(No Model.) 2 Sheets—Sheet 1.

W. H. LENHART.

TUBULAR CUTTER LATHE.

No. 355,540. Patented Jan. 4, 1887.

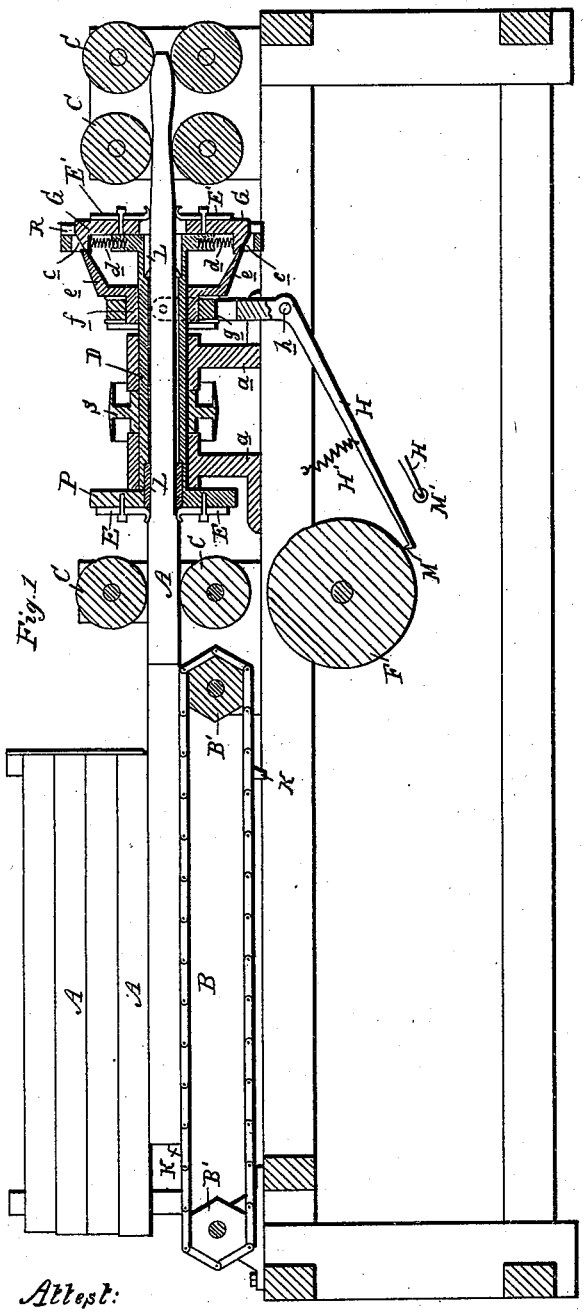

Fig. 1.

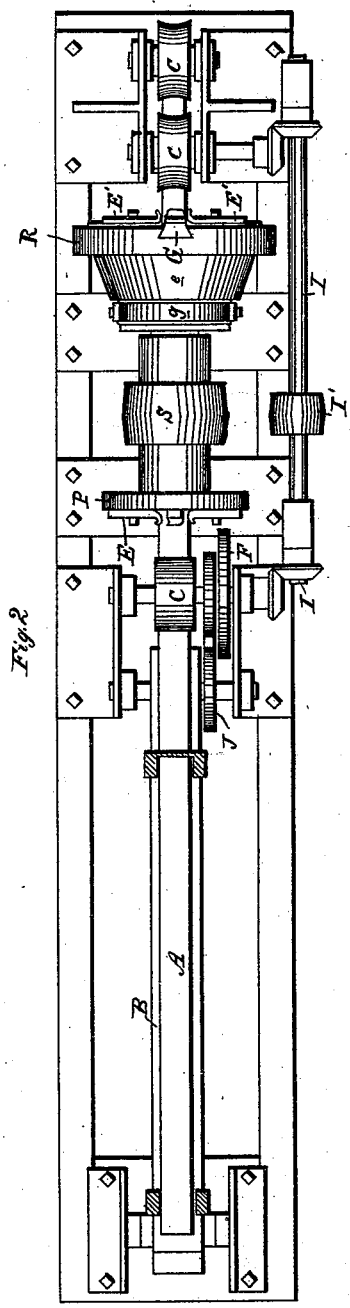

Fig. 2.

Attest:
John Schuman
E. Scully.

Inventor:
William H. Lenhart.
by his Atty
Thos. L. Shroyer

(No Model.) 2 Sheets—Sheet 2.

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Fig 4

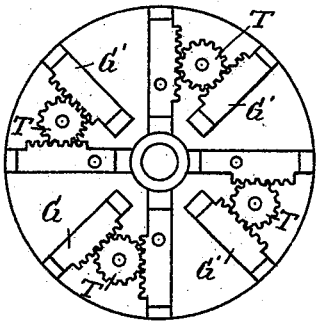
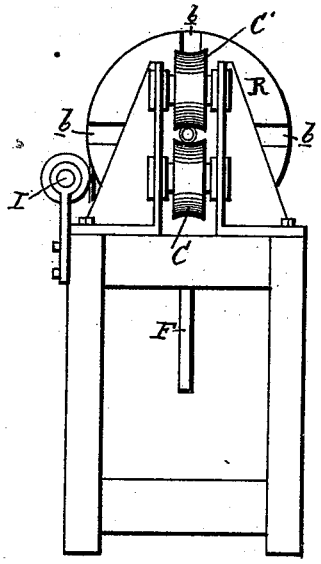


Fig. 3



Attest:
John Schuman.
E. Scully.

Inventor.
William H. Lenhart.
by his Atty
Thos. L. Sprague

UNITED STATES PATENT OFFICE.

WILLIAM H. LENHART, OF DEFIANCE, OHIO.

TUBULAR CUTTER-LATHE.

SPECIFICATION forming part of Letters Patent No. 355,540, dated January 4, 1887.

Application filed April 8, 1886. Serial No. 198,215. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. LENHART, of Defiance, in the county of Defiance and State of Ohio, have invented new and useful Improvements in Lathes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and useful improvement in a lathe of the kind commonly known as a "handle-turning lathe;" and the invention consists in the improved construction and arrangement of the parts, as hereinafter described and claimed.

In the drawings which accompany this specification, Figure 1 is a vertical longitudinal section of my improved lathe. Fig. 2 is a plan thereof. Fig. 3 is an end elevation of the rear end of the machine. Fig. 4 is a detached face view of the cutter-head, showing the arrangement of the sliding knives.

A A are a number of sticks to be turned. They are placed vertically upon each other within a well formed by a suitable frame or rack secured on top of the bed of the lathe in line with the feed-rolls C, which latter are constructed and arranged as usual.

B is a feed-chain passing around sprocket-wheels B′, and having lugs K, all so arranged that the latter in traveling with the chain carry the lowest stick which rests upon the chain to the feed-rolls, which take hold of it and feed it through the cutter-head.

D is a tubular shaft journaled in suitable bearings, *a*, and provided upon its ends with the heads P R.

S is a drive-pulley secured upon the tubular shaft, and suitable power is applied to this pulley to revolve it at a high rate of speed when set in motion.

I is a feed-shaft carrying the pulley I′, to which the power is applied. It is provided with suitable intermediate gearing to communicate the proper motion to the feed-chain, to the live feed-rolls, and to the pattern-wheel F, as shown.

The head P has adjustably secured to it the radial knives E, which operate upon the square stick while the latter is pushed through the cutter-head by the chain-feed, thereby rounding it off straight.

The head R is provided with radial recesses or slots *b*, preferably of dovetail shape, in which are guided the radially-movable knife-holders G, having the radial knives E′ adjustably secured to them. The outer ends of the knife-holders G, which are formed on an incline, *c*, are held in contact by means of suitable springs, *d*, with the inclined guide-flange *e*, carried by a sliding hub, *f*. The sliding hub *f* has a loose collar, *g*, to which the forked ends of the lever H are pivotally secured. The lever H is fulcrumed at *h*, and its free end is provided with a tracer-point, M, which is kept in contact with the pattern-wheel F, all so arranged that the face of the latter, by its contact with the tracer, governs the position of the knife-holders, drawing them in and out as desired, to have the knives E′ shape the stick previously roughed out by the knives E. The face of the pattern-wheel F is preferably of the same length with the stick, so as to have them both travel at a like rate of speed.

In the ends of the tubular shaft D are removably secured the collars L, which are of suitable bore to guide the stick through the cutter-head, and for different-sized work suitable collars are inserted in lieu thereof.

The centrifugal force acquired by the radially-sliding knives tends to draw the tracer-point of the lever H out of contact with the pattern-wheel, and has to be counteracted by a sufficiently-strong spring, H′, the tension of which will overcome said action and keep the tracer point in contact with the face of the pattern-wheel; but as it is impossible in this manner to closely counterbalance the centrifugal force which is always varying with the speed, I preferably use the construction shown in Fig. 4, in which G′ are radially-sliding blocks in the head R, one for each knife-holder, and both the knife-holders and sliding blocks have rack-teeth, which mesh into a pinion, T, secured between each pair, all so arranged that the centrifugal force of each knife-holder and its knife is counteracted, or nearly so, by the centrifugal force of one of the sliding blocks. This construction has the advantage that a more free, correct, and sensitive action of the sliding knives is obtained under the action of the pattern-wheel, and with any degree of speed. A spring, H′, of relatively small tension only, is

required to overcome the friction of the parts.

For ordinary and heavy work a little roller, M′, journaled in the end of the tracing-lever H, is preferably employed instead of the tracing-point M.

It will be seen that my lathe feeds and turns the sticks perfectly automatic. The chain-feed materially assists the feed-rollers in pushing the stick through the first set of roughing-knives, or nearly so. The guiding-collars L always keep the stick in line. The device for radially actuating the knives E′, having few parts, operates in such direct manner that all lost motion is avoided. The tracer, of sharpened steel, traces the pattern accurately. The gear is simple, all the motion, except the rotary motion of the cutter-heads, being obtained by connection with the feed-shaft I, and the counterbalancing of the centrifugal force of the sliding knives in the manner described is a very valuable improvement, as it entirely eliminates the troublesome influence of this factor.

What I claim as my invention is—

1. The combination, with the tube D and the heads P R at opposite ends of said tube and carrying fixed and radially-movable knives E E′, respectively, of the changeable collars L L in said tube, at opposite ends thereof, substantially as and for the purpose specified.

2. The combination, with the tube D, provided with heads P R at opposite ends, the collars L in said tube, at opposite ends thereof, and the driving-pulley S, between said heads, of the knives E, secured to the head P, the head R being provided with radial recesses *b*, the radially-movable knife-holders G, working in said recesses, and the radial knives adjustably secured to said knife-holders, substantially as and for the purpose specified.

3. In a lathe of the kind described, a cutter-head consisting of the tubular shaft D, heads P R at opposite ends of said tube, fixed knives E on the head P, radially-movable knives E′ on the head R, changeable collars L in said tube, and drive-pulleys S, all arranged to operate substantially as described.

4. In a lathe of the kind described, the combination, with the head R, of the radially-movable knife-holders G thereon, and having inclines *c*, the sliding hub *f*, carrying inclined flange *e*, embracing said inclines *c*, the loose collar *g*, embracing said hub, the tracing-lever H, connected with said collar, and the revolving pattern-wheel F, all arranged to operate substantially as described.

5. In a lathe of the kind described, the combination, with the head R, of the radially-sliding knife-holders and the radially-sliding blocks G′, working in guides in said head, and a rack and-pinion engagement between each pair thereof, substantially as described.

WILLIAM H. LENHART.

Witnesses:
W. G. JARVIS,
LYON M. ROBERTS.