(No Model.)

F. A. PRATT.

METAL DRILLING TOOL.

No. 534,009. Patented Feb. 12, 1895.

Fig. 1.

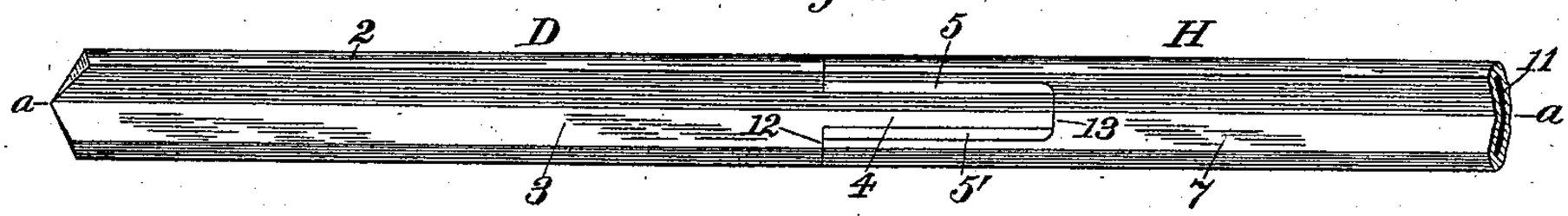


Fig. 2.

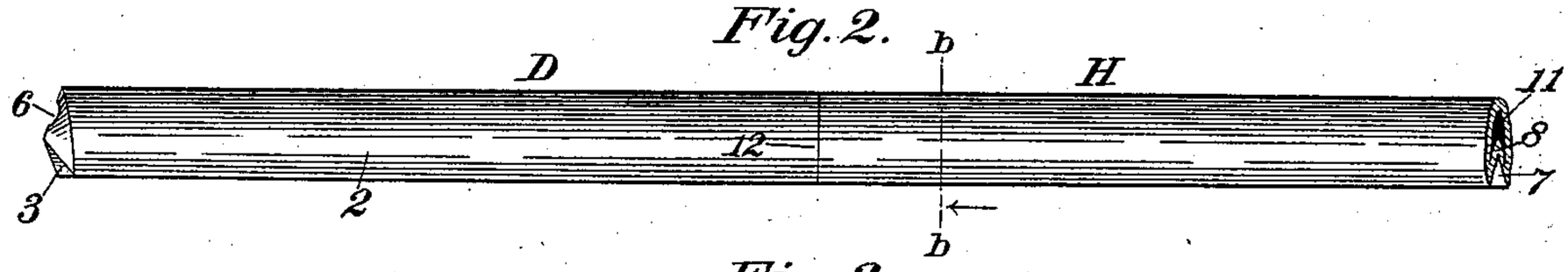


Fig. 3.

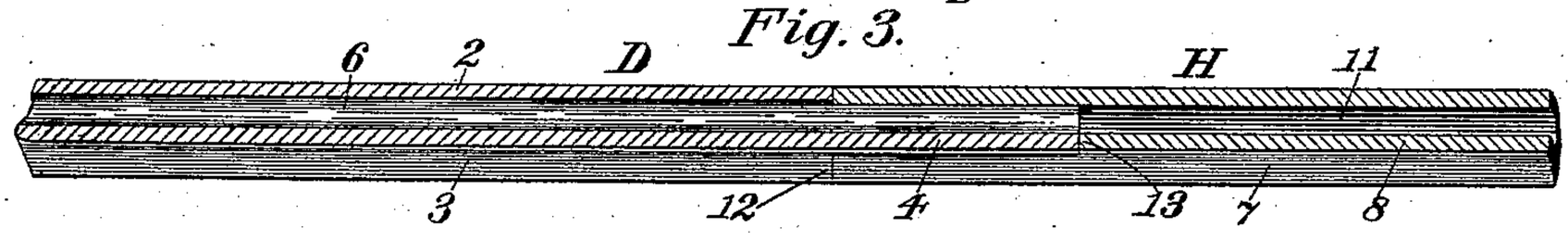


Fig. 4.

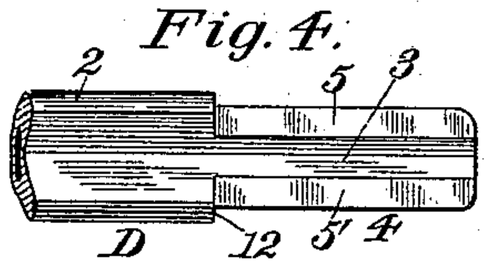


Fig. 5.

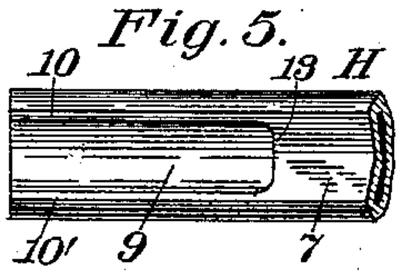


Fig. 10.

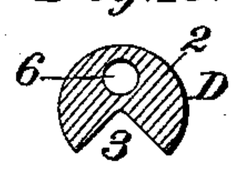


Fig. 11.

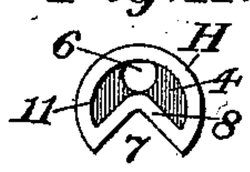


Fig. 6.

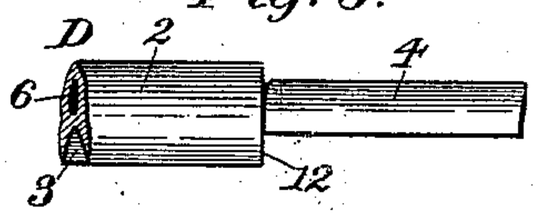


Fig. 7.

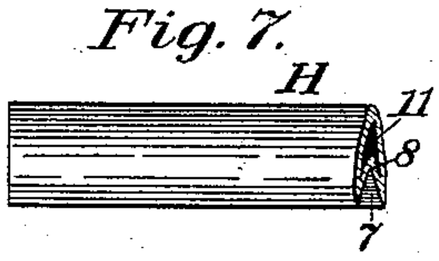


Fig. 12.

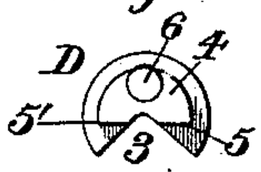


Fig. 13.

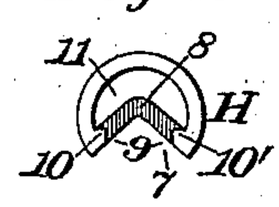


Fig. 8.

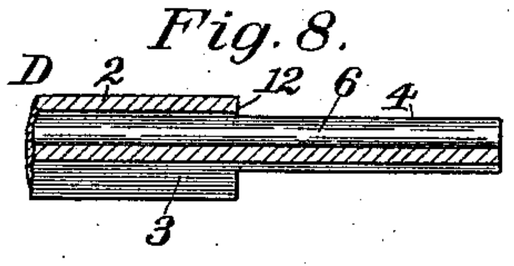


Fig. 9.

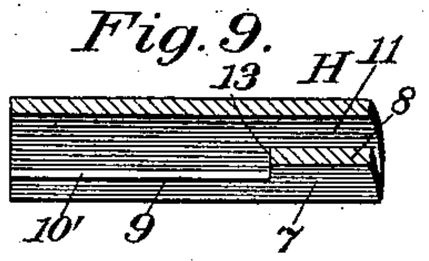
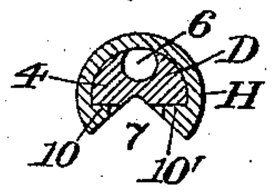


Fig. 14.



Witnesses:

John L. Edwards Jr.

Fred. J. Dole.

Inventor:

Francis A. Pratt.

By his Attorney,

F. A. Richards

UNITED STATES PATENT OFFICE.

FRANCIS A. PRATT, OF HARTFORD, CONNECTICUT.

METAL-DRILLING TOOL.

SPECIFICATION forming part of Letters Patent No. 534,009, dated February 12, 1895.

Application filed June 26, 1894. Serial No. 515,779. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. PRATT, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Metal-Drilling Tools, of which the following is a specification.

This invention relates to that class of drilling-tools which are usually made of relatively small diameter and of considerable length, as required for drilling the small-bore barrels of military rifles, and for other similar work; the object of my present invention being to produce a drilling-tool of such structural character and organization that it will be light, durable and efficient, and will be better qualified for resisting torsional stress than ordinary tools of this class; also to so construct the drilling-tool that oil may be forced through and delivered to the cutting-point of the drill under high pressure without liability of leakage.

In the drawings accompanying and forming part of this specification, Figure 1 is a side view of a drill and holder therefor in assembled condition and constituting a drilling-tool embodying my invention, a portion only of the holder being shown. Fig. 2 is a similar view of the drilling-tool, looking at another side thereof. Fig. 3 is a central longitudinal section of the drilling-tool, taken in line *a*—*a*, Fig. 1. Figs. 4 and 5 are detail side views, similar to Fig. 1, of a portion of the drill and holder, respectively. Figs. 6 and 7 are side views, similar to Fig. 2, showing the adjacent ends of the drill and holder, respectively, in position, respectively to each other, for assembling. Figs. 8 and 9 are central longitudinal sections, similar to Fig. 3, of a portion of the adjacent ends of the drill and holder, respectively, in position, relatively to each other, for assembling. Fig. 10 is a cross-sectional view of the drill, taken near the cutting-edge thereof. Fig. 11 is an end view of the drilling-tool, looking toward the left-hand in Fig. 2. Fig. 12 is an end view of the drill, looking toward the left-hand in Fig. 6. Fig. 13 is an end view of the drill-holder, looking toward the right-hand in Fig. 7. Fig. 14 is a transverse section of the drilling-tool, taken in line *b*—*b*, Fig. 2, looking in the direction of the arrow in said figure.

Similar characters designate like parts in all the figures.

In the embodiment of my invention herein shown and described, the drilling-tool comprises a longitudinally-bored and peripherally-grooved drill-head having a holder-engaging shank or tenon of segmental or angular cross-section with flat bearing faces parallel to the axial line of the drill, and a hollow drill-holder or stem mortised at one end to receive the drill-tenon or shank and having inward oppositely-disposed bearing-faces or flanges coinciding with and engaging the bearing-faces of the tenon or shank of the drill and having a peripheral groove in the plane of, and coinciding with, the peripheral groove of the drill-point, all of which will be hereinafter more fully explained.

The drill proper, which is designated in a general way by D, and which constitutes one member of the drilling-tool, may have its body-portion, 2, of a construction similar to that of the ordinary fluted drill, it being, preferably, symmetrical in cross-section from end to end and having a longitudinal chip-groove or flute, 3, formed in one side and extending the entire length thereof, as illustrated most clearly in Figs. 1, 4, 6, 8 and 12 of the drawings. One end of the drill is diametrically reduced or turned down in lines concentric to the periphery of the body-portion to form a holder-engaging tenon or shank, 4, which tenon or shank is likewise grooved at one side thereof to correspond to and form a continuation of the groove 3 of the body-portion of the drill, said tenon being also cut down at the side thereof adjacent to the groove 3 to form flat bearing-faces, 5 and 5′, at each side of said groove adapted for engaging corresponding bearing-faces upon a holder, H, which holder constitutes the other member of said drilling-tool, as will be hereinafter more fully described. The drill D is longitudinally bored from end to end, as shown at 6, to form an oil-conduit through which oil is introduced and conducted directly to the cutting-point of said drill.

The holder H, which is shown cross-section-

ally crescent-shaped, and which constitutes the other member of the drilling tool, will, in practice, be constructed from ~~a cylindrical~~ metal tube swaged to the cross-sectional form shown in the drawings so as to conform to the contour of the drill D, it having a longitudinal groove or flute, 7, for the out-flow of oil and the passage of chips which coincides with and forms an extension of the groove or flute 3 of said drill. By swaging a metal tube to form the chip-groove 7, as illustrated most clearly in Figs. 7, 9 and 13 of the drawings, an internal truss-like, or V-shaped strengthening-rib, 8, is formed from end to end of the holder, which materially increases the rigidity of the holder, which is very essential in resisting the torsional stress to which the holder is subjected during the operation of drilling.

As a means for forming a rigid bearing for, and preventing lateral movement of, the drill, the holder H is mortised or longitudinally slotted at one side, as shown at 9, central with relation to the groove 7 thereof, to form a seat for the tenon 4 of said drill, said groove being of less width than the internal diameter of the holder H, to form opposite longitudinal bearing-faces, or oppositely-disposed inwardly-projecting flanges, 10 and 10′, to coincide with and engage the bearing-faces 5 and 5′ of the drill-tenon 4, the plane of these bearing-faces or flanges being preferably parallel to the axis of the drill and holder.

It will be noticed that by swaging a round metal tube to the form illustrated in Fig. 13, the interior of said tube corresponds in cross-sectional form to the exterior thereof, but is of slightly less diameter, thus forming an oil-space 11 through said tube of considerable area, which, as shown, will be considerably greater than the area of the oil-hole 6 in the drill D. The oil-space 11 at the drill-receiving end of the holder coincides with and is concentric to the tenon 4 of the drill D; and by mortising the drill-receiving end of said holder, as before described, the outer faces of the grooved portion of said drill and holder, when the parts are assembled, are in alignment with each other; or, in other words—the outer face of the drill-shank or tenon at one side is flush with the outer face of said holder. By diametrically reducing the shank of the drill to form a tenon, and by forming the slot 9 of a length equal to the length of the tenon, a shoulder, 12, is formed upon the drill, which abuts against the end of the holder, and a shoulder, 13, is formed upon the holder, which abuts against the end of the drill-tenon, thus forming a close-fitting joint between the two members of high-pressure resistance capable of preventing leakage of oil.

In practice, after the two members D and H are assembled as shown in Figs. 1, 2 and 3, the joint will be hermetically sealed, and the two members will be fixedly secured together by soldering or brazing in any suitable manner.

Having thus described my invention, I claim—

1. The herein-described drilling-tool, it comprising a longitudinally-bored and peripherally-grooved or fluted drill-head, having a holder-engaging shank or tenon of reduced diameter with bearing-faces, and a holder having a longitudinal recess for receiving said tenon and having internal flanges adapted for engaging the bearing-faces of the tenon and for holding the drill against rotation, substantially as described.

2. In a drilling-tool, a drill comprising a longitudinally-bored and peripherally-fluted body-portion having a concentric tenon of reduced diameter grooved and bored to coincide with, and form a continuation of, the groove and bore of the body-portion, and having bearing-faces adapted for engaging with corresponding bearing-faces of a holder, substantially as described.

3. In a drilling-tool, the herein-described holder, it consisting of a tube longitudinally-depressed at one side to form an internal strengthening-rib and an external groove for the outflow of oil and the passage of chips and having a portion of one end of said rib cut away longitudinally to form inward oppositely-disposed bearing-faces, or flanges, adapted for engagement with bearing-faces of a tenon upon, and for preventing the rotation of, a drill in said holder, substantially as described.

4. The herein-described drilling-tool, it comprising a longitudinally-bored and peripherally-grooved drill-stock or body-portion having a concentric tenon of reduced diameter grooved and bored to coincide with, and form a continuation of, the groove and bore of the body-portion, and having bearing-faces at opposite sides thereof adapted for engagement with corresponding bearing-faces or flanges of a holder, and a hollow holder having an internally-projecting longitudinal strengthening-rib and an external longitudinal chip-groove and having internal flanges or bearing-faces adapted for engaging the bearing-faces of the tenon and for holding the drill against rotation, substantially as described.

5. In a drilling-tool, the combination of the longitudinally-bored and peripherally-grooved or fluted drill having a tenon of segmental or angular cross-section, and a hollow holder internally and externally crescent-shaped in cross-section adapted to receive the tenon of the drill and for holding said drill against rotation, the internal area thereof being greater than the area of the drill-bore, substantially as described.

6. In a drilling-tool, in combination, a drill having a longitudinal oil-conducting opening

therethrough and having a holder-engaging tenon of reduced diameter with plane bearing-faces at opposite sides thereof, and a holder having an internal longitudinal channel of greater area than, and adapted for communicating with, the oil-conducting opening in the drill, and having an external chip-groove and a longitudinal inwardly-projecting strengthening-rib cut away at one end thereof to form bearing-flanges adapted for engaging the bearing-faces of the drill-tenon, and for holding the drill against rotation, substantially as described.

FRANCIS A. PRATT.

Witnesses:
FRANCIS H. RICHARDS,
GEO. M. N. REED.