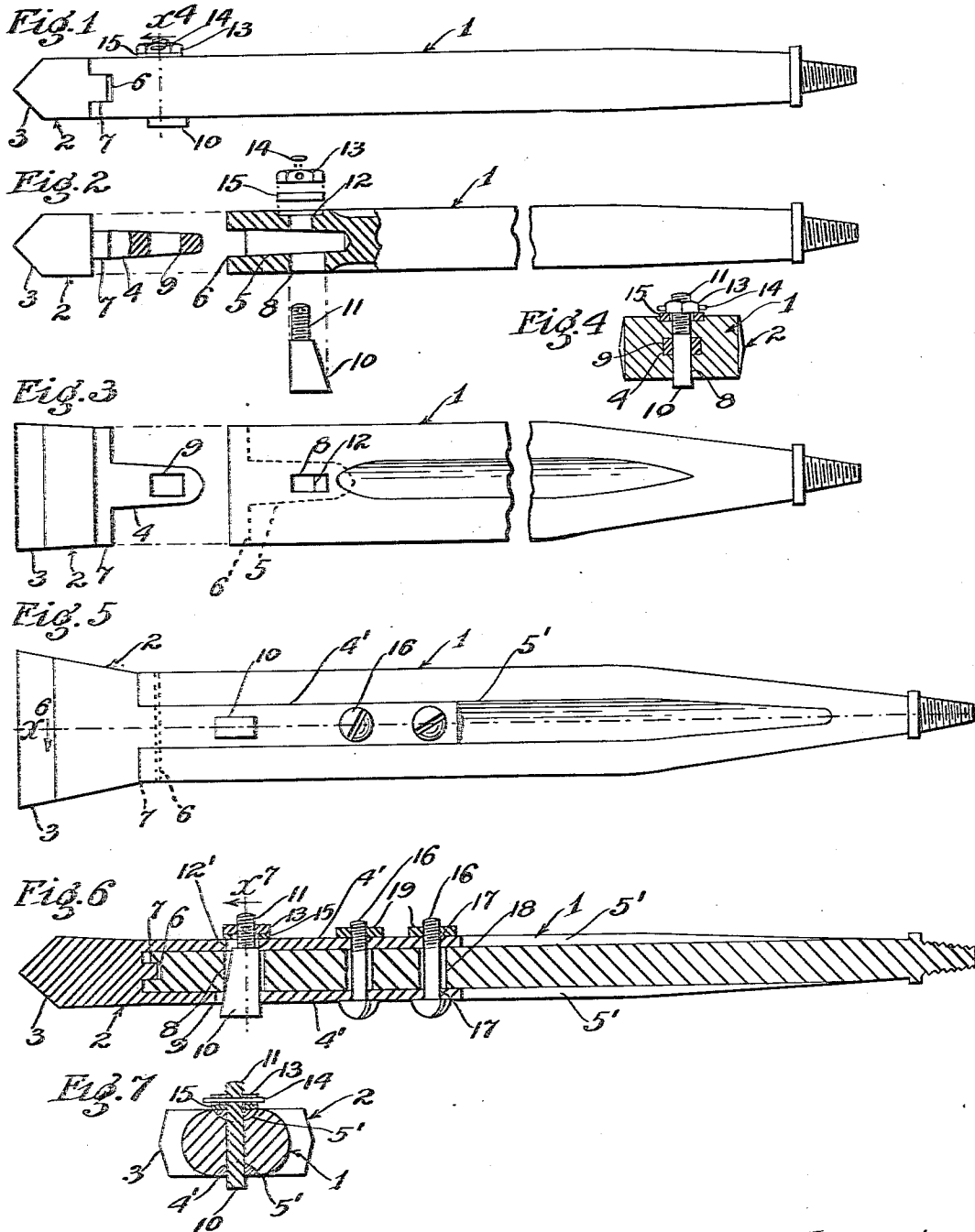


R. CRAIG.
WELL DRILLING TOOL.
APPLICATION FILED MAY 14, 1912.

1,064,618.

Patented June 10, 1913.



Witnesses
G. H. Files.
L. Belle Rice

Inventor
Ras Craig
by
James R. Townsend
his Atty.

UNITED STATES PATENT OFFICE.

RAS CRAIG, OF LOS ANGELES, CALIFORNIA.

WELL-DRILLING TOOL.

1,064,618.

Specification of Letters Patent.

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Application filed May 14, 1912. Serial No. 697,319.

To all whom it may concern:

Be it known that I, RAS CRAIG, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Well-drilling Tool, of which the following is a specification.

An object of the invention is to provide tools of this character having detachable heads, so that a sharp head may be quickly substituted for a dull one, thus avoiding loss of time in drilling wells.

Another object is to minimize the cost of drilling tools by employing a set of drill heads of various sizes with one size of shank.

Another object is the provision of a drilling tool which can be forged in two parts, the drill head of high grade steel and the shank of a lower grade of steel, thus minimizing cost of production.

Other objects are to minimize the time employed in changing drill heads and to produce maximum strength and security of the joined parts.

Other objects and advantages may appear from the subjoined detail description.

The accompanying drawings illustrate some of the forms in which the invention may be embodied.

Figure 1 is an edge view of one form of the invention with the detachable head in place. Fig. 2 is an edge view, partially in mid-section, of the parts shown in Fig. 1 before assembling. Fig. 3 is a side view of the unassembled head and shank shown in Fig. 2. Fig. 4 is a section on line indicated by x^4 , Fig. 1. Fig. 5 is a side view of another form in which the invention may be embodied. Fig. 6 is a longitudinal section on line indicated by x^6 , Fig. 5. Fig. 7 is a cross section on line indicated by x^7 , Fig. 6. Arrows on the several views indicate the direction of sight.

The drill shank 1 is provided with a detachable head 2 having an edge 3 of any suitable shape for the work to be done and the shank and head are provided with interlocking means to securely hold them together during the operation of drilling. Such interlocking means may be entirely or partially of wedging action. For this purpose the head 2 is preferably provided with a stem which may be undivided as at 4 in Figs. 2, 3, or furcated as at 4' in Figs. 6, 7 and the shank 1 is provided with a suitable seat for the stem and in Figs. 2, 3 a tapered

seat is shown at 5 and in Fig. 5 *et seq.* the shank is provided with longitudinal grooves 5' on its sides. The stems 4, 4' and seats 5, 5' may be of any suitable shape for the purpose, and the stem and seat 4, 5 are preferably wedge-shaped and the stem and seat 4', 5' may be rounded as shown in the drawings. The head 2 and stems 4 or 4', as the case may be, are preferably integrally forged. The shank 1 is also provided with a transverse slot 6 to receive a fitting, transverse spline 7 of the head 2, so as to well secure the head against turning relative to the shank.

Means are provided to fasten the stems 4 or 4' in their seats 5 or 5' to prevent separation of the shank and head and such means have a wedging effect so as to compensate for wear at the joint and so as always to draw the tool head up tightly into place. These fastening means may be a wedge-shaped key 10 accommodated in key-seats 8, 9 in the shank 1 and stems 4, 4' respectively. The key-seats 8, 9 are in alinement longitudinally of the tool, but do not register when the shank and head are assembled, they being offset sufficiently from one another so that the head edge of the key 10 will engage the shank 1 and the opposite edge of the key will engage the stem 4 or 4' as the case may be, so that the shank and head will be drawn tightly together when the key 10 is driven home.

The key 10 may be symmetrically tapered in the well-known manner of making wedges; but as shown in the drawings they are preferably formed with one edge parallel with the longitudinal axis of the wedge and the other edge aslant to said axis so as to maximize its bearing value.

The key 10 is provided on its smaller end with a threaded portion 11 which projects through a perforation 12 in the shank as in Fig. 2, or a perforation 12' in one furcation of the stem 4' as in Fig. 6 and the projecting end of the threaded portion is provided with a nut 13 to hold the key tightly in place. The nut 13 may be locked as by a cotter pin 14 and the threaded portion 11 may be provided with one or more washers 15 under the nut 13.

Additional fastening means may be provided as shown in Figs. 5 and 6 in the form of bolts 16 passed through perforations 17, 18 in the stem furcations 4' and shank 1 respectively, the shank perforations 18 being

sufficiently large to allow for take-up of the key 10. These additional fastening means are especially for the purpose of preventing accidental separation of the shank and head in case the key 10 should be forced from the key-seat 8 in the operation of drilling, thus insuring against loss of the head in the well bore.

In practice a set of drilling heads may be provided for one shank and, when the head fastened to the shank needs replacing, the nuts 13 or 13, 19, as the case may be, will be removed, the wedges 10 will be removed in the one case or wedges 10 and bolts 16 in the other case and the head will then be drawn from the shank. Then another head of the same or of a different size will be slipped in place, the wedge driven home and the bolts, nuts and washers replaced, thus effectually securing the drill head to the shank and preventing any looseness at the joint.

I claim:

1. A well-drilling tool comprising a shank having a transverse slot and longitudinal grooves along its sides, a head having a transverse spline to fit the slot and having a furcated stem slidable in the grooves, key-seats in the shank and stem respectively, and a wedge-shaped key in the key-seats to rela-

tively move the shank and head to draw the head tightly into place.

2. A well-drilling tool comprising a shank having a transverse slot and longitudinal grooves along its sides, a head having a transverse spline to fit the slot and having a furcated stem slidable in the grooves, key-seats in the shank and stem respectively, and a wedge-shaped key in the key-seats to fasten the furcations in the grooves.

3. A well-drilling tool comprising a shank having a transverse slot and a seat, a head having a transverse spline to fit the slot and having a stem slidable in the seat, wedging means to fasten the stem in the seat and additional means preventing separation of the shank and head and allowing for take-up of the wedging means.

4. A well-drilling tool comprising a shank having longitudinal grooves, and a detachable head fitting the shank and provided with a furcated stem to fit the grooves.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 7th day of May, 1912.

RAS CRAIG.

In presence of—

JAMES R. TOWNSEND,
GEORGE H. HILES.