(No Model.)

S. W. TITUS & C. C. CLARK.

WELL DRILL.

No. 386,280. Patented July 17, 1888.

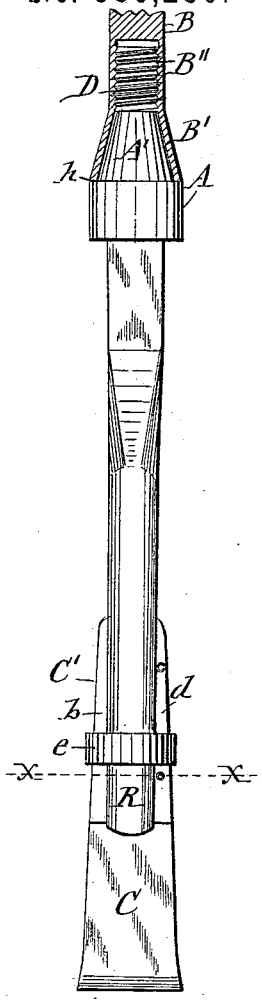

Fig. 1

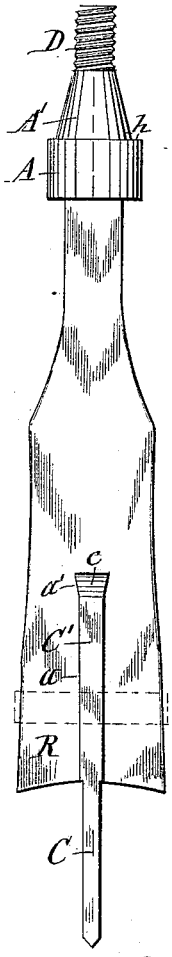

Fig. 2

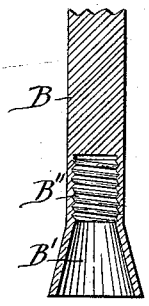

Fig. 6

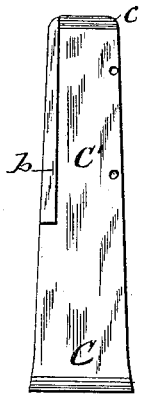

Fig. 5

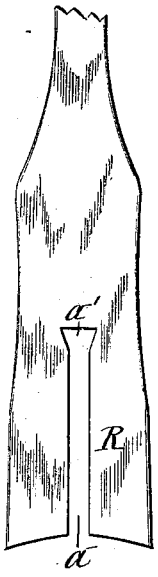

Fig. 4.

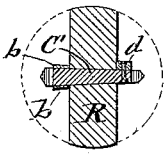

Fig. 3

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BY

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

SILAS W. TITUS AND CHESTER C. CLARK, OF SAN ANGELO, TEXAS.

WELL-DRILL.

SPECIFICATION forming part of Letters Patent No. 386,280, dated July 17, 1888.

Application filed January 18, 1888. Serial No. 261,107. (No model.)

To all whom it may concern:

Be it known that we, SILAS W. TITUS and CHESTER C. CLARK, of San Angelo, in the county of Tom Green, in the State of Texas, have invented new and useful Improvements in Well-Drills, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction of a tool for boring or drilling wells, which tool has the drill-bit and the reamer so united as to operate simultaneously, and thus serve the functions of the so-called "Z-bit" and effectually prevent the tool from being thrown laterally out of the line of cutting when striking bowlders; and the invention also consists in an improved construction of the coupling of the tool to the sinker-bar or drill-bar, all as hereinafter fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side view of the drill-bit and edge view of the reamer, with the coupling of the latter to the sinker-bar shown in section. Fig. 2 is an edge view of the drill-bit and side view of the reamer detached from the sinker-bar and without the band, which is applied to the reamer to prevent its being split. Fig. 3 is a transverse section on line *x x*, Fig. 1. Figs. 4 and 5 are detached side views, respectively, of the reamer and of the drill-bit, and Fig. 6 is a longitudinal section of the coupling end of the sinker-bar.

Similar letters of reference indicate corresponding parts.

C represents the drill-bit of the style usually designated "club-bit," by means of which the drilling is effected, and R denotes the reamer, which is employed for enlarging the hole drilled by the aforesaid bit. These two tools have heretofore been operated separately, and consequently time was lost in exchanging the tools during the operation of sinking the well, and besides this in operating each of said tools separately the tool is frequently crowded or thrown laterally out of its intended line of cutting by striking bowlders. This defect we obviate by our invention of uniting the drill-bit with the reamer in such a manner as to operate them simultaneously. It is obvious that the manner of uniting said tools is susceptible of many modifications, and we therefore do not wish to limit ourselves to the details of construction hereinafter described. We deem it, however, essential to unite said tools at their centers or axes and at right angles to each other and to make the drill-bit to project beyond the reamer.

The construction adopted by us at present is as follows, to wit: The reamer R is provided with the central longitudinal slot, *a*, the inner end of which terminates with the dovetail *a'*, as best seen in Fig. 4 of the drawings. The drill-bit or club-bit C is formed with the elongated shank C', which is slightly beveled transversely, so as to allow it to be readily inserted edgewise into the slot *a* of the reamer. The end of the shank C' is formed with a dovetailed head, *c*, which fits closely in the dovetail end *a'* of the slot *a*, and thus prevents the bit from being withdrawn endwise from the reamer. To confine the bit-shank C' laterally in the slot *a*, we rigidly attach to the sides of the thick portion of the shank C' longitudinal ribs *b b*, which abut against one side of the reamer and detachably connect to the sides of the thin portion of the said shank a strip, *d*, which abuts against the opposite side of the reamer. Inasmuch as the bit is seldom required to be removed from the reamer, the strip *d* may be secured by rivets, as shown in Fig. 3 of the drawings. The dotted circle in said figure illustrates the enlargement of the drilled hole effected by the reamer.

In order to compensate for the weakening of the reamer incident to the slot *a*, and to brace the same so as to prevent its being split by the lateral and torsional strain on the bit C, we apply to the reamer a stout metal band, *e*, which closely embraces the reamer and bit-shank, as repsesented in Fig. 1 of the drawings.

B denotes the drill-bar or sinker-bar to which the tool is connected and by which it is operated.

Owing to the necessary comparatively small diameter of said bar it has been difficult to provide the same with the desired broad bearing on top of the tool to apply the weight of the bar as far as possible from the axis of the tool, and thus relieve as much as possible the coupling-screw from torsional strain. To overcome the said difficulty, we form the upper end or coupling end of the tool with a

wide collar, A, a conical head, A′, on top of said collar, and an annular shoulder, *h*, between the collar and head, and terminate the head with a cylindrical screw, D, and the coupling end of the sinker-bar B we form with a flaring conical socket, B′, and with a screw-threaded socket, B″, at the inner end of the conical socket. In connecting the tool to the sinker-rod the screw D enters and engages the socket B″ and brings the base of the socket B′ to bear on the annular shoulder *h*, while the interior of said socket fits snugly on the conical head A′, as illustrated in Fig. 1 of the drawings.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the reamer R, provided with the longitudinal slot *a*, terminating with the dovetail *a′* at its inner end, and the club-bit C, having the shank C′ formed with the dovetailed head *c* and inserted in the aforesaid slot and detachably secured therein, substantially as described and shown.

2. The combination of the reamer R, provided with the longitudinal slot *a*, the bit C, having the shank C′ inserted in said slot, ribs *b b*, rigidly secured to the said shank and abutting against one side of the reamer, and the strip *d*, detachably connected to the shank C′ and abutting against the opposite side of the reamer, substantially as described and shown.

3. The combination of the reamer R, provided with the slot *a*, terminating with the dovetail *a′*, the bit C, having the shank C′ formed with the dovetailed head *c* and inserted in the aforesaid slot, the ribs *b b*, rigidly secured to the shank C′ and abutting against one side of the reamer, the strip *d*, detachably connected to the said shank and abutting against the opposite side of the reamer, and the band *e*, embracing the reamer and bit-shank, substantially in the manner specified and shown.

In testimony whereof we have hereunto signed our names, in the presence of two witnesses, at San Angelo, in the county of Tom Green, in the State of Texas, this 29th day of December, 1887.

SILAS W. TITUS. [L. S.]
C. C. CLARK. [L. S.]

Witnesses:
L. SCHWARTZ,
FRED GERBER.