

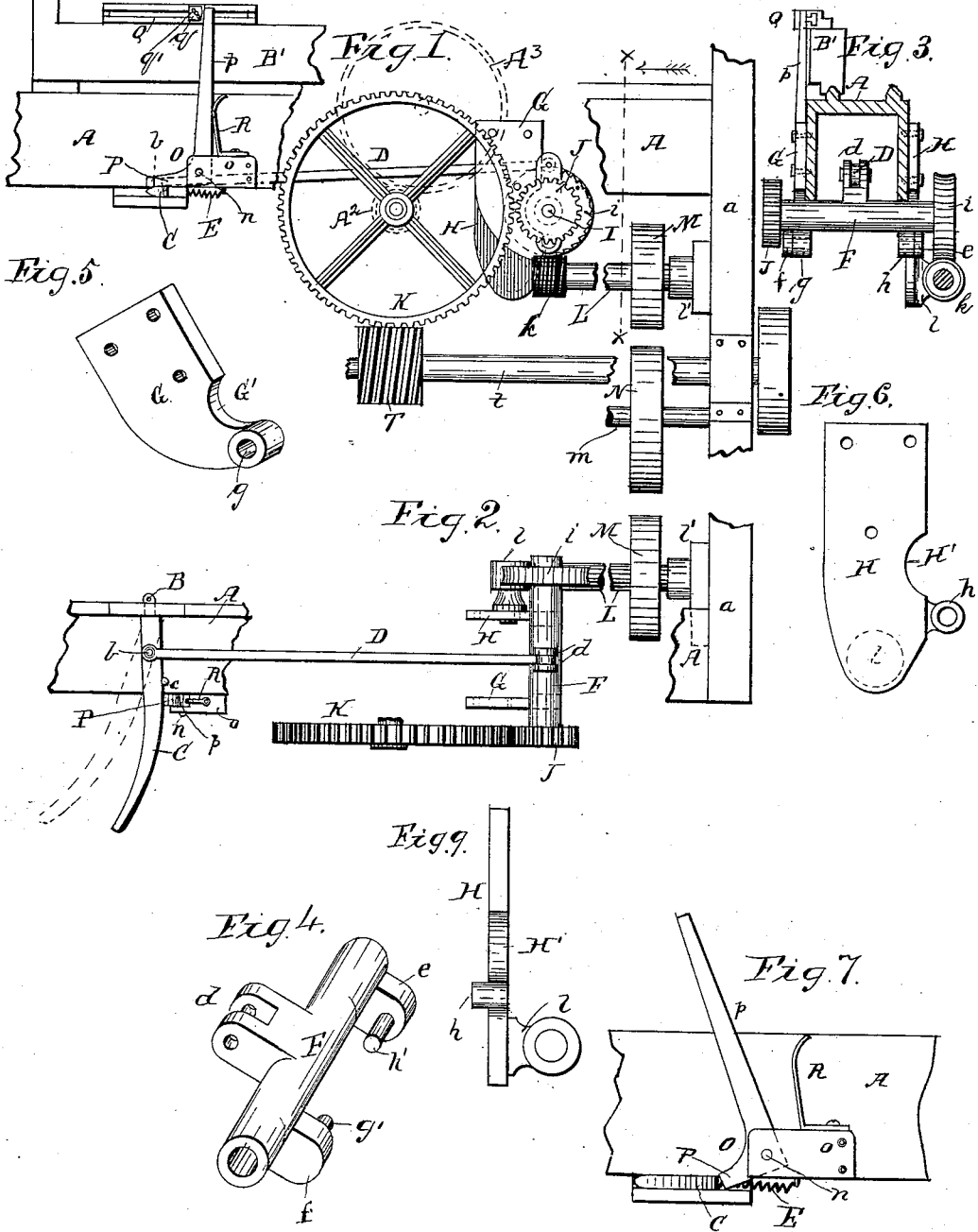
(No Model.)

3 Sheets—Sheet 1.

F. B. GILMAN.  
LAST TURNING LATHE.

No. 469,084.

Patented Feb. 16, 1892.



WITNESSES:  
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(No Model.)

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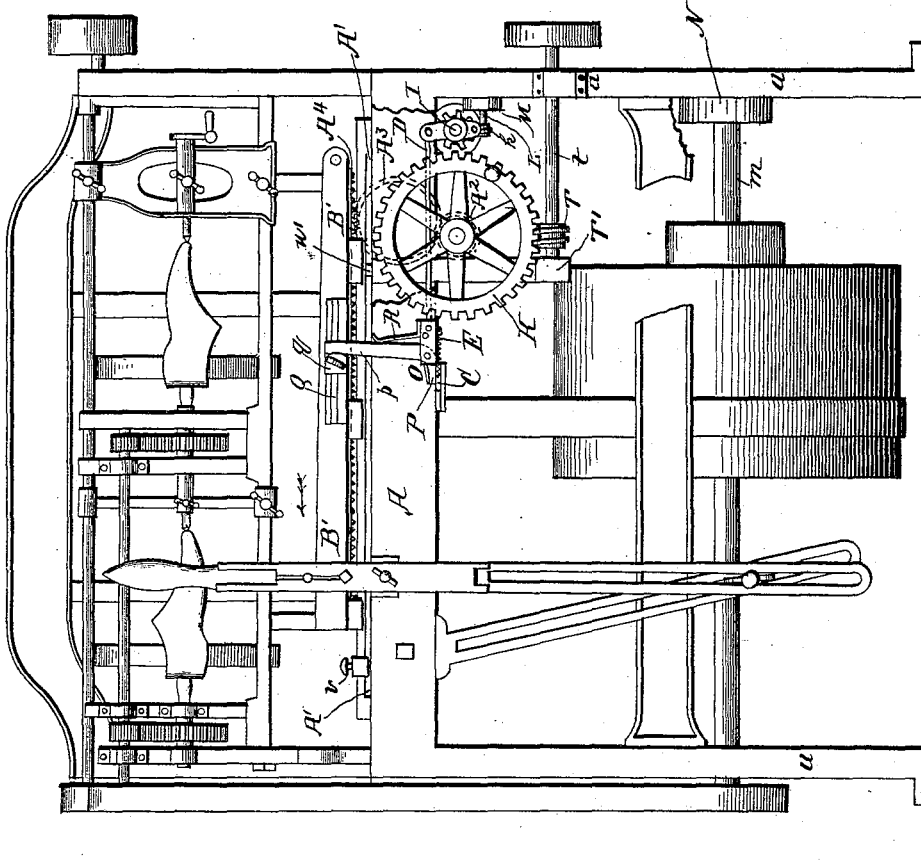


Fig. 8.

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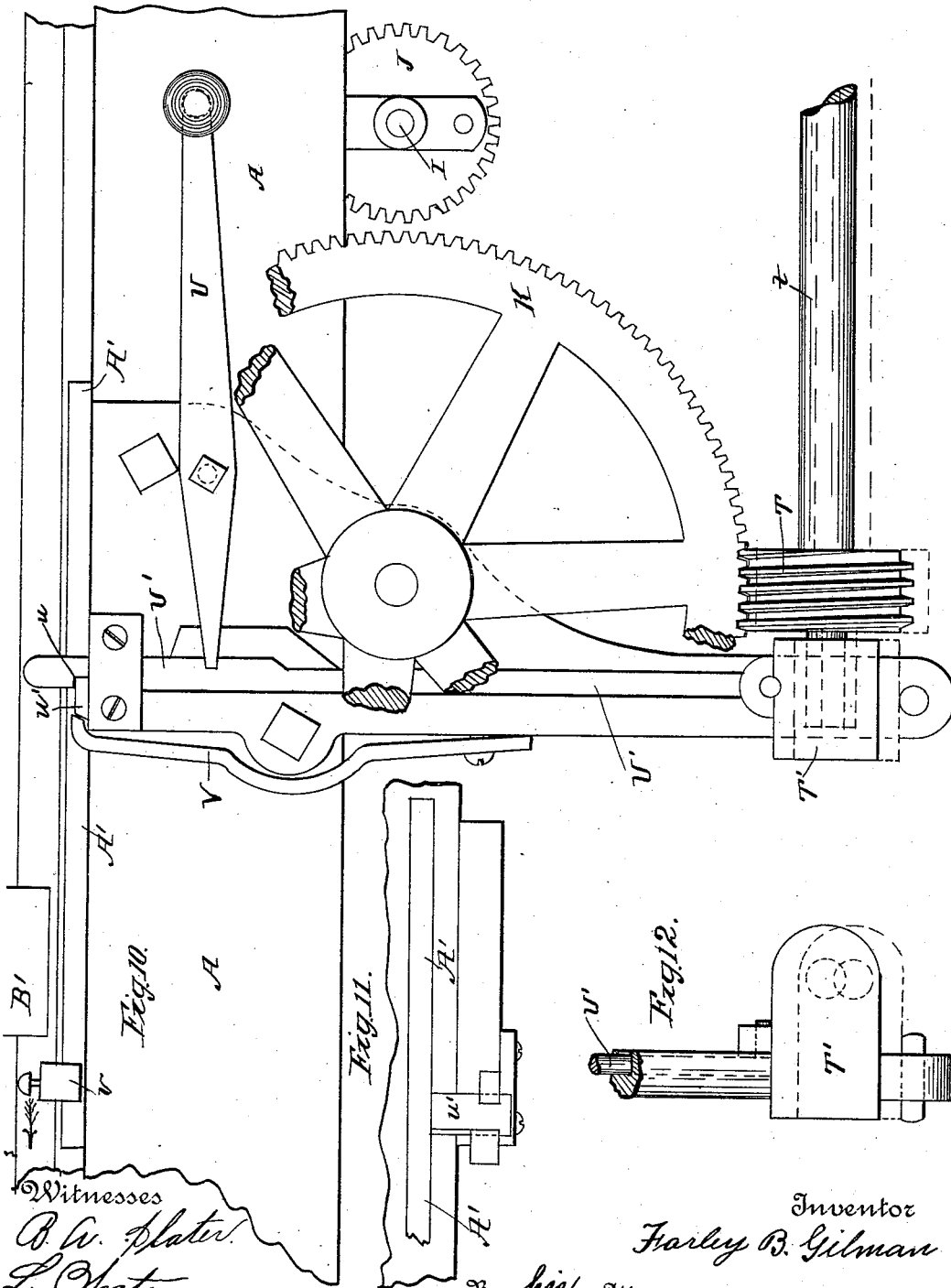
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No. 469,084.

Patented Feb. 16, 1892.



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# UNITED STATES PATENT OFFICE.

FARLEY B. GILMAN, OF SPRINGFIELD, VERMONT.

## LAST-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 469,084, dated February 16, 1892.

Application filed January 22, 1891. Serial No. 378,662. (No model.)

*To all whom it may concern:*

Be it known that I, FARLEY B. GILMAN, a citizen of the United States, residing at Springfield, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Last-Turning Lathes, of which the following is a specification.

This invention relates to last-machines, and particularly to an automatic mechanism operated by the universal power of a lathe for turning lasts and other irregular forms.

The object of the invention is to provide a last-lathe with an automatic mechanism operated by the universal power of the lathe, so as to cause a quick return of the lathe-carriage to the starting-point of turning the last.

A further object of the invention is to provide a last-turning lathe with an automatic mechanism which will operate the lathe-carriage of its own accord, while the operator is changing the lasts, so as to insure a quick return of the carriage to its starting place and save the time and labor usually spent by the operator in having to change the work and set the carriage separately.

A still further object of the invention is to provide a last-turning lathe with an automatic mechanism for the purpose of returning the carriage, and therefore the cutting-tools to their starting-point, and to cause the return motion of the carriage to stop just a sufficient distance beyond the heel of the last to insure the proper space in which to start another cut without the operator's assistance—that is, without it being necessary for the operator to watch the return of the carriage and change its return mechanism to feed the tool for the next cut.

The invention consists in the novel arrangement and construction of parts, as will be hereinafter more fully described and claimed. In the accompanying drawings forming part of this specification, Figure 1 is a side elevation of a last-turning lathe with my improved carriage-return mechanism in its normal position. Fig. 2 is a top view thereof, showing in dotted lines the position of the operating-lever when the mechanism is in operation. Fig. 3 is a cross-section taken on the line  $x x$  of Fig. 1. Fig. 4 is a perspective view of the oscillating sleeve, showing its U-shaped projection on one side and two journal-bearing

projections on the opposite side. Fig. 5 is a perspective view of the front arm having a pivot-bearing and also a bearing for the oscillating sleeve. Fig. 6 is a side elevation of a similar rear arm provided with a bracket-journal for the worm-shaft, and Fig. 7 is a side elevation of the bell-crank lever engaged with the operating-lever. Fig. 8 is a front view of a last-turning lathe with my carriage-returning device attached thereto. Fig. 9 is an end view of the rear arm H. Fig. 10 is an enlarged side elevation of the front of a lathe, showing the feed mechanism. Fig. 11 is a top view of part of such mechanism; and Fig. 12 is a detached view of the sliding box.

The same letters of reference denote the same parts throughout the several figures of the drawings.

To the front sill A of a last-turning lathe, which is supported by suitable standards or legs  $a$ , (shown broken in the drawings,) is secured by a pivot B the lever C, having the end of a connecting-link D pivoted at  $b$ , the forward movement of said lever being controlled by a pin or projection  $c$  on the sill A and the backward movement is controlled by a coil-spring E, secured at one end to the lever C and at the other end to the sill A. The forward end of the connecting-link D is pivoted in a U-shaped projection  $d$  on the sleeve F. This sleeve is provided with two projections  $e$  and  $f$ , located on the opposite side thereof from the U-shaped projection  $d$ . The projections  $e$  and  $f$ , and thereby the sleeve F, is supported by an arm G, bolted to the front of the sill A, and a like arm H, bolted to the rear of the said sill. The arm G has a pivot-bearing  $g$  to receive the pivot  $g'$  of the projection  $f$  and the arm H has a like pivot-bearing  $h$  to receive the pivot  $h'$  of the projection  $e$ . The arms G and H have cut-outs which form bearings G' and H', respectively, to receive the sleeve F, and such cuts are of the same curvature as the said sleeve. Into the sleeve F is closely fitted the shaft I, so as to turn freely therein, which is provided on its front end with a small gear-wheel J, which meshes into a large gear-wheel K on the front of the lathe. On the rear end of the said shaft I is secured worm-gear  $i$ , which meshes with a worm  $k$  on the worm-shaft L, one end of which is supported and journaled in a bracket

journal-bearing  $l$ , while the other end is supported by the piece  $l'$ , secured to one of the standards or legs  $a$ . This worm-shaft L also carries a driving-pulley M, through which motive power is imparted to the above-mentioned gearing by a suitable belt from the pulley N on the drum-shaft  $m$ .

O represents a bell-crank lever pivoted at  $n$  between the side of the sill A and a shoe  $o$ . The short arm P of the lever O extends out from the pivot  $n$  parallel to the sill A and rests on the top of the lever C. The long arm  $p$  of the lever O extends upward from the sill A over a slotted bar Q, which is secured to the lathe-carriage B' and is provided with a stop projection  $q$ , adjustably attached to the bar Q by a set-screw  $q'$ . The shoe  $o$  is provided with a plate-spring R, the free end of which bears against the long arm  $p$  of the crank-lever and keeps it in its normal position.

T represents a worm-gear which meshes into the gear-wheel K and is located upon the shaft  $t$ . This is the ordinary feed mechanism as employed upon last-turning lathes. One end of the shaft  $t$  is journaled in the sliding box T', which is given an upward and downward movement by the connection U, the hook-rod U', having the notch  $u$ , the slide  $w'$ , engaging the notch  $u$ , the curved spring V, and the usual lathe-carriage stop  $v$ .

A' is a sliding bar located upon the top of the sill A and to which the slide  $w'$  is secured or formed in the same piece therewith.

The operation of this automatic mechanism is as follows: The extent of the desired cut on a last is determined and the stop projection  $q$  is set on the slotted bar Q by the set-screw  $q'$ , so as to come in contact with the long arm  $p$  of the bell-crank lever O immediately upon such cut being finished. The shaft of the wheel K has a gear-wheel A<sup>2</sup> upon its rear end, which meshes with a larger gear-wheel A<sup>3</sup>, secured upon the inside of the rear sill, so as to mesh with the rack-bar A<sup>4</sup> of the lathe-carriage B', as shown by dotted lines in Figs. 1 and 8. The workman presses down the lever U, which raises the box T' and the worm T, so that it will engage the wheel K to feed the carriage to the left, as indicated by the arrow in Figs. 8 and 10, to make the cut on the last, and when it is fed in this direction so far as to strike the stop  $v$  the cut is finished, and by the carriage engaging the said stop the sliding bar A' is moved in the direction indicated by the said arrows, carrying the slide  $w'$  with it, so that the said slide  $w'$  disengages the notch  $u$ , allowing the box T', with the worm T, to drop down to the position shown in dotted lines in Figs. 10 and 12, disengaging the wheel K and leaving the carriage free to be operated by means of the wheel J, (which is revolved in the opposite direction from the worm T by means of the worm  $k$  and worm-gear  $i$ ,) meshing with the said wheel K, so as to return the carriage to its starting-point. The wheel K is therefore alternately engaged

by the worm T and by the gear J. It will be observed that the feed on the cut having been stopped by the engagement of the carriage with the stop  $v$ , the lever C is immediately operated by hand to engage the short arm of the bell-crank lever and the carriage given a quick return to its starting-point and stopped there by the stop  $q$  engaging the long arm of the bell-crank lever and causing the said short arm to disengage the lever C. When the cut is finished, the operator pushes the handle C to the position shown in dotted lines, Fig. 2, which allows the short arm P of the bell-crank lever O, which has been resting on top of the lever C while the cut was in progress, to fall down behind the lever C by the pressure of the spring R on the long arm  $p$ . The act of pushing the lever C into the position shown in dotted lines also causes the connecting-link D and the sleeve F to be moved, which carries the shaft I, having the gear-wheel J, into its bearings G' and H' in the arms G and H and the gear-wheel J to mesh with the gear-wheel K, giving the carriage a quick return to its starting-point. The short arm P of the bell-crank lever O remains in the position shown in Fig. 7 until the lathe-carriage has been returned to its starting-point, and as soon as the carriage has reached such point the stop  $q'$  strikes the long arm  $p$  of the bell-crank lever and throws it back, allowing the several parts to assume their normal position and rendering the carriage in proper position for the lathe to commence another cut.

I do not wish to be understood as limiting myself to the construction of the parts and the manner of connecting them to a machine for turning lasts and other like forms, as is herein described, but reserve to myself the exclusive right to alter the position of said parts to each other as well as their construction, so as to produce a machine of the character described without departing from the spirit of my invention.

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

1. The combination, with a last-turning lathe, its feed mechanism, and its carriage provided with a stop, of a trip mechanism consisting of a bell-crank lever, the plate-spring, the lever C, and the coil-spring, and connections with said feed mechanism, whereby the latter is stopped so as to leave the carriage free to be returned to its starting-point, substantially as set forth.

2. The combination, with the trip mechanism and the feed mechanism, of a connected mechanism consisting of the oscillating sleeve containing the shaft provided with two gear-wheels, and the link secured to the sleeve and to the operating-lever of the said trip mechanism, and connections with said feed mechanism whereby the latter is operated, substantially as and for the purpose set forth.

3. In a last-turning lathe, the trip mechan-

ism, the feed mechanism, and the connected mechanism comprising the oscillating sleeve provided with pivots, the shaft located in the sleeve and provided with two gear-wheels, and the link secured to the sleeve and to the operating-lever of the said trip mechanism, in combination with the arms G and H, each having a cut-out that forms a bearing for the said sleeve and each having a pivot-bearing for the said sleeve-pivots, substantially as set forth.

4. The combination, with a last-turning lathe, its carriage, and its feed mechanism, of the bell-crank lever, the shoe secured to the sill of the lathe and having the said lever pivoted therein, the operating-lever also secured to the lathe-sill, so as to engage the bell-crank lever, the connected mechanism, and connections with said feed mechanism whereby the latter is stopped, so as to leave the carriage free to be returned to its starting-point, substantially as set forth.

5. The combination, with a last-turning lathe, of the trip mechanism, the gear-wheel

K and the pinion A<sup>2</sup>, located upon the same shaft, the adjustable worm, the gear-wheel J, the oscillating sleeve, and the link D, the said wheel K to be alternately engaged by the said worm and wheel J, substantially as shown and described, and for the purpose set forth.

6. In a last-turning lathe, the combination of the adjustable worm of the oscillating sleeve, the shaft journaled in the sleeve and provided with the gear-wheel J, the gear-wheel K, located between the adjustable worm and the gear-wheel J, so as to be alternately engaged by the worm and the gear-wheel J, with the trip mechanism and the rod D, connecting the trip mechanism with the oscillating sleeve, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

FARLEY B. GILMAN.

Witnesses:

FREDERICK V. A. TOWNSEND,  
A. M. ALLBE.