

M. H. LYONS.
LAST LATHE.

APPLICATION FILED APR. 28, 1909.

Patented Apr. 12, 1910

2 SHEETS—SHEET 1.

954,447.

Fig. 1.

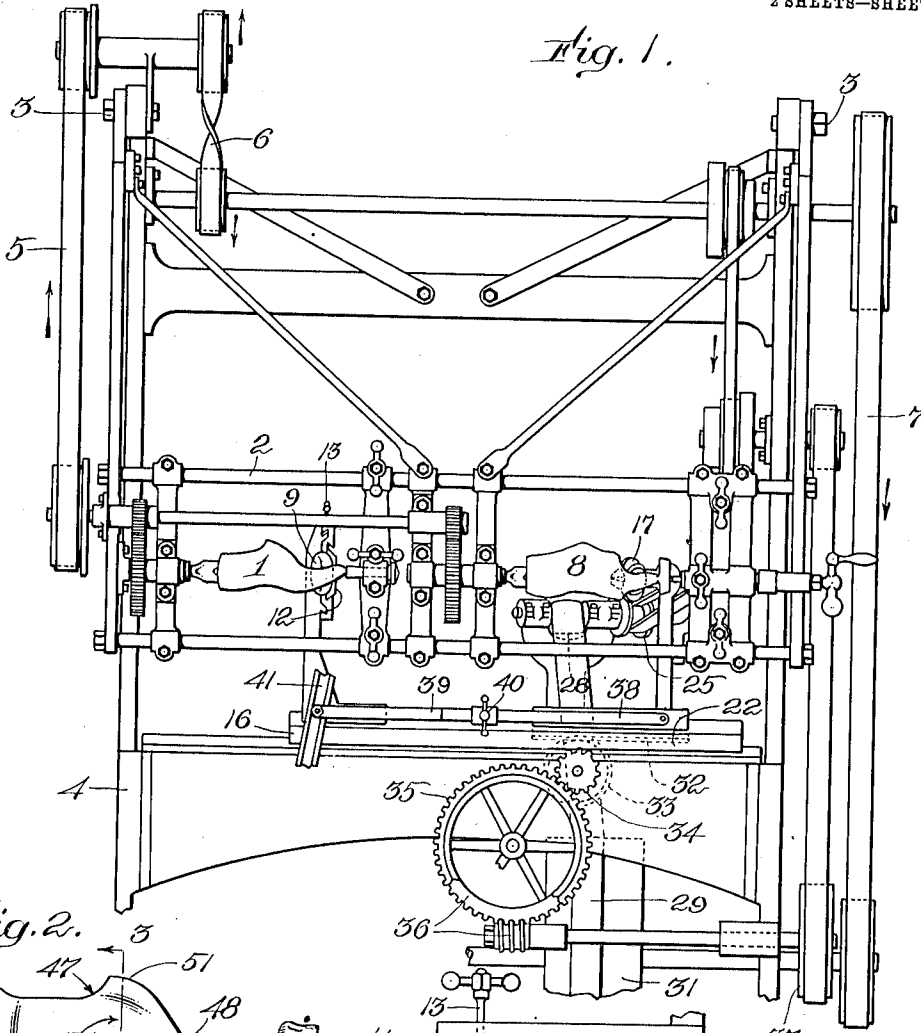


Fig. 2.

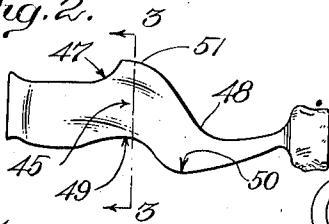


Fig. 3.

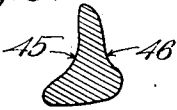
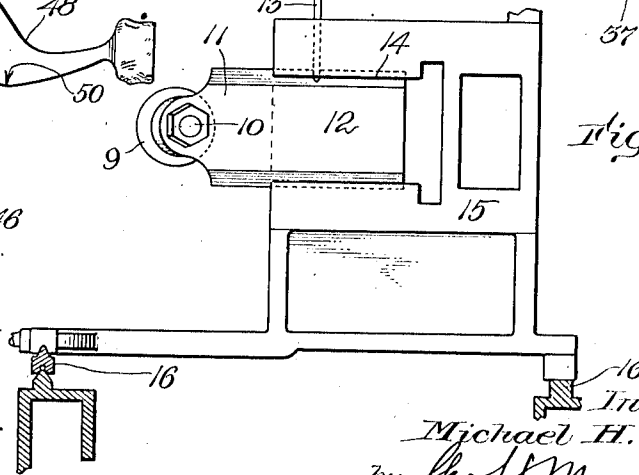


Fig. 4.



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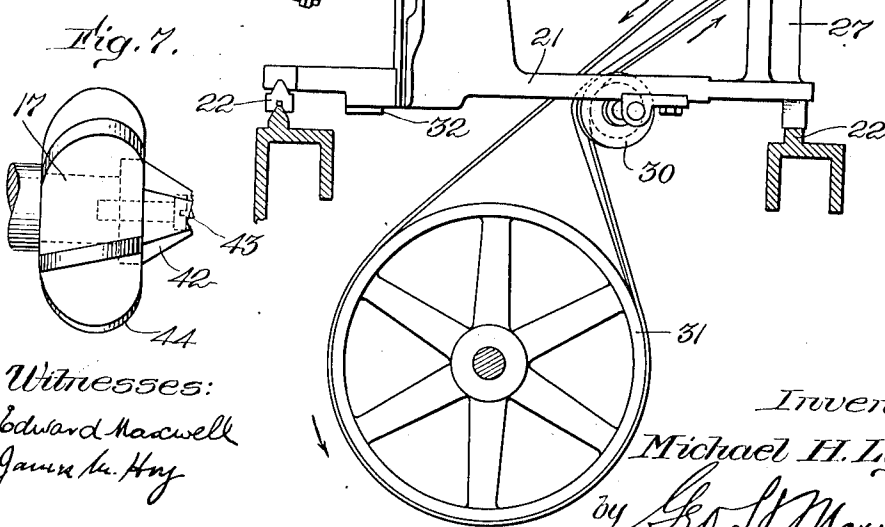
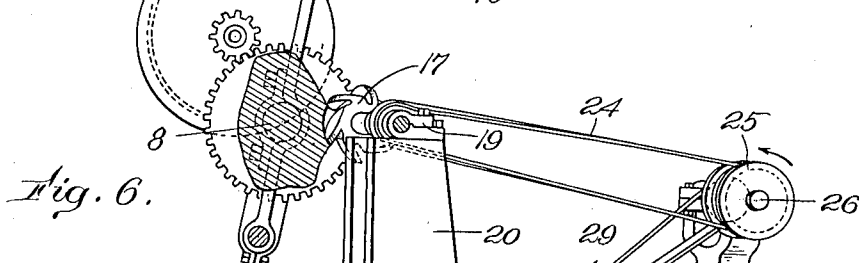
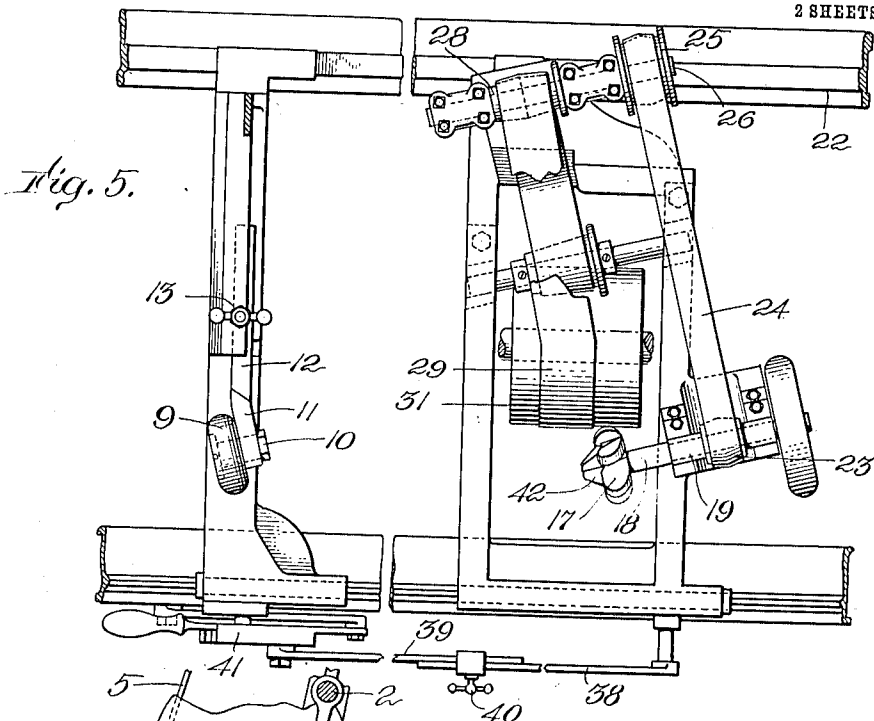
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

MICHAEL H. LYONS, OF BROCKTON, MASSACHUSETTS.

LAST-LATHE.

954,447.

Specification of Letters Patent. Patented Apr. 12, 1910.

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To all whom it may concern:

Be it known that I, MICHAEL H. LYONS, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Last-Lathes, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In turning certain irregular shapes such as modern shoe-lasts, special curves are met with which it is practically impossible to turn properly with the present turning lathe. For instance, the modern tendency in last manufacture is to have a very narrow cone, and in some styles of lasts there are various sharp bends, and it has been found necessary to do considerably hand shaving on lasts, at those points because the pattern wheel and the rotary cutter of the ordinary lathe has been unable to follow into and reproduce these sharp curves. Accordingly my invention aims to provide means for overcoming these defects. To this end I use a small pattern wheel and small cutterhead, which are set obliquely to the work, all as will be more apparent from the following description, reference being had to the accompanying drawings, in which I have shown a preferred embodiment of the invention.

In the drawings, Figure 1 shows in front elevation a regular Kimball & Sprague lathe, having my invention applied thereto; Figs. 2 and 3 are views in side elevation and cross-section respectively of a last, showing the special work which it is the object of my invention to accomplish; Fig. 4 is a cross-sectional detail showing in side elevation the arrangement of the pattern wheel supporting mechanism; Fig. 5 is a fragmentary top plan view of sufficient parts of the machine to make my invention readily understood; Fig. 6 is an enlarged cross-sectional detail similar to Fig. 4, showing the relative position of the cutterhead and its operating mechanism; and Fig. 7 is a fragmentary view in side elevation of said cutterhead.

I have shown herein a usual type of last-turning lathe, but it will be understood that my invention is applicable to any of the well-known lathes. As herein shown, a model 1 is held in place in usual manner in the swing frame 2 of the machine, said

swing frame being pivoted at 3 to the main frame 4 of the machine and driven by belts 5, 6, 7, and the work or last block 8 is mounted in usual manner at the opposite end of said swing frame. I deem it unnecessary to go into a detailed explanation of the last lathe itself as all the parts and operation thereof are old and well-known.

Coöperating with the model is a pattern wheel 9 which is substantially the same as heretofore excepting that it is small and its axis is oblique to or out of parallelism with the axis of rotation of the model or pattern 1. This small pattern wheel 9 is journaled at 10 in the angularly bent or oblique end 11 of a slide support 12 held adjustably by a hand screw 13 in dove-tailed ways 14 of an upright frame 15 mounted to reciprocate longitudinally of the machine in usual manner on ways 16.

Coöperating with the last block 8 is a small cutterhead 17 of the same diameter and peripheral shape and size as the pattern wheel 9 and set to rotate at the same oblique angle as the pattern wheel, being herein shown as mounted at the end of the axis 18 journaled at 19 in standards 20 extending upwardly from a carriage 21 mounted to slide longitudinally of the lathe on ways 22 the same as the pattern carriage 15. The cutterhead may be driven by any suitable means, but to adapt it to the type of lathe herein shown I have provided a pulley 23 on the shaft 18 connected by a belt 24 to a pulley 25 on a shaft 26 set obliquely on a standard 27 and carrying a small pulley 28 from which a belt 29 extends over an idler or direction pulley 30 to the usual driving drum 31. The cutter carriage is provided with a usual rack 32 driven by a toothed pinion 33 and a train of gears 34, 35, 36, from a belt pulley 37, and the cutter carriage and pattern wheel carriage are connected in usual manner by bars 38, 39, adjustably secured by a hand screw 40, and by grading mechanism 41, all of which being the same as heretofore it is unnecessary to explain.

The cutterhead has at its front side a nose-like portion 42 held adjustably in the rest of the cutterhead by a set screw 43 which prepares the way ahead of the peripheral portion 44 of the cutterhead 17 for the finishing operation of the peripheral part 44 in accordance with the requirements of the small pattern wheel 9.

The general operation of the lathe is the

same as heretofore, but, because of the special features which constitute my invention, it becomes possible to turn a last even of the extreme shape shown in Figs. 2 and 3. The end 42 of the cutter head routs out the wood ahead of the finishing blades 44 thereof, thereby not only permitting a quicker turning of the work but materially increasing the efficiency thereof inasmuch as both the pattern wheel and the cutter can readily follow such curvatures as indicated at 45, 46, 47, 48, 49, Figs. 2 and 3. If the axes of the pattern wheel and the cutterhead were parallel to the last-lathe centers or axes of rotation of the model and the work, the small wheel and the small cutter could not be used, as there would not be sufficient clearance to permit the rotation of the pattern and work. For instance, under such circumstances, the projecting portion 50 of the work would be liable to hit the shaft or journal or adjacent portion of the cutter when the latter was cutting at 47.

It has heretofore been considered necessary to employ a large cutter because certain of the cutter blades have been gouging cutters, and intermediate blades have been finishing cutters, but by having the gouging or routing cutters at the front as at 42 in my cutter, I am enabled to secure all the requisites of proper and rapid removal of the wood, and leave all the finishing cutters together to constitute simply the finishing operation separate from the rough-work operation of the cutter. Furthermore, by thus reducing the size and setting the axis obliquely as shown and explained, the cutter (and also the pattern wheel) is enabled to enter considerably within the extreme outer circle of rotation of the work (and pattern or model) for forming any desired reentrant curvatures such as shown at 45-49, without interfering in any way with the work. As the angle of the supporting spindle 18 is oblique, it is carried away from the projecting portions of the work so that the latter cannot hit it or any of the adjacent parts as the work rotates while the cutter is cutting the internal curves 45-49 mentioned.

As already intimated, my invention is applicable to the various last-turning lathes, and also is not confined to the precise constructional details herein shown, as many variations in shape and arrangement may be resorted to without departing from the spirit and scope of the invention as defined in the appended claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent is:

1. In a last-turning lathe, the combination with work-holding means and model-holding means, of a cutter spindle set obliquely to the longitudinal axis of the work at an angle away from the work in a direction away from that of the feed when cutting, having its end which is nearer and which points toward the work and which extends toward the work in the direction of the relative cutting movement freely projecting beyond its bearings, a cutter on said free end of said spindle having a finishing portion of relatively large diameter projecting radially beyond said bearings, and a pattern wheel for engaging the model set in the same relation to the model that said cutter is set with relation to the work and adjustable relatively to said cutter toward and from the work.

2. In a last-turning lathe, the combination with work-holding means and model-holding means, of a cutter spindle set obliquely to the longitudinal axis of the work, having its end which is nearer the work and which extends in the direction of the relative cutting movement freely projecting beyond its bearings, a cutter on said free end of said spindle, said cutter having at its forward end a rough-work turning portion of relatively small diameter, and between said front end and its bearings a finishing portion of relatively large diameter.

3. In a last-turning lathe, the combination with work-holding means and model-holding means, of a small cutter capable of cutting in accordance with the sharp curves and reentrant angles of an extreme last model, said small cutter having its axial support set with relation to the work at such an oblique angle extending away from the work as to be entirely outside of the range of movement of the projecting finished portions of the work, and having a finishing portion of relatively large diameter extending freely beyond said bearings and a central forwardly projecting rough-work turning portion of relatively small diameter, and a small pattern member for following the model adjustable toward and from the work, having the same engaging size and shape as the cutter and set at the same angle with relation to the model as said cutter is set with relation to the work.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MICHAEL H. LYONS.

Witnesses:

FRED L. SPRAGUE,
FRED BRIDGWOOD.