(No Model.)

A. P. LANTERMAN.

MORTISING CHISEL.

No. 412,275. Patented Oct. 8. 1889.

Fig. 1.

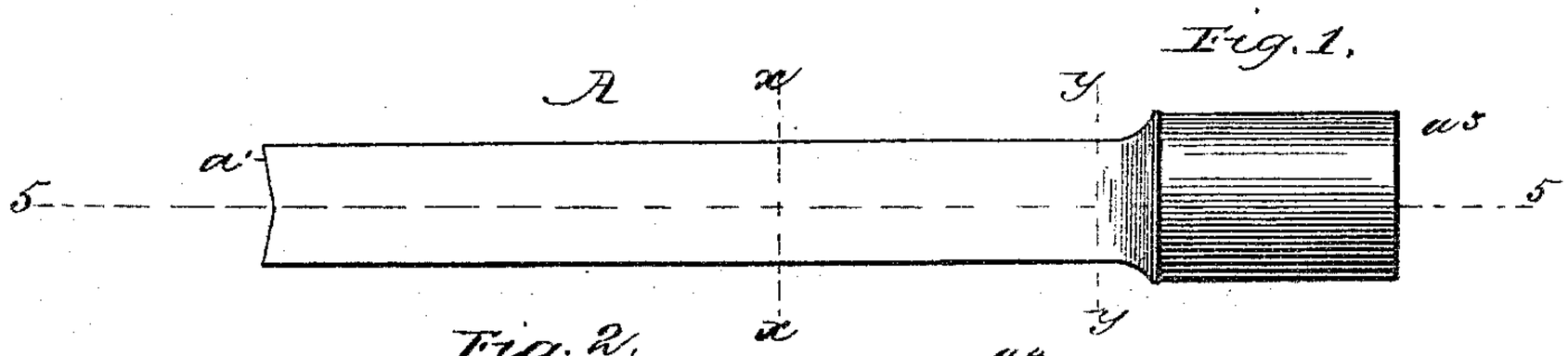


Fig. 2.

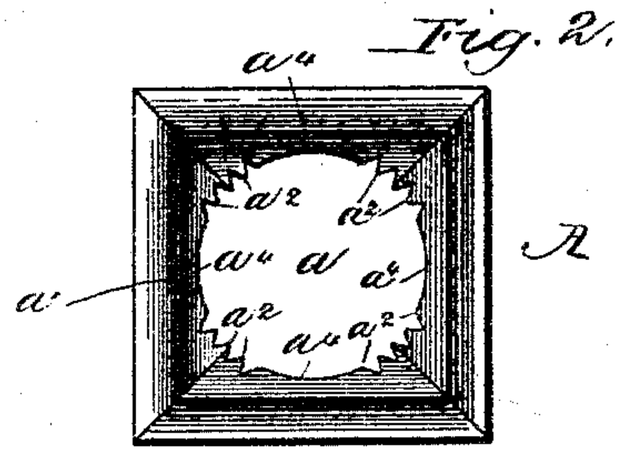


Fig. 3.

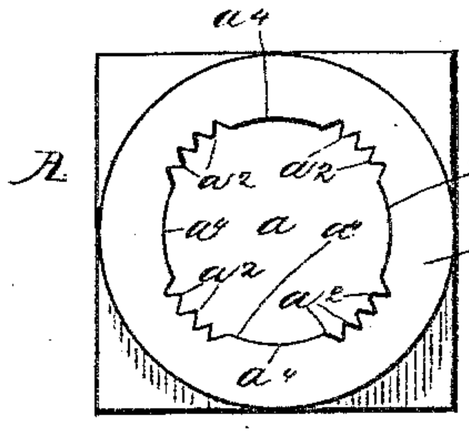


Fig. 11.

Fig. 4.

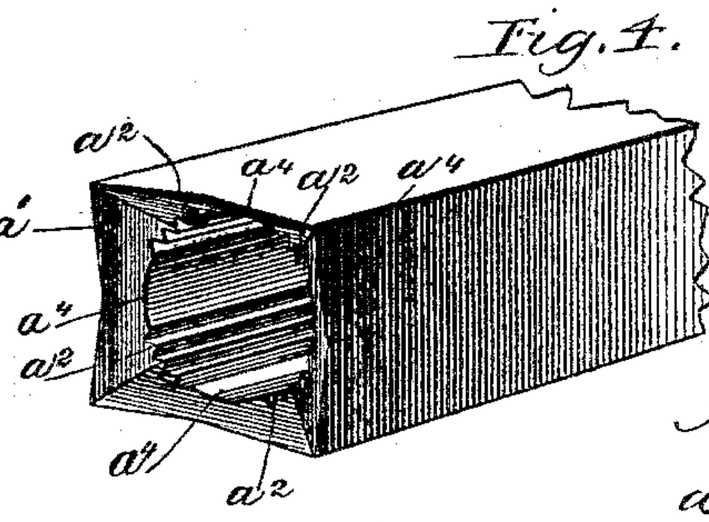


Fig. 7.

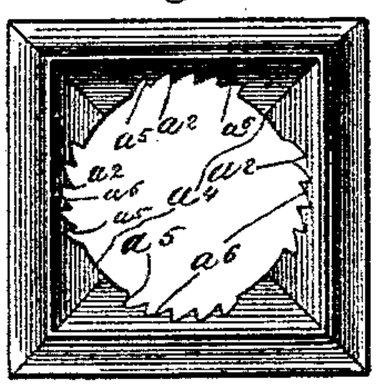


Fig. 8.

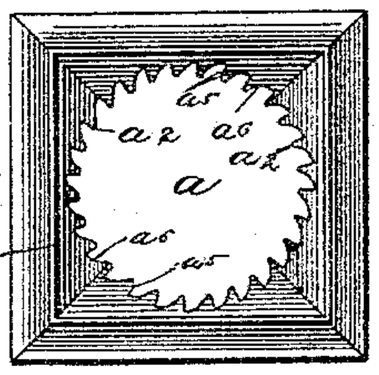


Fig. 5.

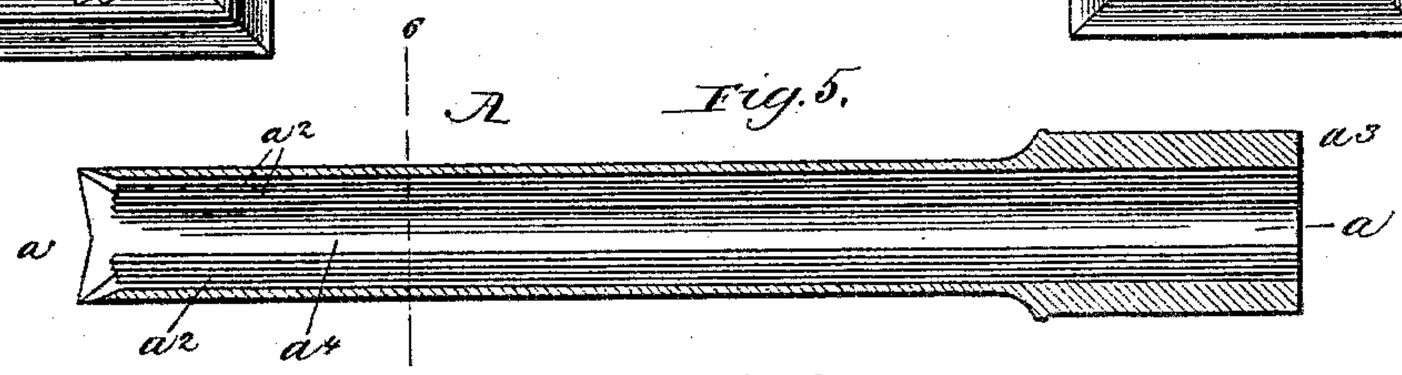
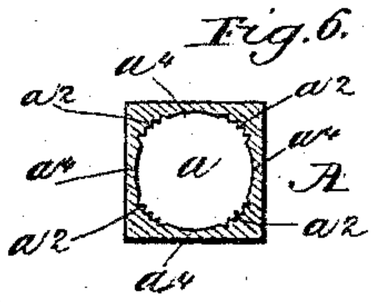


Fig. 6.



Witnesses
O. F. Poulter.
A. Coates.

Fig. 9.

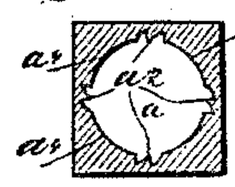


Fig. 10.

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UNITED STATES PATENT OFFICE.

ALVIN P. LANTERMAN, OF CHICAGO, ILLINOIS.

MORTISING-CHISEL.

SPECIFICATION forming part of Letters Patent No. 412,275, dated October 8, 1889.

Application filed June 11, 1889. Serial No. 313,941. (No model.)

To all whom it may concern:

Be it known that I, ALVIN P. LANTERMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Mortising-Chisels, of which the following is a specification.

My invention relates to a construction of mortising-chisel more particularly adapted for cutting square holes and involving a rotary spiral bit arranged for operation within a long hollow chisel, having its lower end adapted to form a square or rectangular cutting-edge, the bit being during operation revolved and gradually lowered by an appropriate member of a machine adapted for such purpose, so as to cause the bit to bore into the wood, and the chisel being during such operation depressed by another appropriate member of the machine, so that it may descend simultaneously with and follow the work of the bit, in order to square the round hole made by the bit.

The objects of my invention are to effectively prevent the chips from whirling around with the bit during operation and to compel them to pass freely and rapidly and from the point of cut up or back through the hollow chisel to the point of discharge, to avoid all danger of the chips becoming compacted within and clogging up the space between the bit and the inner wall of the hollow chisel, to avoid retardation of the rotary action of the bit, and to dispense with all necessity for longitudinal chip-discharge slots or openings formed through the sides of the hollow chisel, and thereby to avoid undesirably prolonging and weakening a chisel designed for cutting deep holes.

In a hollow mortising-chisel characterized by my invention the wall of the chisel-bore is provided with longitudinally-extending serrations—that is to say, the wall is notched longitudinally in a manner to provide it with defined teeth, each of a width proportional to the length of the two long gaps, respectively, at its opposite sides. The pitch, shape, and number of these teeth or serrations can be varied, and I may either provide the wall of the chisel-bore with teeth or serrations alternating with longitudinally-extending widths or plain cylindric surface portions, or I may serrate the entire surface of said wall, since in either case the serrated portion or portions will, while offering a positive frictional resistance to the whirling or revolution of the chips with the rotating bit, offer no material frictional resistance to the direct or straight longitudinal passage of the chips from the point of cut to the point of discharge, and, moreover, so guide and direct the chips as to compel them to take such course.

In the annexed drawings, Figure 1 represents in elevation the hollow chisel. Fig. 2 is an end view of the hollow chisel on a larger scale, the end shown being the cutting end. Fig. 3 is an end view of the chisel on the scale adopted in Fig. 2, the end shown being the butt or discharge end of the chisel. Fig. 4 represents in perspective and on a similar scale the cutting end of the hollow chisel. Fig. 5 represents a longitudinal central section taken through the chisel shown in Fig. 1 on line 5 5. Fig. 6 is a transverse section through said hollow chisel on line 6 6 in Fig. 5. Fig. 7 is a view similar to Fig. 2, and shows a preferred form and arrangement of serrations. Fig. 8 is a like view with, however, the entire surface of the wall of the chisel-bore serrated. Fig. 9 is a view corresponding to Fig. 6, but shows the wall of the chisel-bore serrated, so as to provide it with four teeth severally arranged at different points. Fig. 10 is a like view, but shows the wall of the bore provided with three sets of serrations. Fig. 11 shows a spiral bit substantially proportioned for the size of chisel-bore shown in Fig. 5.

The chisel A is provided with a longitudinally-arranged central bore *a*, which will in practice be proportioned to the size of bit B that is to be employed in conjunction with the hollow chisel. The cutting end *a'* of the chisel is properly sharpened, and is preferably shaped for cutting a square hole. The cylindric wall of the bore *a* of this chisel is provided with serrations or teeth a^2, which extend along said bore. The gaps or notches which are formed in the wall of the bore, so as to serrate or provide the same with defined teeth, extend longitudinally along said wall; and hence I have herein termed the serrations as "longitudinally-extending serrations," it being seen that each tooth or serration is of a

width proportional to the length of each gap or notch which is cut into the wall to produce a tooth.

For the purpose of cutting holes the butt-end a^3 of the chisel is to be held in a machine suitable for raising and lowering it, which said machine will also be adapted for holding the bit and for both rotating and imparting thereto an end movement, it being understood that the chisel and bit will be so held by the machine that the bit may extend down through the bore of the chisel.

During operation the bit will bore a round hole in the wood, and while the bit is performing such work the machine will cause the chisel to have an end movement in a direction to cut away the wood about the hole formed by the bit, and hence square the same, it being desirable to cut with the chisel as rapidly as the bit bores the hole, so that the chips may pass up or back through the hollow chisel. The longitudinal serrations within the bore of the hollow chisel effectively prevent the chips from whirling round with the revolving bit and compel them to travel directly back to the upper discharge end of the hollow chisel, it being of course understood that the boring-tools may be held horizontally or vertically, or at any desired angle. The portions a^4 of the wall of the chisel-bore, which in a majority of figures are non-serrated, are preferably left to so guide and center the bit, it being seen that the teeth formed by the longitudinal serrations do not project within the true radius of the bore, and hence that they do not interfere with the operation of the bit. These non-serrated portions of the wall of the bore are simply of sufficient width to provide guiding-surface for the bit, the remaining portion of the bore (and hence a large portion of its surface) being occupied by the serrations, which, being arranged in oppositely-disposed sets, most effectively prevent the tool from becoming clogged and compel the chips to work back to the discharge end of the hollow chisel.

I find by practical experiment that by the foregoing arrangement I am enabled to dispense entirely with the chip-discharging slots which have heretofore been provided through the sides of the hollow chisel, and which have usually been formed to extend about from line x to line y, Fig. 1. It will be evident that where the chisel is thus provided with chip-discharging slots a hole of considerable depth could not be cut with an ordinary length of chisel, and that to construct the chisel for boring a deep hole the length of chisel from line x, Fig. 1, to the cutting end must be equal to the length of hole to be bored, while, on the contrary, by my improvement the length of chisel from line y to the cutting end need only be equal to the required depth of hole. I therefore not only shorten up the chisel, but also prevent breakage.

I have not herein illustrated a machine for operating the chisel and bit, since machines for operating hollow chisels in conjunction with rotary bits are well known in the art. I prefer adapting the chisel for cutting square holes, and hence may make the chisel externally square in cross-section; but I may also make the chisel externally cylindric for the purpose of boring pump-logs.

In Figs. 2, 3, 4, 5, and 6 I have shown the teeth or serrations made V-shaped in cross-section, and I may employ to advantage substantially such form. I prefer, however, to employ a form of tooth or serration best illustrated in Fig. 7, wherein each tooth has one side a^5 in a plane substantially radial to the cylindric bore and its opposite side a^6 formed on a curve or incline, it being seen that the sides a^5 of the teeth will be directly opposed to the rotation of the chips when the bit turns to the right in cutting.

When the chisel is adapted for cutting square holes and is made superficially square in cross-section, the sets of serrations are advantageously arranged, respectively, opposite the several corners of the chisel, for the reason that there will be more metal at such points; and, moreover, I find in practice that such arrangement is productive of highly-satisfactory results, since the bore of the chisel will then have oppositely-arranged and longitudinally-extending widths of plain cylindric surface alternating with serrated portions; but good results can be attained by otherwise arranging the serrations—as, for example, I can serrate the entire wall of the bore, as in Fig. 8, the edges of the teeth in such case being somewhat blunt, whereby said edges arranged in a circle will serve to guide and center the bit. I can also employ two or more sets of serrations, as will be understood by reference to Fig. 10, wherein the wall of the chisel-bore is provided with three sets or series of serrations. I may also serrate the wall of the bore, so as to provide it at each of several points with a single tooth, as in Fig. 9, although of course such arrangement is not nearly so effective as the hereinbefore-described mode of serrating the wall, so as to provide at each point a plurality of teeth.

What I claim as my invention is—

1. A hollow mortising-chisel for the purpose described, having the wall of its bore provided with longitudinally-extending serrations, as set forth.

2. A hollow mortising-chisel for the purpose described, having the wall of its bore composed of longitudinally-extending widths of plain cylindric surface alternating with series of longitudinally-extending serrations, as set forth.

ALVIN P. LANTERMAN.

Witnesses:
CHAS. G. PAGE,
A. COATES.