

L. S. HAYDEN.
EXPANSION BIT.
APPLICATION FILED MAY 24, 1912.

1,056,670.

Patented Mar. 18, 1913.

Fig. 1

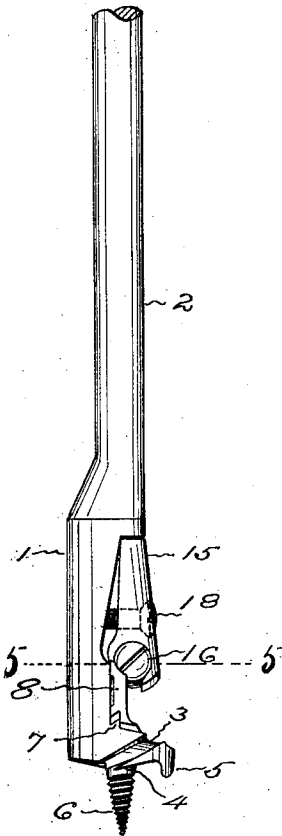


Fig. 2

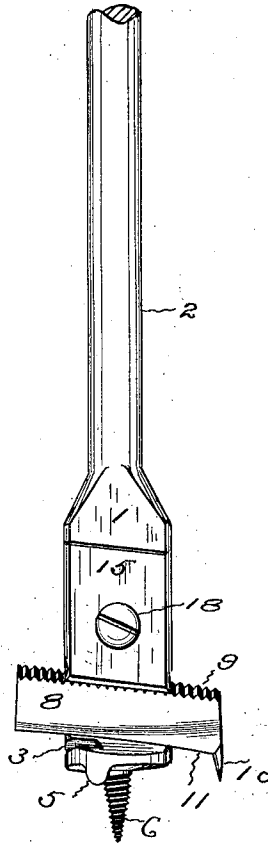


Fig. 3

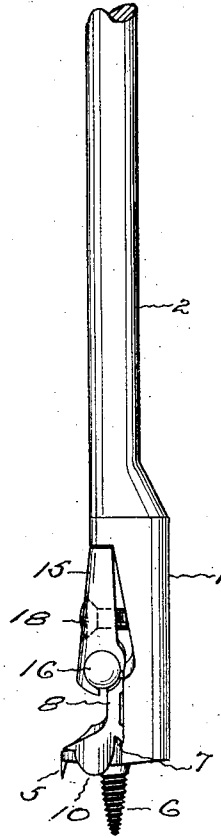


Fig. 6

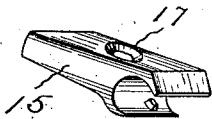


Fig. 4

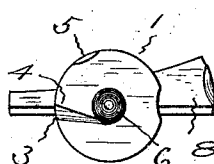


Fig. 7

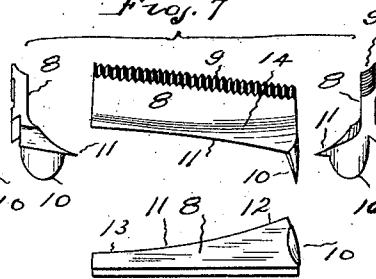
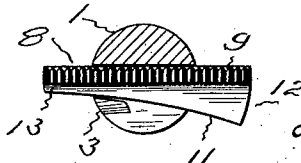


Fig. 5



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UNITED STATES PATENT OFFICE.

LOUIS S. HAYDEN, OF ESSEX, CONNECTICUT, ASSIGNOR TO THE CONNECTICUT VALLEY MANUFACTURING COMPANY, OF ESSEX, CONNECTICUT, A CORPORATION OF CONNECTICUT.

EXPANSION-BIT.

1,056,670.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed May 24, 1912. Serial No. 699,408.

To all whom it may concern:

Be it known that I, LOUIS S. HAYDEN, a citizen of the United States, residing at Essex, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Expansion-Bits, of which the following is a specification.

This invention relates to those wood boring tools which are provided with a cutting blade that can be adjusted more or less to one side of the center for the purpose of enabling the bit to be used for boring holes of different sizes.

The object of the invention is to provide a simple and cheap bit of this character which is strong and durable, and which is so constructed that the cutting blade may be easily and quickly adjusted to the necessary degree to bore the required hole and can be securely clamped in the position to which it is set by means of the adjusting part. This object is attained by locating the adjusting screw in the clamp plate and causing it to engage teeth in the edge of the cutting blade in such manner that when the clamp plate is tightened the adjusting screw which engages the teeth binds the blade in position.

Figure 1 of the accompanying drawings is a view looking at one side of a bit which embodies this invention. Fig. 2 is a view looking at the front. Fig. 3 is a view looking at the other side. Fig. 4 is a view looking at the bottom. Fig. 5 is a transverse section taken on the plane indicated by the dotted line 5—5 on Fig. 1. Fig. 6 is a perspective view of the clamp plate, and Fig. 7 shows plan, bottom and end views of the cutting blade and illustrate the feature of its construction whereby the angle of the cutting lip is the same from one end of the blade to the other.

The head 1 at the end of the shank 2 is cut away on one side so as to provide the necessary recess for the clamp plate and cutting blade. At the end of the head is the usual throat 3 and throat lip 4 for deflecting chips over the cutter blade, the head spur 5 and the centering or lead screw 6. The lower end of the recess is provided with the undercut shoulder 7 which dovetails into the angular recess in the bottom edge near the back of the cutting blade 8 for the purpose of holding that edge of the cutting blade in place. The upper edge of

the cutting blade is inclined and provided with rack teeth 9. On the outer end and projecting downwardly from the cutting blade is the blade spur 10.

A novel feature of the cutting blade is that the cutting lip 11, which is curved from the wide end 12 to the narrow end 13, so that it will not, however adjusted, interfere with the passage of chips up through the clearing throat, is tapered on the same angle from end to end in order that the same cutting effect may be obtained for its entire length, and the same cutting angle always be insured wherever the blade is adjusted. To accomplish this, that is, to have the cutting edge of the cutting lip on a curve and to have the angle of the cutting lip always the same, the lip when it is formed is milled off on the upper side so that the line 14 is on a curve, which, of course, is farther back from the cutting edge of the lip at the highest part of the cutting lip than it is at the lowest part of the cutting lip, as shown clearly in Fig. 7. This may be accomplished by either causing the bit blade to travel on a curve below the milling cutter by which it is shaped, or by causing the milling cutter to travel on a curve over the bit blade. By milling the blade on a curve in this manner, the angle of the cutting lip always remains the same, and yet the cutting edge of the lip will be on a curve.

The clamp plate 15 has a recess along its lower edge so as to provide a transverse groove for the adjusting screw 16. The clamp plate is also provided with a hole 17 for the clamp screw 18. When the clamp screw is turned in, the upper edge of the clamp plate abuts against the upper edge of the recess in the head, and the threads on the adjusting screw enter the threads of the rack on the edge of the cutting blade and are pressed down thereon in such manner as to hold the upper edge of the cutting blade in position and at the same time force it down so that the dove-tail holds the lower edge of the blade. When the clamp screw is loosened, the cutting blade may be adjusted by turning the adjusting screw which is held in the clamp plate in any desired manner.

With this construction the cutting blade is very securely held in place by the adjusting screw when the clamp plate is tightened. The adjusting screw bears on the edge of the

clamp plate for practically its whole length, and as the screw threads and rack teeth are cut the same, the threads engage on their edges and at the bottoms so that there is a large surface and no liability of breaking or jamming the threads. When the clamp plate is taken off, the adjusting screw remains in its groove and thus there is no danger of its dropping out and becoming lost.

10 The invention claimed is:

1. An expansion bit having a head with a recess, a cutting blade movable transversely of the head in said recess, said blade having a rack at one edge, a clamp plate, an adjusting screw carried by the clamp plate and adapted to engage the rack at the edge of the blade, and means for securing the clamp plate in position.

2. An expansion bit having a head with a recess, a blade movable transversely of the head in said recess, said blade having an inclined upper edge that is provided with rack teeth, a clamp plate held in said recess in the head, an adjusting screw carried by the clamp plate and adapted to bear on the toothed inclined edge of the blade, and means for tightening the clamp plate and causing the adjusting screw to bind the blade in position.

3. An expansion bit having a head with a recess, a blade movable transversely of the head in said recess, said blade having its lower edge inclined and engaging an inclined wall of the recess and having its upper edge inclined and provided with rack teeth, a clamp plate with its upper edge engaging the wall at the upper end of the recess in the head and having a transverse

recess in its lower edge, an adjusting screw held in said recess and adapted to engage the inclined rack at the upper edge of the blade, and a screw for tightening the clamp plate and causing the adjusting screw to bind the blade in position.

4. An expansion bit having a head with a recess on one side, a lead screw projecting from one end and a throat extending from the end adjacent to the lead screw to the recess, a blade movable transversely in the head with its lower edge engaged with the wall at the lower end of the recess in the head, said blade having a cutting lip that is wider at one end than the other and has a curved cutting edge that is of uniform angle from one end to the other, a clamp plate, an adjusting screw engaging the cutting blade, and means for tightening the clamp plate and causing the blade to be secured in position.

5. A cutting blade for an expansion bit having a cutting lip that is wider at one end than the other, has a curved cutting edge, and increases in thickness on a curve from the narrow end to the wide end whereby the cutting edge of the lip will be curved and the angle of taper of the lip will be the same from one end to the other.

6. A cutting blade for an expansion bit having a cutting lip that is wider at one end than the other and has a curved cutting edge that is of uniform angle from one end to the other.

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