(No Model.) 3 Sheets—Sheet 1.

C. W. WILDER.

WOOD TURNING LATHE.

No. 345,466. Patented July 13, 1886.

Fig 1.

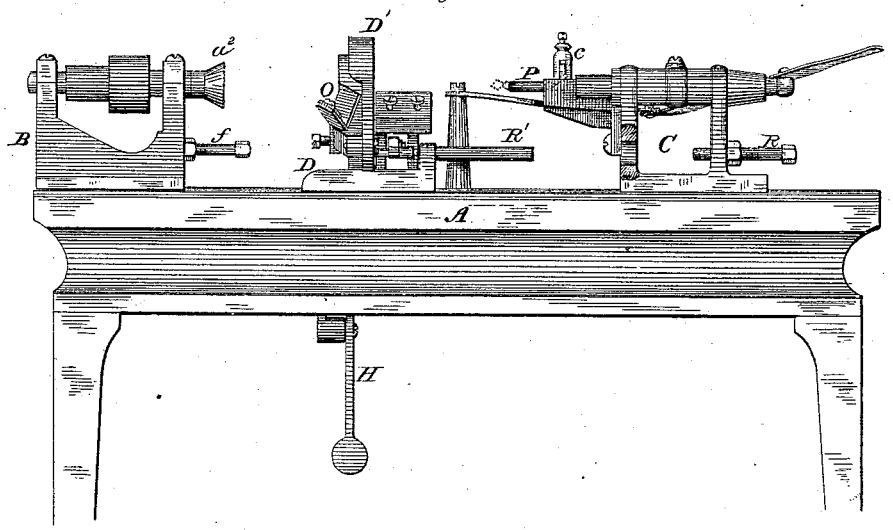
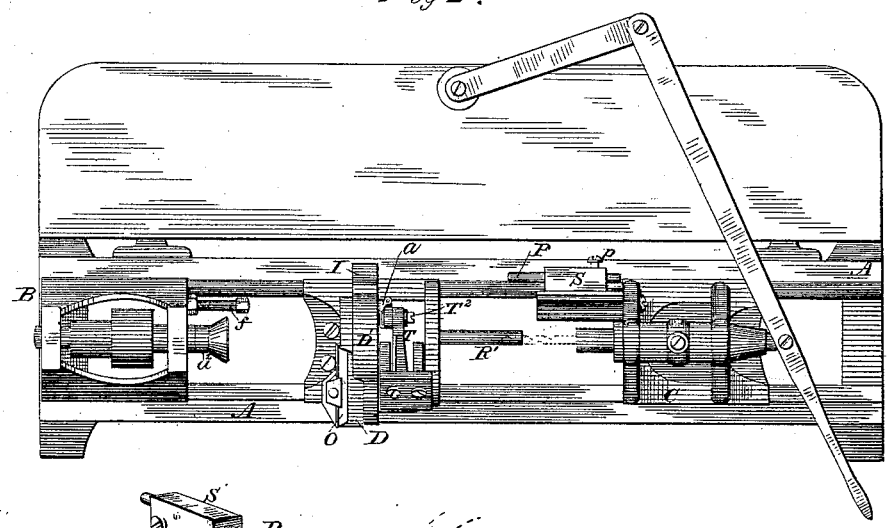


Fig 2.



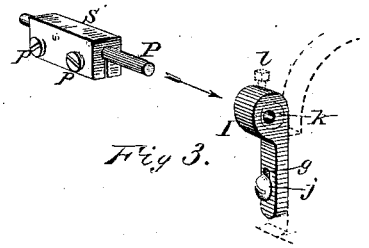


Fig 3.

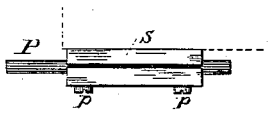


Fig 4.

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Fig 5.

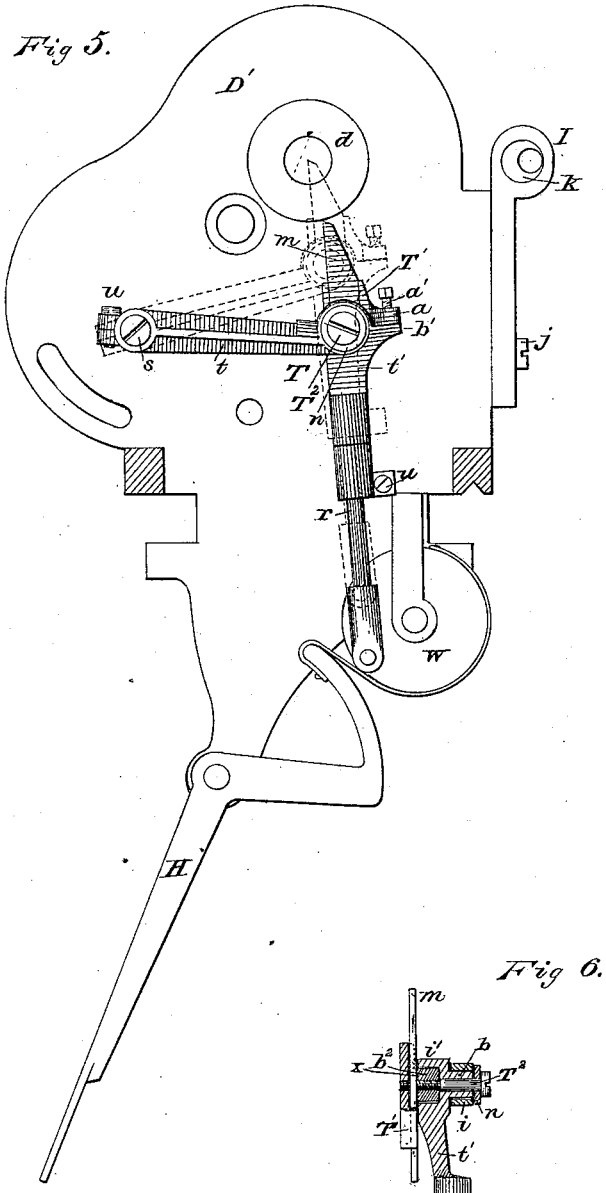

Fig 6.

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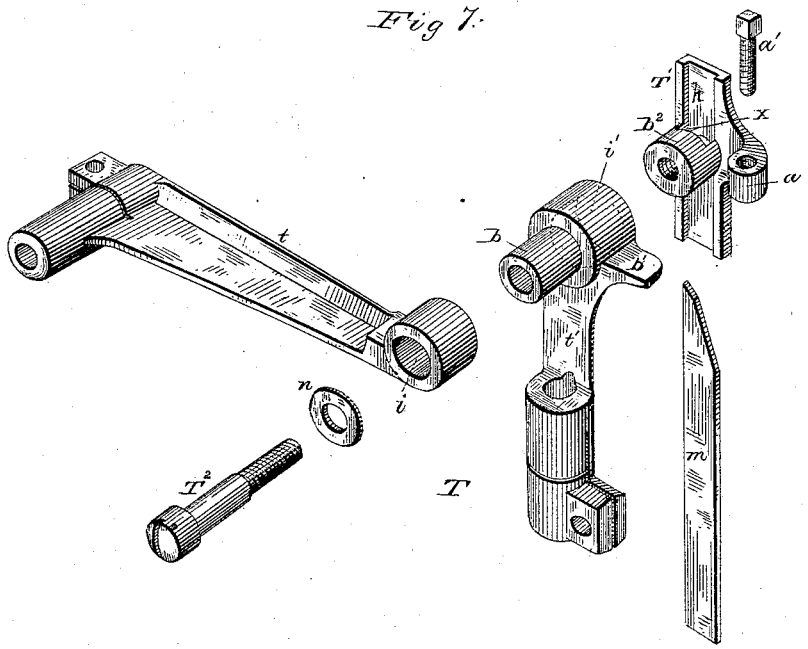
WOOD TURNING LATHE.

No. 345,466. Patented July 13, 1886.

Fig 7.



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UNITED STATES PATENT OFFICE.

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WOOD-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 345,466, dated July 13, 1886.

Application filed July 13, 1885. Serial No. 171,513. (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, of which the following is a specification, reference being had therein to the accompanying drawings.

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

The object of this invention is to secure a perfect alignment of the sliding tail-stock and the central sliding tool stock or carriage. Owing to wear and other causes the sliding tail-stock and sliding carriage become more or less loose on the track or ways on which they slide, and this looseness permits of a slight lateral motion of the carriage and sliding tail-stock, one being liable to crowd toward one side and the other toward the opposite side, whereby their tools are thrown out of alignment or out of their proper relative positions. In this invention the two sliding carriages are interlocked in such a manner that one cannot sway or move laterally without carrying the other with it, whereby the tools are kept in line or in proper relative positions.

The object of this invention is, further, to provide means which cannot be interfered with by falling shavings, for regulating the movement of the sliding carriage so as to secure a uniformity in the length of the work.

The object of this invention is, further, to so arrange the articulated cutting-off tool-holder that the axis of its tool, when the latter is presented to the work and during its movement toward the center thereof, will be in alignment, or nearly so, with a radius of the work. By this arrangement and movement of the tool the chips are thrown out, and the choking of the kerf is avoided.

In the accompanying drawings, Figure 1 is a front elevation of this improved wood-turning lathe. Fig. 2 is a plan thereof. Fig. 3 is a detail in perspective of the devices for interlocking the sliding carriages. Fig. 4 is a view of the under side of one of the said devices. Fig. 5 is a transverse section of the machine on the line 5 5 of Fig. 2, showing, especially, the cutting-off tool-holder and its connections, and omitting some of the other parts. Fig. 6 is a side elevation, partly in section, of the articulated cutting-off tool-holder and its tool. Fig. 7 is a perspective view of the several parts comprising the articulated tool-holder with its tool.

Similar letters of reference have been applied to corresponding parts throughout the several figures of the drawings.

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, and between them the sliding tool-carriage D is arranged. The spindle or head-stock is provided with the usual chuck, a^2, 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, *c*, for holding a tool to act on the end of the stick for forming a tenon or other terminal thereon, when required.

All 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.

The body of the lathe is preferably provided on one side with an **A**-guideway, and on the other side with a flat bearing-way on which the tool-carriage and tail-stock slide. The single **A**-formed guideway tends to secure 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 carriage or tail-stock. A hand-lever is employed for moving the tail-stock.

From the base of the tool-carriage D, and about midway thereof, the usual upright web, D′, rises. This upright web 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 *o*, which cuts off the corners from the stick and reduces it to a size to enter the socket of the ring *d*, is mounted in any suitable manner on the front side of the upright web D′, and projects obliquely into a radial gap in the socket-ring *d*, and the shaping and cutting-off tools are arranged in appropriate holders on the opposite side of the web, being brought into action by the knee-lever H, projecting from the carriage below the bed of the lathe.

The sliding tail-stock and the central sliding carriage are provided with an aligning device for preventing the lateral movement or swaying thereof in different directions and securing an accurate alignment or retention of the tools in their proper relative positions. This device consists, preferably, of an eye, I, on the carriage, and a pin, P, on the tail-stock. The eye is preferably vertically adjustable on the upright web D′ of the carriage, its shank being provided with a vertical slot, *g*, through which the fastening or set screw *j* passes. The eye is preferably provided with an adjustable bushing, *k*, the hole in which is eccentric to the outer circumference of the bushing. This bushing is held in fixed position by means of a set-screw, *l*, passing through the shell of the eye. The slot in the eye and the eccentric bushing enable the eye to be adjusted in every direction to compensate for any unequal wear of the carriage or tail-stock on the track, and secure the proper interlocking of the central and tail stocks. The interlocking-pin P, attached to the tail-stock, is preferably held in a split holder or clamp S, the jaws of which are pressed together by screws *p*, whereby the pin is firmly held and rendered adjustable endwise. The holder, instead of being split, may be solid, except the perforation for the pin, and provided with a set-screw for holding the pin. When the tail-stock is moved forward to bring its tool into contact with the work, the pin P attached thereto enters the eye I on the central carriage, and said carriage and stock are interlocked and held in alignment, whereby their tools are kept in proper relative positions.

An adjustable stop-rod, R, is attached to the tail-stock for pushing the central carriage along the track in front of said stop. In Patent No. 242,242, heretofore granted to me, this adjustable stop-rod is shown as attached to the front standard of the tail-stock and adapted to come in contact directly with said carriage at a point beneath the cutting-tools. In such position the shavings from such tools fall between the end of the rod and the carriage, and as the length of the work is determined by the movement of the carriage, which is regulated by the adjustment of this rod, the intervention of shavings, as aforesaid, alters the length of the work produced. To avoid this difficulty, the said rod in my present invention is attached to the rear standard of the tail-stock, and the central carriage is provided with a rod, R′, extending backward in line with said screw-rod. An opening is made in the front standard of the tail-stock, through which said fixed rod of the carriage passes, and the two rods come together at a point in the rear of the cutting-tools, where no falling shavings can interfere.

The head-stock is provided with the usual fixed rod, *f*, for determining the movement of the central carriage.

In my patent 242,242 is shown an articulated cutting-off tool-holder in which the tool is fixed to the horizontal arm of the tool-holder at right angles thereto. In that case the tool moves in the arc of a circle traversed by the free end of said arm, and in order that the point of the tool shall touch the center of the stick being cut at the finish of the stroke the inner face of the tool is necessarily at a considerable angle to the radius of the stick at the start of the cut, on the periphery thereof, and in that case the chips are not thrown off with such force as to prevent the choking of the kerf. In my present invention I avoid this difficulty by arranging the cutting-off tool *m* in such a manner that its inner face during its entire stroke is on a line, or nearly so, with the radius of the stick being cut. This position allows the chips to be thrown out with greater force and avoids the choking of the kerf.

To secure the radial alignment of the tool, it is attached to the vertical arm of the articulated tool-holder T, as clearly shown in Fig. 5, wherein the inner face of the tool is parallel, or nearly so, with a straight line running from the center of the ring supporting the work to the point of connection of the lower vertical arm of the tool-holder with its actuating-wheel *w*, and in the movement of the tool from the periphery of the stick being cut to the center thereof, it preserves approximately this relation to such a line.

The articulated tool-holder comprises the horizontal arm *t* and the vertical arm *t′*. The horizontal arm *t* is pivoted at its outer end by means of the pivot-screw *s* to the web D′ of the central carriage, and the vertical arm *t′* has a socket at its lower end for receiving the upper end of a connecting-rod, *r*, which connects it with the crank-wheel *w*. The outer ends of these arms are split, and provided with clamp-screws *u u* for tightly clamping them to the pivot and connecting-rod respectively. The horizontal arm *t* is provided at its inner end with eye *i*, and the vertical arm is provided at its upper end, on its rear side, with a tubular boss, *b*, which fits into said eye and constitutes the connecting-pivot on which said arms turn. The vertical arm *t′* is also pro-

vided on its front side, opposite said boss, with a socket, i', and with a laterally-projecting lug, b'. A tool-clamp, T', which serves to clamp the severing-tool to its articulated holder T, is provided with a tubular boss, b^2, which fits in the socket i' of the vertical arm of said holder, and with a laterally-projecting curved arm, a, above the lug b', through which an adjusting-screw, a', passes into contact with said lug for determining the axial adjustment of said clamp. This tool-clamp T' is preferably provided with a longitudinal recess, h, on its inner face, into which the tool is fitted, and the boss b^2 is provided with a slot, x, corresponding with said recess, to permit the insertion of the tool, the tubular boss b^2 of said tool-clamp being screw-threaded on its interior. When the parts are assembled, the tubular boss b of the vertical arm of the tool-holder is inserted in the eye i of the horizontal arm thereof, said boss being slightly longer than said eye, so as to project through it and permit the horizontal arm to turn freely on said boss without end friction, and the tubular boss b^2 of the tool-clamp T' is inserted in the socket i of the vertical arm. A screw-bolt, T^2, is then passed through the nut n, and through the tubular boss b of the vertical arm t', which is then within the eye i of the horizontal arm t, and takes into the tubular boss b^2 of the tool-clamp T', which tubular boss b^2 is within the socket i' of said vertical arm. The screw T^2, taking into the boss b^2 of the tool-holder T', draws said tool-clamp toward the vertical arm and tightly clamps the tool between the outer face of the socket i' and the inner face of said clamp.

The knee-lever for actuating the articulated tool-holder is preferably connected with the actuating-wheel in the manner shown in my patent No. 254,419.

It is not deemed necessary to describe in detail the other parts of this lathe, as they are fully set forth in my former patents heretofore referred to.

I claim as my invention—

1. In a lathe, the combination, with the guideways, of two sliding tool-carriages or tool-stocks provided with an aligning device auxiliary to said guideways for maintaining said carriages in alignment, substantially as set forth.

2. The combination, in a lathe, of a sliding tool stock or carriage provided with an eye, and a sliding tool stock or carriage provided with a pin adapted to engage with said eye for maintaining the carriages in alignment, substantially as described.

3. The combination, in a lathe, of a sliding tool stock or carriage provided with an eye, said eye being adjustable on the carriage, and a sliding tool stock or carriage provided with a pin adapted to engage with said eye for maintaining the carriages in alignment, substantially as described.

4. The combination, in a lathe, of a sliding tool stock or carriage provided with an eye, said eye being provided with an eccentric bushing, and a sliding tool stock or carriage provided with a pin adapted to engage with said eye for maintaining the carriages in alignment, substantially as described.

5. The combination, in a lathe, of a sliding tool stock or carriage provided with an eye, said eye being provided with an eccentric bushing and being adjustable on the carriage, and a sliding tool stock or carriage provided with a pin adapted to engage with said eye for maintaining the carriages in alignment, substantially as described.

6. The combination, in a lathe, of a sliding tool stock or carriage provided with an eye and a sliding tool stock or carriage provided with a pin adapted to engage with said eye for maintaining the carriages in alignment, and a clamp in which said pin is adjustable longitudinally, substantially as described.

7. The combination, in a lathe, of a sliding tool-carriage provided with a rod extending backward therefrom and a sliding tail stock or carriage provided with an adjustable rod attached to the rear part of said tail-stock, and adapted for contact with the rod of said carriage at a point remote from the cutting-tools, substantially as described.

8. The combination, in a lathe, of a tool-stock, an articulated tool-holder, the horizontal arm of which is pivoted to said stock, a crank-wheel to which the vertical arm of said tool-holder is pivoted, and a tool fixed to said vertical arm, the front face of said tool being in line, or nearly so, with the radius of the work to be cut, substantially as described.

9. An articulated tool-holder for lathes, one member of which is provided with an eye, the other member being provided with a tubular boss turning in said eye, with a socket on the side opposite said boss, and with a laterally-projecting lug, in combination with a tool-clamp provided with a tubular boss fitting said socket, and with a laterally-projecting arm having an adjusting-screw for contact with said lug, substantially as described.

10. An articulated tool-holder for lathes, one member of which is provided with an eye the other member being provided with a tubular boss turning in said eye, with a socket on the side opposite said boss, and with a laterally-projecting lug, in combination with a tool-clamp provided with a tubular boss fitting said socket, and with a laterally-projecting curved arm having an adjusting-screw for contact with said lug, the boss of said tool-clamp being screw-threaded, and a screw-bolt passing through the boss of the tool-holder and entering the boss of the tool-clamp, substantially as described.

11. The combination, with a tool-holder provided with a tubular recess, of a tool-clamp for a lathe-tool, consisting of a recessed plate provided with a tubular boss for insertion in said recess, and having a slot corresponding

with the recess in the plate, and a set-screw passing through said boss, substantially as described.

12. The combination, with a tool-holder provided with a tubular recess, of a tool-clamp for a lathe-tool, consisting of a recessed plate provided with a tubular boss for insertion in said tubular recess, and having a slot corresponding with the recess in the plate, substantially as described.

13. The combination, with a tool-holder provided with a tubular recess, and having a projecting lug, of a tool-clamp for a lathe-tool, consisting of a recessed plate provided with a tubular boss for insertion in said tubular recess, and having a slot corresponding with the recess in the plate, and a laterally-projecting curved arm provided with an adjustable screw for contact with said lug, substantially as described.

14. The combination, with a tool-holder provided with a tubular recess, of a clamp for a lathe-tool, consisting of a plate provided with a tubular boss for insertion in said tubular recess, said boss being provided with a slot, through which the tool passes, substantially as described.

15. The combination, in a lathe, of a tool-carriage, a tool-carrying arm approximately in line with the radius of the work, a cutting-off tool attached at one end to said arm in line therewith, a crank-wheel to which said arm is connected, and an arm pivoted at one end to the carriage and at the opposite end to said tool-carrying arm, whereby longitudinal and slightly-lateral movements are imparted to the tool-carrying arm and its tool, substantially as described.

CHARLES W. WILDER.

Witnesses:

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CHAS. S. HAYDEN.