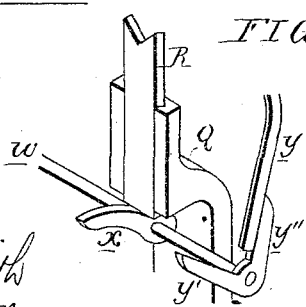
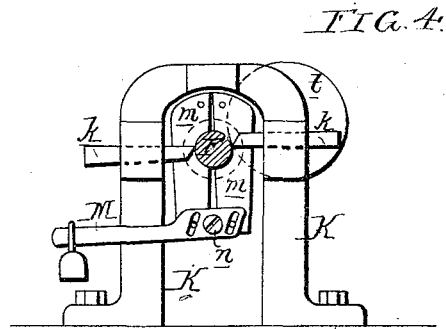
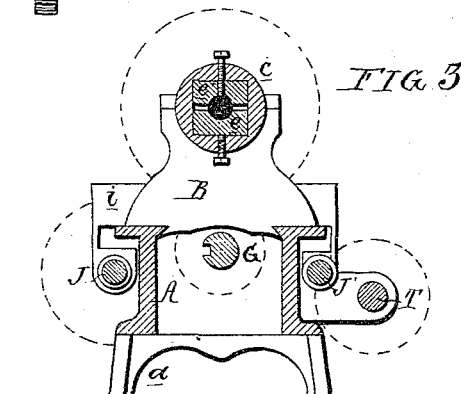
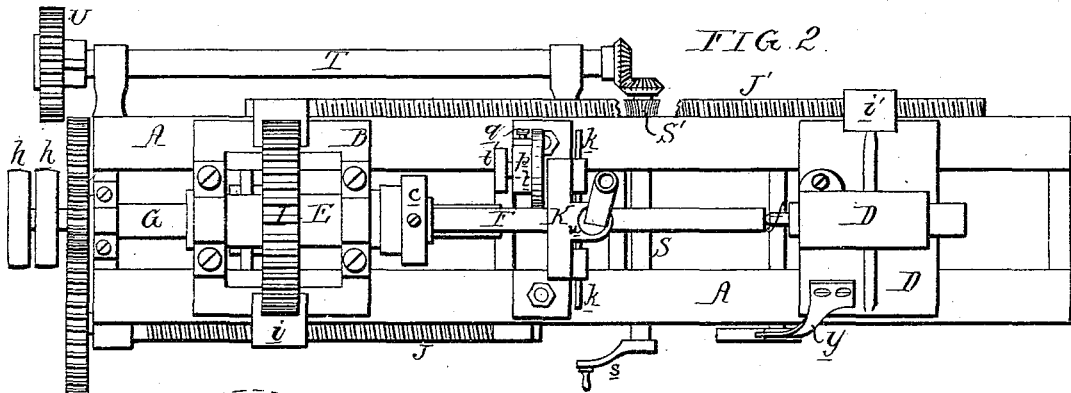
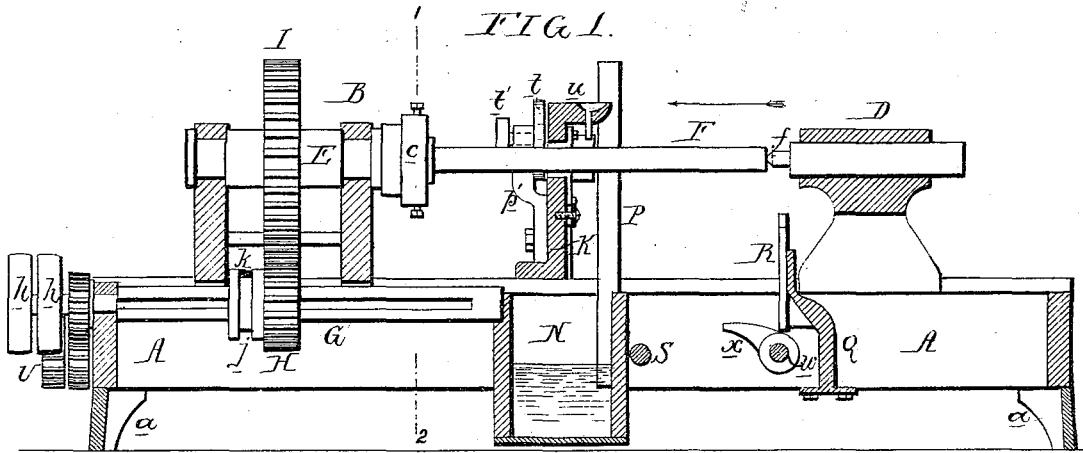


A. WOOD.

Metal Shaft Turning-Lathes.

No. 149,020.

Patented March 24, 1874.



Witnesses
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Hubert Howson

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By his attys.
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UNITED STATES PATENT OFFICE.

AURIN WOOD, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN METAL-SHAFT-TURNING LATHES.

Specification forming part of Letters Patent No. 149,020, dated March 24, 1874; application filed August 21, 1873.

To all whom it may concern:

Be it known that I, AURIN WOOD, of Worcester, Worcester county, State of Massachusetts, have invented an Improved Shaft-Turning Lathe, of which the following is a specification:

The object of my invention is to turn long shafts rapidly and truly by a lathe, the main feature of which consists in causing the head-stocks, carrying a rotating shaft, to traverse, while the tools remain stationary, as shown in the accompanying drawings, in which—

Figure 1 represents a vertical section of my shaft-turning lathe; Fig. 2, a plan view; Fig. 3, a section on the line 1 2; Fig. 4, a view of the tools and shaft-steadying device, and Fig. 5 a view of the device for preventing the shaft from sagging.

The bed A of the lathe is supported on suitable legs *a a*, and has on its upper surface guides for the two head-stocks B and D, the former carrying a tubular spindle, E, through which the shaft F to be turned can be introduced to and withdrawn from its place on the lathe, the said shaft being gripped, at one end, by and between jaws *e e'*, fitted to a chuck, *c*, on the spindle E, and at the opposite end revolving on the usual adjustable center *f* of the head-stock D. G is the driving-shaft, turning in suitable bearings in the bed of the lathe, and having the usual fast and loose pulleys *h h*, the shaft having a longitudinal slot for receiving a key on a pinion, H, which gears into a cog-wheel, I, on the spindle, a projection, *j*, on the pinion having a groove for receiving a bar, *k*, attached to the head-stock B, so that any movement of the latter must be accompanied by a like movement of the pinion. A screw-shaft, J, adapted to suitable bearings in front of the lathe-bed, is driven by suitable cog-wheels from the shaft G, and a nut, *i*, attached to the head-stock B, is arranged to embrace the threaded portion of the screw-shaft, so that the revolution of the latter must cause the head-stock to traverse the bed of the lathe. The nut *i* should be so constructed as to be readily thrown in or out of gear with the screw-shaft in a manner adopted in connection with ordinary slide-rests. On the opposite side of the lathe-bed there is a screw, *J'*, which serves to connect the two head-stocks together, one end of this screw be-

ing secured to the head-stock B, and the other end being adapted to a nut, *i'*, on the head-stock D. By manipulating this screw *J'* the relative positions of the two head-stocks can be altered at pleasure. On the bed of the lathe is secured the tool-holder K, (best observed in Fig. 4,) and to this holder are attached as many cutting-tools, *k*, as may be convenient or desirable. To the holder are suspended two jaws, *m m*, for embracing and steadying the shaft F, these jaws being controlled by a weighted lever, M, which is hung to a central pin, *n*, on the holder K, the lever having two inclined slots, so adapted to pins on the jaws *m m* that the latter are caused by the weighted lever to embrace the said shaft F, thereby steadying the same near the point where the action of the cutting-tools takes place. In a bearing, *p*, in a bracket, *p'*, secured to the tool-holder, turns a spindle carrying a polishing-wheel, *t*, and pulley, *t'*, which may be driven by a band from any adjacent pulley, the said bearing being so arranged on the bracket that it can be adjusted horizontally toward the shaft F by a set-screw, *q*. This combination of a shaft-steadying device with a polishing-wheel is a special feature of my invention, and may be employed either in connection with a traversing slide or with a fixed tool-holder, as shown. To the bed of the lathe, below the tool-carrier K, is attached a cistern, N, containing oil, soap and water, or other liquids usually applied to tools used in cutting wrought-iron, and within this cistern is contained the lower end of a pump-barrel, P, a plunger in which raises the liquid and discharges it from a spout into a receiver, *u*, on the top of the tool-holder K, whence the liquid is directed through a tube onto the shaft at the point where the cutting-tools *k k* are applied. It is immaterial from what source the plunger of the pump derives its reciprocating motion, but it may be remarked that as the tools and pump-barrel are stationary, every facility is afforded for operating the plunger through mechanism driven from the shaft G, or from the line or counter shafts above the lathe.

It should be understood that the lathe is much longer than the drawing indicates. It is intended, in fact, to be long enough to turn the longest line-shafts; hence it is necessary to provide the lathe, at intervals throughout

its length, with proper supports to prevent the sagging of the shaft. The device which I employ for this purpose is illustrated in Fig. 1, and in the perspective view, Fig. 5. To the bed of the lathe is secured a frame, Q, to vertical V-shaped guides, in which is adapted the support R, arranged at the upper end for fitting against and steadying the shaft F. A shaft, *w*, extends across and turns in the bed of the lathe, and to this shaft is secured a cam, *x*, bearing against the lower end of the support R, so that, by turning the shaft, the said support may be raised to and be retained by the cam against the shaft F. An arm, *y*, on the head-stock D will, as the latter moves in the direction of the arrow, Fig. 1, strike an arm, *y'*, on the shaft *w*, and turn the same so as to depress the cam *x*, when the support R will fall and present no further obstacle to the progress of the said head-stock in the direction of the arrow, when, prior to the introduction of a new shaft, F, into the lathe, the head-stock D has to be moved in a contrary direction. Its arm *y* will strike the arm *y''* on the shaft *w*, and thereby cause the cam to elevate the support R and retain it in its elevated position. As it is frequently necessary to move the head-stocks along the bed of the lathe at a faster rate than can be effected by the screw-shaft J, I gear a transverse shaft, S, provided with a suitable handle, *s*, into a longitudinal shaft, T, at the rear of the lathe-bed, the said longitudinal shaft being provided with a cog-wheel, U, which can be moved in or out of gear with wheels connected with the driving-shaft. On the said shaft S is a pinion, S', which gears into the thread of the screw-shaft J', so that the latter will, on turning the shaft S, serve as a rack, the movement of which must be accompanied by that of the head-stocks.

When it is desirable to move the head-stocks by power, the wheel U may be moved into gear with a wheel driven from a shaft, G. The head stock B is, in the first instance, moved as near to the tool-holder K as circumstances will permit, and then the shaft F is introduced through the tubular spindle E, the head-stock D being set as far back on the bed as the length of the shaft F may require, and its center *f*

properly adjusted to the central recess in the end of the shaft. The shaft G is now set in motion, when, through the medium of the screw-shaft J and connecting-screw J', both head-stocks will traverse simultaneously in the direction of the arrow, carrying with them the shaft F, which is first acted on by the tools, and then by the smoothing and polishing wheel, and this is continued until the shaft has been turned and smoothed from the point where the tools first acted on it to its centered end, the supports R giving way to the head-stock D as the latter traverses the bed of the lathe. I have found, in practice, that long shafts may be turned thus more truly and rapidly than in lathes having fixed head-stocks and traversing tools.

I claim as my invention—

1. The combination, in a shaft-turning lathe, of the holder K, its fixed tools *k k*, and two head-stocks, B D, traversing the lathe-bed and carrying the rotating shaft, as specified.
2. The combination of the traversing head-stock B, its spindle E, and wheel I with the main driving-shaft G and pinion H, the position of which is determined by the head-stock, as specified.
3. The combination of the tool-holder K, jaws *m m*, and weighted lever M, slotted to receive pins on the said jaws, as and for the purpose set forth.
4. The combination, in a shaft-turning lathe, of a shaft-steadying device and adjustable polishing-wheel *t*, arranged as set forth.
5. The combination of the wheel *t* and stationary cutters, as and for the purpose specified.
6. The support R, in combination with a cam, *x*, and the devices described, or their equivalents, through which the said cam is operated from the head-stock.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AURIN WOOD.

Witnesses:

OTIS WARREN,
JOSEPH A. HOWLAND.