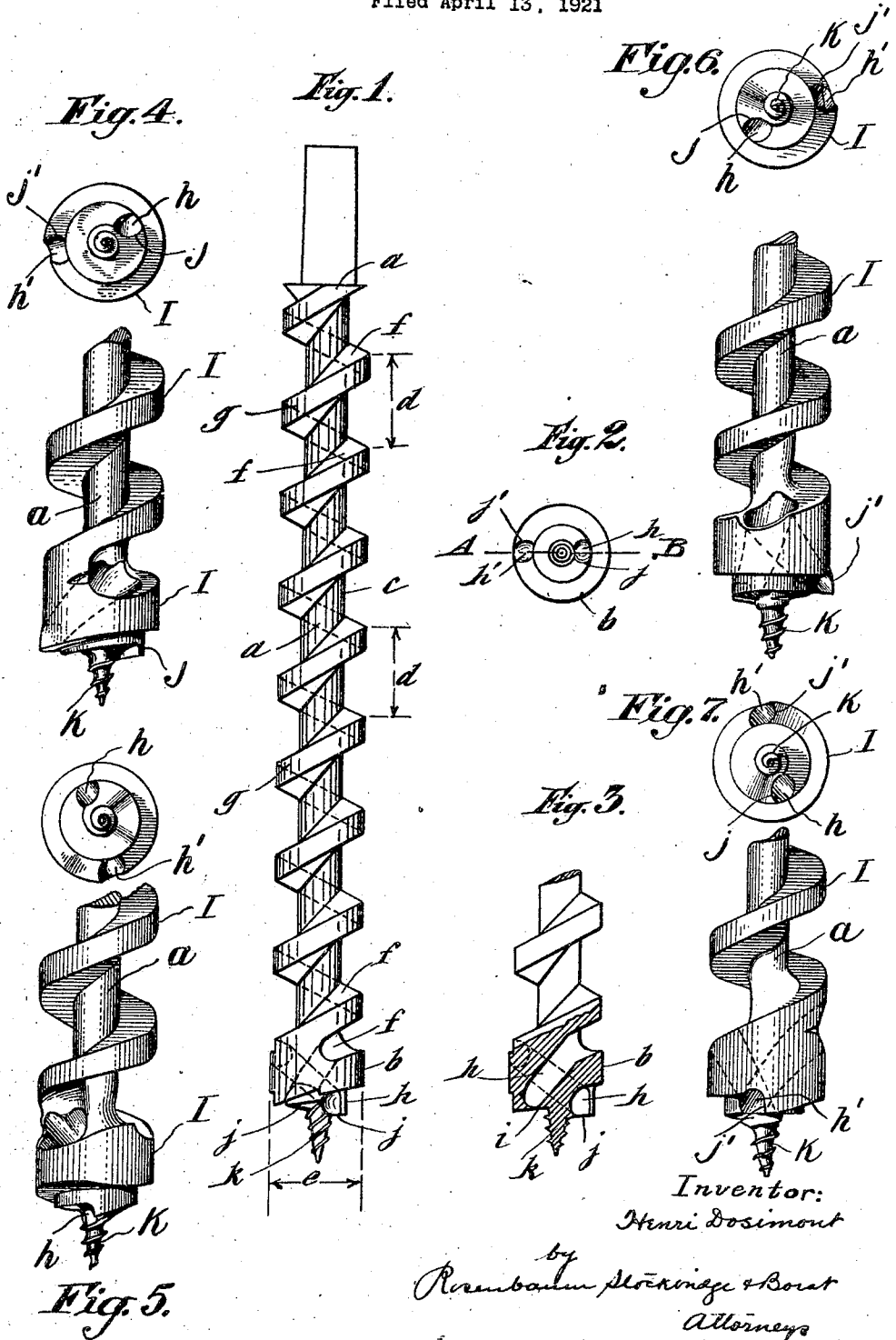


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DRILL BIT OR AUGER  
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# UNITED STATES PATENT OFFICE.

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## DRILL BIT OR AUGER.

Application filed April 13, 1921. Serial No. 461,050.

*To all whom it may concern:*

Be it known that I, HENRI DOSIMONT, a subject of the King of Belgium, residing at Arville, Province du Luxembourg, in the Kingdom of Belgium, have invented certain new and useful Improvements in Drill Bits or Augers, of which the following is a specification.

This invention relates to drill bits or augers used for boring wood.

In bits designed for the boring of the holes of considerable depth, the body of the bit has heretofore usually been composed of a rod or flat bar twisted hellically and designed to act as a lateral guide for the bit and to prevent its oscillation in the hole bored. It has already been proposed, in connection with bits or augers of this type, to form at the end of the spirally wound bar or rod a head with an unbroken periphery designed to facilitate still further the guidance of the bit, the said head being perforated with passages for permitting of the escape of the shavings cut by the bit properly so called.

In all the known constructions the disadvantage, however, is met with that, during drilling at considerable depth, the shavings cut off accumulate in the turns of the spiral formed by the twisted rod serving as a support to the bit, with the result that it is necessary, frequently to withdraw the bit from the hole in order to permit of the removal of the accumulated shavings, which would otherwise render the boring operation impossible.

This disadvantage arises from the fact that, in all existing constructions of bit or auger, the separated shavings are forced by pressure between the spirals formed by the twisted bar of the bit, each fresh shaving cut off forcing in front of it those previously severed; the result is that the shavings accumulate gradually in the spiral and press against the walls of the hole which is being bored and wedge themselves therein, and eventually completely stop up one or more of the spirals of the bit.

This invention has mainly for its object to obviate this particularly important disadvantage and to obtain an automatic evacu-

ation of the shavings without the liability of any stoppage taking place which would necessitate a withdrawal of the bit during the boring operation.

This result is obtained, according to the invention, by making the body of the bit, instead of from a simple rod or bar helically twisted, as hitherto, in the form of a feed device, the body of the bit being composed of a rod of cylindrical section, in which is cut, for example, throughout its whole length, a feed-helix.

Furthermore, in the practical realization of the invention, as the feed-helix is cut or formed in a rod of cylindrical section, it is possible to give the spirals any desired depth, whereby the external peripheral surface of the helix can perform the role of a guide surface replacing, under particularly advantageous conditions, the guidance hitherto obtained by the twisting of the bar forming the body of the bit.

The bit forming the subject of this invention is, therefore, distinguished from bits the bodies of which are formed from a strip or bar twisted to a helical shape, by reason of the fact that each turn presents two surfaces which serve a predetermined purpose, one of these surfaces being substantially perpendicular to the longitudinal axis of the bit and the other being an external peripheral surface enveloping the longitudinal axis and constituting the guide surface in the hole bored.

The improved bit or auger is preferably provided, in a known manner, with a solid head forming a lower guide surface, and this head is provided with evacuation passages which possess the peculiarity of forming a continuation of the helicoidal discharge passage in such a manner as to effect the discharge of the shavings over a surface corresponding to the inclined discharge passage, which comprises the characteristic feature of the invention. Furthermore, the bit is characterised by the fact that it is provided, in planes perpendicular to the axis, with two or more spoon-shaped cutters formed by the orifices of the discharge passages for the shavings at the end of the bit. This construction effects

the advantage of dividing the shavings and partially shredding them so as to facilitate, by reason of their reduced dimension, their passage into the discharge helix formed in the body of the bit.

In the accompanying drawing there is shown, by way of example, one form of bit or auger constructed according to the invention.

Figure 1 is an elevation of the bit or auger.

Fig. 2 is an end view of the bit provided with cutters at the termination of the discharge orifices for the shavings.

Figure 3 is a sectional view of the head of the bit taken substantially along the line A—B of Fig. 2 and showing the arrangement of the discharge passages.

Figures 4, 5, 6, and 7 are views of the lower portion of the bit in various positions of rotation.

As shown in Fig. 1, the bit or auger forming the subject of the invention, instead of being made, as has hitherto been the practice, from a flat bar twisted to a helical form, is composed of a cylindrical rod  $a$ , the original diameter of which corresponds to the diameter of the head  $b$ , which determines the diameter of the bit. This rod  $a$  is cut in such a manner as to provide a discharge helix  $c$ , the pitch  $d$  of which is equal to the diameter. The cutting of the helix is, moreover, so carried out that each spiral presents what may be termed a discharge surface  $f$  coiled around the core  $a$  and a peripheral guide surface  $g$  of a suitable depth and design for ensuring the efficient guidance of the bit in the hole bored.

By reason of the fact that the pitch  $d$  of the helix is equal to the diameter  $e$  of the head of the bit, the inclination of the discharge surface  $f$  is such that during the rotation of the bit in the hole bored the shavings located between two successive spirals are discharged by the rotation of the bit without any pressure being exerted in the axial direction other than that resulting from the combined action of the helicoidal surface  $f$  and of the wall of the hole. The result of this arrangement is that, if the bit turns without boring, it completely empties the hole bored of any shavings which may be found there. The head of the bit shown is of unbroken periphery and the discharge surface  $f$  of the helix extends into the solid head  $b$  in the form of one or more passages  $h$ , which possess the same inclination and open into the face  $i$  of the bit, as spoon-shaped recesses  $j$  forming cutters. In the example illustrated, it is assumed that the head  $b$  is provided with two spoon-shaped cutters  $j$ ,  $j^1$  situated in slightly different planes, that is, at different distances from the tip

of the bit, each of the said cutters corresponding to a passage  $h$ ,  $h^1$ , forming a prolongation or extension of the helicoidal discharge surface  $f$ . The bit is terminated by a screw point  $k$  which however is not indispensable but which may be useful for the purpose of centering and for facility in work.

It will be noted that, as a result of the arrangement of the two cutters  $j$ ,  $j^1$  in two different planes perpendicular to the axis of the bit at levels slightly different from one another, the action of the bit is progressive, each of the cutters  $j$ ,  $j^1$  only cutting the wood over a width corresponding to a quarter of the diameter of the bit. Thus the end face of the bit is provided with the central screw point and two concentrically arranged helical extensions which terminate in cutting shoulders at different distances from the end of the screw point, the inner extension terminating nearest the tip of the screw. The apertures  $h$  and  $h^1$  emerge through the extensions at their terminals so as to form the cutting edges at the terminals of the extensions. The cutting edges also extend along the outer edge of the terminal so that the advance terminal of each extension cuts a corner. The shavings thus produced, by reason of the inclination of the passages  $h$ ,  $h^1$  forming the extension of the helicoidal surface  $f$ , substantially enter into the discharge screw without being pressed against one another as is the case with bits as heretofore made, and these shavings are immediately automatically evacuated by the discharge surface  $f$  without any liability of the bit becoming clogged up; holes, therefore, can be bored of any depth in any kind of wood and at any desired speed without the liability of the occurrence of any of the well-known disadvantages which are met with in the use of bits as heretofore made.

What I claim is:

1. In a bit or auger, a body formed of a cylindrical rod provided with a helical groove, a head at the end of said rod, the said head having an unbroken periphery and passages forming cutting orifices in said head, the said passages being formed as extensions of the helical groove, and ending in the face of the head perpendicularly to the longitudinal axis of the rod.
2. In a bit or auger, a body formed of a cylindrical rod, the said rod being provided with a helical groove, the pitch of which corresponds to the diameter of the cylindrical rod, the external peripheral surface of the rod forming a guiding surface for the bit in the hole formed, a head at the end of said rod, the said head being provided with two cutters placed at different levels and ending in two planes perpendicular to the axis of the bit, the said cutters co-

operating with discharge orifices formed as extensions of the helical groove of the rod within the head.

3. In a bit or auger, a body having an advance head with an unbroken periphery and a helical discharge groove extending from the rear of the head backwardly along the body, the advance end face of the head having a plurality of concentric helical extensions terminating in cutting shoulders at different longitudinal distances from the advance tip of the bit or auger, said head having passages from the shoulders to the discharge groove whereby the borings will be removed through the groove.

4. In a bit or auger, a body having independent concentric helical extensions upon its advance end face which extensions terminate in cutting shoulders, at different distances from the advance tip of the bit or auger, and passages leading from the shoulders backwardly along the body for removing the borings.

5. In a bit or auger, a body having independent concentric helical extensions upon its advance end face which exten-

sions terminate in cutting shoulders at different distances from the advance tip of the bit or auger, the cutting edge of each of the shoulders extending transversely across its extension of the body substantially radially of the axis of the bit and along the outer side wall whereby each shoulder cuts a corner.

6. In a bit or auger, a body having concentric helical extensions upon its advance end face which extensions terminate in cutting shoulders at different distances from the advance tip of the bit or auger, the inner extension terminating in its cutting shoulder in advance of the outer extension, the body having a spiral chip conveying groove running endwise rearwardly from the extensions and communicating with the shoulders by individual passages.

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

HENRI DOSIMONT.

Witnesses:

F. BREAUX,  
EM. GENARD.