T. MILLER, Jr. & S. H. HAINES.

Lathes for Turning Axles.

No. 155,742. Patented Oct. 6, 1874.

FIG. 1

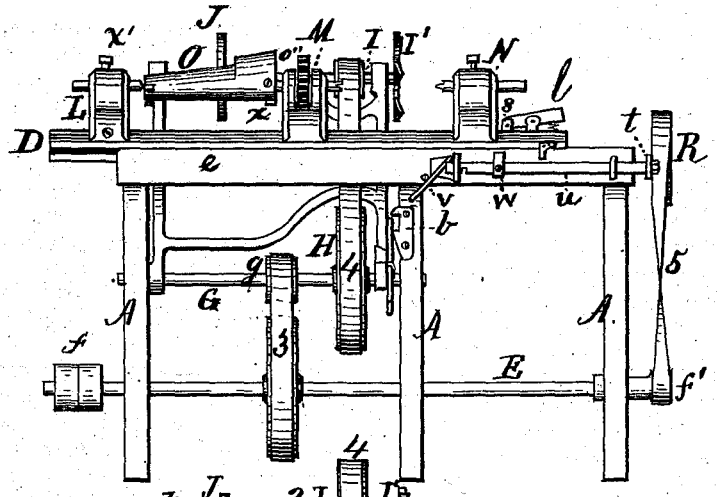


FIG. 2

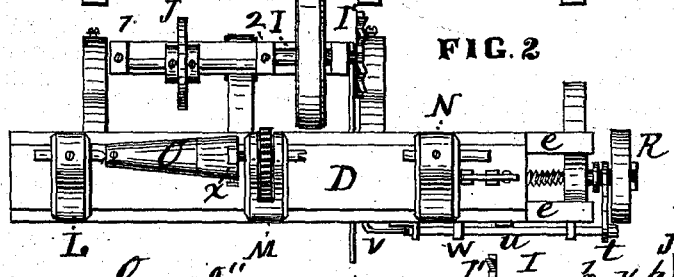


FIG. 4

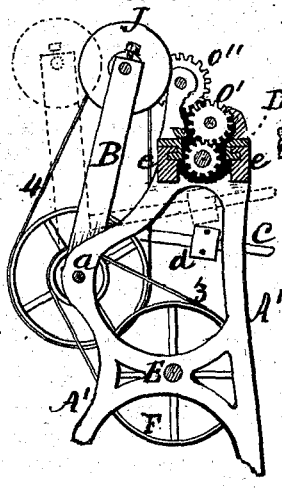


FIG. 5

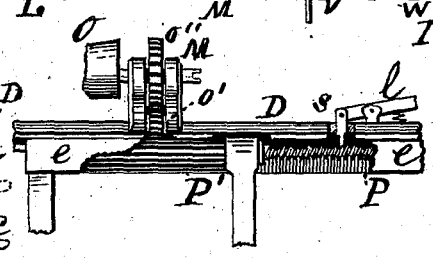
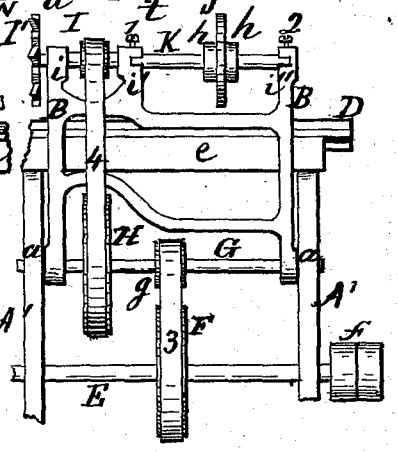


FIG. 3



WITNESSES;

John M. Davidson

F. B. Lauderbo

INVENTORS:

Thos. Miller Jr.

Samuel H. Haines

By

H. R. S. Keck Atty.

UNITED STATES PATENT OFFICE.

THOMAS MILLER, JR., AND SAMUEL H. HAINES, OF SPRINGBOROUGH, OHIO.

IMPROVEMENT IN LATHES FOR TURNING AXLES.

Specification forming part of Letters Patent No. **155,742**, dated October 6, 1874; application filed March 13, 1874.

To all whom it may concern:

Be it known that we, THOMAS MILLER, Jr., and SAMUEL H. HAINES, of Springborough, in the county of Warren and State of Ohio, have jointly invented a new and useful Improvement in Lathes for Turning Axles; and we do hereby declare that the following is an exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1 represents a front elevation of our improved machine. Fig. 2 represents a top view of same. Fig. 3 represents a rear elevation of so much of the machine as to show the hinged frame upon which the pattern-wheel and tool are mounted. Fig. 4 represents an end view in elevation, with a portion broken away to exhibit the spur-gears *o' o''*; and Fig. 5 represents the traveling table and its driving and gear mechanism.

Our invention relates to the combination of certain new features, by means of which the turning of axle-arms can be more easily, cheaply, and perfectly accomplished.

The main frame A A' and the adjustable vibratory hinged frame B are pivoted together at *a a*, and the hand-lever *c* is rigidly secured to the latter, and extends out in front of the machine, and may be made fast in the notch in plate *b*, or held by its weight *d*, when the work is being done. Upon the top of the frame A A' two longitudinal grooved rails, *e e*, are secured, in which tongues formed upon the traveling table D work, as seen in Fig. 4. The driving-shaft E is furnished with large belt-wheel F and small pulley *f'*. Shaft G is provided with pulley *g* and belt-wheel H, and the shaft I, upon which the tool I' is mounted, has its bearings in the stands *i i'* of the swinging frame B; and pattern-wheel J is free to revolve, by contact with the pattern O, upon its shaft K, it being held by two adjustable collars, *h*, so as to be moved upon its shaft for different lengths of axle-arms to be turned; and the set-screws 1 2 serve to secure the shaft K, which is adjustable laterally in grooves in the studs *i' i''*, as seen in Fig. 3. This adjustment of the pattern-wheel shaft is necesssary in order to turn axle-arms of different sizes by the use of the same pattern. The traveling table D, which will carry the pattern and the axle to be turned, has three chuck-stands, L M N, each of which is provided with suitable spurs, by which the pattern O and the work to be turned will be secured. The central stand M is permanently secured to the table; but the stands L and N are adjustable, so as to change the relative distances from the central stand for different lengths of pattern used and the work to be done. Between the rails *e e*, upon which table D travels, the screw-shaft P and elongated pinion P', which are rigidly connected together, are located, having suitable journal-bearings in the frame A A'. Upon the table D the lever *l* is pivoted upon its fixed fulcrum, and to one end of lever *l* there is pivoted a short stud, *s*, passing down through a hole in the table D, and the lower end of stud *s* is formed with a curved and V-shaped edge to traverse between the threads of the screw P. This stud *s* is held down by the spiral spring upon the table, which bears up against the free end of lever *l*; and when the table is to be returned after a piece of work has been done, the operator can place his thumb upon lever *l* and raise stud *s*, and then slide the table freely upon its rails *e e*, ready for the next work. Connected with the screw-shaft P there is a clutch, which operates automatically to stop the work at any desired stage of it. This clutch is connected with the pulley R, and is actuated through the short lever or clutch-fork *t*, sliding notched bar *u*, spring *v*, and adjustable stop-weight *w*. The belts 3 and 4 drive the cutting-tool I', and the belt 5 drives the screw or worm gear and elongated pinion P', which serve as a single shaft. The central stand M has a wide central slot or mortise extending down through it, in which the two spur-gears *o' o''* are located and suitably journaled. The short shaft of spur-gear *o''* revolves with it, and its projecting ends are provided with strong tangs to enter the end of the "axle-timber" and the chuck-block *x*. Gear *o''* meshes with long pinion-roller P', which it traverses as the table travels with the work. The axle-arm O, which serves as a pattern, has a groove formed in each end, in which are placed, at right angles to each other, chuck-blocks *x x'*, which may be adjusted and held at desired relations to each other and to the pattern by set-screws, as represented at Figs.

1 and 2. The object of these adjustable blocks is to provide means of alternating the position of the pattern, so as to give the proper or desired "swing" and "gather" to both the right and left arms of an axle. Without this provision two sets of patterns, pattern-wheels, and tools would be necessary; but with this improvement the axle is reversed in the lathe, so as to turn both of its arms with the single set of mechanism, as stated. The pattern-wheel J is of equal thickness with the tool I′, and traverses the same relative course on the pattern which is being cut away upon the axle by the tool. The alternate cutting-teeth of the tool (which is a rotary cutter) are formed for cutting with the grain of the wood, and the intermediate teeth cut across the grain, so as to form the necessary square shoulder upon the axle-arm.

The operation of this machine may be briefly explained. The cutting-tool is revolved by means of belts 3 4, and screw-shaft P and pinion P′ are revolved by belt 5. The table D is gradually moved along upon its grooved rails *e e* by the connection of the V-shaped edge of the stud *s* with the screw-shaft P, and the pattern O and axle-timber will be revolved by the pinion P′ and gears *o′ o″*. The shaft of the latter, revolving with it, will cause the pattern and timber to revolve with the same speed. The pattern-wheel J will rest against the pattern, and be revolved by its friction upon the revolving pattern. The adjustable weight *d* on lever *c* will give the vibratory frame sufficient inclination to hold the tool I′ to its work. The stop-weight *w* on bar *u* is adjustable, and the bar *u* has a notch in its under side, which will catch upon one of the staples through which the bar works, and there be held by spring *v*, when the stud upon the edge of table D is brought in contact with the stop-weight *w*, and this will throw the clutch out of connection and stop the motion of the table D. The same spring *v*, which thus holds the clutch out of gear, also serves to hold the clutch in gear until the movement of the table causes bar *u* to be moved and its notch to fall upon the staple, as represented.

Having described our invention, we claim—

The combination, in an axle-lathe, of the screw-shaft P and long pinion P′ with the traveling table D and its gears *o′ o″*, substantially as described.

Witness our hands this 30th day of January, A. D. 1874.

THOMAS MILLER, JR.
SAMUEL H. HAINES.

Witnesses:
H. P. K. PECK,
E. C. MARTIN.