W. H. FRENCH.

DRILLING APPARATUS.

APPLICATION FILED MAY 16, 1912.

1,047,625.

Patented Dec. 17, 1912.

Fig. 1.

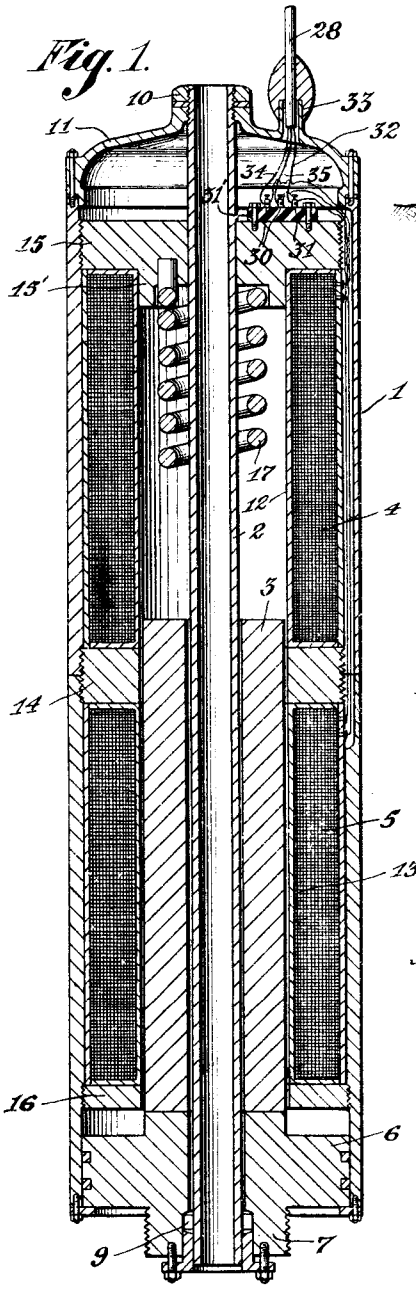


Fig. 2.

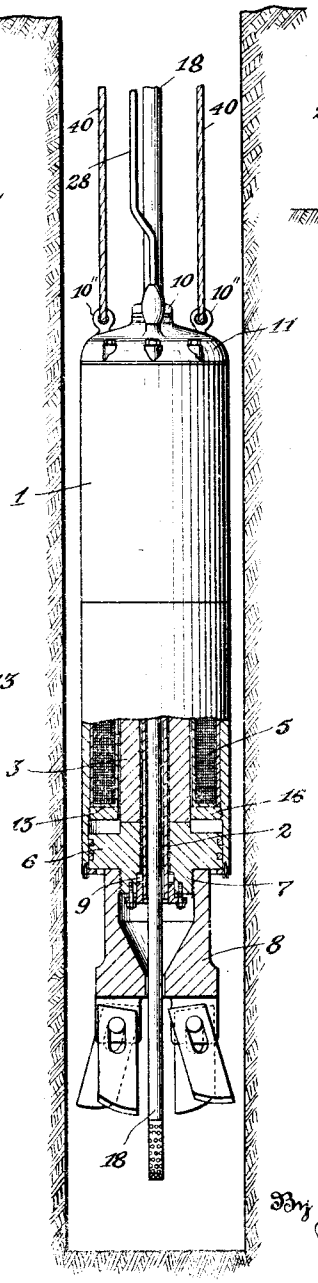
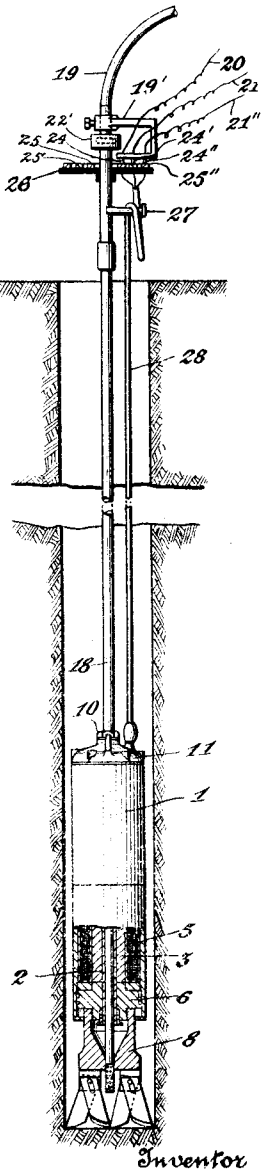


Fig. 3.



Witnesses

James E. Sprott.

Arlita Adams

Inventor

William H. French.

By Adams & Brooks

Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM H. FRENCH, OF SEATTLE, WASHINGTON

DRILLING APPARATUS.

1,047,625. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed May 16, 1912. Serial No. 697,788.

To all whom it may concern:

Be it known that I, WILLIAM H. FRENCH, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Drilling Apparatus, of which the following is a specification.

My invention has for one of its objects the provision of a novel drill driving device especially designed for service in conjunction with well sinking tubes.

A further object resides in the provision of a device of this character adapted to be slidably supported on a well sinking tube, whereby it is free thereof and capable of lowering by gravity as the work progresses.

Other objects will be set forth as my description progresses and those features of construction, arrangements and combinations of parts on which I desire protection, succinctly defined in my annexed claims.

Referring to the accompanying drawing, wherein similar reference characters designate corresponding parts throughout: Figure 1 is a longitudinal section of my drill driving device. Fig. 2 is a view partly in vertical section and partly in elevation showing the device in connection with a well sinking tube, the device being elevated slightly on said tube, and Fig. 3 is a similar view with the device in lowered position.

Referring to the drawings by numerals of reference, 1 designates a casing conveniently formed of upper and lower sections and having a through passage or tube 2, on which latter a hammer 3 is slidably supported. Hammer 3 which is cylindrical in form and suitably bored for reception of tube 2, constitutes a core for suitable solenoids, as 4 and 5.

Reference numeral 6 indicates a head slidably supported in the lower end portion of casing 1 in the path of hammer 3, and provided on its lower face with an annular boss 7 which is externally screw-threaded for connection with a suitable drill body, as 8, as shown in Figs. 2 and 3. Tube 2, which is of non-magnetizable metal, projects through a stuffing box 9 of head 6 and has its upper end threaded in a removable cap 11, of the casing, and provided with a lock nut 10. Solenoids 4 and 5 are mounted on spools, as 12, 13 which latter are held between shoulders 14, 15 and 16, as clearly shown in Fig. 1. These shoulders are in the form of annular iron rings and have screw-threaded engagement in casing 1. Shoulder or ring 14 connects the upper and lower casing sections, and like shoulder or ring 16 has its opening of suitable diameter to freely receive hammer 3. Shoulder 15 is provided with a tubular extension 15′ which extends downwardly into solenoid 4 and has attached thereto a spiral spring 17 which serves as a buffer for hammer 3 to cushion the inward or upward movement of the latter.

Reference numeral 18 indicates a suction pipe which normally extends through tube 2 and has swivel connection, as at 22′, with a pipe extension 19 which, in operation, is connected with a suitable pumping apparatus, not shown.

Reference numerals 30, 30 and 31, indicate binding posts mounted on an insulating support 31′ of shoulder 15. The positive terminals of solenoids 4 and 5 are each connected with a respective binding post 30, by suitable insulated electric wires, and the negative terminals thereof connected by a common wire with post 31, to which latter the return wire 32 is also connected.

Secured to extension 19 is a bracket 19′, of insulating material, on which are mounted suitable electric brushes 24, 24′, 24″, for collecting rings 25, 25′, 25″, which brushes are conveniently connected by wires 20, 21, 21″ with a source of electrical energy, not shown, with which the usual commutator mechanism is associated for effecting the passage of the current to the solenoids 4 and 5 alternately. Cap 11 is provided with an integral nipple 33 to which is soldered a lead tube 28 inclosing insulated electric wires 34, 35 which are connected, each with a respective binding post 30.

Rings 25, 25′, 25″, which are connected with wires 34, 35 and 32 respectively, are secured to an insulating flange 26, fixed on the upper section of pipe 18. This section of pipe 18 is further provided with an arm 27 over which a suitable length of tube 28 is looped, the same to be unwound when it is found desirable to lengthen pipe 18 by adding sections thereto as the sinking of the well progresses.

In operation, my device, which is of considerable weight, is freely supported on pipe 18, by which construction, it is permitted to lower with respect to the suction pipe as the underlying material is loosened by

the bits of drill body 8 and subsequently removed through suction pipe 18. Casing 1 is conveniently raised and lowered by means of ropes 40 which are secured to eye extensions 10″ of cap 11.

Having thus described my invention what I claim as new, and desire to secure by Letters Patent of the United States of America, is:—

1. In drilling apparatus, in combination with a well sinking tube, a drilling device comprising a casing having a through passage freely receiving said well sinking tube, a drill, means for supporting said drill on said casing, a hammer in said casing for driving said drill, and means for operating said hammer.

2. In drilling apparatus, in combination with a well sinking tube, a drilling device comprising a casing having a through passage freely receiving said well sinking tube, a drill, means for supporting said drill on said casing, a hammer in said casing for driving said drill, means for operating said hammer, and means for elevating said drilling device on said well sinking tube.

3. In drilling apparatus, in combination with a well sinking tube, a drilling device slidably engaged on said tube for lowering movement thereon by gravity, said drilling device comprising a casing, a drill supported on said casing, and reciprocatory means in said casing for operating said drill.

Signed at Seattle, Washington this 3rd day of May 1912.

WILLIAM H. FRENCH.

Witnesses:
STEPHEN A. BROOKS,
ARLITA ADAMS.