

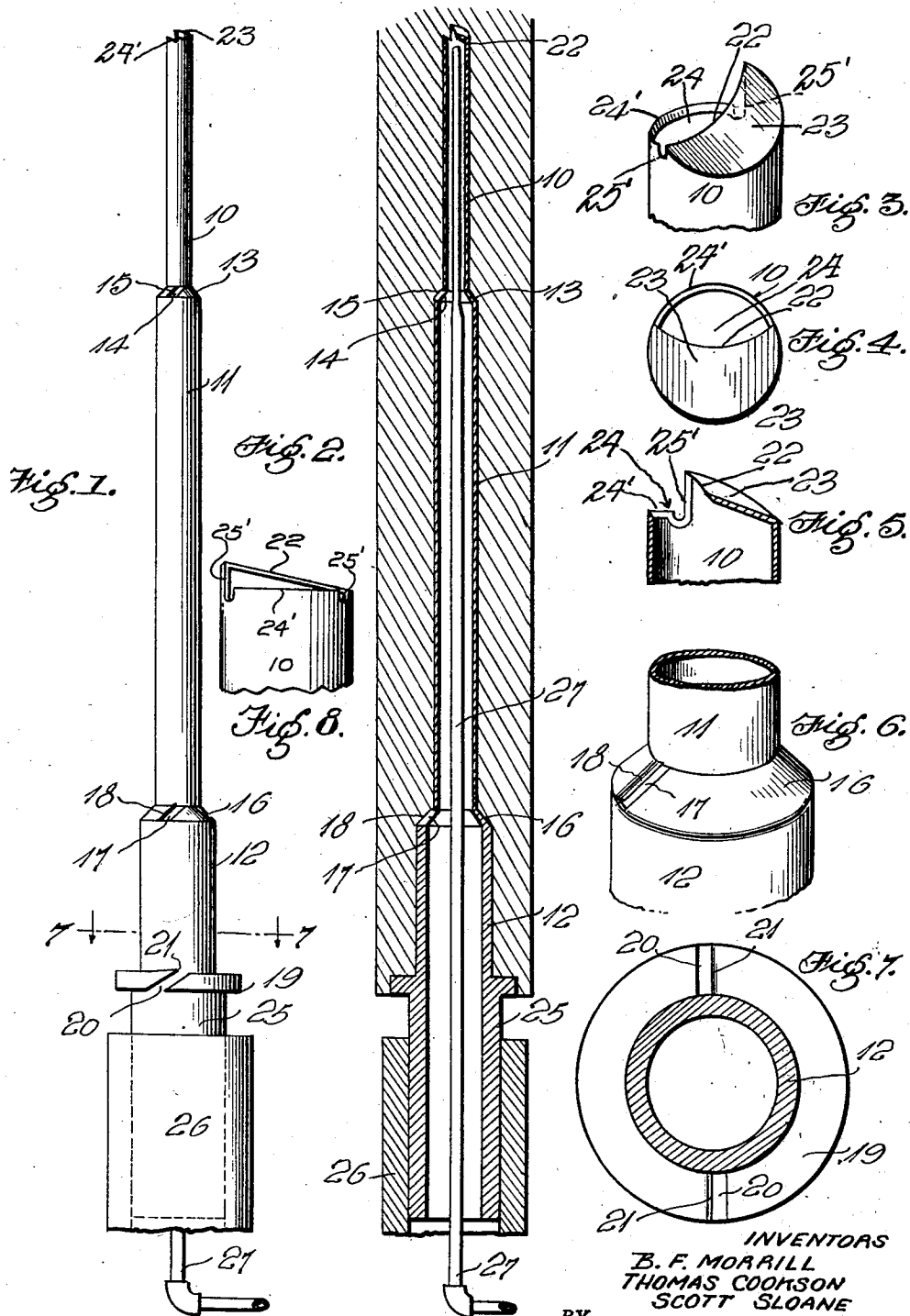
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BIT

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BIT

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The present invention is a cylindrical bit for boring deep holes in wood, such as required in the manufacture of bobbins.

In accordance with our invention, we provide a cylindrical bit having a concave cutting edge which produces a hole of the exact size, and it is impossible to vary the diameter of the hole, in any particular. The bit will also remain at dead center, after the starting of the boring operation, whereby the bobbins are constructed in extreme accuracy. The cylindrical bit is tubular so that the chips or shavings fall through the same from the point or points of cutting, thereby preventing the bit from being forced off center by choking or clogging and crowding against the wall of the hole being bored. This also permits of the continuous boring operation, eliminating the usual intermittent boring action present with the ordinary boring bits. It is preferred to provide means to aid in the removal of the chips or shavings from the interior of the tubular bit. This may be accomplished by passing a compressed air supply pipe axially through the tubular bit and the compressed air supply discharging into the same near the cutter serves to aid in the removal of the chips or shavings and also retains the bit suitably cooled. The cooling of the bit is important in rapid boring, which is ordinarily employed in drilling hardwood. The bit may be made in sections of increasing diameters to properly form the bore of the bobbin in sections of increasing diameters. The bit is preferably provided with a cutter to trim the end of the bobbin so that it will be of the proper length, all operations being accomplished before the bobbin blank is removed from the bit.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a cylindrical bit embodying our invention,

Figure 2 is a central vertical longitudinal section through the same, with the bobbin blank in place thereon at the completion of the formation of the bore,

Figure 3 is a perspective view of the upper or forward end of the bit,

Figure 4 is a plan view of the same,

Figure 5 is a central vertical section through the same,

Figure 6 is a fragmentary perspective view of the bit, showing the tapered shoulder,

Figure 7 is a transverse section taken on line 7-7 of Figure 1, and,

Figure 8 is a fragmentary side elevation of the upper end of the bit.

The bit is tubular and may be formed in any suitable number of cylindrical tubular sections 10, 11 and 12. The section 11 is of larger diameter than the section 10 and the section 12 of larger diameter than the section 11. The section 11 forms with the section 10 an upwardly tapering shoulder 13, having one or more radial slots 14, formed therein, with an upwardly projecting cutter or blade 15 arranged above the same. This cutter 15 is identical with the cutter 18, to be described. An upwardly tapering shoulder 16 connects the section 12 with the section 11 and a radial slot or slots 17 is provided, with an upwardly projecting radial cutter or blade 18.

A trimmer 19 is provided, in the form of a horizontal ring, having a slot or slots 20, with an upwardly projecting cutter or blade 21 arranged over the same.

The upper end of the tubular section or body portion 10 is provided with a concave cutting edge 22, formed upon a blade 23, and this blade covers a portion of the bore of the tubular section 10, while the remaining portion of such bore is uncovered affording a passage 24, for the free entrance of chips or shavings, into the tubular section 10. The blade 23 is inclined in a direction longitudinally of the concave edge 22, and satisfactory results are obtainable by having this inclination ten degrees from the horizontal, when the bit is vertically disposed while the invention is not restricted to the precise inclination. The blade 23 is also inclined transversely with respect to the cutting edge 22, and this inclination may be about thirty-five degrees from the horizontal when the bit is vertically disposed, but the invention is

not restricted to this precise inclination. The blade 23 is, therefore, inclined in planes at right angles to each other. Particular attention is called to the fact that the blade 23 is of such dimension that the concave cutting edge 22 thereof extends slightly past the center of the tubular section 10. This is important as it enables the cutting edge to cut or remove the material throughout the entire area of the circle, and if the cutting edge did not extend slightly beyond the center there would be a remaining core. The tubular section or body portion 10 is also provided at its forward end and circumferentially opposite the concave cutting edge 22 with a preferably horizontal edge 24', and this edge is preferably beveled, and serves to guide the chips or shavings to the interior of the tubular body portion. As more clearly shown in Figure 8, the edge 24' is at the elevation of the low end of the inclined blade 23. At the ends of the guiding edge 24', and arranged between the edge 24' and the cutting edge 22 are vertical edges 25', which are beveled upon their inner sides, and serve to deflect or guide the chips or shavings to the interior of the tubular section or body portion.

While we have shown but one cutting edge 22, yet the invention is not restricted to the use of one, as any suitable number of these cutting edges may be co-related and used, as is obvious.

The tubular section 12 is carried by a shank 25 which is held in a chuck 26. The bit is preferably vertical in use and may rotate while the blank is held stationary or the bit may be stationary and the blank rotated, or both bit and blank rotated at different speeds in opposite directions.

The numeral 27 designates a compressed air supply pipe extending longitudinally through the tubular bit and having its discharge end arranged adjacent to the concave cutting edges 22. Compressed air is thus fed into the tubular bit to aid in removing the chips or shavings and to keep the bit properly cooled, particularly when driven at high speed.

An important feature of the invention is the provision of the tubular bit with the concave cutting edge or edges. As a result of this construction, the bit cuts a true bore, by cutting across the grain instead of following or separating the grain of wood, as is done by the ordinary bit, with convex or cone pointed cutting edge or edges. When a rough bobbin or blank is more-or-less crooked, the concave cutting edge or edges has no tendency to follow or be guided by the crooked grain, because the cutting edge revolves around the center, and has no point to press against the grain. This mode of operation is the opposite to the ordinary cone pointed bit. Our improved bit will commence boring a blank with an uneven or inclined end or surface just as easily

or better than the ordinary bit would do with a blank having a trimmed or square end, as the concave cutting edge commences on the outside of the circle at its high end and works toward the center, thus making a true circle of the hole of exact size, because there is nothing to lead the bit off center, as the sides of the bit are perfectly straight and are free from cutting edges which would lead them off center.

It is to be understood that the form of our invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of our invention, or the scope of the subjoined claims.

Having thus described our invention, we claim:—

1. A bit for drilling long bores in wood, comprising a tubular body portion provided at its forward end with a blade extending across a portion of a bore of the tubular body portion and affording a passage leading into the tubular body portion, said blade having a concave cutting edge, said blade being inclined longitudinally of the concave cutting edge, and said blade having an edge disposed circumferentially opposite the concave cutting edge and arranged at substantially the elevation of the low end of the concave cutting edge.

2. A bit for drilling long bores in wood, comprising a tubular body portion provided at its forward end with an inclined blade covering a portion of the bore of the tubular body portion, said blade having a concave cutting edge extending beyond the center of said bore, said tubular body portion being also provided with a guiding edge to conduct the chips into the tubular body portion.

3. A bit for drilling long bores in wood, comprising a cylindrical tubular body portion, provided at its forward end with a blade having a cutting edge, said blade having a cutting edge provided with a cutting point terminating flush with the periphery of the cylindrical tubular body portion, and the center of said cutting edge extending laterally beyond the center of the cylindrical tubular body portion, said blade affording a passage leading into the tubular body portion.

4. A bit for drilling long bores in wood, comprising a cylindrical tubular body portion provided at its forward end with a blade which is transversely inclined with respect to the axis of rotation of the tubular body portion, said blade having a cutting edge provided with a leaning cutting point, which terminates flush with the periphery of the cylindrical body portion, said cutting edge having its center extending laterally beyond the center of the cylindrical tubular body portion.

tion, said blade affording a passage leading into the tubular body portion.

5 5. A bit for drilling long bores in wood, comprising a cylindrical tubular body portion, provided at its forward end with a blade which is inclined transversely with respect to the axis of rotation of the cylindrical tubular body portion, said blade having a concaved cutting edge provided with a leaning cutting point which terminate flush with the periphery of the cylindrical tubular body portion, the center of the cutting edge extending laterally beyond the center of the cylindrical tubular body portion, said bit being free from guiding means disposed forwardly of said blade.

10 6. A bit for drilling long bores in wood, comprising a cylindrical tubular body portion provided at its forward end with a blade which is transversely inclined with respect to the axis of rotation of the tubular body portion, said blade having a cutting edge provided with a leaning cutting point which terminates flush with the periphery of the cylindrical tubular body portion, said blade affording a passage leading into the tubular body portion.

In testimony whereof we affix our signatures.

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