING TOOL FOR WELLS.

Continuation in part of application Serial No. 296,151, filed May 10, 1919. This application filed January 17, 1920. Serial No. 352,083.

To all whom it may concern:

Be it known that I, ARTHUR H. BRANDON, a citizen of the United States of America, residing at Toledo, Lucas County, Ohio, have invented new and useful Magnetic Fishing Tools for Wells, of which the following is a specification.

This invention relates to features of capacity and range of penetration for effective electro-magnetic fishing operations.

This application as to features of common disclosure, is a continuation of Ser. No. 296,151, filed May 10, 1919.

This invention has utility when incorporated in electro-magnetic fishing tools for wells.

Referring to the drawings:

Fig. 1 is a fragmentary side elevation of an embodiment of the invention in connection with an oil well rig;

Fig. 2 is a view, with parts broken away, of an electro-magnet embodying ideas of the invention therein;

Fig. 3 is a bottom plan view of the electro-magnet fishing tool of Fig. 2; and

Fig. 4 is a detail view of a winged magnetic straight central prong.

In a drilling outfit or rig, there may be the prime mover or motor 1, connected by belt 2 for operating sand line 3 extending for operation in derrick 4 to well 5. In the well 5 the sand line 3 has hoisting connection by swivel joint 6 to stem 7 of a core member of an electro-magnet which may normally be held from rotation in its movement into and out of the well 5 by springs 8 which may extend to engage the walls of the well.

A reel 9 may be mounted in a convenient position in the derrick 4 and has a conductor pair of wires 10 extending into the core member of the electro-magnet. This line 10 extending downward into the well 5 adjacent the hoist line 3 and may be clamped thereto by clamps 11 to maintain spaced relation against relative twisting in the well between the lines 3 and 10. Connector lines 12, 13, may extend to the reel 9 supplying electrical energy to the magnet in the well 5.

The core member 7 of the magnet may comprise a central stem pole portion 14 and an outer relatively concentric pole portion 15. This pole portion 15 is of cylindrical form, enveloping an energizing coil 16.

While in practice there is really no tendency for the coil to escape, holding means may be provided to resist movement of the coil. To this end bolts 17 in mounting ring 18 upon pole 15 preclude any relative movement of the coil 16. This ring primarily serves the purpose of increasing the magnetic flux capacity in radially concentrated regions for more effective pole face action in engaging and holding parts for withdrawal from the well, giving, an increasing effective capacity amounting to possibly one hundred percent, in the use of magnetic structure ring 18, over use without such ring.

In the instance of sand or mud flow into the well, there is a superimposed material rendering it difficult to get magnetic action to the imbedded or lost parts, which it is desired to remove. In these instances, bolts 19 may mount prongs 20, 21, upon the respective poles of the magnet and with the settling of the core member 7 in the well, these prongs will readily imbed in loose material adjacent the wall of the well for effective magnetic pulling into the line of the well of under reaming or other parts which may be lodged even laterally of the axis of the well. In collecting small iron or steel parts or fragments, one prong may be sufficient. The length of such prong 21 may be shorter than the prong 20, when the mud or sediment to be penetrated is shallow. For driving centrally into the hole for small fragments, a prong 23 may have direct threaded connection with central pole 14, and wings 24 may hold the prong 23 from turning as well as provide additional magnetic engaging points for lost iron or steel parts being fished from a well.

What is claimed and it is desired to secure by Letters Patent is:

1. An electro-magnet fishing tool for wells comprising a core member, hoisting means connected to one end of said core member and the other end of said core member comprising concentric pole portions one of said pole portions being provided with an extension terminal face.

2. An electro-magnet fishing tool for wells comprising a core member, holding means therefor connected to one end thereof from which hoisting end said member has inner

and outer poles extending, one of said poles having an extension terminal face extending beyond the outer pole.

3. A fishing tool for wells comprising an electro-magnet core member having concentric inner and outer poles, and an inwardly projecting ring from the outer pole adjacent the face of said pole.

4. A concentric pole electro-magnet fishing tool for wells having an attachable prong.

5. An electro-magnet fishing tool for wells having an energizing coil provided with a pair of concentric poles, and a pair of detachable prongs projecting therefrom.

6. An electro-magnet fishing tool for wells comprising a concentric double pole magnet, an energizing coil concentric to the poles and therebetween, and a detachable prong on each pole, one prong being offset.

7. A fishing tool for wells comprising an electro-magnetic core member, holding means from one end of the core member, said member having extending away from said hoisting means a concentric stem pole, a second pole of cylindrical form about the stem pole, an energizing coil on the stem within the cylinder, a ring carried by the cylinder pole and extending towards the stem pole for increasing the capacity of the pole face, and a prong from each of said poles, the inner pole prong being offset to bring the pair of prongs in a peripheral

region for working adjacent the edges of a well.

8. A fishing apparatus for wells including an electromagnet engaging tool comprising at one end a central pole, an annular pole concentric therewith, and a coil therebetween, said poles terminating at said end in a common plane with the housed coil.

9. A fishing apparatus for wells including a waterproofed electromagnet engaging tool comprising at one end outer and inner magnetic poles, and an energizing coil for the poles wound about the inner pole and protected by the outer pole, said poles terminating at said end in a common plane with the housed coil.

10. A fishing apparatus for wells including an electromagnet core member providing an annular recess extending upwardly from its lower end, a coil in said recess, and a waterproofed current carrying line through the core member to the coil, said poles terminating at said end in a common plane with the housed coil.

11. A fishing apparatus for wells including an electromagnet engaging tool and a radially extending yieldable device permitting the tool to descend of its own weight and centering the tool in its travel in the well to hold the magnet away from the well walls.

In witness whereof I affix my signature.

ARTHUR H. BRANDON.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,439,686, granted December 26, 1922, upon the application of Arthur H. Brandon, of Toledo, Ohio, assignor, by mesne assignments, to The Deep Well Engineering Company, of Toledo, Ohio, a Corporation of Ohio, for an improvement in "Magnetic Fishing Tools for Wells," errors appear in the printed specification requiring correction as follows: Page 1, line 106, claim 2, and page 2, line 25, claim 7, for the word "hoisting" read *holding*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of January, A. D., 1923.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.