

No. 646,752.

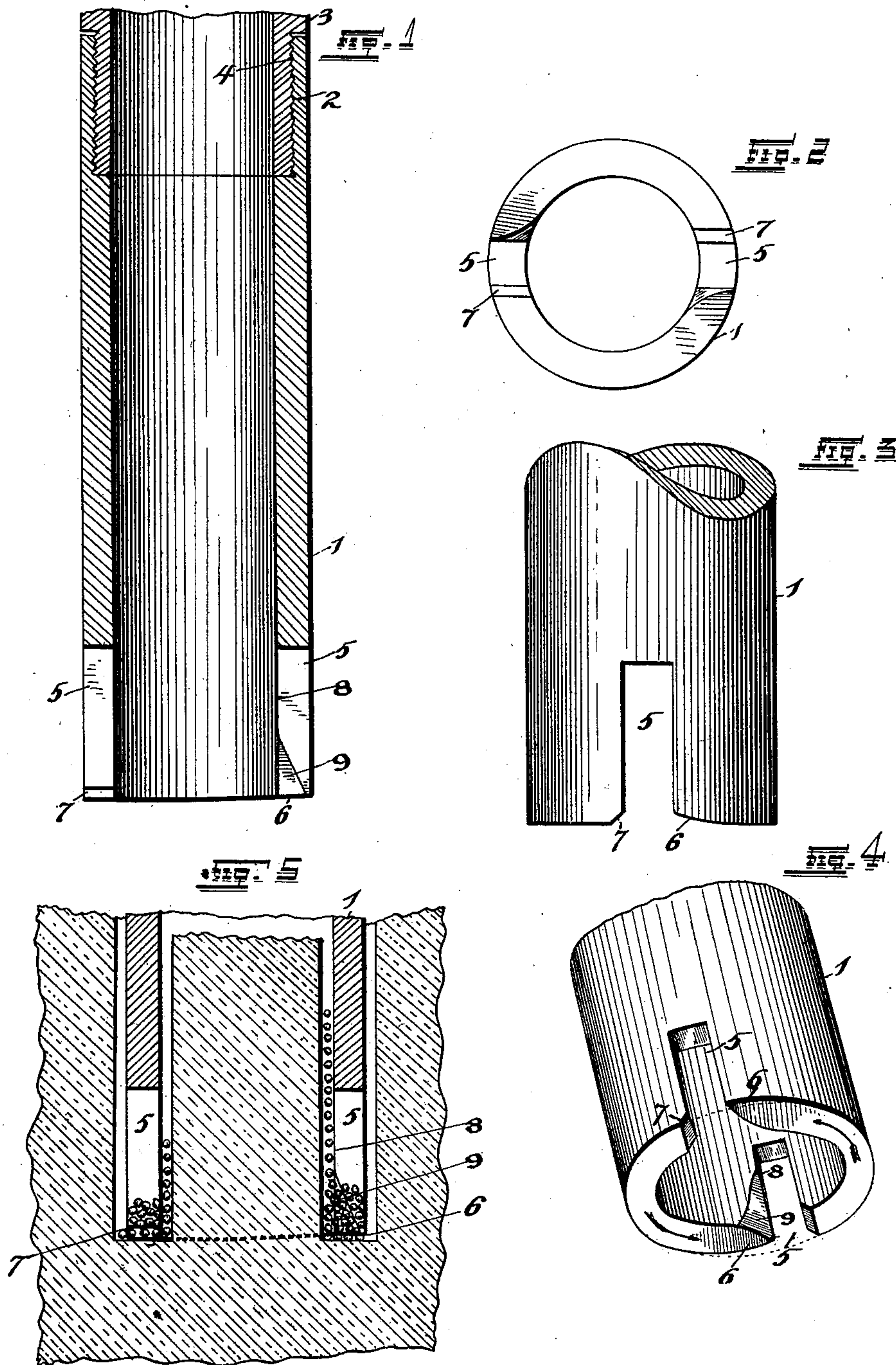
Patented Apr. 3, 1900.

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DRILL HEAD.

(Application filed Nov. 11, 1899.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES A. NIEL AND CHARLES E. BONNETT, OF ST. LOUIS, MISSOURI.

## DRILL-HEAD.

SPECIFICATION forming part of Letters Patent No. 646,752, dated April 3, 1900.

Application filed November 11, 1899. Serial No. 736,594. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES A. NIEL and CHARLES E. BONNETT, of the city of St. Louis, Missouri, have invented certain new and useful Improvements in Drill-Heads, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to drill-heads; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

The object of this invention is to provide an improved drill-head which can be operated at little cost and which is adapted for use in drilling through hard substances.

Figure 1 is a vertical sectional view of our improved drill-head. Fig. 2 is an end view of the same. Fig. 3 is a side view. Fig. 4 is a view in perspective of our complete invention. Fig. 5 is a vertical sectional view showing our improved drill-head in operation.

Referring to the drawings, 1 denotes a tubular drill-head provided on its upper end with the interior screw-threads 2 for attaching the drill-head to a driving rod or tube 3, provided with corresponding exterior screw-threads 4. Extending upwardly from the lower end of the tubular drill-head 1 are a plurality of slots 5. On the lower end of the tube 1 on corresponding sides of the slots 5 are the sloping surfaces 6, one of which is provided for each of the slots 5, and on the opposite sides of the slots 5 from the flared surfaces 6 are the sloping edges 7. The inner edges 8 of the slots 5 on the same side as the flared surfaces 6 are cut away, forming the surfaces 9, which slope from the inner surface of the tube 1 to the outer edges of the slots 5.

In operation the drill-head 1 being joined to a driving-rod 3, as described above and as shown in Fig. 1, is rotated by means of machinery and pressed downwardly at the same time by the same machinery. This will cut through soft substances, which may be extracted from the drill-head 1 and the tubular driving-rod 3. When any hard substance is encountered—such as rock, ore, &c.—chilled

cast-iron shot are poured into the tubular driving-rod 3, whence they fall downwardly upon the upper surface of the substance through which the drill is being operated.

Experience shows that when a tubular drill-head is operated a certain distance is left between the inner surface of the drill-head and the substance around which the drill-head passes. When the shot are poured into the drill-head, as described above, and fall downwardly upon the substance in the drill-head, they pass on downwardly between the said drill-head and said substance and fill the slots 5 in the lower end of said drill-head. As the drill-head is rotated in the direction indicated by the arrows in Fig. 4 a portion of the shot passes beneath the surface 6 and between the lower end of the drill-head 1 and the drilled substance. These shot being of chilled cast-iron are not crushed, but bite into the drilled substance, however hard, and greatly accelerate the operation. A space is also left between the outer surface of the drill-head and the drilled substance, and shot may also be applied there, if desired.

The substance around which the drill-head passes may be removed when desired and examined to ascertain the nature of the substance which is being drilled.

Drills in which diamonds are used as the cutting edges are very costly and unsatisfactory in that often when in operation the drill comes to a crevice and the diamond, loosened through continuous use, drops out and is lost and must be replaced, which makes the operation very costly and full of risk.

A drill of our improved construction gives satisfaction fully as great, and very little cost is necessitated in its operation, for if the shot should become lost in any way they can be replaced at very little cost.

The drill-head is of such length that in case it becomes worn on the lower end the slots 5 can be extended farther and the other sloping edges provided, so that a drill-head does not become useless after a short usage, but can be used until almost entirely worn out.

We claim—

A tubular drill-head having slots in its lower

end, a flared edge 9 on the inner edge of each  
of said slots, a flared surface 6 on the same  
side of each of said slots on the bottom of said  
drill-head, a flared corner 7 on the opposite  
5 side of each of said slots, and a means for at-  
taching said drill-head to a driving rod or  
tube substantially as specified.

In testimony whereof we affix our signa-  
tures in presence of two witnesses.

CHARLES A. NIEL.

CHARLES E. BONNETT.

Witnesses:

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J. D. RIPPEY.