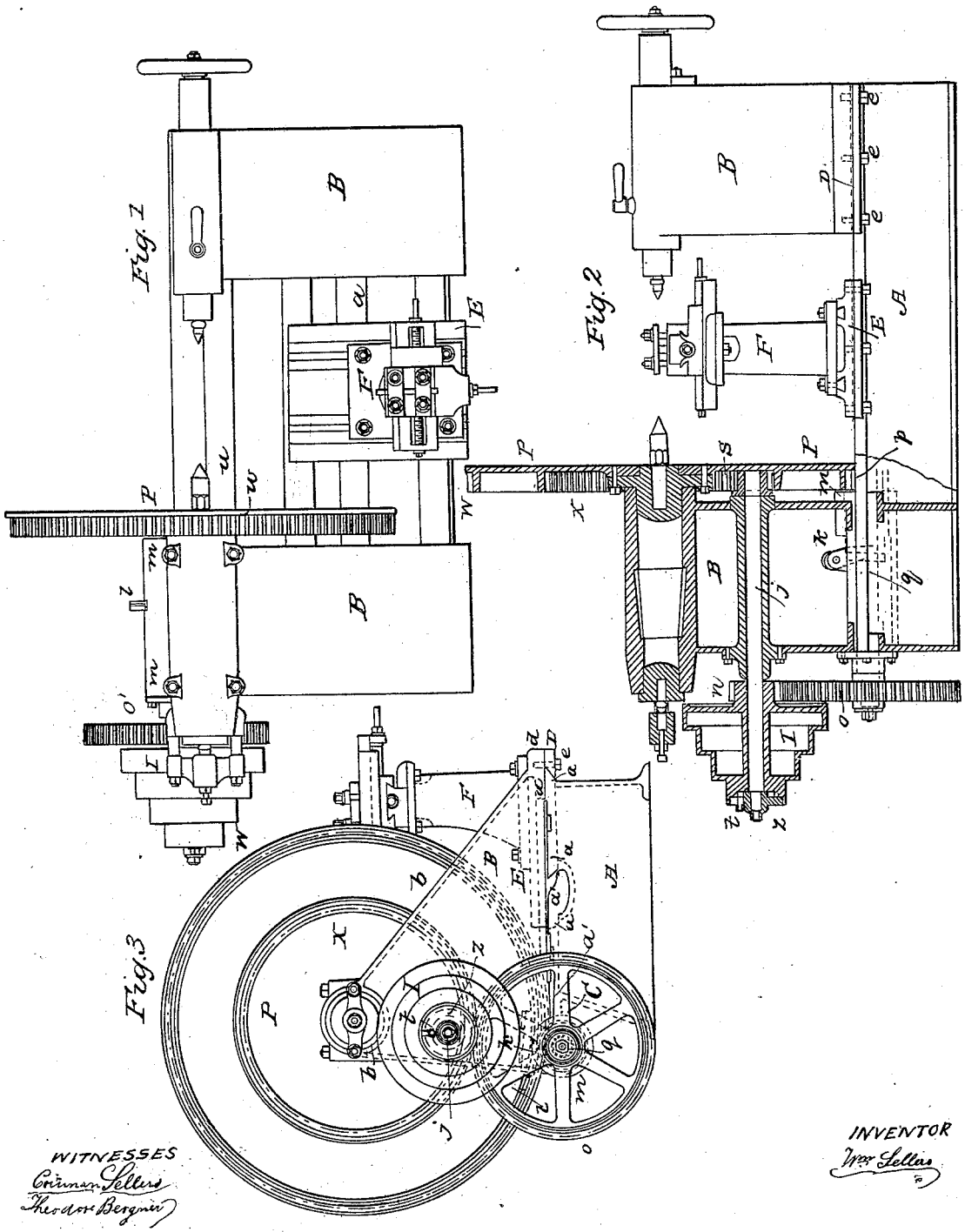
W. SELLERS.

Turning Lathe.

No. 27,478. Patented March 13, 1860.



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WILLIAM SELLERS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN TURNING-LATHES.

Specification forming part of Letters Patent No. **27,478**, dated March 13, 1860.

To all whom it may concern:

Be it known that I, WILLIAM SELLERS, of the city of Philadelphia and State of Pennsylvania, have invented certain Improvements in Turning-Lathes; and I do hereby declare that the following is a full and exact description of the construction and operation thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan; Fig. 2, a side view of lathe and vertical section of poppet-head, and Fig. 3 is an end view.

The object of my invention in the improvement in turning-lathes is, first, to so arrange the head which supports the revolving spindle as to enable it to occupy a shorter space on the bed and at the same time increase its stiffness; second, to place the centers which carry the work to be operated upon in such a position with reference to the bed-piece that the strain of the cut shall fall within the line of the bed, while that side of the work opposite the cutting-tool may project beyond the line of the bed, by so doing reducing the width of the bed-piece to the narrowest possible limits without impairing the stability; third, to construct the bed-piece and heads that are attached thereto in such a manner that the parallelism of the axes of the spindles in every direction may depend upon the truth of two surfaces of the bed, with corresponding surfaces on the heads; fourth, to construct the upper surface of lathe-beds in such a manner that the slide-rest may move only on one half of it, the other half being of similar form, so that the slide-rest may be transferred upon it, thereby enabling it to work upon any part of any piece the lathe is capable of swinging, such arrangement permitting the use of a smaller slide-rest with advantage.

To accomplish these results I provide the bed-piece A, having its upper surface horizontal, and divided longitudinally into equal and similar parts *a a*. The edges of these parts *a a* are finished at a sufficiently acute angle with the upper side to answer the purposes hereinafter described.

B B, Fig. 1, are the heads, carrying the "live" and "dead" spindles of the lathe, as they are technically called, and in order to give these heads the greatest amount of rigidity with the least metal, I make them in the form of a hollow box, uniting the front and back ends together by the side webs *b b*, Fig. 3, as far up as the center of the revolving spindle of that head, and entirely surrounding the spindle on the other head, thus greatly increasing the ability of the heads to resist the end-thrust of any work that may be suspended on the centers for the purpose of being operated upon, and enabling me to make these heads shorter in the direction of the length of the bed than can be done by any of the methods now in use, and in the same proportion to diminish the length of the bed itself.

In order to attach the heads B B to the bed-piece A, I provide a projection, C, Fig. 3, cast on the head, which corresponds with the side *a'* on the back of the bed-piece, and on the opposite side a piece, D, is provided, which piece is made to correspond with the adjoining edge of the bed on one side, and to fit against and rest on a projection, *d*, of the head on the other.

The piece D is attached to the head B by means of the bolts *e e e*, and one side resting on the projection *d* and the other against the bed-piece, while the middle is clear of any support. It is plain that by tightening the bolts *e e e* the head will be forced over on that side until the projection C will allow it to go no farther, and, as the sides *a' a'* are at an acute angle with the surfaces *a a* of the bed, the head will then be forced against the surfaces *a a* and held firmly in that position.

In turning work with a single slide-rest and tool, as we can only operate upon one side of the work, I take advantage of this fact to place the axis of my lathe-spindles as far to one side of the bed as possible, allowing the part of the work opposite the cutting-tool to be beyond the line of the bed.

To keep the lathe steady, I do not carry the axis of the spindles beyond the bed entirely, but only so far as may permit the center of gravity of the whole to fall within the base of the bed, thereby making use of the whole upper surface of the bed for the slide-rest to move upon, while in ordinary lathes for turning purposes that part of the bed beyond the line of centers from the slide-rest is useless for this purpose.

The bottom plate E of the slide-rest is attached to the bed-piece in the same manner

as the heads B B; but it only embraces one-half the upper side of the bed—that is, one of the surfaces *a a*. These being both alike, as before described, the slide-rest may be transferred from one to the other, and attached to either, as the character of the work to be operated upon may require.

The post F of the slide-rest is made so as to be movable upon the bottom plate E in a direction at right angles to the bed-piece A, for the purpose of adjusting the position of the cutting-tool to the size of the work to be operated upon.

To give motion to the face-plate P, to which the work to be turned must be attached, I provide the external wheel W, gearing with the pinion *p*, which pinion is arranged so as to be placed out of or in gear with the wheel W by means of the clutch *k*, operated by a wrench on the square end *l* of the clutch-shaft.

The pinion *p* is driven by the shaft *q*, and is fitted so as to slide easily thereon, and is turned by a feather-key fitted in the shaft. It is supported in proper position to gear with the wheel W by the projection *m* on the head B. The other end of the shaft *q* is supported by the projection *m* on the head B, and on the outer end of this shaft I place the gear-wheel O, which is driven by the pinion *n* on the cone-pulley I. The cone-pulley I turns freely on and is supported by the shaft *j*, and may also be attached to the shaft *j* by means of the clutch-bolt *t* sliding in the face-plate *z*, which is keyed fast on the shaft *j*. On the other end of the shaft *j* I place the pinion S, gearing with the internal wheel X on the face-plate P.

If, now, the pinion *p* be placed out of gear with the external wheel W on the face-plate P, and the clutch-bolt *t* be moved so as to attach the cone-pulleys I to the shaft *j*, when motion is communicated to the cone-pulleys the face-plate P will be driven by the pinion S. Again, if the clutch-bolt *t* be moved so that the cone-pulleys I shall be disengaged from the shaft *j*, and the pinion *p* be placed in gear with the external wheel W on the face-plate P, motion will be communicated to the plate P through the pinion *n*, wheel O, shaft *q*, and pinion *p*, and the pinion S and shaft *j* will be driven by the face-plate, thus giving a much slower motion to the plate than when it is driven by the pinion S.

Besides the convenience in fitting up the work by the combination of the internal and external gearing on the same plate, the internal wheel, being cast with the plate, serves as a brace, and makes the plate much stiffer than it would be without it.

I am aware that bed-pieces and heads have been attached together in such a manner that the truth of the line of centers in every direction is dependent upon the truth of two surfaces of the bed and corresponding surfaces on the heads; but in these cases the lathes have been very small, and the bed in the form of a triangular bar. I do not therefore claim, broadly, such attachment of heads to bed.

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

1. Constructing lathe-heads in the form of a hollow box, and revolving the spindle in journals which are connected together and surround the spindle throughout its length, substantially as described, and for the purposes specified, whether said journals are so arranged as to form a continuous bearing throughout the entire length of the spindle or not.

2. Attaching the heads of a lathe to the bed in such a manner that a line drawn from the axis of a spindle perpendicular to the upper surface of said bed shall fall on or about the back edge of the bed, substantially as described, and for the purpose specified.

3. Constructing lathe-beds with their upper surfaces horizontal, or substantially so, when this is combined with one other surface on the bed and corresponding surfaces on the heads, which surfaces, being brought in contact, shall insure the parallelism of the axis of the spindles, substantially as described.

4. The use of a lathe-bed having its upper surface divided longitudinally into two similar parts, each part having its edges beveled, so that the slide-rest may be attached to either side, substantially as described, and for the purpose specified.

5. The combination of the internal and external gearing on the same face-plate, for the purpose of obtaining the required variation of speed and of stiffening the plate, substantially as described.

WM. SELLERS.

Witnesses:

COLEMAN SELLERS,

THEODORE BERGNER.