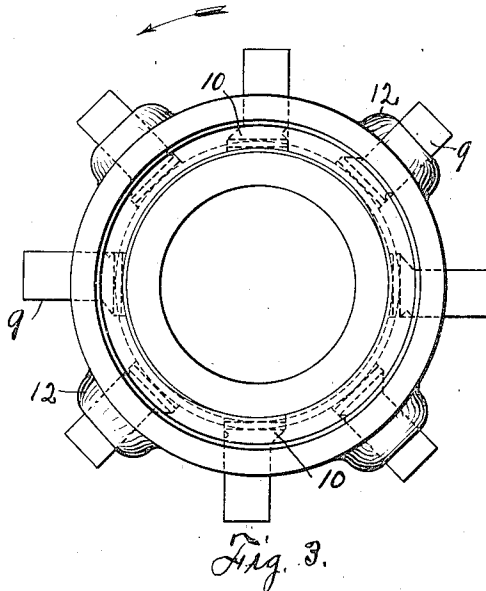
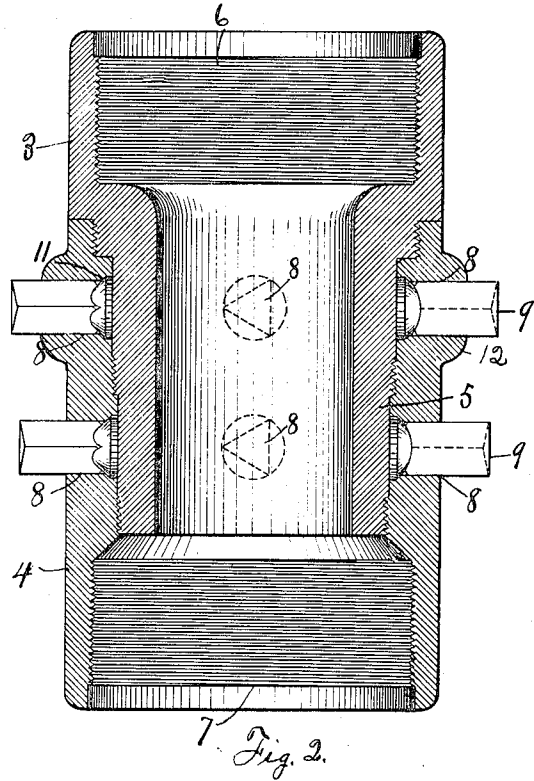
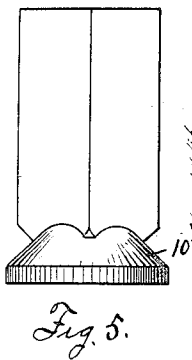
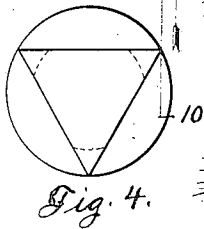
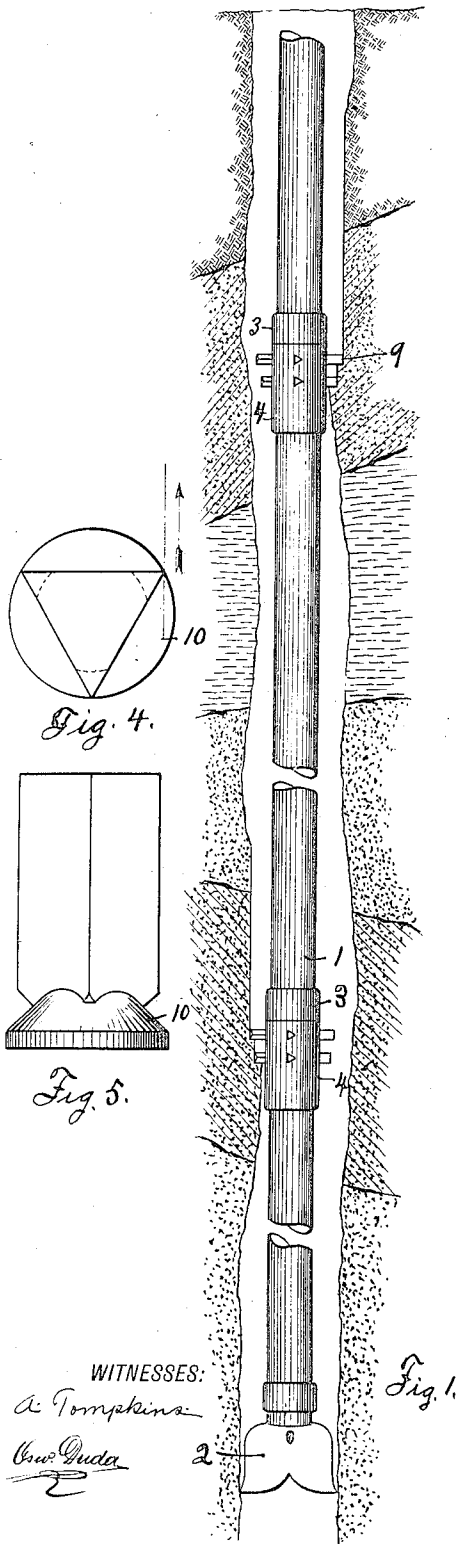


H. R. DECKER.
HOLE STRAIGHTENER.
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1,045,954.

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HARRY R. DECKER, OF HOUSTON, TEXAS.

HOLE-STRAIGHTENER.

1,045,954.

Specification of Letters Patent.

Patented Dec. 3, 1912.

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To all whom it may concern:

Be it known that I, HARRY R. DECKER, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Hole-Straighteners, of which the following is a specification.

My invention relates to new and useful improvements in hole straighteners and more particularly to such devices as are designed to straighten the bore of an oil or other well.

It is a well known fact that the bit carried by the drill stem in boring is easily deflected from a straight course by inclined strata, and as variously inclined strata may be encountered the bore when completed may follow a zigzagged course, in which case it is impossible to set a casing in the well, which is as large as the well bore and sometimes it is entirely impossible to set the casing by reason thereof.

This invention comprehends an improved device, carried by the drill stem which is designed to cut off all projections jutting out into the well bore and to straighten said bore so that the same will readily receive the well casing.

With the above and other objects in view my invention has particular relation to certain novel features of construction and operation an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a drill stem with the bit attached and provided with the improved straightener, showing the same in operation. Fig. 2 is an enlarged sectional view of the device showing the projecting cutters. Fig. 3 is a bottom plan view thereof. Fig. 4 is an end view of one of the cutters and Fig. 5 is a side elevation thereof.

Referring now more particularly to the drawings, wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 refers to the drill stem, which is composed of a plurality of sections, united in a manner hereinafter described. This stem carries at its lower end a cutting bit 2 of any desirable form and for the usual purpose.

The numerals 3 and 4 respectively, refer to the male and female members of the collar uniting the stem sections. The main portions of these members are of a uniform

diameter but the male member has a reduced extension 5 whose outer surface is stepped as shown, to correspond to the similarly shaped inner surface of the female member, within which said extension closely fits. These members are also inwardly threaded at the points indicated by the numerals 6 and 7 to receive the outwardly threaded ends of their respective stem sections.

The member 3 is provided with a series of rows of triangular perforations 8 arranged around said member and designed to receive the cutters 9. These cutters are oblong members preferably triangular in cross section so they will have cutting edges, and are so arranged with reference to the direction of the stem rotation, as indicated by the arrows in Figs. 3 and 4, that the lower angles thereof will contact with the surface to be cut away and become the cutting edges of the cutters. The cutters of each row are equal in length to the cutters of the other row but the cutters of the upper row project farther from the stem than those beneath, by reason of the stepped arrangement of the collar members, as shown in Fig. 2. This unequal projection of the cutters is desirable in order that each row may do a portion of the work and the obstruction be gradually removed; otherwise, the lower row would remove the entire obstruction leaving no portion thereof to be cut away by the cutters of the upper row. These cutters are first inserted through the perforations 8 from within the female member of the collar and are provided with heads 10 which bury within the enlarged portions 11 of the inner ends of perforations 8 so as to be flush with the inner surface of said member. The cutters are thus held from passing entirely through said perforations. The male member 3 of the collar is then inserted in the female member and it is to be observed that the portions of the collar members intermediate the rows of cutters as well as on each side thereof are correspondingly threaded and thus said members engage with each other so as to exclude all water from passing through said perforations and form a perfectly tight joint. The male member rests closely against the cutter heads and operates to hold the cutters firmly in place.

In reaming out holes of large diameter it is desirable to use long cutters, in which case bosses 12 are provided which project

from the cutter support and surround the cutters for the purpose of reinforcing and strengthening the same; otherwise, it would be necessary to provide collars having very thick walls which would be objectionable because they would likely cause the bore to clog and would also interfere with water circulation as well as be expensive in construction.

Any desirable number, of this form of collar, carrying the cutting members, may be secured on the drill stem, the number to be determined by the nature of the formation passed through and the consequent course of the well bore. With this form of drill stem, carrying said cutters, the bore, when completed, will be thoroughly reamed out and ready to receive the well casing.

What I claim is:—

1. In a device of the character described the combination with a drill stem of a plurality of supporting members arranged at intervals along said stem, reinforcing bosses carried by said supporting members, cutters carried by said supporting members, said cutters being provided with heads to hold the same against outward movement in said supporting members.

2. A device of the character described including a drill stem, a collar on the same, said collar comprising a male and a female member, cutters passing radially through one of said members, heads carried by said cutters and reinforcing means carried by said member carrying the cutters.

3. A device of the character described including a drill stem, a collar on the same, said collar comprising a male and a female member, cutting means passing radially through one of said members provided with a cutting edge on its under side, means carried by said cutting means for holding the same against outward movement in the member through which it passes and reinforcing means carried by the said female member.

4. In a device of the character described, the combination with a hollow drill stem, of a plurality of supporting members arranged at intervals therealong, cutters carried by said supporting members and extending radially therefrom, means for securing said

cutters against outward movement and means for reinforcing the cutters.

5. A device of the character described including a drill stem, a plurality of collars carried thereby and arranged at intervals therealong, cutters passing radially through said collars, a means carried by each cutter for securing it against outward movement and reinforcing means carried by the collars for bracing said cutters.

6. A device of the character described including a drill stem and a plurality of collars arranged at intervals therealong, each collar comprising a male and a female member, cutting means passing radially through the female members and provided with cutting edges and whose inner ends rest against the male members and means carried by the cutting means for securing the same against outward movement in the member carrying the same.

7. In a device of the character described, the combination with a drill stem having a longitudinal passageway therethrough, of a plurality of supporting members arranged therealong, cutters carried by said supporting members and extending radially therefrom, and means for securing said cutters against lengthwise movement in said supporting members.

8. In a device of the character described, the combination with a drill stem hollow from end to end, of a plurality of supporting members arranged at intervals therealong, cutters carried by said supporting members and extending therealong.

9. In a device of the character described, the combination with a drill stem having a passageway therethrough, and having a plurality of supporting members arranged at intervals therealong, of cutters carried by said supporting members and extending radially therefrom, and means for securing said cutters against lengthwise movement in their supporting members.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY R. DECKER.

Witnesses:

J. W. YEAGLEY,
E. FRUCKBECK.