June 24, 1930. J. H. HOLLESTELLE 1,766,253

DRILLING TOOL

Original Filed Sept. 8, 1922 2 Sheets-Sheet 1

Fig. 1.

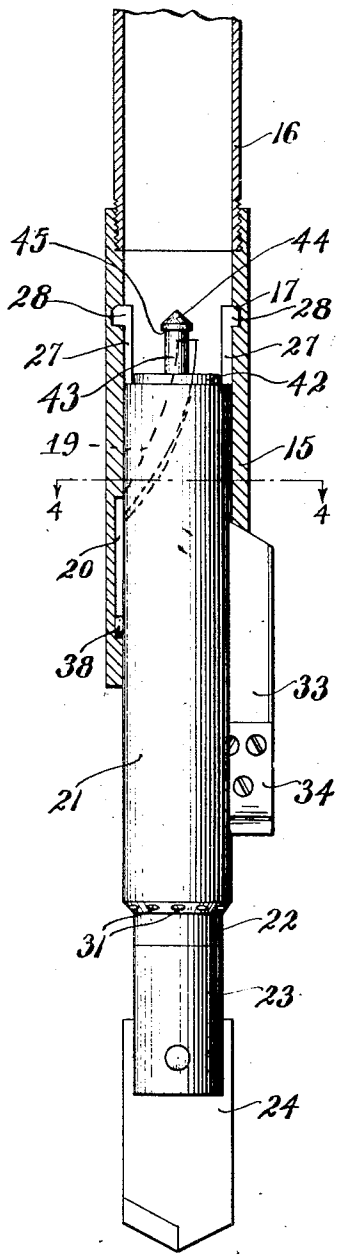


Fig. 2.

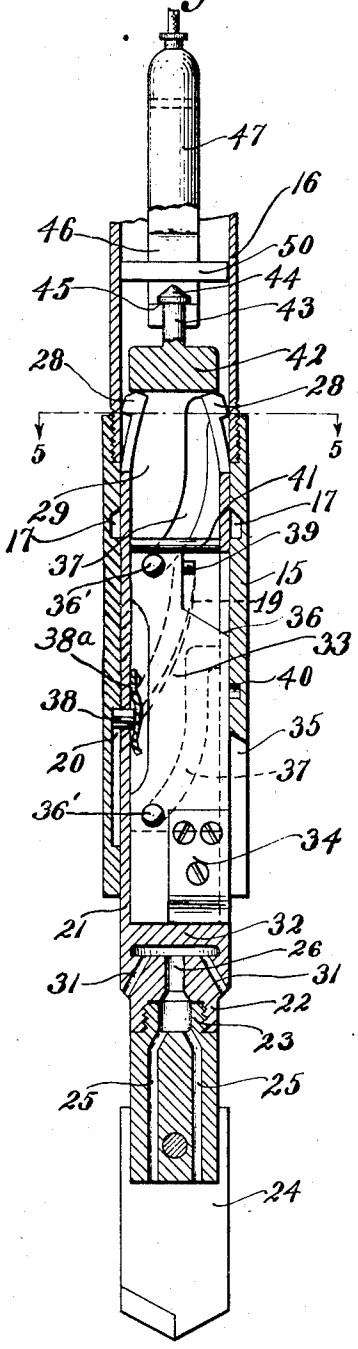
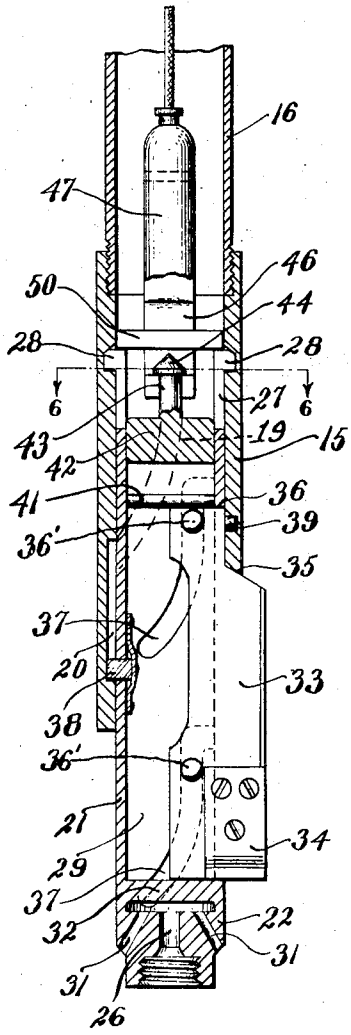


Fig. 3.



WITNESS:

J. H. McKenna

T. L. Hoeflake

J. H. Hollestelle.
INVENTOR

BY Victor J. Evans.
ATTORNEY

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Fig. 4.

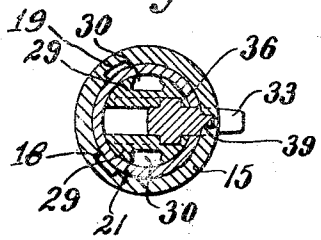


Fig. 5.

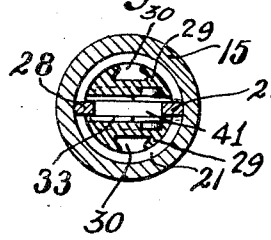


Fig. 6.

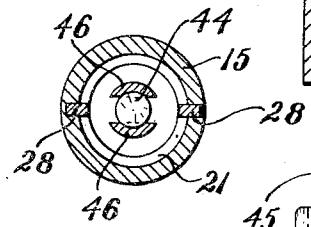


Fig. 7.

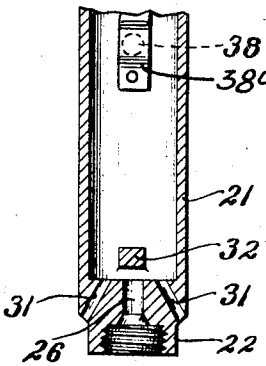
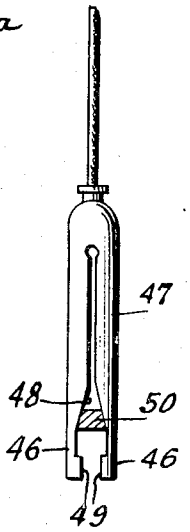


Fig. 11.



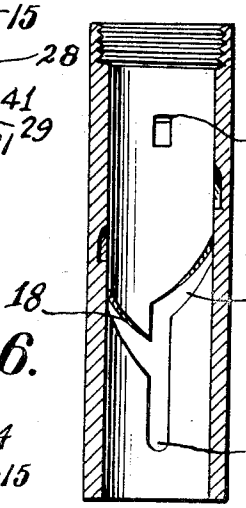


Fig. 10.

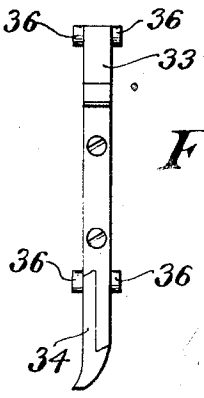


Fig. 8.

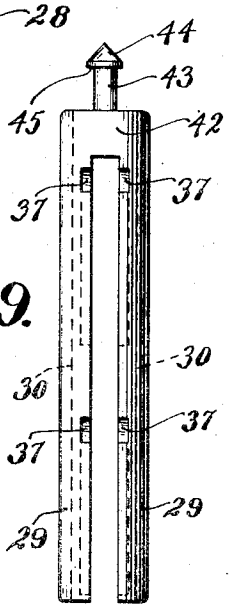


Fig. 9.

J. H. Hollestelle.
INVENTOR

BY Victor J. Evans.
ATTORNEY

WITNESS:

Patented June 24, 1930 1,766,253

UNITED STATES PATENT OFFICE

JAN HENDRIK HOLLESTELLE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE KENNEDYE CORPORATION, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE

DRILLING TOOL

Application filed September 8, 1922. Serial No. 586,932. Renewed July 12, 1929.

This invention relates to well drilling tools and has for an object the provision of a tool of this character which includes both a center bit and a lateral extension bit, whereby a drilling and reaming operation is provided and which is capable of use either as a rotary or an impact drilling tool.

Another object of the invention is the provision of a normally retracted lateral extension bit having means whereby the latter will be automatically extended when the tool reaches its lowered or drilling position.

Another object of the invention is the provision of means whereby the tool may be lowered, together with means for automatically releasing the lowering means to permit operation of the lateral bit extending means.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a side elevation of a drilling tool constructed in accordance with the invention with the drill shoe and casing shown in section and a lateral extension bit extended.

Figure 2 is a central vertical sectional view of the same with the lateral extension bit retracted and the parts in the position assumed before the tool reaches its lowered position.

Figure 3 is a view similar to Figure 2 with the lateral bit extended and locked in extended position.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a section on the line 5—5 of Figure 2.

Figure 6 is a section on the line 6—6 of Figure 3.

Figure 7 is a detail sectional view of the lower end of the bit carrying member, the section being taken at right angles to Figures 2 and 3.

Figure 8 is an edge view of the lateral bit.

Figure 9 is a detail elevation of the guide for the extension bit.

Figure 10 is a detail sectional view of the drill shoe.

Figure 11 is a detail elevation of the lowering tool.

Referring in detail to the drawings, the invention is shown as including a drill shoe 15, which is interiorly threaded at its upper end for connection with the lowermost section 16 of a casing of any standard type. The shoe 15 is provided with oppositely located sockets 17 and with spiral grooves 18 and 19, both of which are in communication with a longitudinally disposed groove 20.

Located within the shoe 15 and movable longitudinally therein is a bit carrying member 21, whose lower end is provided with a threaded socket 22 for the reception of various types of bits, coring devices and so forth. Secured within this socket 22 is the shank 23 of a center bit 24, the said shank being provided with longitudinally disposed passages 25 which communicate with a passage 26 provided in the bit carrying member 21, whereby water may be fed to the center bit. The upper end of the bit carrying member 21 is provided with spring fingers 27 having lugs 28 at their free ends and these lugs are adapted to engage in the sockets 17 of the drill shoe for the purpose of holding the member 21 against longitudinal movement with respect to said shoe.

Located within the bit carrying member 21 are spaced guides 29 having grooves 30 therein adjacent the inner periphery of the member 21 so as to provide passages for the water to the center bit. In addition, the bit carrying member 21 is provided with downwardly and outwardly extending passages 31, which also serve as water passages. The guides 29 have their lower ends arranged upon opposite sides of a spacing rib 32 which is carried by the bit carrying member 21 and positioned between the guides 29 and resting upon this rib 32 is an extension bit 33, the latter being provided at its lower outer corner with a cutting element 34. An edge plate 33^a is secured to the bit 33 by means of screws 33^b. When the bit 33 is projected in the posi-

tion shown in Figures 3 and 4 of the drawings, this cutting element 34 will act as a reamer to enlarge the bore made by the center bit 24. The bit carrying member 21 and the shoe 15 are provided with longitudinally disposed slots 35 and 36 respectively so as to permit of the extension of the bit 33. Extending from opposite side faces of the bit 33 are upper and lower pins or studs 36', which are movable in vertically disposed curved grooves 37 provided in each of the guide members 29, while the bit carrying member 21 is provided with a stud 38 carried by a spring 38[a] and which operates in the grooves 18, 19 and 20. This permits of the bit carrying member being moved with respect to the drill shoe and when so moved the said member will carry with it the guide members 29 and the grooves 37 will cause the bit 33 to be extended through the slots 35 and 36. When in this extended position, a stud 39 which is carried by the bit 33 engages a socket 40 provided in the shoe 15 so as to prevent any tendency to upward movement.

The carrier bolt 41 extends transversely across the bit carrying member 21 above the bit 33, while the guide members 29 are connected at their upper ends by a head 42. Extending from this head 42 is a shank 43, whose upper end carries a beveled or cone-shaped head 44 having a shoulder 45 at its juncture with the shank 33. This head is adapted to be received within the jaws 46 of a lowering tool 47. The opposed faces of these jaws are upwardly and inwardly inclined as shown at 48, while their lower ends carry inwardly extending lugs 49 which are adapted to engage the shoulders 45 so as to grip the head 44. A wedge pin 50 extends between the jaws 46 and acts to force these jaws apart to release the lowering tool from the head 44, as will be hereinafter apparent.

The tool is lowered within the shoe 15 until the stud 38 enters either of the grooves 18 or 19 and is permitted further downward movement, the particular groove entered causing the tool to rotate so as to bring the lugs 28 directly above or in line with the sockets 17. When the tool is in this position, the bit 34 is in line with the slots 35 and 36, the upper end of said bit being above the upper end of the slot, and the stud 38 at the upper end of the slot 20. This position of the parts is shown in Figure 2 of the drawings. Further downward movement of the tool will bring the lugs 28 into position to enter the sockets 17, the tool being guided by the downward travel of the lug 38 in the vertical slot 20. During this further downward movement of the tool, the bit 34 will have reached a position opposite the slots 35 and 36, and as the lugs 28 have entered the sockets 17 the head 42 is released from its position upon these lugs and is permitted downward movement so that the spaced guides 29 will move downward independently of the member 21. During this downward movement engagement of the studs 36' with the walls of the grooves 37 will force the bit 34 outward through the slots 35 and 36, so that the parts will then be arranged as shown in Figure 3 of the drawings. By permitting the lowering tool 47 to move downward, the wedge 50 will engage the lugs 28 or the head 44, so that the wedge will be forced inward between the jaws to move said jaws relatively outward and release the tool. This position of the parts is illustrated in Figure 1 of the drawings.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:—

1. In a drilling tool, a casing carried shoe having a slot therein, a bit carrying member movably positioned within the shoe and also having a slot therein, a normally retracted lateral extension bit within the bit carrying member, interengaging means between the shoe and bit carrying member to bring the slots into register when the said bit carrying member is moved within the shoe, means to lock the bit carrying member and shoe against relative movement when the slots are in register, and means operable when the bit carrying member and shoe are locked together to force the bit laterally through the slots.

2. In a drilling tool, a casing carried shoe having a slot therein, a bit carrying member movably positioned within the shoe and also having a slot therein, a normally retracted lateral extension bit within the bit carrying member, interengaging means between the shoe and bit carrying member to bring the slots into register when the said bit carrying member is moved within the shoe, means to lock the bit carrying member and shoe against relative movement when the slots are in register, a bifurcated member located within and movable independently of the bit carrying member, and interengaging means between the bifurcated member and bit to move said bit laterally through the slots when the bifurcated member is independently moved.

In testimony whereof I affix my signature.

JAN HENDRIK HOLLESTELLE.