(No Model.)

E. CONRADY.

LATHE.

No. 475,671. Patented May 24, 1892.

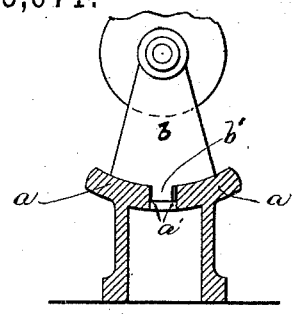


FIG. 1.

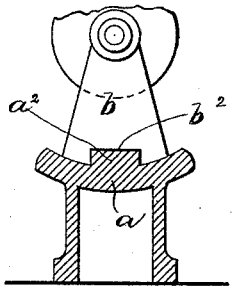


FIG. 2.

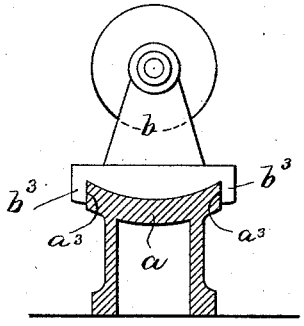


FIG. 3.

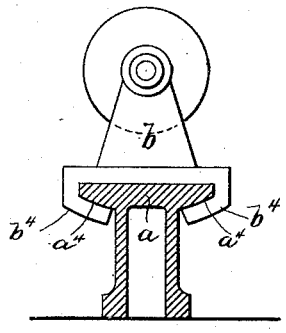
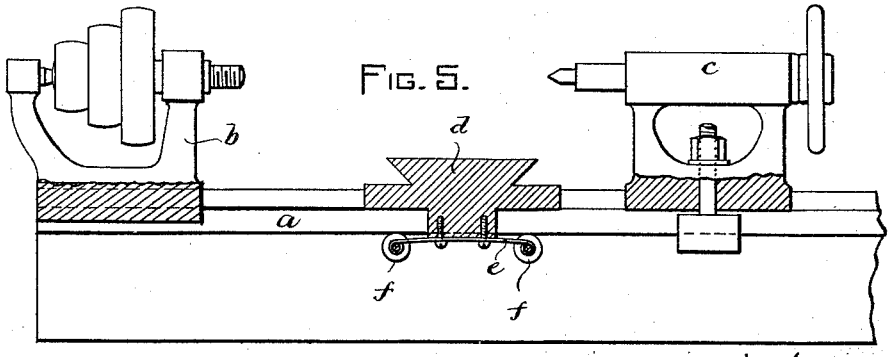


FIG. 4.

FIG. 5.



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UNITED STATES PATENT OFFICE.

EUGENE CONRADY, OF KEIGHLEY, ENGLAND.

LATHE.

SPECIFICATION forming part of Letters Patent No. 475,671, dated May 24, 1892.

Application filed August 8, 1891. Serial No. 402,116. (No model.)

To all whom it may concern:

Be it known that I, EUGENE CONRADY, of Keighley, in the county of York, England, have invented certain new and useful Improvements in Lathes, of which the following is a specification.

This invention relates to lathes; and it has for its object to provide a lathe-bed of such form as will do away with the necessity of a number of true and parallel surfaces on the same and on the head-stock, tail-stock, tool-carriage, &c., sliding thereon.

The invention also has for its object to provide a lathe-bed of a form which will neutralize any lateral play or side shake of the sliding parts above mentioned upon the same and will prevent said side shake from making any variation in the position of the tool with respect to the "center line" or axis of the spindle of the lathe.

The invention consists in a lathe-bed having a bearing-surface for the sliding parts, such as the head-stock, tail-stock, and tool-carriage, said parts each having a bearing-surface corresponding to the bearing-surface of the bed, a cross-section of the lathe-bed, showing the bearing-surface thereof formed on a curve which is an arc of a circle, of which the center is the axial line of the spindle thereof, all of which I will now proceed to describe and claim.

In the accompanying drawings, forming a a part of this specification, Figure 1 represents a cross-section of a lathe-bed embodying my invention. Fig. 2 represents a similar view showing a slightly different form of lathe-bed. Fig. 3 represents a similar view showing another slight change in the form of the lathe-bed. Fig. 4 represents a similar view showing a modification. Fig. 5 represents a front elevation of a lathe, showing the general arrangement of the parts.

The same letters of reference indicate the same parts in all the figures.

In lathes now in common use the lathe-bed is made with a level upper surface and with two or more inclined surfaces, or with a level upper surface with guides or ways projecting upwardly therefrom, on which the sliding parts move and to which they are accurately fitted. It is essential to the correct working of the lathe that each of these surfaces should be perfectly true and that they should all be true to each other, for if they be not true, and the moving parts do not fit them with the greatest accuracy, said parts will have a certain amount of lateral play or side shake and the centers or the tool will shift, thus rendering accurate work impossible. I have overcome this difficulty and have made the accuracy of a lathe to depend on the truth of one bearing-surface only by means of the invention which I will now proceed to describe.

In carrying out my invention I construct a lathe-bed a with its upper surface curved in cross-section, the curve of said upper surface being an arc of a circle, of which the center is the axial line of the spindle.

b represents the head-stock of the lathe.

In the form of my invention shown in Fig. 1 I show the bed a divided by a groove or slot, having the side faces a' a'. The head-stock b is provided with a projection b', which enters the said slot and prevents said head-stock from moving laterally too far for convenience in practical use. It will be observed, however, that the faces a' a' need not be true, as even if the head-stock is allowed a comparatively great amount of lateral play this movement will not affect or shift the center of rotation of the spindle or of the work held by the lathe, it being readily understood that said side play takes place on a curved bearing-surface, the curve of which is an arc of a circle of which said center of rotation is the central point, so that no movement on the line of said arc can change the position of the center.

In Fig. 2 I have shown the bed a provided with an upward projection a^2 and the head-stock b provided with a slot or groove b^2 to receive the same, the functions of said projection and slot being the same as those of the slot and projection shown in Fig. 1.

In Fig. 3 I show another form of the invention, in which the head-stock b overlaps at the front and back the bed a, and has two downward projections b^3 b^3 lying alongside of the back and front edges a^3 a^3 of the bed a. These projections b^3, bearing on the edges of the bed, serve the same purpose as the slots and projections shown in the two forms first described, as will be readily seen.

In cases where the strain is such as to tend

to lift the sliding parts off the lathe-bed I provide the modified form shown in Fig. 4. In this form the curved bearing-surface of the lathe-bed is on the under side of the same and is of course convex. The said convex under side of the lathe-bed is also curved in the arc of a circle of which the axis of the lathe-spindle is the center.

The head-stock b is provided with flanges $b^4 b^4$, which fit around the edges and under the surfaces $a^4 a^4$ of the bed.

In speaking of the head-stock b in describing the various forms of my invention above it will be obvious that the tail-stock and tool-carriage are constructed similarly and that the head-stock stands for a type of the sliding parts of the lathe whatever they may be called.

It will be readily understood that any part of a sliding part of a lathe thus constructed will always maintain the same distance from the center line of the lathe, and consequently that a cutting-tool attached to the tool-carriage or slide-rest of a lathe of this construction will turn a piece of work revolving between the lathe-centers perfectly true and parallel, however much lateral play the tool-carriage may have.

The general arrangement of a simple lathe, according to my invention, is shown in Fig. 5, in which the head-stock b and tail-stock c are shown fixed to the bed a in the usual way by bolt and nut and the saddle d for the slide-rest held down to the bed by a flat spring e of suitable strength with anti-friction rollers $f f$ at its ends.

All appliances used on common lathes—such, for instance, as automatic feed and screw-cutting attachments—can, of course, be fitted to lathes of my construction.

The term "lathe" in this specification is intended to comprise, first, all kinds of common lathes in which the work revolves while the tool stands still, including those for special work—as, for instance, screw-making lathes, turret-lathes, and similar machines; second, boring-machines, such as are used for boring out the cylinders of steam-engines and for similar work, the characteristic of this second kind of lathes being that the work is held stationary on a table while the cutting-tool revolves.

I do not desire to limit myself to the specific forms of lathe-bed herein shown and described, as the same may be varied in many ways without departing from the spirit of my invention, the essential feature of my invention being the curved bearing-surface of the bed which is an arc of a circle of which the center of rotation of the spindle is the center.

I claim—

1. In a lathe, the improved bed having a guiding or bearing surface which is curved in cross-section, the curve of said surface being an arc of a circle of which the center is the axial line of the spindle thereof, as set forth.

2. In a lathe, the combination of a bed having a guiding or bearing surface which is curved in cross-section, the curve of said surface being an arc of a circle of which the center is the axial line of the spindle thereof, and sliding parts, such as the head-stock, tail-stock, and tool-carriage, provided with a corresponding bearing-surface, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of July, A. D. 1891.

EUGENE CONRADY.

Witnesses:
HORACE W. STANSFELD,
Merchant, Bradford.
WM. TEALE KIRK,
Cashier, Bradford.