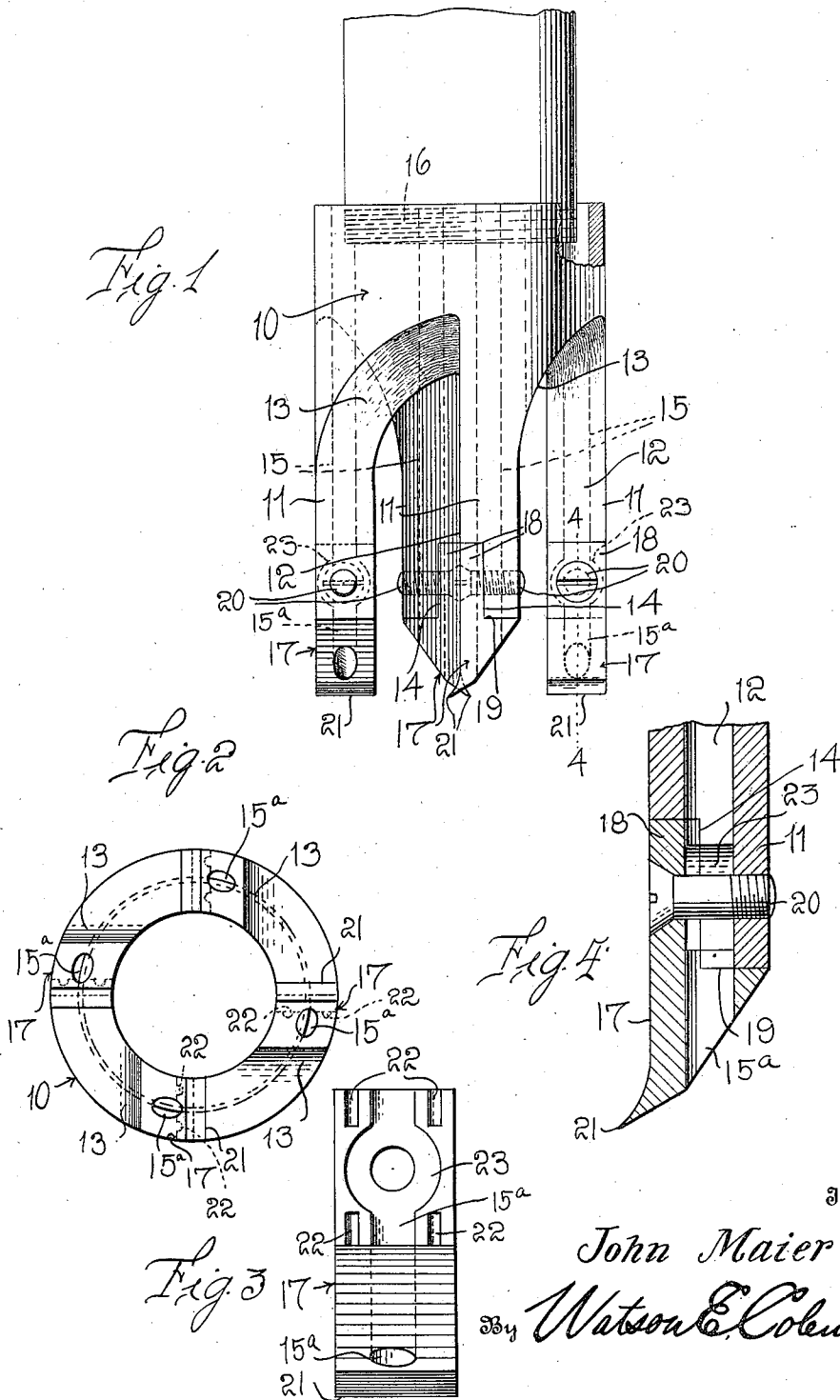


J. MAIER.  
WELL DRILLING TOOL.  
APPLICATION FILED MAR. 11, 1918.

1,297,708.

Patented Mar. 18, 1919.



Inventor

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# UNITED STATES PATENT OFFICE.

JOHN MAIER, OF DETROIT, MICHIGAN.

## WELL-DRILLING TOOL.

1,297,708.

Specification of Letters Patent.

Patented Mar. 18, 1919.

Application filed March 11, 1918. Serial No. 221,752.

*To all whom it may concern:*

Be it known that I, JOHN MAIER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Well-Drilling Tools, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to well drilling tools, and particularly to that variety of well drilling tool where an annular cutter is used for cutting out a cylindrical core.

15 The general object of this invention is to provide a cutter of this description having a plurality of cutting blades, as they may be termed, with air cooling channels or passages extending down through the blades and opening upon the face of the cutting knives or cutters proper.

20 A further object of the invention is to improve the cutting points or knives attached to the extremities of the blades, and particularly by providing cutting points or knives which are detachable and provide means whereby the knives shall be held in proper alinement with the downwardly extending blades of the annular cutter.

25 My invention is illustrated in the accompanying drawings, wherein:

30 Figure 1 is a perspective view of a well drilling tool constructed in accordance with my invention:

35 Fig. 2 is an under side plan view of the tool;

Fig. 3 is a face view of one of the cutters; and

Fig. 4 is a fragmentary longitudinal section on the line 4-4 of Fig. 1.

40 Referring to these drawings, 10 designates the body of the cutter, which is annular in cross section and is provided at spaced points with the downwardly extending blades 11. Each blade is longitudinally straight or vertical on one face for the greater portion of its length, as at 12 and on the other face is outwardly curved as at 13, until it intersects with the straight face of the next adjacent blade. Each blade at its lower end, and upon its vertical face is cut away as at 14 to a little less than half its thickness and each blade is formed with a longitudinally extending passage or channel 15 extending vertically along the blade and terminating at the upper end of the cutter 10. This upper end of the cutter 10 is in-

creased as to interior diameter and is interiorly screw-threaded as at 16, the bores or channels 15 being so disposed that the screw-threaded or enlarged portion 16 of the hollow interior of the body intersects these passages or bores 15.

Coacting with the lower ends of the blades are the cutters or knives 17. These are cut away so as to form shanks 18 and shoulders 19, the inner faces of these shanks bearing against the cut-away ends 14 and the shoulders bearing against the lower ends of the blades 11. These cutters are also formed with bores 15<sup>a</sup>, which when the cutters are in place register with the bores 15. The cutters are held to the lower ends of the blades by screws 20 which have their heads countersunk in the shanks of the cutters. One face of the cutter extends straight downward nearly to the lower extremity of the cutter and then is outwardly curved, while the under face of the cutter is upwardly and outwardly beveled to the extremity of the shoulder 19. This provides a cutting point 21 which projects beyond the side face of the cutter and of the corresponding blade. All of these cutting points extend in the same direction. The bore 15<sup>a</sup> opens upon the lower face of the cutter.

85 In order to prevent any lateral oscillation of the cutter upon its corresponding blade, the cutter is preferably formed with vertical grooves 22 and the confronting face of the blade is formed with ribs which engage in these grooves. It will be noted that the bores 15 and 15<sup>a</sup> are enlarged at the point 23 so as to extend around the screws 20 and permit free passage past the screws.

90 With this construction it is obvious that a reciprocation of the drill will cause cool air to be forced down into the blades and to the cutters themselves, thus preventing these cutters and blades from becoming overheated, which they are very liable to do. In other words, I have provided means for air cooling the cutters and their blades. It will be further obvious that the cutters or knives proper may be readily removed for engagement with the body of the drill so that the knives may be sharpened or new knives or cutters put in place when the old ones are worn.

Having described my invention, what I claim is:

1. A drilling tool comprising an annular body formed with downwardly extending

blades, and cutting knives detachably  
mounted upon the lower ends of the blades,  
the tool being formed with longitudinally  
extending air channels, each extending  
5 downward through a corresponding blade,  
each opening at its upper end to the upper  
end of the body and each cutting knife hav-  
ing an air passage registering with the air  
passage in the blade and opening upon the  
10 under face of the cutter.

2. A drilling tool comprising an annular  
body interiorly screw-threaded at its upper  
end and formed with downwardly extending  
blades, and cutting knives detachably  
15 mounted upon the lower ends of the blades,  
the lower end of each blade being reduced  
in thickness and the upper end of the cor-  
responding knife being reduced in thickness  
to overlap the reduced portion of the blade,

the tool being formed with a plurality of 20  
longitudinally extending air channels, each  
extending downward from the upper end of  
the body and through a corresponding blade  
and intersecting the reduced portion of the  
blade, each of the cutting knives having an 25  
air passage registering with the air passage  
in the blade, and screws passing through the  
reduced portions of each blade and cutting  
knife and engaging them with each other,  
the corresponding air channel being en- 30  
larged to pass around said screw.

In testimony whereof I hereunto affix my  
signature in the presence of two witnesses.

JOHN MAIER.

Witnesses:

FERDINAND ZIGANSK,  
CARL WILHELM.