

(No Model.)

2 Sheets—Sheet 1.

N. THOMAS.

LATHE FOR TURNING CROSS HEAD PINS.

No. 322,212.

Patented July 14, 1885.

Fig. 1.

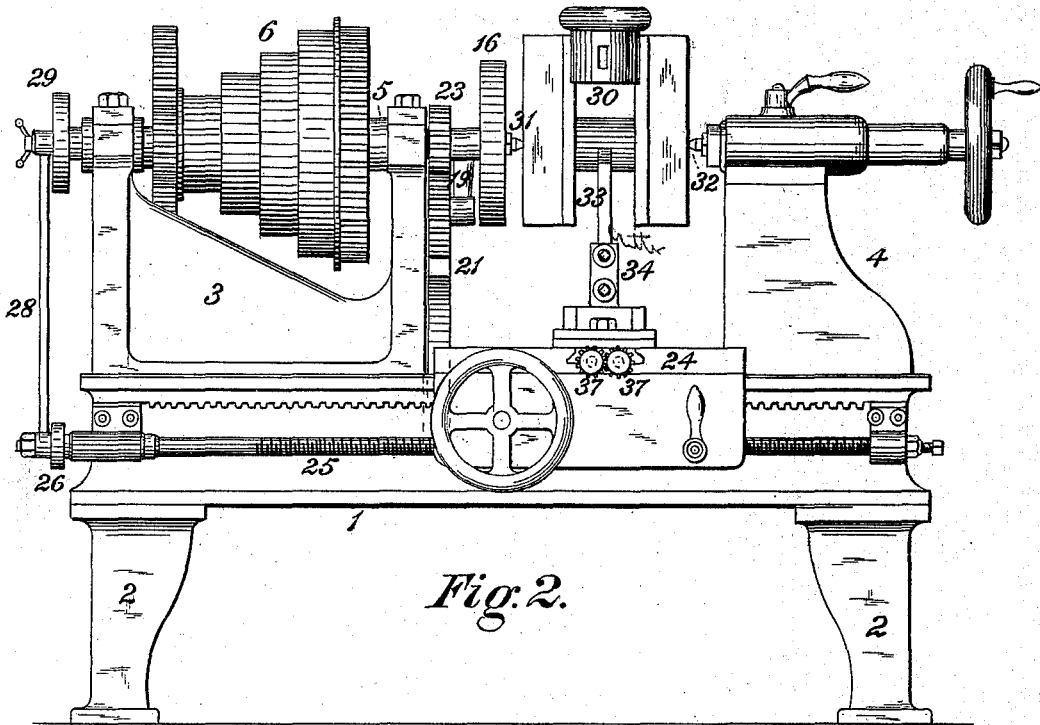
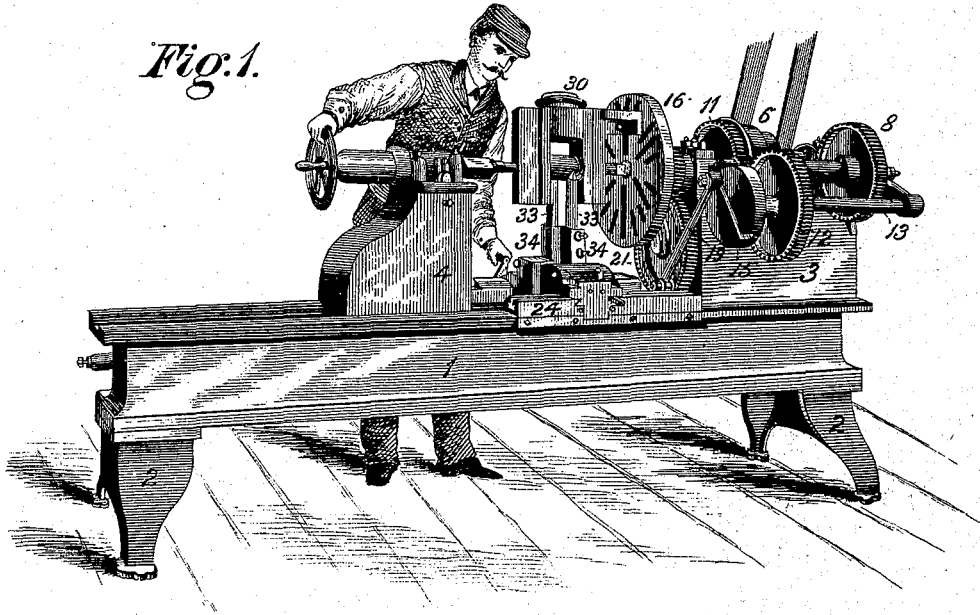


Fig. 2.

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Inventor:

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by J. Thomas Bell  
att'y.

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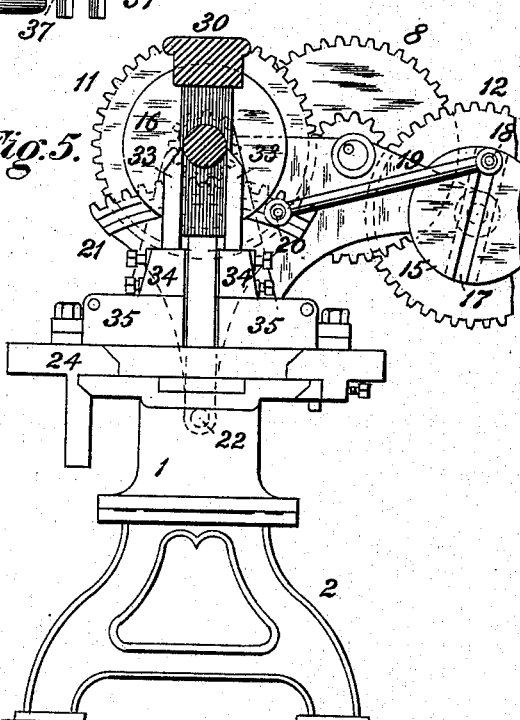
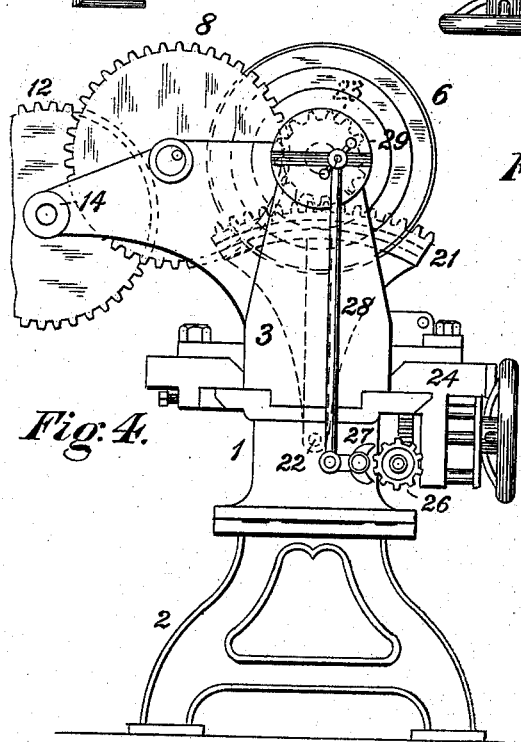
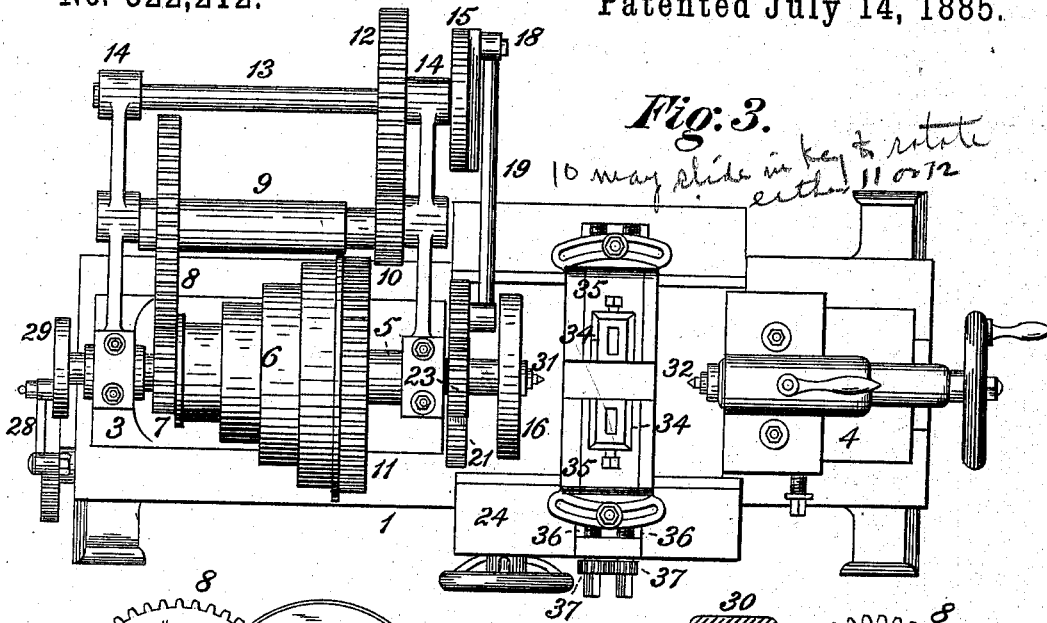


Fig. 4.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

NICHOLAS THOMAS, OF CHICAGO, ILLINOIS.

## LATHE FOR TURNING CROSS-HEAD PINS.

SPECIFICATION forming part of Letters Patent No. 322,212, dated July 14, 1885.

Application filed May 22, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, NICHOLAS THOMAS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lathes for Turning Cross-Head Pins, &c., of which improvements the following is a specification.

The object of my invention is to provide effective and desirable means which may be readily applied to lathes of the ordinary construction for turning the pins of cross-heads or other articles, which, by reason of their relation to other parts of the structure with which they are connected, cannot be turned in lathes in the operation of which the spindle and the work carried thereby are continuously rotated.

To this end my improvements consist in certain novel devices and combinations, herein after fully set forth.

In the accompanying drawings, Figure 1 is a view in perspective of a lathe embodying my invention; Fig. 2, a side view in elevation of the same; Fig. 3, a plan or top view; Fig. 4, an end view as seen from the left; and Fig. 5, an end view as seen from the right, with the tail-stock removed and the piece of work operated on shown in vertical section.

My improvements are herein illustrated as applied in a back-gear lathe which is otherwise of the present standard construction. The lathe bed or shears 1, which is supported upon legs or standards 2, carries at its opposite ends a head-stock, 3, and a tail-stock, 4. The live-spindle 5 is mounted in bearings in the head-stock 3, and a cone or stepped pulley, 6, to which is secured a pinion, 7, is fitted to rotate freely upon said spindle. The pinion 7 meshes with a gear, 8, fixed upon the back gear-shaft, 9, which carries a pinion, 10, said pinion being adapted either to mesh with a gear, 11, fixed upon the spindle 5, when it is desired to rotate said spindle continuously to operate the lathe in the ordinary manner, or to engage another gear, 12, and through the same and its connections to impart an oscillatory or partially rotative movement to the spindle for the performance of the class of work for which my improvements are designed, as presently to be described. To this end the

pinion 10 is fitted to slide longitudinally upon a key or feather on the shaft 9, so as to be brought either into engagement with the spindle-gear 11 or with a gear, 12, fixed upon a supplemental crank-shaft, 13, mounted in bearings 14, in the head-stock 3, exterior to the back gear-shaft, 9. A crank-disk, 15, is secured upon the end of the shaft 13, nearest the face-plate 16 of the lathe, and a diametric slot, 17, is formed in the disk 15 to receive a crank-pin, 18, which may be adjusted and fixed in position in said slot at such distance from the center of the shaft 13 as may be necessary to impart the degree of oscillatory movement to the live-spindle 5 which is required by the character of the work to be performed. A connecting-rod, 19, is coupled to the crank-pin 18 and to a wrist-pin, 20, upon a segmental gear, 21, pivoted by a pin or stud, 22, to the head-stock 3. The gear 21 meshes with a pinion, 23, secured upon the spindle 5, and, when vibrated or oscillated by the connecting-rod 19 about the center of its pivot 22, imparts a corresponding vibratory or oscillatory movement to the spindle 5 and the work carried upon the face-plate 16 thereof, the degree of such movement being regulated by the adjustment of the crank-pin 18 in the slot 17 of the disk 15.

It will be obvious that in lieu of employing a segmental gear, as described and shown in Figs. 2 to 5, a circular gear adapted to oscillate about its center, as shown in Fig. 1, may be used with similar effect; but I deem the construction first referred to more convenient and desirable. The saddle or carriage 24 is fitted to slide longitudinally upon the bed 1 in the usual manner, and is moved by a feed-screw, 25, actuated intermittently by a ratchet attachment similar to that of a planing-machine, the feed-screw carrying a ratchet-pinion, 26, which is engaged by pawls 27, which are swung about a center by a connecting-rod, 28, coupled to a crank-disk, 29, on the spindle 5. The ordinary lathe feed-gear may be readily substituted when a continuous feed is desired for performing the usual work of a lathe.

The cross-head 30, or other piece of work to be operated on, may be chucked on the face-

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plate or supported between the live and dead centers 31 32 in the ordinary manner, and two tools or cutters, 33, are by preference employed, said tools being secured in tool-posts 5 34, each of which is fixed in a slide-block, 35, hung to the saddle, as in a planer, so that the tool may lift from its work when the traverse of the work is reversed. Each of the slide-blocks 35 is operated by an independent cross 10 feed-screw, 36, having either a right or left hand thread, and carrying a pinion, 37, one or both of said pinions, being fitted to slide longitudinally upon its feed-screw, so that the tools may be set independently one of the other. 15 After setting the tools, the pinions are slipped into gear with each other, and the two tools will then be caused to simultaneously advance to or recede from the center line of the spindle. It will be seen that this construction is 20 advantageously applicable in facilitating the employment of two tools in any class of work on an ordinary lathe.

In the operation of the lathe in turning up a cross-head pin, the crank-pin 18 being ad- 25 justed to effect the desired amount of traverse, and the piece of work to be operated on being chucked on the face-plate or secured between the centers 31 32, a flat spot is formed on the cross-head pin or other member to be turned 30 for the commencement of the cut of one of the tools, which is set, and a half-revolution of the spindle made. The other tool is then set exactly similar to the first, and the pinions 37 placed in gear, upon which the tools will be 35 simultaneously operated, and will cut alternately, each turning one-half of the circumference of the pin as the same is vibrated about its center by the connecting-rod 19, so that no time is lost and the cuts of the two 40 tools join to make a true circle.

When it is desired to use the lathe in the ordinary manner, the segmental gear is disconnected, the pinion 10 moved into engagement with the gear 11, and the usual lathe-feed substituted for that shown, the two posts being 45 retained, or a single tool-holder employed, as may be desired.

While the employment of the intermediate gears, 21 23, for transmitting movement to the 50 spindle from the connecting-rod may in most cases be found desirable, the same is not essential, and said gears can under my invention be dispensed with, and the connecting-rod be coupled directly to the face-plate or 55 spindle.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a lathe-spindle, a crank-shaft fitted to rotate in bearings in the head-stock or supporting-head of said spindle, 60 and an intermediate connection whereby vibratory movement is imparted to the spindle from the crank-shaft, substantially as and for the purpose set forth.

2. The combination of a lathe-spindle, a 55 crank-shaft mounted on the head-stock or supporting-head of said spindle, a gear adapted to vibrate about an axis on the head-stock, a connecting-rod coupled to a pin on the crank-shaft and to said gear, and a pinion secured 70 upon the spindle and meshing with said gear, substantially as set forth.

3. The combination of a lathe-spindle, a cone-pulley fitting freely thereon, a crank-shaft mounted in bearings in the head-stock 75 or supporting-head of the spindle, gearing for rotating said shaft from the cone-pulley, a gear adapted to vibrate about an axis on the head-stock, a connecting-rod coupled to a pin on the crank-shaft and to said gear, and a pinion 80 secured upon the spindle and meshing with said gear, substantially as set forth.

4. The combination of a lathe-spindle, a cone-pulley fitting freely thereon, a back gear-shaft and a supplemental crank-shaft, each 85 mounted in bearings on the head-stock or supporting-head of the spindle, gearing for rotating the back gear-shaft from the cone-pulley, a pinion fitted to slide longitudinally on the back gear-shaft and to engage either a gear 90 on the crank-shaft or a gear fixed upon the spindle, a gear adapted to vibrate about an axis on the head-stock, a connecting-rod coupled to a pin on the crank-shaft and to said gear, and a pinion secured upon the spin- 95 dle and meshing with said gear, substantially as set forth.

5. The combination of a lathe-spindle, a lathe carriage or saddle, two tools or cutters, each mounted in an independent slide-block 100 on the carriage, two feed-screws, each governing the movement of one of said slide-blocks toward and from the center line of the spindle, and two pinions, each mounted upon one of said feed-screws, either of said pinions being 105 fitted to slide longitudinally upon its feed-screw, so that said pinions may be engaged or disengaged to enable either coincident or independent movement of the slide-blocks and tools to be effected, substantially as set forth. 110

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