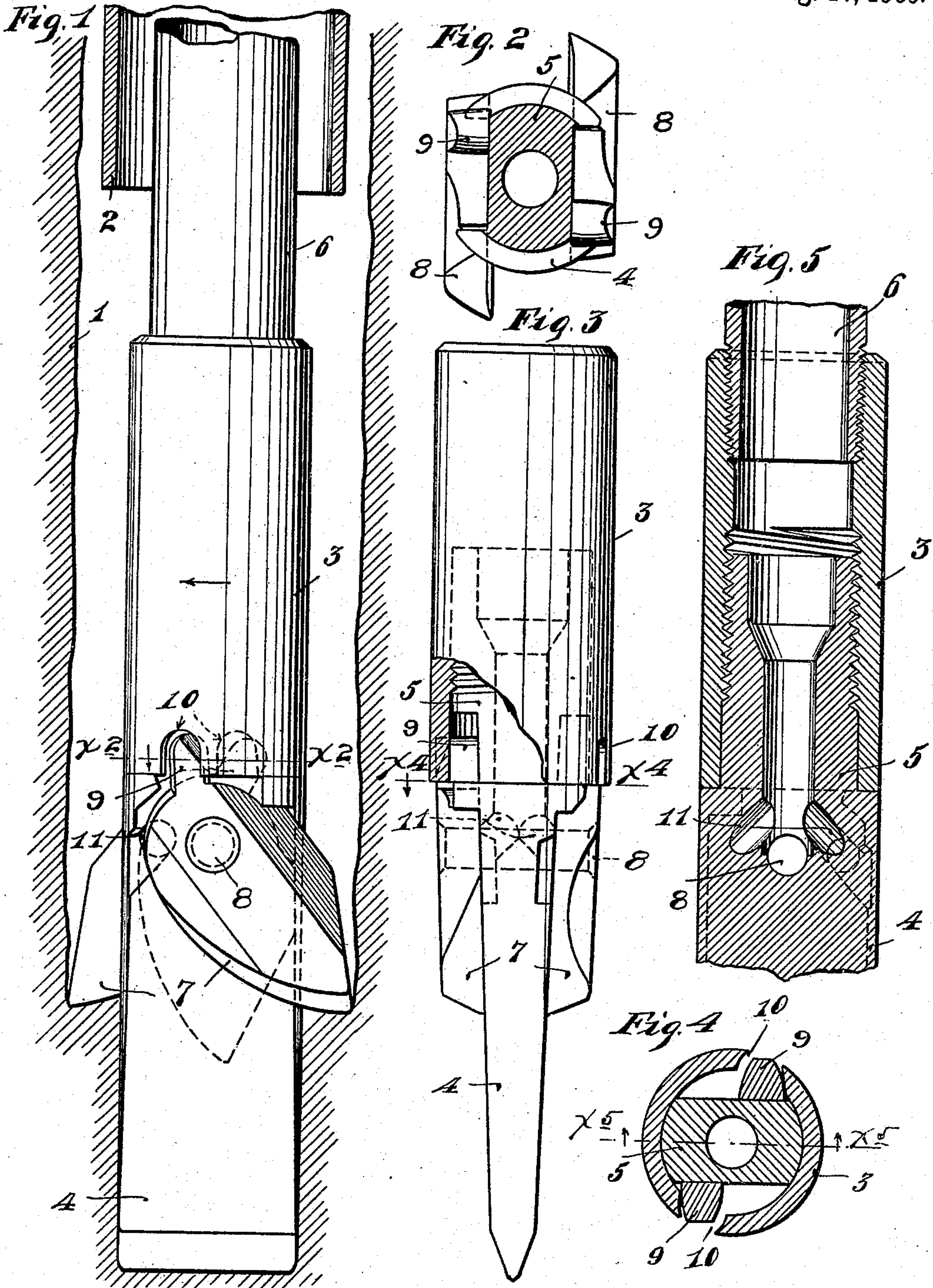


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JETTING DRILL.  
APPLICATION FILED AUG. 6, 1908.

931,021.

Patented Aug. 17, 1909.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILLIAM ADAMS, OF SHERBURN, MINNESOTA.

## JETTING-DRILL.

No. 931,021.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed August 6, 1908. Serial No. 447,217.

*To all whom it may concern:*

Be it known that I, WILLIAM ADAMS, a citizen of the United States, residing at Sherburn, in the county of Martin and State of Minnesota, have invented certain new and useful Improvements in Jetting-Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that type of drill generally known as a jetting drill, and has for its object to improve the same in the several particulars hereinafter noted.

To the above ends, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the improved drill, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view showing the improved drill in side elevation, but showing the hole bored thereby, and a pipe which is being sunk into the hole, in vertical section. Fig. 2 is a horizontal section, taken on the line  $x^2 x^2$  of Fig. 3. Fig. 3 is a view in elevation looking at the improved drill, in a direction ninety degrees from the direction in which the drill is viewed in Fig. 1. Fig. 4 is a horizontal section, taken on the line  $x^4 x^4$  of Fig. 3; and Fig. 5 is a vertical section, taken on the line  $x^5 x^5$  of Fig. 4.

In Fig. 1, the numeral 1 indicates a hole that is being bored in the ground by the improved drill, and the numeral 2 indicates a pipe which is being sunk into the hole bored by the drill.

The head of the drill is made up of a sleeve 3 and a cutting tool in the form of a heavy chisel or drill blade 4 having a hollow threaded stem 5 that works with screw-threaded engagement within the sleeve 3. The sleeve 3 is rigidly connected to the lower end of the lower member of a sectional operating pipe 6 of the customary construction, and the said parts 3 and 6, as shown, are thus rigidly connected by threaded engagement. The sleeve 3 and the chisel 4 are of such size that they are capable of being freely drawn through the sections of the pipe 2.

As is well known, it is customary to pro-

vide the chisel or primary cutting tool with pivoted cutting wings or blades which, when opened out, adapt the tool to bore a hole larger than the pipe through which the tool is bodily passed to and from operative position. My invention is directed to the provision of simple and efficient means whereby these pivoted wings or blades may be positively opened up and positively closed, by manipulation of the tool from the upper end of its operating pipe or stem. These pivoted blades or wings 7 are pivoted at 8 to flattened opposite sides of the shank of the chisel 4, and are provided with projecting lugs or teeth 9 that work in notches or seats cut in the extreme lower edge of the sleeve 3. With this construction, when the sleeve 3 is rotated slightly in respect to the chisel 4, in the direction of the arrow marked thereon on Fig. 1, the cutting blades 7 will be positively opened up, as shown in Fig. 1 by full lines; and by slight reverse movement of said sleeve 3, in respect to said chisel, the said cutting blades will be positively forced into closed positions, indicated by dotted lines in Fig. 1. The engagement of the lugs 9 in the seats 10 limit the pivotal movement of the sleeve 3 in respect to the chisel 4, so that the said sleeve will not be accidentally removed from the shank of the chisel, while the tool is at work at the bottom of the bore.

It is, of course, understood that in operating the tool it is vibrated vertically and at the same time given a step by step rotary movement in the direction of the arrow marked on Fig. 1. This rotary movement, as already stated, is that which is required to keep the pivoted blade 7 turned outward, as shown by full lines in Fig. 1. When the tool is to be withdrawn upward through the pipe tube, the pipe 6 and rigidly secured sleeve 3 are first given a slight backward rotation, to-wit: a rotation in a direction reverse from that given by the arrow on Fig. 1, and this serves to positively turn the pivotal blades 7 into their respective positions, shown by dotted lines in Fig. 1, so that the tool may then be freely drawn upward through the pipe tube.

The water will be supplied to the drill in the usual way through the operating pipe 6 and thence through the hollow stem of the chisel 5 and through discharge ports 11 that extend to opposite sides of the chisel from the axial passage of the said stem.



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

1. In a boring tool, the combination with an operating stem and a chisel connected thereto for oscillatory movements, of a pair of cutting blades pivotally connected to said chisel and having direct engagement with said stem, whereby said blades may be positively moved to and from operative positions by oscillatory movements of said operating stem in respect to the chisel, substantially as described.

2. In a boring tool the combination with a chisel and a pair of cutting blades pivotally connected thereto and having projecting

lugs, of an operating pipe provided with a rigidly secured sleeve within which the shank of said chisel is rotatively connected, and which sleeve is provided with notches that engage the lugs of said blades, whereby said blades may be moved to and from operative positions, by limited oscillatory movements of said operating pipe and sleeve, in respect to said chisel.

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

WILLIAM ADAMS.

Witnesses:

S. D. O'NEILL,  
WM. A. BORCHARDL.