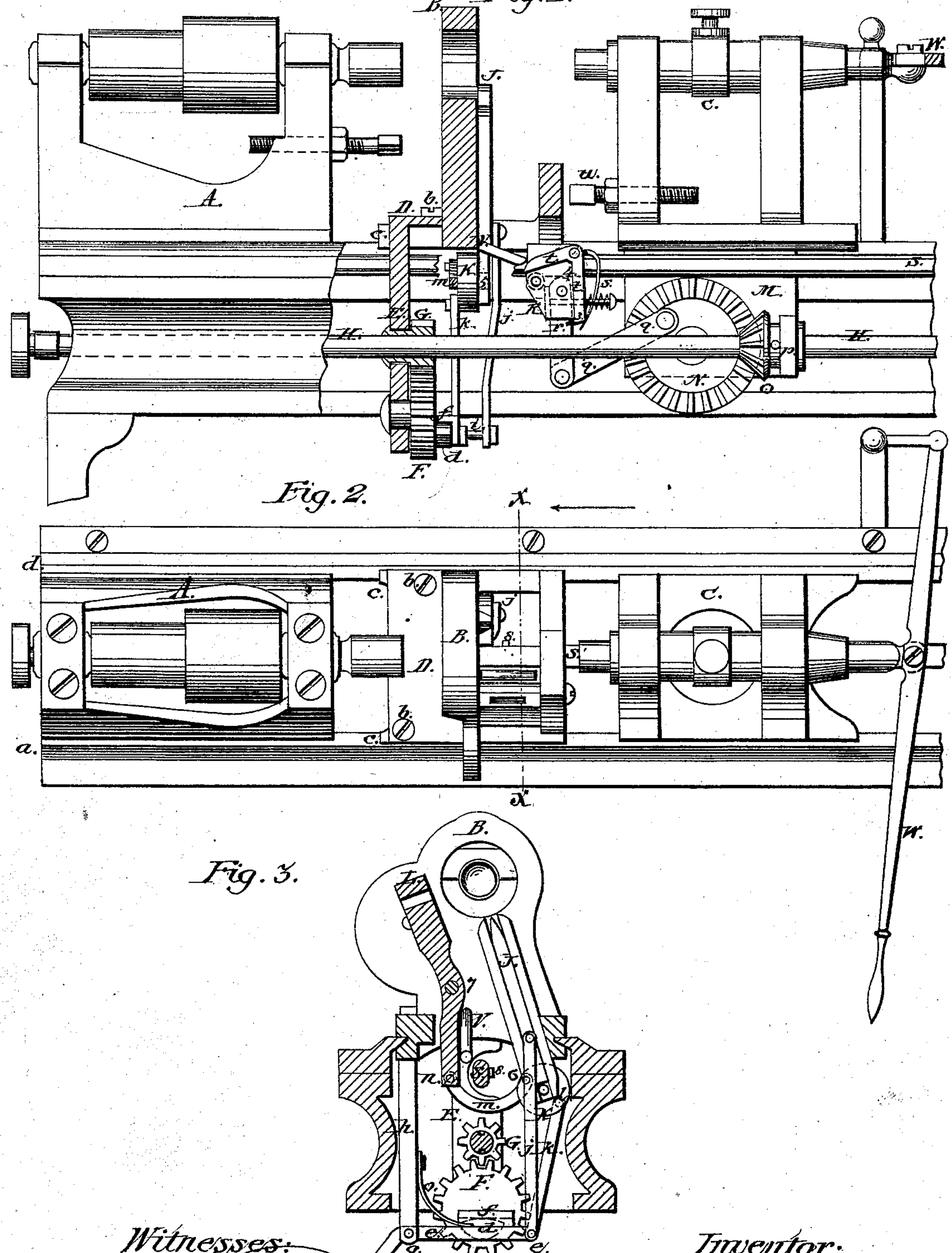
C. W. WILDER.
Lathes.

No. 150,737. Patented May 12, 1874.

Fig. 1.

Fig. 2.

Fig. 3.



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AM. PHOTO-LITHOGRAPHIC Co. N. Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

CHARLES W. WILDER, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN LATHES.

Specification forming part of Letters Patent No. **150,737**, dated May 12, 1874; application filed October 15, 1873.

To all whom it may concern:

Be it known that I, CHARLES W. WILDER, of the city of Fitchburg, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Lathes, as patented to A. D. Waymoth, July 29, 1856, and August 11, 1857, and used for turning spools, bobbins, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a side view of the improved lathe with certain parts broken away, as will be hereafter more fully described. Fig. 2 represents a top or plan view of the same; and Fig. 3 represents a vertical section on the line *x x*, Fig. 2.

To enable those skilled in the art to which my invention belongs to make and use the same, I will now proceed to describe it in detail.

In the drawings, Figs. 1 and 2, A represents the head-stock, B the center-piece, and C the tail-stock.

The said improvements relate, first, to a cam device for operating the knives, instead of by the old knee-lever; second, to a mechanism or clutch device for automatically moving both center-piece and tail-stock on their metal ways during the operation of the machine; third, to a double-slotted feed-rod, as will be hereafter described.

Secured to the center-piece or tool-carriage B by screws *b* is a metal plate, D, resting on extended parts *c* of the carriage-frame, and attached to this plate *c*, projecting downward from its under surface, is a similar and longer metal plate, E, which furnishes bearings for the gear F and the upper gear G, meshing into it.

A peculiarity of this latter gear G is that its journal is a cylinder, through which passes the double-slotted feed-rod H, and being so combined as to turn with said rod.

On the disk of gear F is a cam, *d*, of the shape as shown in Fig. 3. To the arm *e* of lever I is attached a metal piece, *f*, its upper edge bent to an angle, so that the cam *d* may come in contact with the under surface thereof as it revolves, and thereby automatically raise arm *e*. Lever I is fulcrumed at *g* in the end of projecting rod *h*. From the end of said arm *e* of lever I projects a short rod, *i*, hinged to which is a draw-bar, *j*, connected with and moving the cutting-off knife J up and down in its slot. On the other end of the short rod *i*, and hinged to it, is a similar draw-bar or flat metal strip, *k*, attached by a hinged joint to a pin, *l*, in the disk of a crank-wheel, K, which turns on a screw or pin, 5, fast in a downward-projecting part of the center-piece. At a point nearly opposite pin *l*, in the disk of wheel K, is journaled to a stud one end of a short link or bar, *m*, the other end of said link or bar being hinged to the lower end of tool-holding piece L by a projecting stud, *n*. The tool-holding piece L is pivoted at 7 between two upright parts of the center-piece.

From the foregoing description, it will be seen that with every revolution of the large gear F the upper end of the tool-holding piece will be moved forward with its shaping-knife, (the knife being attached to the upper end of piece L in any suitable manner,) to shape or turn in proper form the article to be produced.

As soon as the forming-knife has been thrown sufficiently far forward to shape the article, stud 6 is thrown past the center, and causes the upper end of the tool-piece, to which is attached the shaping-knife, to move backward, and thus withdraw the shaping-knife, while the cutting-off knife is forced up still farther to complete its work of cutting off the article being turned. As soon as the article is cut off, cam *d* passes from under the plate *f*, when spring *o* (shown in Fig. 3) forces lever I, and the parts connected therewith, back into the position shown in Fig. 3.

From the base part of the frame of the tail-stock C, and attached to it, projecting downward, is a flat metal piece, M, supporting and furnishing bearings for a bevel-gear, N, meshing into bevel-gear O, which slides on feed-rod H; the journal of said gear O, which is its hub turning in the piece *p*, projecting from and attached to piece M. Feed-rod H is provided with two slots upon opposite sides, and into which two splines project from the hub or journal of gear O. These splines thus arranged to work in slots upon opposite sides of feed-rod H prevent all cramping or bind-

ing of gear O as it is moved back and forth during the operation of the machine.

By means of gear N and hinged bar *q*, combined with it as shown, the sliding clutch device is operated as follows: First, said device is constructed of a shell, R, having a bar, *r*, pivoted between its sides. This bar being jointed at its other end to bar *q*, a spring, *s*, bears against a metal piece, *t*, bent to the form of an angle, which piece is also pivoted to the shell, and having the end of its arm 3 bent across the surface of bar *r*, and the edge of said bent portion fitting into a notch in said bar *r*. The corner 4 of this latter bar is rounded off, while the opposite corner is left square and sharp, so that when the said bar *r* is in the position shown in Fig. 1, it is just beginning to clutch the bar S, on which the clutch device slides, and as the clutch device is thus clamped to bar S, while the slotted feed-rod continues to revolve, the tail-stock is drawn toward the head-stock the desired distance during each revolution of the bevel-gear N. The center-piece is also moved along the desired distance, to form the next article or object to be turned, during each revolution of said gear, in consequence of the head of the adjusting screw or bolt *u* striking against the rear part of the center-piece, as indicated in Figs. 1 and 2, and forcing the center-piece along the proper distance.

The operation is as follows: A stick having been chucked or placed in position between the head-stock and center-piece, the feed-rod H is put in motion, which brings the shaping-knife in the tool-holder first into play; then said knife moves back by the operation of the cam device, as heretofore explained, and simultaneously with this latter movement the cutting-off knife slides up, performs its office, and falls back. While the shaping-knife has been performing its work, the clutch device has been sliding along on its bar the proper distance, and, coming in contact with the stop V, attached to center-piece B, its forward motion is arrested, and consequently as gear N continues to revolve, it, together with the tail-stock, is thrown back sufficiently to release or withdraw a boring-bit (when one is used in the end of the tail-spindle) from the article being turned or formed in the lathe, before the article is entirely severed from the stick by the cutting-off knife. As soon as the article is cut off and drops from the lathe, the tail-stock is drawn forward, thereby throwing the center-piece forward a sufficient distance to form another article, when the operation of shaping and cutting off is repeated until the stick is used up.

For the purpose of arresting the forward movement of the tail-stock after the turning has been continued as near the head-stock as it can be done with safety, the sliding bar S is provided with a stop, 8, against which the forward end of the clutch device strikes, thereby stopping the forward movement of the tail-stock, and consequently the center stock, although the feed-rod H may be continued in motion. After one stick of material has been turned or used up, the feed-rod is stopped, and the tail-stock and center-piece are slid or pushed back by hand, after which a new stick is chucked, and the operation is repeated.

The feed-rod H is driven by a belt, and for that purpose a tight and loose pulley or a clutch device may be combined with it, so that said feed-rod may be stopped, at the will of the operator, by some suitable shipping or unclutching device.

The tail-stock may be operated by means of lever W, and the center-piece mechanism by knee-lever I, as in the Waymoth lathe referred to, if at any time it would be desirable to do so.

Different holes are to be made in gear N, so that the crank-pin can be changed to give the clutch device a greater or less throw for turning different lengths of article.

Having described my improvements in turning-lathes, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the center-piece B and tail-stock C of the lathe, of the mechanism, as herein described, for automatically moving them forward, and operating the shaping and cutting-off knives, substantially as and for the purposes set forth.

2. The combination, with the slide-rod S and feed-rod H, of gears O and N and clutch device, substantially as and for the purposes set forth.

3. The combination, with shell R and bent piece *t*, of the bar *r* and spring *s*, substantially as and for the purposes set forth.

4. The combination, with center-piece B and clutch device, of the stop device V, substantially as and for the purposes set forth.

5. The combination, with slide-bar S and clutch device, of stop 8, substantially as and for the purposes set forth.

6. The combination, with gear F and lever I, of cam *d* and bent metal piece *f*, substantially as and for the purposes set forth.

7. The combination, with the tool-holder L and cutting-off knife, of arm *e*, bars *k* and *m*, and crank-wheel K, substantially as and for the purposes set forth.

8. The combination, with arm *e*, of spring *o* and cam *d*, substantially as and for the purposes set forth.

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