(No Model.) 2 Sheets—Sheet 1.

J. MILLS.

Hub Lathe.

No. 242,468. Patented June 7, 1881.

FIG. 1.

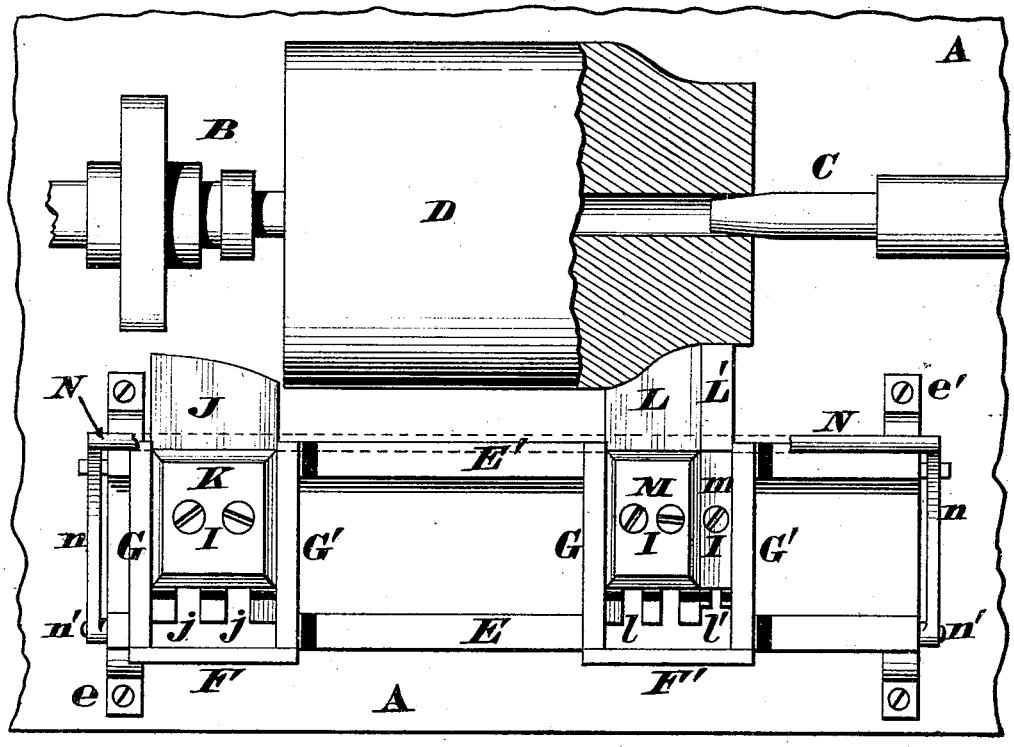


FIG. 2.

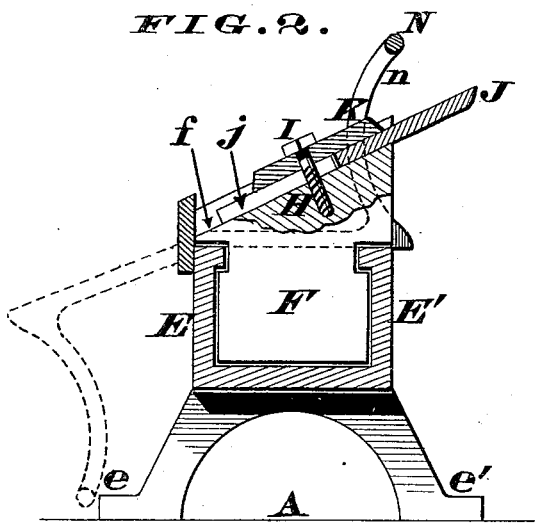
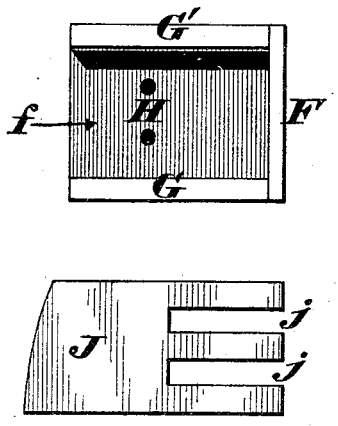


FIG. 3.



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(No Model.) 2 Sheets—Sheet 2.

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FIG. 4.

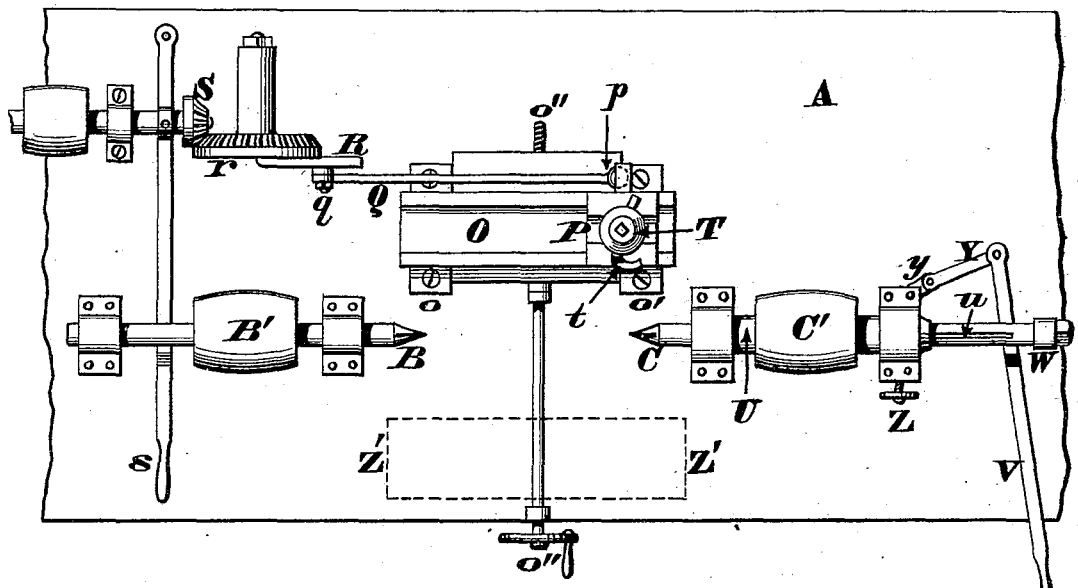


FIG. 6.

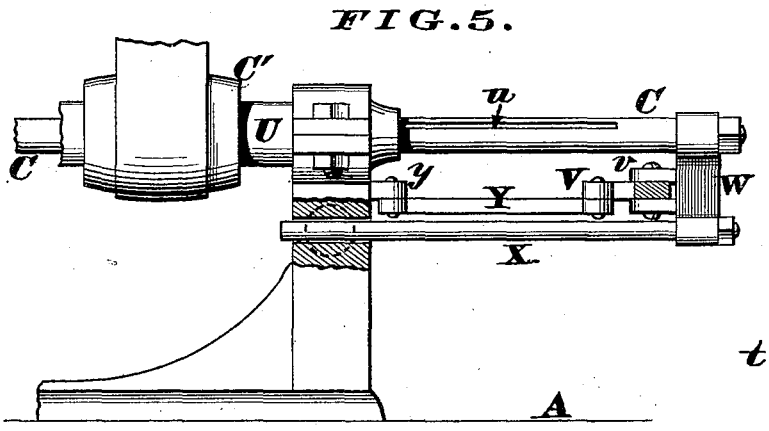
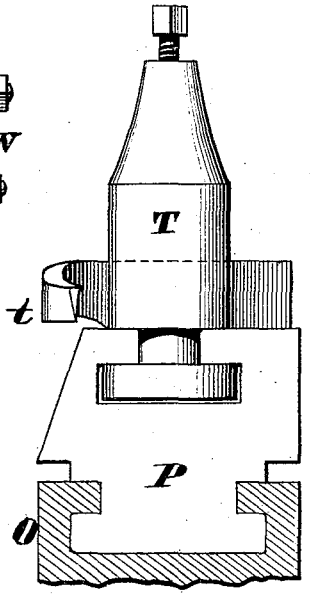


FIG. 5.



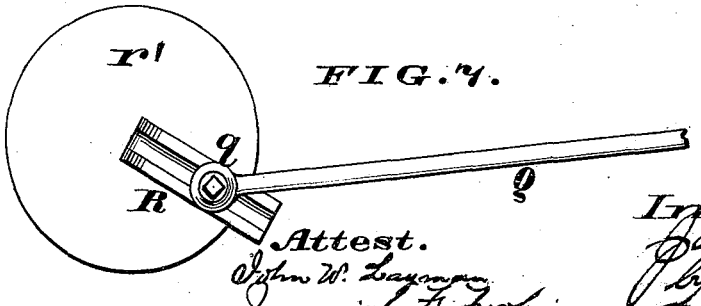


FIG. 7.

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UNITED STATES PATENT OFFICE.

JAMES MILLS, OF CINCINNATI, OHIO.

HUB-LATHE.

SPECIFICATION forming part of Letters Patent No. 242,468, dated June 7, 1881.

Application filed July 6, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES MILLS, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Hub-Lathes, of which the following is a specification.

My invention consists in combining with a wood-turning lathe a rapidly-reciprocating rougher for reducing a hub or other block to about the proper diameter, and one or more cutters capable of being readily and independently shifted by hand, for the purpose of imparting the desired shape or finish to said block. This rapidly-reciprocating rougher is disposed longitudinally of the lathe, as are also the finishing-cutters, the hub or other block being mounted on customary spindles interposed between said roughing and finishing devices. Furthermore, this rougher is mounted on a slide, so as to be advanced toward the block or retracted therefrom, as occasion may require, and is driven with a crank-connection or any equivalent mechanical device capable of driving said rougher at a very high speed. By thus disposing a rapidly-reciprocating rougher and reciprocating hand-finisher longitudinally of the lathe, I am enabled to turn down the hub and then give it the desired shape without removing the block from the spindles, as hereinafter more fully described. In addition to this leading feature of my invention, I have devised minor improvements in such lathes, the details of which devices will be hereinafter fully described, and pointed out in the claims.

In the annexed drawings, Figure 1 is a plan of the front portion of a lathe-bed provided with my finishing-cutters. Fig. 2 is a transverse section through the guide and one of its shiftable slides. Fig. 3 is a plan of one of the slides and its cutter, these two members being detached from each other. Fig. 4 is a plan of the lathe-bed with the rougher attachment applied thereto, the position of the hub-finisher being indicated by the dotted lines $Z'Z'$. Fig. 5 is an enlarged vertical section of the shiftable spindle of the rougher. Fig. 6 is an enlarged elevation of the tool-post and its accessories. Fig. 7 is an elevation of a modified form of the devices that drive the rougher.

Referring to Fig. 1, A represents a portion of a lathe-bed of any approved form, and B C are the head and tail spindles of the same, which spindles may be so shaped as to drive the block D in the most effective manner. Located in front of these spindles is a guide consisting, preferably, of a pair of shears, E E′, secured to said bed *e e′*, and carrying two slides or carriages, F F′, of which slides the one F will be more fully described. This slide has two cheeks, G G′, and an inclined face, *f*, which latter is tapped at H H to receive screws or bolts I that secure to said slide F any approved shape of cutter J. These screws pass through longitudinal slots, *j*, of the knife or cutter, and through a cap, K, the cheeks G G′ serving to prevent lateral play of the knife. The other slide, F′, is made in a precisely similar manner, but its cutter is made of two slotted pieces, L *l* L′ *l′*, secured in position by screws I and appropriate caps M *m*.

N is a tool-rest arranged parallel with and a suitable distance above the guide E′, said rest consisting of a bar whose opposite ends are so bent as to afford arms *n*, pivoted at *n′* to the guide E, or to the lathe-bed A. When in use, the rear ends of these arms rest upon the guide E′, or upon lugs projecting from the same, but when the rest is not needed it can be turned down in front of the guide E, as indicated by dotted lines in Fig. 2.

My rougher attachment consists, essentially, of a laterally-adjustable slide, O, mounted on suitable guides *o o′*, so as to be shifted either toward or away from the spindles B C by means of the feed-screw *o″*, as seen in Fig. 4. This slide has guides, which may be similar to the ones E E′, for the purpose of confining to a correct path the reciprocating carriage P, to which latter is coupled, by a ball-joint, *p*, one end of a pitman, Q, the other end of said pitman being adjustably attached, at *q*, to a driving-crank, R, operated by any suitable mechanism. Preferably this crank is attached to or cast with a bevel-wheel, *r*, driven by a pinion, S, which latter is capable of being thrown in or out of gear with said wheel by means of a lever, *s*, or otherwise.

The carriage P is furnished with a post, T, armed with a suitable knife, *t*, whose cutting-

edge is on the lower side of the tool and toward the lathe-spindles B C. B′ and C′ represent the pulleys that drive these spindles, said pulleys being run at uniform speed by bands communicating with an elevated shaft or otherwise. By thus rendering both of these spindles drivers, and running them at the same speed, less friction is generated than would be the case if one of them was made stationary, in the usual manner.

Pulley C′ is fastened to a mandrel, U, having a pin or feather engaging with the longitudinal groove *u* of spindle C, in order that the latter may continue to revolve while it is being shifted either to the right or left. This shifting is effected by a lever V, pivoted at *v* to a plate, W, uniting spindle C *u* to a stop-rod, X, one end of said lever being coupled to a link, Y, which latter is jointed, at *y*, to the spindle-frame. Spindle C must be free to revolve within the coupling W without becoming detached therefrom when said spindle is advanced or retracted.

Z is a hand-wheel and screw wherewith the stop-rod X can be locked at any desired point, so as to adjust the spindle C to hubs of various lengths.

The dotted lines Z′ Z′ (seen in Fig. 4) represent the location of the guide E E′, with its slides, cutters, &c.

The operation of my improved hub-lathe is as follows: Mandrel C is first retracted, and the slides F F′ shifted to the opposite ends of guides E E′, after which act the block D is applied to spindle B, and the one C is then advanced, inserted in the central bore of said block, and securely locked therein by screwing stop Z firmly against the rod X. The lathe is now set in motion, thus imparting a rapid reciprocation to carriage P, and as its slide O is fed toward the spindles B C by screw *o″* the appropriate cutter or knife *t* speedily reduces the block D to the proper diameter. This roughing operation having been effected, slide O is retracted, and the one F′ is then grasped by the turner and drawn toward the center of guide E E′, thereby causing the cutters L L′ to reduce the right end of the block to the shape shown in Fig. 1, or to any other shape, according to the contour of the cutting-edges of said knives L L′. The slide F′ is now retracted, and the one, F, brought into service by shifting the latter toward the center of guide E E′, so as to turn down the left end of the block. Slide F is finally retracted, the finished hub disengaged from the spindles, another block applied to the lathe, and the above-described operations repeated.

From this description it is evident that the readily-shiftable slides F F′, in connection with their attached cutters J L, serve to turn down the opposite ends of the hub in the most expeditious and uniform manner, which result cannot be so speedily and accurately effected by those lathes whose knives are fed transversely of the bed A, or, in other words, at right angles to the spindles B C, as such a transverse action is not always regular, but will sometimes cut away too much of the block, while at other times it will not remove enough of the same; but with my attachment the utmost uniformity is obtained, as the knives J L are first set to secure the necessary depth of cut, and consequently there can be no variation until said knives are intentionally shifted on their respective slides F F′. Furthermore the block is roughed out and then finished without removing it from the spindles of the lathe, thereby saving both time and labor.

Suitable stops may be applied to the shears E E′, to limit the advance of the slides F F′, or the block may be scored circumferentially to indicate how far the knives are to be moved longitudinally of said block.

While preferring to dispose the guides E E′ parallel to the spindles B C, and to mount two slides on said guide, yet this arrangement may be modified by employing two separate guides located obliquely with reference to said spindles, and providing each guide with an independent cutter-slide. Furthermore, the slide O may be curved so as to cause its carriage P to describe an arc of a circle of any desired radius, or said slide may be set to rough out a conical block.

In Fig. 7 the crank R is applied to a pulley, *r′*, which latter may be driven with a belt.

Finally, I do not propose to limit myself to any special form or combination of knives or cutters, but reserve the right of modifying the same to suit the requirements of any peculiar hub.

I am aware it is not new to apply roughing and finishing cutters to turning-lathes, as such attachments are seen in several patents, and, therefore, my claim to this feature of the invention is not designed to be construed broadly, but is limited to the within-described combination of rapidly-reciprocating laterally-adjustable rougher, driven with a crank-connection, and a pair of independently hand-shiftable finishing-cutters when disposed longitudinally of the lathe and on opposite sides of its spindles.

I claim as my invention—

1. The combination, in a wood-turning lathe, of a rapidly-reciprocating laterally-adjustable rougher, driven with a crank-connection, and one or more hand-shiftable cutters, said rougher and finisher being disposed longitudinally of the lathe and on opposite sides of its spindles, substantially as described.

2. A roughing attachment consisting of the laterally-shiftable slide O, carrying a rapidly-reciprocating carriage, P, armed with a suitable-tool, *t*, said carriage being driven with a crank-connection, as herein described.

3. The combination, in a hub-lathe, of the laterally-adjustable slide O, rapidly-reciprocating carriage P, pitman Q, and crank R, as herein described.

4. The combination of longitudinally-grooved

live-spindle C *u*, driving-pulley C′, mandrel U, shifting-lever V *v*, coupling W, stop-rod X, and locking device Z, as herein described.

5. The tool-rest consisting of a bar, N, extending longitudinally of the finisher-guide E′, and provided with arms *n*, pivoted to said guide at *n*′, for the purpose specified.

In testimony of which invention I hereunto set my hand.

JAMES MILLS.

Witnesses:
JAMES H. LAYMAN,
GEO. H. KOLKER.