(No Model.) 2 Sheets—Sheet 1.

T. H. WORRALL.

TAPER AND PULLEY TURNING ATTACHMENT FOR LATHES.

No. 332,578. Patented Dec. 15, 1885.

Fig. 1.

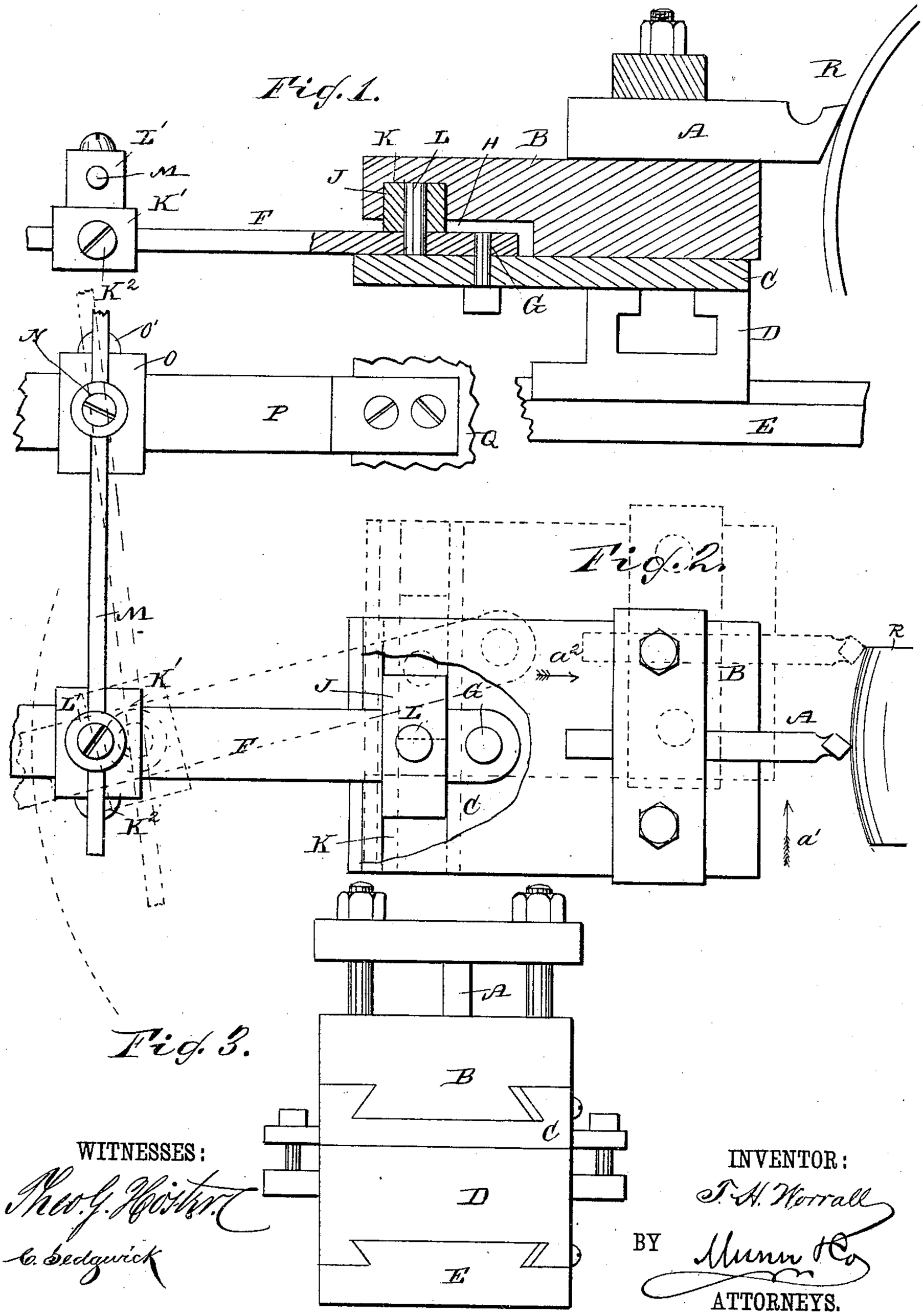

Fig. 2.

Fig. 3.

WITNESSES:

Rec'd. Hoisted

C. Sedgwick

INVENTOR:

T. H. Worrall

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

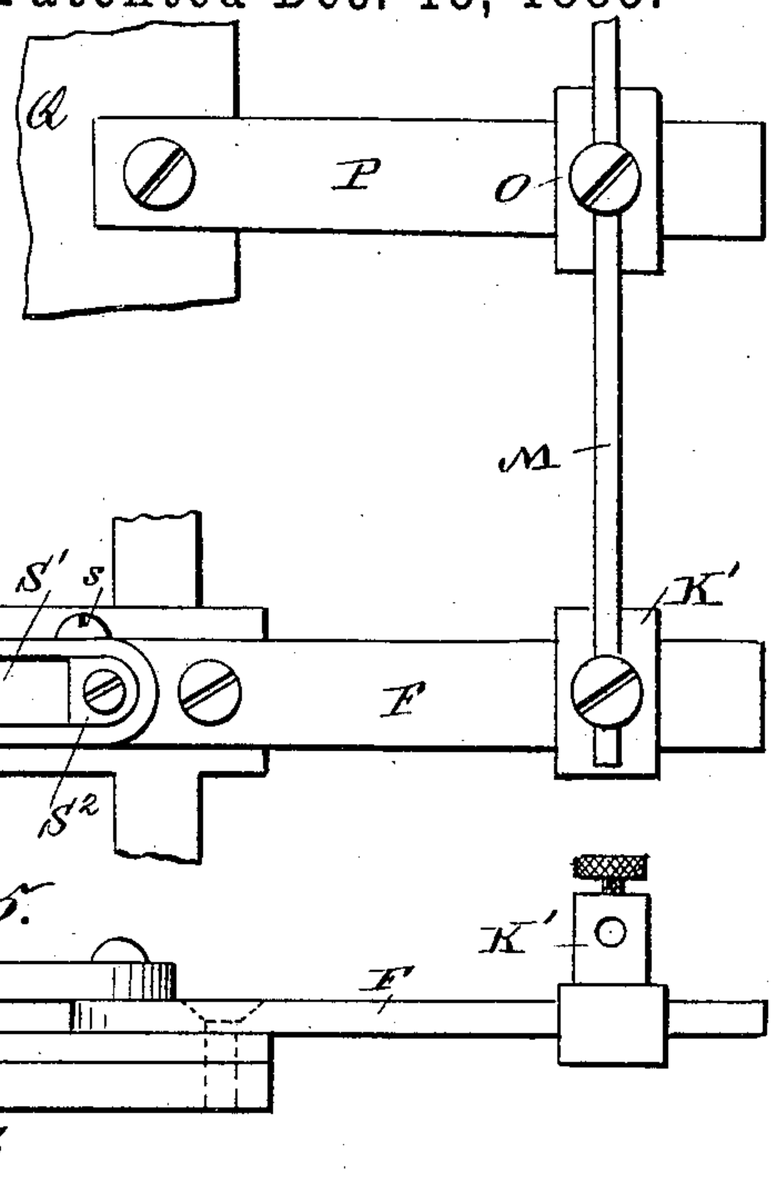


Fig. 5.

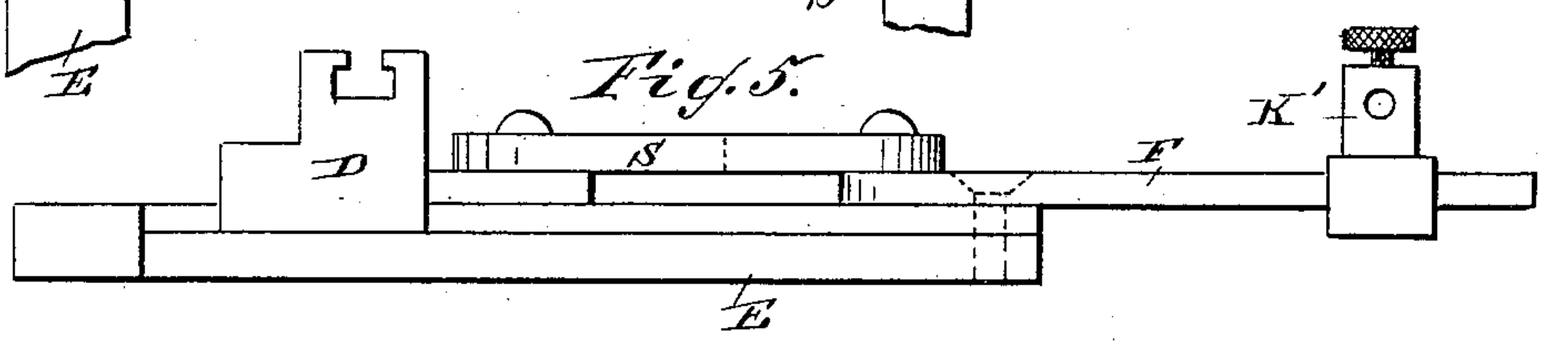


Fig. 6.

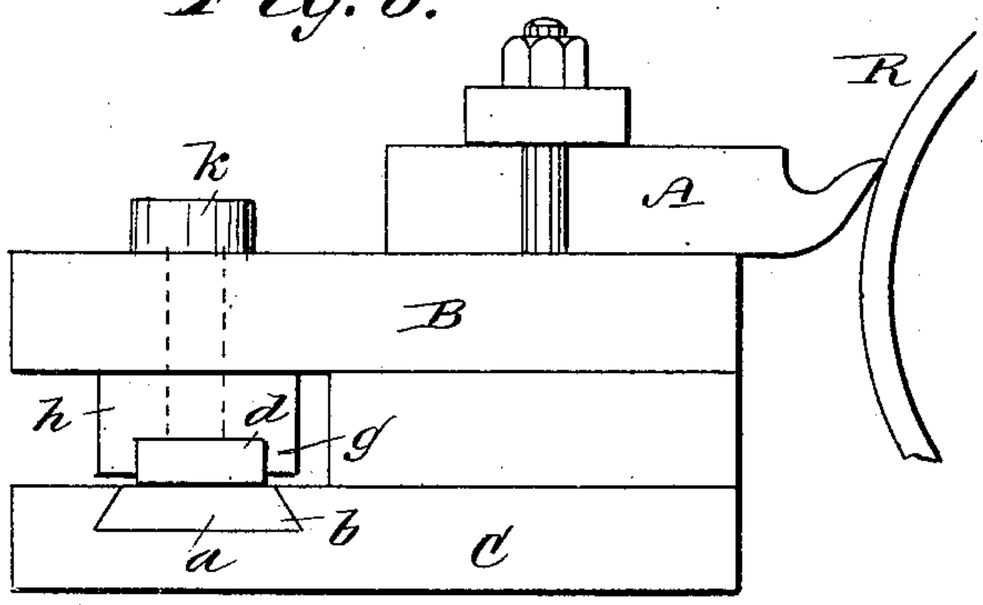
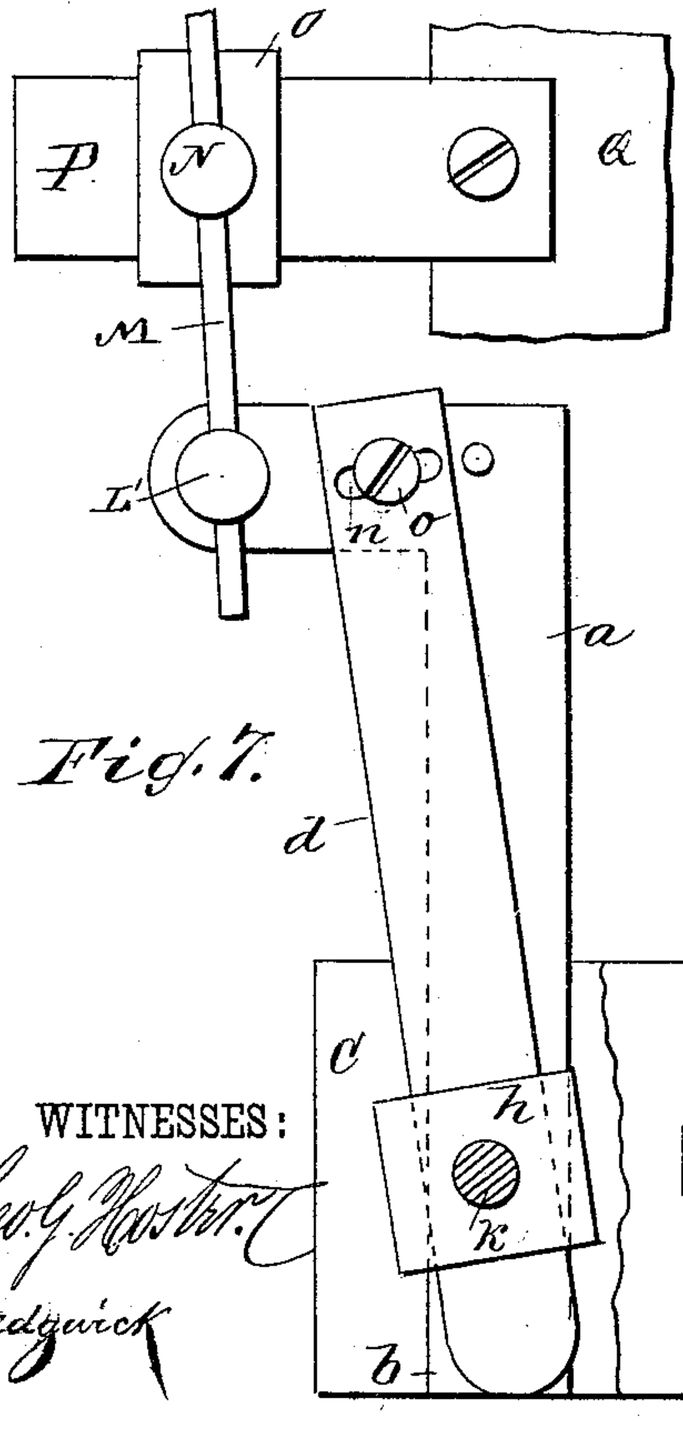


Fig. 7.



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UNITED STATES PATENT OFFICE.

THOMAS H. WORRALL, OF MEREDITH VILLAGE, NEW HAMPSHIRE.

TAPER AND PULLEY TURNING ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 332,578, dated December 15, 1885.

Application filed March 5, 1885. Serial No. 157,822. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. WORRALL, of Meredith Village, in the county of Belknap and State of New Hampshire, have invented a new and Improved Taper and Pulley Turning Attachment for Engine-Lathes, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved attachment for engine-lathes, whereby the tool-holder is automatically shifted to turn a convex face on the rim of a pulley or to turn a bevel, as may be desired.

The invention consists in the arrangement and combination of parts and details, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved pulley-turning attachment for engine-lathes. Fig. 2 is a plan view of the same, parts being broken out. Fig. 3 is an end view of the tool-holder. Fig. 4 is a plan view of a modification. Fig. 5 is a side view of the same. Fig. 6 is side view of the attachment for tapering. Fig. 7 is a plan view of the same.

The tool A is bolted on the part B, which is arranged to slide on the plate C, which is bolted to the tool-post holder D on the lathe-carriage E. A lever, F, has one end pivoted by a pivot, G, to the top of the plate C, a recess, H, being formed in the under side of the piece B for receiving the end of the arm or lever F. A block, J, is arranged to slide in a groove, K, in the under side of the block B, and a pin, L, is passed through the block J into the lever F. On the lever F a slide, K′, is mounted, which is held in place by a binding-screw, K^2, and on the said slide K′ a swivel-stud, L′, is arranged, in which one end of a bar or rod, M, is held, the other end of the rod being held in a swivel-stud, N, on a slide, O, held in place by a screw, O′, on a bar or rod, P, projecting from the lathe-bed Q to which it is fixed. The tool A acts on the outer face of the rim of the pulley R. The carriage reciprocates in the direction of the arrow a' and in the reverse of this direction.

The operation is a follows: Supposing the carriage to be moving in the direction of the arrow a', Fig. 2, and the tool has arrived at the middle of the rim of the pulley, as shown in said figure, as the carriage continues its movement in this direction the lever F will by its connection to the fixed bar P on the lathe-bed and to the tool-holder, cause the latter to be moved in the direction of the arrow a^2 until the tool arrives at the edge of the pulley being turned, when the parts will assume the position shown in dotted lines. The carriage is then moved in the reverse direction of the arrow a', when the tool-holder will be moved in the reverse direction of the arrow a^2 until the tool arrives at the middle of the pulley, when the tool-holder will again begin and continue to move in the direction of the said arrow a^2 until the tool arrives at the other edge of pulley.

By repeating the above operation a convex curve will be formed on the rim of the pulley.

The block J may be removed from the pin L, and an ogee or other shaped groove made instead of the plain groove K, that would give other movements to the tool.

If the arm or lever F is pivoted to the piece C by means of the pin L, and the bolt G connects the arm F with the piece B, the tool-holder, instead of being moved from the pulley as the tool approaches the middle thereof, will be moved toward the same, thereby forming a concave curve in the outer surface of the rim of the pulley in place of the convex curve in the manner described. The curve on the rim of the pulley can easily be changed by adjusting the slides K′ and O different distances from the pivoted or fixed ends of the arm P and lever F.

If desired, the lever or arm F may be pivoted on the back of the tool-carriage E, as shown in Figs. 4 and 5, the connection with the arm P remaining the same. Communication between the arm or lever F and the tool-post hold D is established by means of the link or lever S, which is pivoted to the tool-post holder D and to the inner end of the lever or arm F. The lever S has a longitudinal slot,

S′, in which the block S^2 is held, which is fastened on the lever F, and the slot is provided, to allow the tool to move up to the pulley when the block S^2 is not held fast by a set-screw, *s*. Between the handle U on the feed-screw and the carriage E a short space is left to permit the screw to move with the tool-post, in order that the lever or arm F may control the tool. The connecting-lever S may be connected with the nut that holds the feed screw, which obviates the necessity of the space between the handle and the carriage. The connecting-lever S, omitting slot S′, may be used instead of block J and groove K shown in Figs. 1 and 2. The operation is the same as with the construction shown in Figs. 1, 2, and 3, and the parts are adjusted for turning convex or concave pulleys by connecting the lever S to the lever F on opposite sides of the pivot of the said lever F.

For turning bevels, an angle-lever, *a*, is substituted for the lever F, which angle-lever is dovetailed and works in a dovetailed groove, *b*, in the piece C. A slide, *d*, is secured at an angle on the lever *a*, and passes into a groove, *g*, in the bottom of a block, *h*, pivoted on the under side of the plate B by the bolt *k*. When the carriage moves in the direction of the straight shank of the angle-lever *a*, the said lever slides through the groove *b*, and the slide *d* slides through the groove in the block *h*, and as it is held at an inclination to the shank of the lever *a* it moves the piece B and the tool-holder on it in the direction of the arrow *m′* during the stroke in one direction and in the inverse direction of the arrow *m′* during the return-stroke. A bevel can thus be made on the rim of the pulley or other work, which bevel can be changed by changing the position of the slide *d*, which has a slot, *n*, through which a screw, *o*, is passed for holding the said slide *d* in the desired position on the short shank of the lever *a*.

Only one half of the rim of the pulley is turned at a time, and then the pulley is reversed so that the other half can be turned.

The above-described machine can also be used for any other taper work.

An emery-wheel may be used with attachment instead of an ordinary steel tool.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a lathe, the combination, with a carriage and a sliding tool-holder thereon, of a lever having its inner end movably connected to the carriage and its outer or free end connected to the bed of the same, and intermediate connections between the inner end of the said lever and the sliding tool-holder, substantially as herein shown and described.

2. In a lathe, the combination, with the bed and a carriage thereon, of a sliding tool-holder on the carriage, and a lever pivoted to the carriage and connected to the tool-holder and bed, substantially as herein shown and described.

3. In a lathe, the combination, with the bed and a carriage thereon, of a tool-holder fitted in ways on the carriage, a lever pivoted to the carriage and to the tool-holder, and a bar connected to the said lever and to a fixed arm on the bed, substantially as herein shown and described.

4. In an engine-lathe, the combination, with the arm P, fixed on the bed, of the pivoted lever F, connected by a rod, M, with the arm P, the sliding tool-holder, and the link or lever S, connecting the tool-holder and the lever F, substantially as herein shown and described.

5. In an engine-lathe, the combination, with the arm P fixed on the bed, of the pivoted lever F, connected by a rod, M, with the arm P, the sliding tool-holder, the link or lever S, having a slot, S′, and the block S^2, placed in the slot S′ and held on the lever F, substantially as herein shown and described.

6. The herein-described attachment for lathes, consisting of the sliding tool-holder, the pivoted lever F, the link S, pivoted to the lever and holder, and the bar M, swiveled to the said lever and to a fixed support, as specified.

THOMAS H. WORRALL.

Witnesses:
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CURTIS F. SMITH.