No. 841,184. PATENTED JAN. 15, 1907.

W. E. ROESKE.

LUBRICATING TUBULAR DRILL.

APPLICATION FILED NOV. 27, 1905.

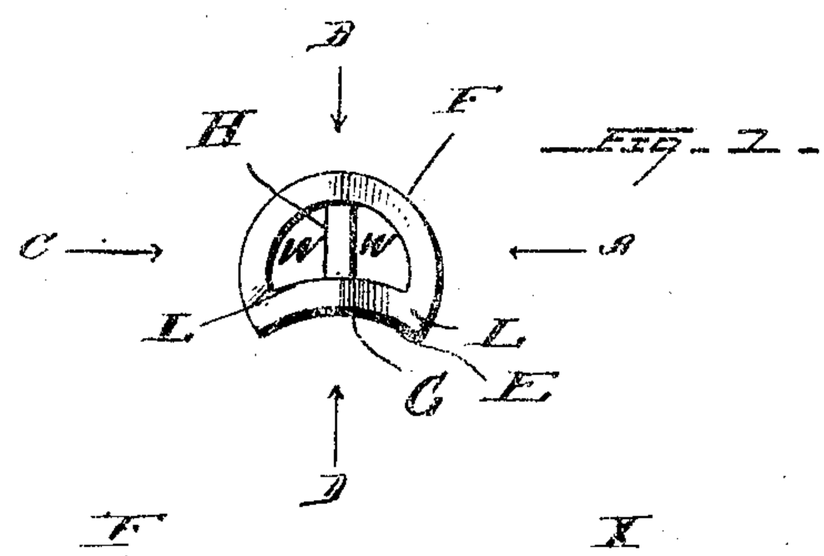

Fig. 1.

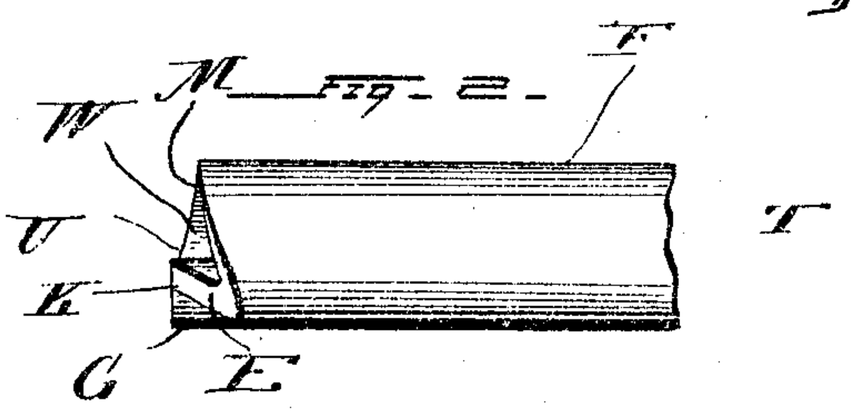

Fig. 2.

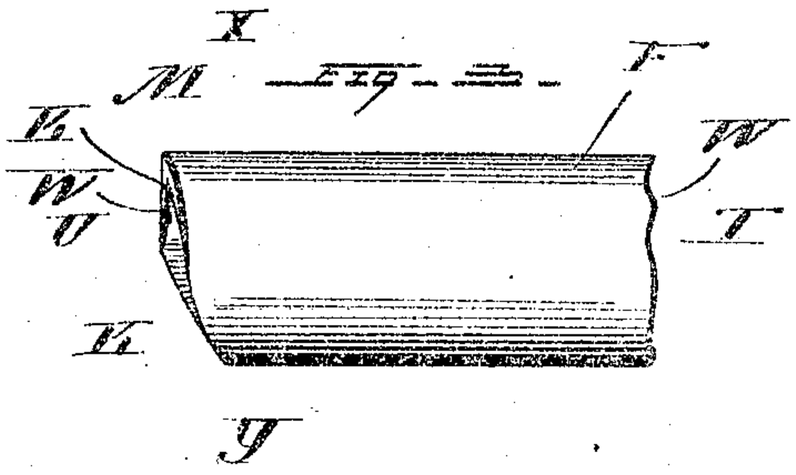

Fig. 3.

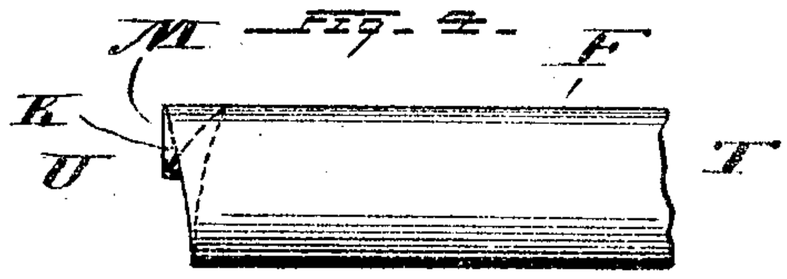

Fig. 4.

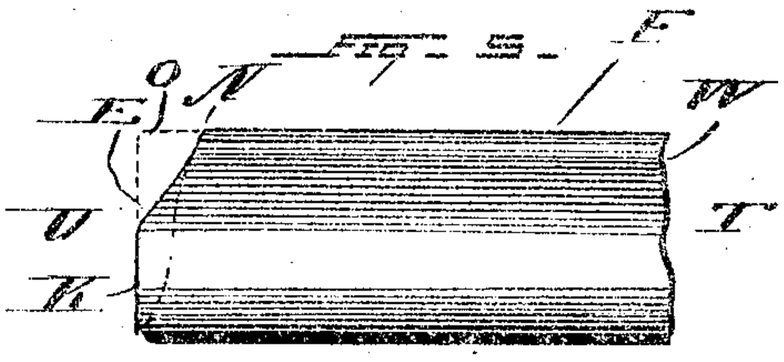

Fig. 5.

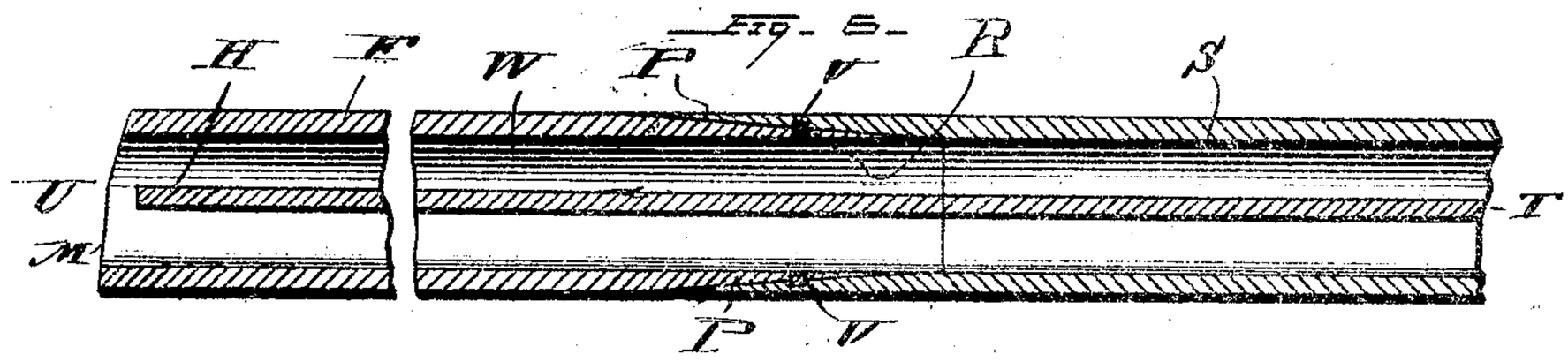

Fig. 6.

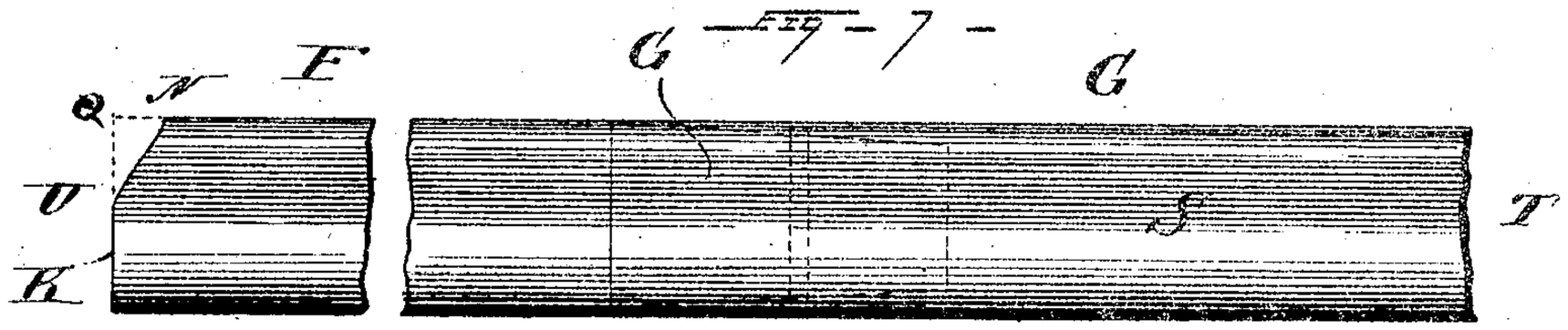

Fig. 7.

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LUBRICATING TUBULAR DRILL.

No. 841,184. Specification of Letters Patent. Patented Jan. 15, 1907.

Application filed November 27, 1905. Serial No. 289,271.

To all whom it may concern:

Be it known that I, WILLIAM E. ROESKE, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Lubricating Tubular Drills, of which the following is a specification.

The invention relates to those tubular drills that have internal passages through which lubricating material may be forced to the cutting-lips for washing out the chips and conducting away the heat incident to drilling and for otherwise aiding the cutting action of the drill and prolonging its life.

This invention further relates to a drilling-tool of such structural organization as will be better qualified for resisting torsional stress than ordinary tools of this class and one through which the oil forced to the cutting-point may be delivered under high pressure without liability of leakage.

My invention consists mainly in the construction of the cutting er of the drill, the conformation of the longitudinal oil-cavity, in the curvature of the peripherally-grooved fluting, in the steel bridge reinforcing the cutting extremity of the drill-point, and the manner of attachment of the hollow hold r or stem, as more particularly hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an end view of the drill-point. Fig. 2 is a side view with the peripheral fluting downward, showing the bevel of the cutting edge and its disposition with reference to the peripheral fluting. Fig. 3 is another side view of the drill-point as seen when rotated a quarter-revolution beyond the position shown in Fig. 2. Fig. 4 is another side view of the drill-point when rotated a quarter-revolution beyond the position shown in Fig. 3. Fig. 5 is a side view still further revolved, showing the offset or bevel E on that portion of the extremity of said drill-point a acent to the cutting-lip on the convex cylindrical element F. Fig. 6 is a longitudinal section of the assembled drill point and shank. Fig. 7 is a longitudinal view of the drill and shank, showing the peripheral fluting.

In the process of making a drill which embodies the invention a steel tube F of circular cross-section formed to approximately the diameter and length of the completed drill-point may be cut throughout its length by two longitudinal cuttings at distances of approximately one hundred and twenty degrees of the cylindrical circumference and so much of the tube as is included in said arc between said longitudinal cuttings removed, another steel tube G of less diameter than the first, divided by two longitudinal cuttings intercepting an arc of more than a hundred and eighty degrees of horizontal circumference. The two cylindrical sectors thus formed are regarded as joined in such a manner that their horizontal cross-section is a lune, as shown in Fig. 1, and both arcs of said lune, F and G, are supported at their middle points B and D by the steel bridge H, which bridge does not necessarily extend throughout the entire length of the drill-point, as it is designed primarily to give stability to the cutting-lip K. The peculiar shape of this drill may also be formed by properly molding or compressing the wall of a single cylinder until the conditions described have been obtained, thus forming a hollow drill of lunar cross-section, with a longitudinal peripheral groove, as described.

The smaller arc L of the lunar cross-section referred to is at its middle point approximately at the center of the circle described by the radius of the larger arc of the lune, and in a horizontal cross-section of the drill taken at the edge of the cutting-lip or slightly above it the radius of the drill forms a chord with the cutting-lip, which lip is in line with a perpendicular to the longitudinal axis of the drill, by which arrangement the cutting-lip is within the radius of a circle described by the drill's rotation. The cutting-lip K is ground in a plane passing obliquely through a diameter of the drill, as shown at M, which method of grinding provides free access by the cutting-lip to the metal worked upon, as the edges M and K are in a plane having an inclination of less than ninety degrees to the longitudinal axis U T. The cutting-lip K is the first half of the concave lunar arc L above referred to. The remaining part of said concave arc is shown at E, which together with the cutting-lip K constitute the arc of fluted periphery; but so much of said arc E as lies between the longitudinal axis U T, being one-half of the arc of fluted periphery and continuous with the cutting-lip K and the circumference of the outer cylindrical element F, is cut by a plane passing through the radius of the drill-cylinder B D, said radius B D being perpendicular to the longitudinal axis U T and at an angle in a horizontal plane of ninety degrees or thereabouts from the ra-

dius nearly coincident with the cutting-lip K, and the plane of grinding in this part of the drill-point is at an angle of less than ninety degrees to the longitudinal axis U T, by which means a triangular space U N O is left between this part of the drill-point's extremity on both interior and exterior cylindrical segments and the material worked upon, permitting free application of the lubricant from the interior of the drill.

The union of the drill-point with the shank or stem is accomplished as shown in Fig. 7. A conical taper on that end of the drill-point P is received in a conical opening R in the drill stock or shank S, and on both the male and female elements of this conical joint are turned grooves V, which precisely overlap when the drill is assembled. The grooves are filled with a composition metal melting at a low temperature, by which means the drill is welded to its shank without materially weakening its strength at the joint.

The steel bridge H is a block interposed radially at the cutting extremity of the drill-point, giving it increased resistance to torsional strain without materially clogging the interior oil-passage W. The longitudinal fluting formed by the imposition of the smaller cylindrical element G, connected concavely to the larger cylindrical element F, affords an avenue for washing out the chips produced in drilling.

Oil is applied at the head of the drill under high pressure and is conveyed to the cutting edge or lip of the drill through the open space formed in the interior of the drill by means of the junction of the two cylindrical elements as described above.

Having thus fully described my invention, I claim—

1. A metal-boring drill composed of the union of two cylindrical sectors, having an interior opening of lunar cross-section bounded by said sectors, and at its extremity a cutting-lip on the edge of one of the cylindrical sectors.

2. A hollow metal-boring drill of lunar cross-section having a longitudinal peripheral fluting, one half of the arc at the extremity of said fluting being disposed at right angles to the longitudinal axis of the drill and the other half of said fluting being cut by a plane passing through the transverse diameter perpendicular to the chord of the minor arc of the lune at an angle of less than ninety degrees, the drill being also cut by a plane passing at an angle of less than ninety degrees to the longitudinal axis of the drill passing through the first-mentioned half of the arc of fluting.

3. A hollow metal-boring drill with a longitudinal peripheral fluting, formed by the rigid union of two cylindrical segments of unequal diameters and provided with a cutting-lip and a flat steel bridge radially interposed between the extremity of the cylindrical segments.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 7th day of November, 1905.

WILLIAM E. ROESKE.

Witnesses:
J. A. HANLEY,
E. L. GILBERT