

June 2, 1931.

W. WRIGHT

1,807,646

DRILL BIT

Filed Dec. 29, 1927

Fig. 1.

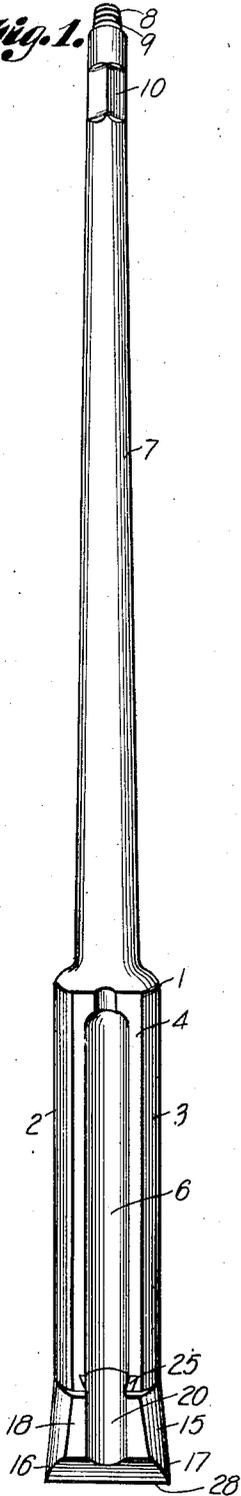


Fig. 2.

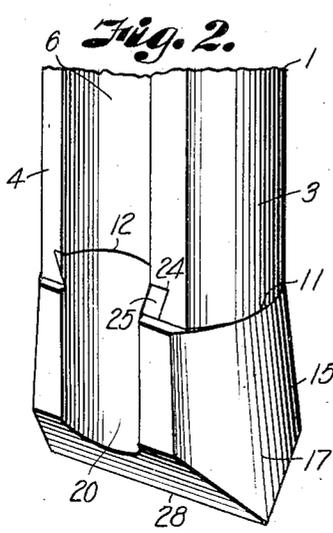


Fig. 3.

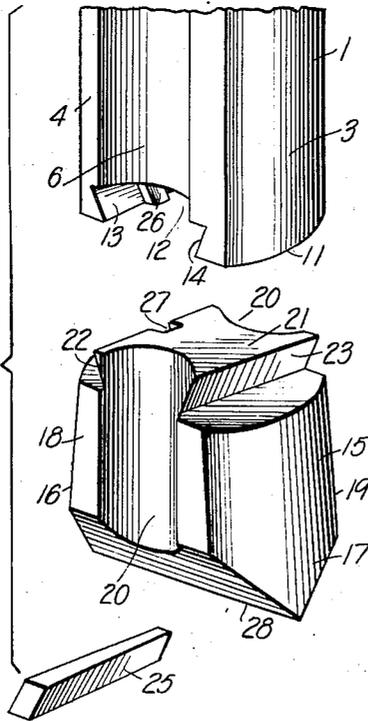


Fig. 4.

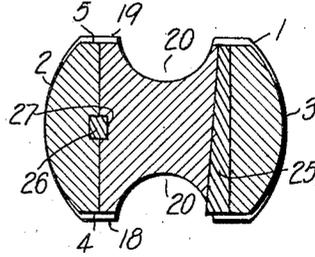


Fig. 5.

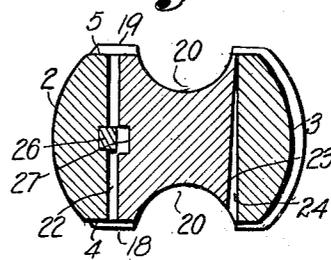
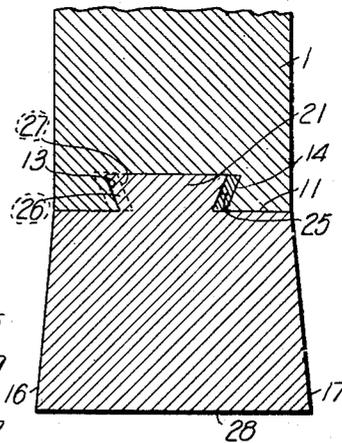


Fig. 6.



INVENTOR
William Wright
BY *Arthur P. Brown*
ATTORNEY

UNITED STATES PATENT OFFICE

WILLIAM WRIGHT, OF TULSA, OKLAHOMA, ASSIGNOR TO OKLAHOMA IRON WORKS, OF TULSA, OKLAHOMA, A CORPORATION OF OKLAHOMA

DRILL BIT

Application filed December 29, 1927. Serial No. 243,263.

My invention relates to drill bits and more particularly to devices of that character for use in oil well drilling and has for its principal object to simplify and reduce cost of manufacture, use and maintenance of bits of this type as compared with those of ordinary construction, by providing for separate construction of the working tip and body portion of the tool, so that they may be made of different materials, and so that the tip or working portion may be removed from the body portion for replacement or repairs, sharpening and tempering, and for substitution of cutting edges whereby the bit may be adapted to the character of the formations being drilled.

In accomplishing these and other objects of the invention I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a bit constructed according to my invention.

Fig. 2 is an enlarged detail perspective view of the lower end of the bit.

Fig. 3 is a similar view showing the cutting tip removed from and in spaced relation to the body portion of the bit.

Fig. 4 is a horizontal sectional view on the line 4—4, Fig. 2, illustrating the keying of the cutting tip to the body portion.

Fig. 5 is a similar view illustrating the wedging key removed and the cutting tip moved out of contact with the centering key on the body portion.

Fig. 6 is a vertical sectional view through the lower portion of the bit.

Referring more in detail to the drawings:

1 designates the body portion of the bit which, as in ordinary construction, comprises an elongated body of relatively mild steel having rounded edges 2 and 3 and flat side faces 4 and 5 provided with the usual water courses or grooves 6 for permitting easy displacement of liquid from the well as the bit rises and falls in the drilling operation. Integral with and extending upwardly from the body portion is a relatively long shank 7, tapered toward its upper end and provided at its terminal with a reduced extension 8

having tapered screw threads 9 by which the bit may be secured to a string of drilling tools, as in common practice; the upper end of the stem being provided with a squared portion 10 to facilitate application of a wrench or the like for setting up the threaded connection 8. The lower end of the body portion is surfaced in a horizontal plane, as at 11, and is provided with a dove-tailed groove 12 which extends across the face 11 between the flat side faces 4 and 5; the sides 13 and 14 of the groove being inclined inwardly toward the center plane of the bit at equal distance from the longitudinal axis of the body portion of the bit.

Attention is here called to the fact that mass is provided in the body portion for adding weight to the bit and that the body may, therefore, be composed of a cheap grade of forged steel, the removable tip being of high-grade tool steel adaptable for the usual cutting operations.

The cutting tip comprises a forging 15, shaped to the cross sectional contour of the body portion and having outwardly flared sides 16 and 17 conforming to the sides 2 and 3 of the body, flat faces 18 and 19 conforming to the side faces 4 and 5 and provided with water-course grooves 20 in line with the grooves 6 in the body portion, and a dove-tailed tongue 21 receivable in the groove of the body portion, but offset relative to the longitudinal axis of the tip so that its side 22 will contact the side 13 of the groove, and its side 23 extends angularly and in spaced relation to the side 14 of the groove 12 to provide a slot 24 for receiving a wedge shaped pin 25, whereby the cutting tip may be securely keyed in the dove-tailed groove of the body portion.

In order to center the cutting tip on the body portion, I prefer to provide the side 13 of the groove 12 of the body portion opposite the wedge with a key 26 which projects from the face of the body and engages in a key seat 27 in the side 22 of the dove-tailed tongue when the tip is set by its locking wedge, so that when the wedge is driven into position the cutting tip cannot slide on the body portion to loosen the wedging key.

Cutting tips may be provided with various shaped cutting edges 28, adapted for use in different formations to be drilled; the present drawings illustrating a tip having a chisel edge suitable for drilling in rock formation.

Cutting tips may be forged but from comparatively small masses of steel, which may be easily handled for forging and sharpening, and which may be evenly heated and tempered without the danger of cracking or breaking from uneven expansion incident to the cooling and hardening operation.

With the cutting tip formed separately of the body of the bit, the body and shank may be formed integral and of a length to bridge earth crevices through which the drill must pass, without inconvenience which would occur if it were necessary to handle the entire bit when the tip is dressed.

In assembling the cutting tip with the body portion the dove-tailed tongue 21 is slid into the groove 12 and then moved laterally until the key 26 enters the groove 27. The wedge key is then driven into the slot 24 formed between the tongue and the wall of the groove 12, so that the bit is aligned with the body of the bit and securely wedged to the body portion. In removing the cutting tip for sharpening or replacement the reverse order is followed.

It is further apparent that when necessary the relatively small tip may be removed and readily transported to the forge shop for re-tempering and sharpening, thereby insuring better results than when the bit is sharpened in the field by less expert workmen.

What I claim and desire to secure by Letters Patent is:

In a drill bit including a body member having a transverse dovetail groove, a head member having a dovetail tongue of less width than said groove, and a wedge movable in the groove in engagement with one side wall thereof to urge the tongue toward the opposite side wall of the groove, a key fixed to said last named side wall of the groove, the tongue being provided with a seat for said key whereby the operation of the wedge may cause the key to engage said seat.

In testimony whereof I affix my signature.

WILLIAM WRIGHT.

55

60

65