(No Model.) 2 Sheets—Sheet 1.

C. W. WILDER.

WOOD TURNING LATHE.

No. 254,419. Patented Feb. 28, 1882.

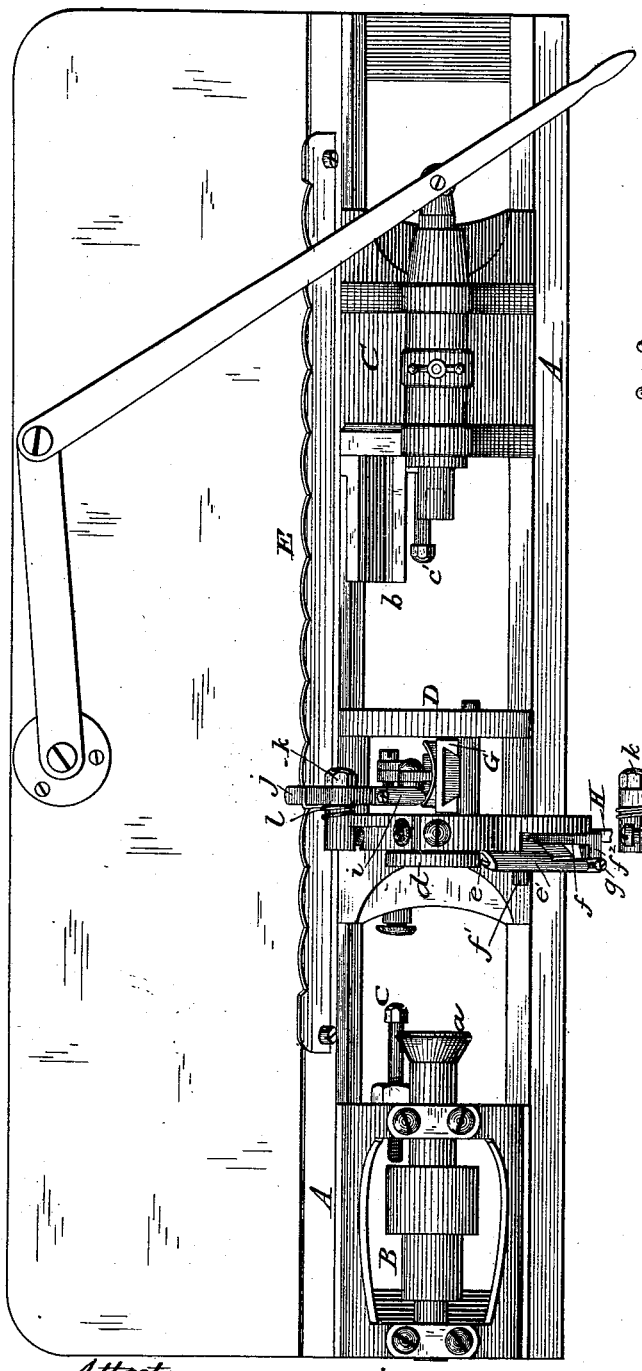


Fig. 1.

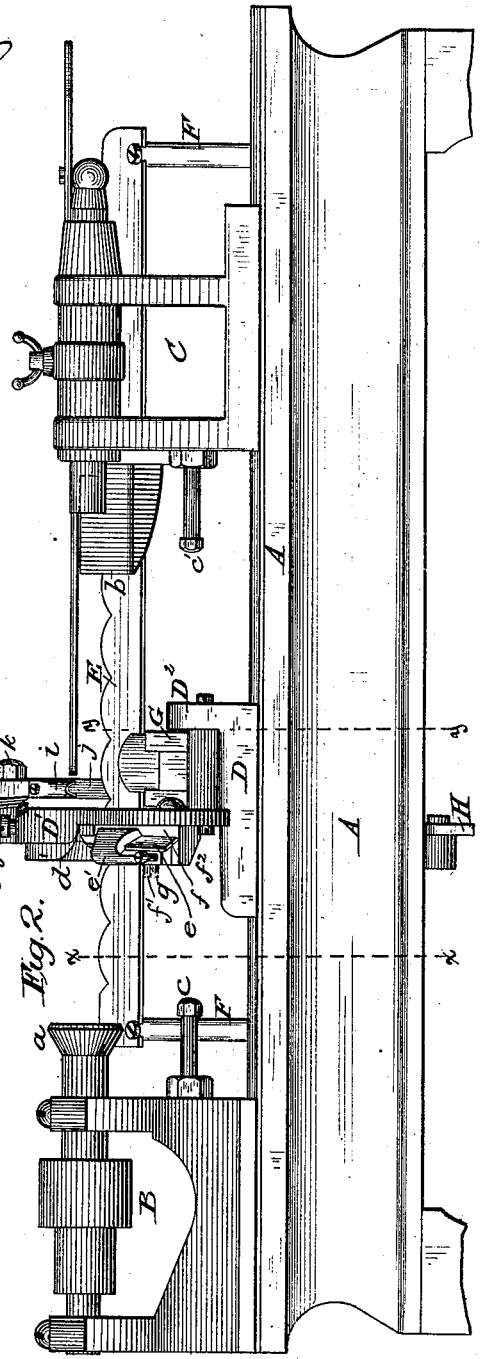


Fig. 2.

Attest:
Sidney P. Hollingsworth.
W. T. Cole.

Inventor:
Chas. W. Wilder.
By F. C. Loomis.
Attorney.

(No Model.) 2 Sheets—Sheet 2.

C. W. WILDER.

WOOD TURNING LATHE.

No. 254,419. Patented Feb. 28, 1882.

Fig. 4.

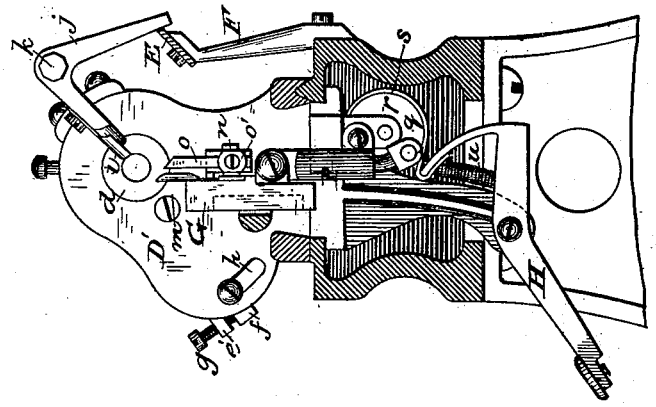


Fig. 5.

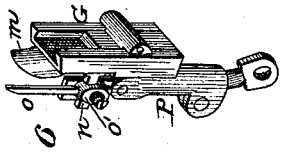


Fig. 6

Fig. 3.

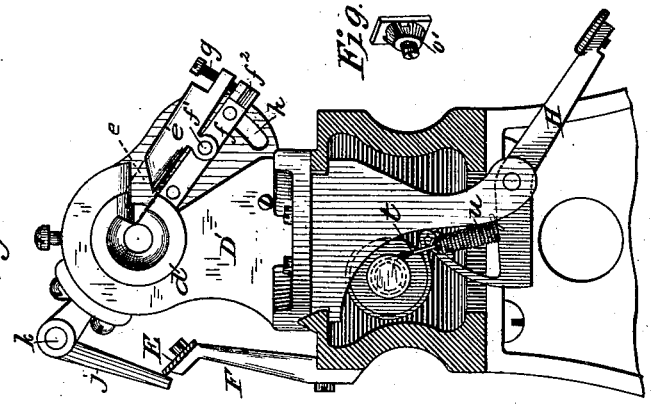
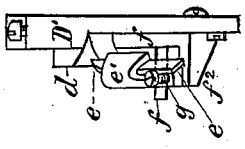


Fig. 7.



Attest

Sidney P. Hollingsworth

W. T. Cole

Inventor:

Chas. W. Wilder

By F. C. Sowles

Attorney.

UNITED STATES PATENT OFFICE.

CHARLES W. WILDER, OF FITCHBURG, MASSACHUSETTS.

WOOD-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 254,419, dated February 28, 1882.

Application filed January 22, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. WILDER, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Wood-Turning Lathes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of lathes for rapidly forming various small wooden articles of regular shapes—such as spools, pill-boxes, handles, &c.—the beds of which are equipped with a fixed head-stock and sliding tail-stock and a central sliding tool-holding carriage, the head-stock having a chuck to hold and revolve a long stick of wood from which a number of articles may be successively turned, while the central carriage is fitted with a guide-socket to receive the roughed-out end of the stick with roughing-out tool on the front side thereof, and shaping, finishing, and cutting-off tools on the tail side thereof, while the tail-stock carries a boring-tool for simultaneously boring the work.

The nature of my invention consists, first, in a carriage arranged to slide on the ways of the lathe in a direction with the length thereof, and having combined with and attached to it a shaping-tool guided by a pattern, a finishing and a cutting-off tool guided by a sliding holder, and an actuating-lever connected by peculiar devices to said holder, whereby the attendant has complete control over the said finishing and cutting-off tools.

The invention further consists in a novel mode of mounting and adjusting the roughing-cutter on one side of the tool-carriage, whereby said cutter is adjustable for ring-rests of various sizes.

The invention further consists in certain novel means, hereinafter described, whereby the attendant can with his knee exercise perfect control over the movements of the finishing and cutting-off tools without the use of stiff-rod connections.

The invention finally consists in a novel device for clamping the cutting-off tool to its holder and securing the same to the finishing-tool slide, as will be hereinafter described.

Figure 1 of the drawings is a plan view of a lathe embodying these improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section on line *x x* of Fig. 2, showing the front side of the tool-carriage. Fig. 4 is a transverse section on the line *y y* of Fig. 2, showing the rear side of said carriage. Fig. 5 is a perspective view, showing the finishing and cutting-off tools, and their guides and supports detached from the sliding tool-carriage. Fig. 6 is a perspective view of the holder for the cutting-off tool. Fig. 7 is a side view of part of the tool-carriage, showing the roughing-tool and its holder adjusted away from the cheek of the carriage.

The body or frame A of the lathe is fitted at one end with the usual fixed head-stock, B, and at the opposite end with the sliding tail-stock C, while between the two the sliding tool-carriage D is arranged.

The spindle of the head-stock is provided with the usual chuck, *a*, to hold and revolve the wooden stick, which chuck has preferably a conical mouth, in which a screw-thread is formed to engage the end of the stick. The spindle of the tail-stock is adapted to hold a boring-tool, as shown, for work requiring it, and the tail-stock is also provided with a tool-post, *b*, for holding a tool to act on the end of the stick for forming a tenon or other terminal thereon when required. Adjustable stop-screws *c c'* project respectively from the face of the head and tail stocks to limit the movement of the tool-carriage and tail-stocks.

All of the parts above referred to are about of the usual construction, and the lathe is operated and the work performed thereon in the usual manner, which hence requires no further description. The body of the lathe, however, is provided on one side with a Λ-guideway, and on the other side with a flat bearing-way, on which the tool-carriage and tool-stock slide. The single Λ-formed guideway secures an accurate alignment of centers and prevents undue play or wear, while the flat bearing-way enables the frame to spring or twist without cramping the carriages. A hand-lever is employed for moving the tail-stock.

The novel features of my invention are mainly

embodied in the tool-carriage D. From the base of this carriage, and about midway thereof, the usual upright web, D′, rises. This upright has a central opening provided with a ring, *d*, into the flaring mouth of which the stick first enters. This ring has a central bore of a size corresponding to the rough diameter of the work, and forms a guide and socket for the same to turn in. The roughing-out tool *e*, which cuts off the corners from the stick and reduces it to a size to enter the socket of the ring *d*, is mounted on the front side of the upright and projects obliquely into a radial gap in the socket-ring *d*, while the shaping, finishing, and cutting-off tools *i m o* are arranged in appropriate holders on the opposite side of the upright, the two latter being brought into action by the knee-lever H, projecting from the carriage below the bed of the lathe. According to the present invention, the roughing-tool *e* is held in a slotted holder, *e′*, pivoted to a stud, *f′*, which projects from an arm, *f*, attached to the front face of the upright D′. The lower end of this holder is provided with a set-screw, *g*, the end of which rests upon a lug, f^2, projecting from the lower end of the arm *f*. By means of this set-screw the outer end of the pivoted tool-holder may be raised and the cutting-tool forced down and held against the guide-socket ring in such a manner as to prevent vibration of the tool. This tool-holder is also adapted to slide outward and inward on the pivot, whereby the tool is adjusted longitudinally of the lathe to give it greater or less depth of cut for guide-socket rings or ring-rests of different sizes.

The arm *f* is attached to the upright by means of screws, said screws passing through the upright from the rear side thereof, and entering said arm near its inner and outer ends respectively. The screw at the inner end serves as a pivot-screw, while that at the outer end serves as a set-screw and is adapted to move in a curved slot, *h*, in the upright. This connection enables the arm carrying the tool-holder to be raised or lowered.

Immediately in the rear of the upright D′ is a shaping-tool, *i*. This tool is attached by means of a screw or otherwise to the short arm of a bent lever, *j*, which turns on a pivot, *k*, projecting from a support fastened to the periphery of the upright. The long arm of this bent lever is held by means of a spring, *l*, against the pattern-strip E, which extends parallel with the bed of the lathe and is supported on standards F F, rising therefrom. The action of this knife is thus controlled by the pattern-strip. As the lathe is designed to make a succession of articles from the stick without removing the latter, the pattern-strip is made with a succession of similar forms.

A finishing-tool, *m*, is attached to an inclined sliding tool-holder, G, moving on dovetailed guideways mounted between the uprights D′ D^2 of the tool-carriage, and operated by the knee-lever. This tool is adapted to cut the wood by a shearing cut, one part thereof being higher than the other, and the highest part reaching the wood first. This sliding tool-holder is provided with a horizontally-projecting arm, *n*, which carries a cutting-off tool, *o*, the holder *o′* of which is adjustable on said arm. The inner end of this arm is bent longitudinally of the lathe and attached to the said sliding tool-holder by means of a slot and set-screw, by means of which latter the arm may be adjusted toward or from the upright.

The holder *o′* for the severing-tool is provided with a vertical and a horizontal slot opening into each other, the former of which receives said tool and the latter the projecting arm. A set-screw in the holder clamps the severing-tool between the holder and the arm, and secures vertical adjustment of the tool.

The vertical slide G is provided, near its center, with an outwardly-projecting ear, by means of which it is attached to the arm *p*, which is raised and lowered by the wrist *q* in the crank-wheel *r*. A flexible elastic belt or strap, *s*, is attached at one end to the periphery of the crank-wheel, passes over the same, and is attached at the other end to the inner end of the knee-lever H, or to an arc-shaped arm attached thereto. Said lever is pivoted to an arm depending from the tool-carriage between the ways. As the outer end of the knee-lever is pressed down the crank-wheel is turned by means of the strap and the tool-carrying slide is raised. Another strap or cord, *t*, is wound upon the shaft of the crank-wheel, and connected at one end to a spiral or other spring which serves to turn back the crank-wheel and restore the slide to place.

The operation is as follows: The stick being placed in position, it is first acted on by the roughing-tool, which removes the corners and reduces it so that it will pass through the socket-ring. After passing through the ring the stick is next acted upon by the shaping-tool, whereby it is shaped according to the forms in the pattern-strip, but roughly shaped, however, owing to the spiral action of said tool. After being so shaped the work is smoothed by the finishing-tool, and then severed by the cutting-off tool, both of which latter are attached to the slide operated by the knee-lever. As the finishing-tool is slightly tipped toward the work, when it passes upward the wood is relieved from contact with it while being severed by the cutting-off tool. The slide G, bearing the shaping and cutting-off tools, being connected by a rod to a crank-wheel, and this crank-wheel being connected to the knee-lever by a flexible strap and to the tool-carriage by a strap or cord and a spring, it will be seen that the power required to depress the knee-lever is practically unvarying, owing to the fact that the leverage does not lengthen or shorten, and that there are no "dead-centers" to overcome. For this reason the flexible-strap connection between the knee-lever and its crank-wheel is a great improvement on the connections used in the machine secured to me by Letters Patent Nos. 150,737 and 242,242.

What is claimed as the invention is—

1. A tool-carriage having an interchangeable ring-rest through which the stick passes, provided with a roughing-tool which is pivoted to a vertically-adjustable arm, and which is itself vertically adjustable, for the purpose of causing it to bear on said ring, substantially as described.

2. The combination, with the tool-carriage and a removable ring-rest, of a roughing-tool supported by a tool-holder which is adjustable vertically and longitudinally of the lathe on a stud fixed to a vertically-adjustable arm, substantially as described.

3. The combination, with the flanged and throated ring-rest of the tool-carriage, of the vertically-adjustable arm *f* and the adjustable tool-holder, the stud *f'*, and the set-screw *g*, substantially as described.

4. In a lathe of the character described, a tool-holder connected to the wrist-pin of a crank-wheel the hub of which turns about a bearing depending from the tool-carriage, in combination with a retracting-spring, an actuating-lever, and a flexible connection between the crank-wheel and lever, substantially as described.

5. The combination, in a lathe, of a movable tool-carriage, a movable finishing-tool, a knee-lever, a crank-wheel, a flexible connection between the knee-lever and crank-wheel which allows an unvarying leverage and an instantaneous release of the tool from the finished work, and means for retracting the tool when the knee-lever is released, substantially as described.

6. The combination in a lathe of the character described, of the holder of the finishing-tool, the arm rigid thereon, and the holder of the cutting-off tool, having right-angular intersecting-grooves therein, and the binding-screw for confining the tool and its holder to said arm, substantially as described.

CHARLES W. WILDER.

Witnesses:
CHAS. S. HAYDEN,
DANIEL H. RELCH.