J. KAMMERDINER.

DRILLING APPARATUS.

APPLICATION FILED JUNE 25, 1914.

1,128,326. Patented Feb. 16, 1915.

Fig. 1.

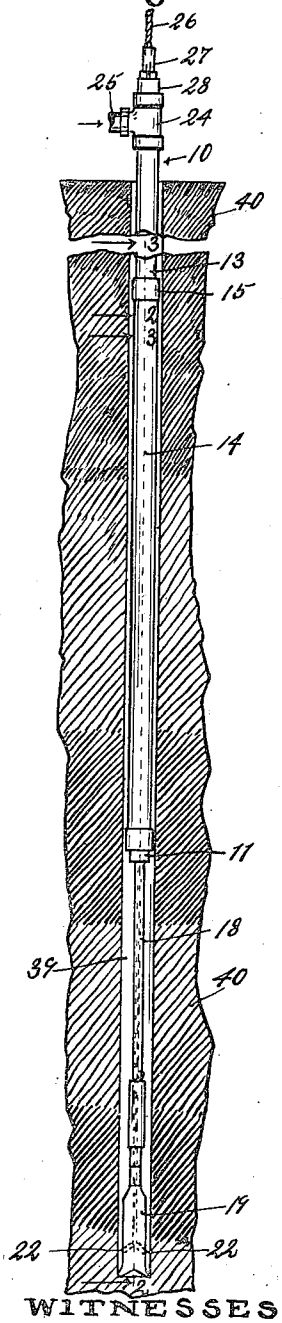


Fig. 2.

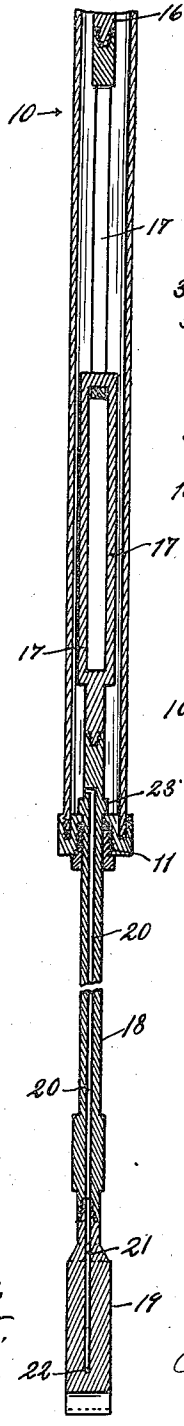


Fig. 3.

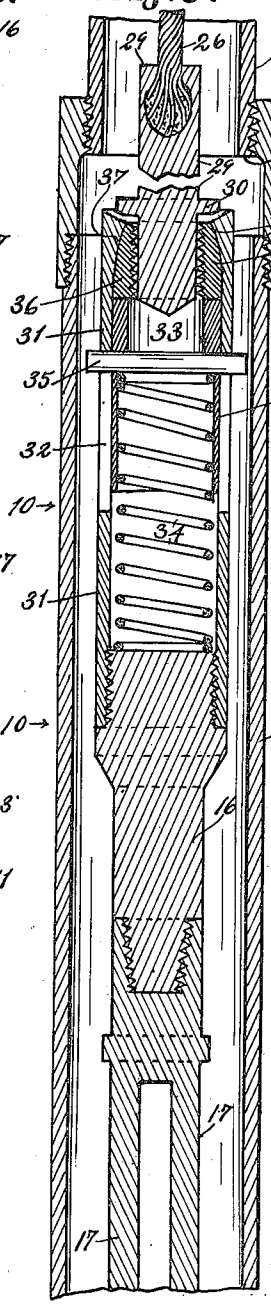


Fig. 4.

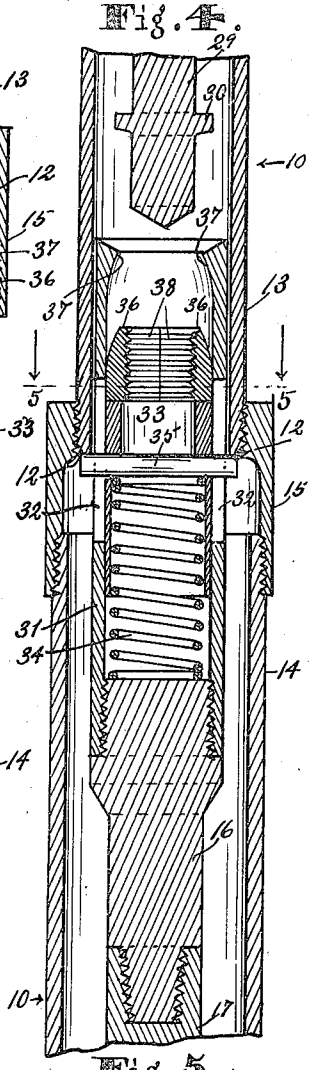
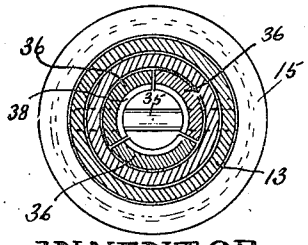


Fig. 5.



WITNESSES:

W. M. Goulde.

Emma G. Hattberg.

INVENTOR.

James Kammerdiner

By Alex. H. Liddiers

ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES KAMMERDINER, OF FULLERTON, CALIFORNIA.

DRILLING APPARATUS.

1,128,326. Specification of Letters Patent. Patented Feb. 16, 1915.

Application filed June 25, 1914. Serial No. 847,330.

To all whom it may concern:

Be it known that I, JAMES KAMMERDINER, a citizen of the United States of America, residing at Fullerton, county of Orange, State of California, have invented a certain new and useful Drilling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to drilling apparatus, and it may be said to consist in the provision of the novel and advantageous features and in the novel and improved construction, arrangement, and combination of parts and devices as will be apparent from the description and claims which follow hereinafter.

One object of the invention is to provide a novel and improved percussive drilling apparatus in which the stem of the drill bit is hollow and passes through a stuffing box at the lower end of the casing; whereby the drilling operation may be expedited by the use of fluid under pressure, and the drill bit may be of such size as to make a hole sufficiently larger than the casing to permit of the casing being let down as the hole is deepened without the necessity of bailing or reaming the hole.

Another object of the invention is to provide a novel and improved means whereby the rope or cable may be easily and quickly operatively connected with or disconnected from drilling mechanism without raising the drilling mechanism from the lower part of the casing.

Further objects of the invention are to provide drilling apparatus of the nature specified which is simple in construction, economical to manufacture, install, and maintain, easy and convenient to use, and effective in action.

Other objects and the advantages of the invention will be apparent from careful consideration of the following description of the preferred form of the construction embodying it, taken in connection with the accompanying drawings in which—

Figure 1 is a broken elevational view of the drilling apparatus in use; Fig. 2 is an enlarged broken longitudinal sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is an enlarged longitudinal sectional view taken on the line 3—3 of Fig. 1 and showing the cable operatively connected with the drilling mechanism; Fig. 4 is a broken enlarged sectional view of the drilling apparatus, showing the cable operatively disconnected from the drilling mechanism; and Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 4.

The casing 10 is provided with a stuffing box 11 or the like at its lower end and it is provided with a shoulder 12 at a suitable distance above its lower end. The shoulder 12 is preferably provided by means of the lower end of the section 13 of the casing which section is of smaller diameter than the lower section 14 of the casing and is connected to the section 14 by means of the union 15.

The drilling mechanism preferably consists of the bar 16 having its lower end screwed into the upper end of the jars 17, and the stem 18 which passes slidably through the stuffing box 11 and which has its upper end detachably connected to the lower end of the jars 17 and has detachably mounted on its lower end the bit 19 which latter is preferably greater in width than are the sections 13 or 14, or the union 15, in diameter. The stem 18 has thereon a shoulder 23 and it is provided with a passageway 20 which is in communication with the passageway 21 and the branch passageways 22 in the bit 19. A T-fitting 24 is provided at the upper end of the casing 10, and to the T-fitting 24 is connected a pipe 25 leading to a suitable source—not shown—of water under pressure. The rope or cable 26 preferably has thereon a sliding rod 27 which passes through the stuffing box 28 on the T-fitting 24. The cable 26 may be operated by the usual or any approved means not shown.

The improved means for operatively connecting or disconnecting the cable 26 and the drilling mechanism will now be described. A mandrel 29 provided with a shoulder 30 has its upper end suitably secured to the lower end of the cable 26 and has its lower end portion adapted to fit into the converging upper end portion of the hollow part 31 which latter is formed with longitudinal slots 32 and has its lower end suitably attached to the upper end of the bar 16 of the drilling mechanism. With the hollow part 31 is movably arranged a part

33 which has thereon a pin 35 extending laterally beyond the part 31 through the slots 32 and which is pressed upwardly by a spring 34 resting on the top end of the bar 16. Slips 36 resting on the top end of the part 33 have one side thereof formed to fit against the converging upper end portion 37 of the part 31 and have the other side 38 thereof roughened to grip the lower end portion of the mandrel 29 when the spring 34 acts to move upwardly the part 33 and thereby move the slips against the converging portion 37 of the part 31, see Fig. 3.

In drilling a hole 39 in the ground 40, fluid under pressure passes through the pipe 25, casing 10, and passageways 20, 21, and 22, and acts to soften the ground at the bottom of the hole and carry mud or loose dirt to the top and thence out of the hole. The casing 10 may be raised, lowered, or held in adjusted position by the usual pipe lifting device or other suitable means, not shown. As the hole 39 is deepened sections of casing may be added at the top of the hole by first lowering the casing 10 to have the shoulder 12 engage the pin 35 and move downwardly the part 33 against the spring 34 so that the slips 36 can move downwardly out of engagement with the mandrel 29, see Fig. 4, and then unscrewing the T-fitting 24 and raising the cable 26 out of the casing 10 until the shoulder 30 engages the lower end of the stuffing box 28 and lifts the T-fitting out of the way, whereupon the additional sections may be connected to the top of the casing. The shoulder 23 engages with the upper end of the stuffing box 11 when the cable 26 is operatively disconnected from the drilling mechanism. When sections are joined to the casing 10, the same may be lowered in the hole 39 and the fitting 24 may be screwed on the top thereof and the cable 26 may be let down to have the mandrel 29 enter the converging portion 37 of the part 31, whereupon the casing 10 may be raised to raise the shoulder 12 out of engagement with the pin 35 to allow the spring 34 to act to move the part 30 and thus cause the slips 36 to be crowded between the converging portion 37 and the mandrel 29 to grip the latter.

The form of construction which has been particularly illustrated and described admits of many minor changes and modifications, wherefore the right is reserved to all such changes and modifications as do not depart from the spirit and scope of the invention which is defined in the appended claims.

I claim:

1. In combination in percussive drilling apparatus, a casing, a stuffing box at the lower end of the casing, a T-fitting at the upper end of the casing, a pipe on the T-fitting for conducting fluid under pressure, drilling mechanism including a stem passing slidably through the stuffing box and provided with a passageway, a bit on the lower end of the stem having passageways in communication with the first mentioned passageway, said bit being greater in width than the diameter of the casing, and means for operating the drilling mechanism.

2. In drilling apparatus, the combination of a casing, drilling mechanism disposed in the casing and including a stem extending beyond the lower end of the casing, a bit on the lower end of the stem, a shoulder on the stem, means at the lower end of the casing for the shoulder to bear against to support the drilling mechanism, a cable, and means for operatively connecting said cable with or disconnecting said cable from the drilling mechanism, the last mentioned means including a mandrel carried on the cable and slips carried on the drilling mechanism.

3. The combination of a casing provided with a shoulder, drilling mechanism disposed in the casing, a hollow part thereon provided with a converging portion, slips in the hollow part, a cable, a mandrel on the cable adapted to fit into the hollow part, automatic means for moving the slips against said converging portion, and a pin engageable by said shoulder to render the automatic means inoperative.

4. The combination of a casing provided with a shoulder, drilling mechanism disposed in the casing, a hollow part thereon provided with slots and with a converging portion, a spring-pressed part arranged in the hollow-part and having a pin thereon extending through said slots and adapted to be engaged by said shoulder, a cable having a mandrel thereon adapted to fit into the hollow part, and slips disposed on the spring-pressed part and adapted to grip the mandrel when positioned adjacent to said converging portions.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 19th day of June A. D. 1914.

JAMES KAMMERDINER.

Witnesses:
W. A. AMEND,
A. H. LIDDERS.