(No Model.)

J. E. ATWOOD.

METAL TURNING LATHE.

No. 291,971. Patented Jan. 15, 1884.

Fig 1.

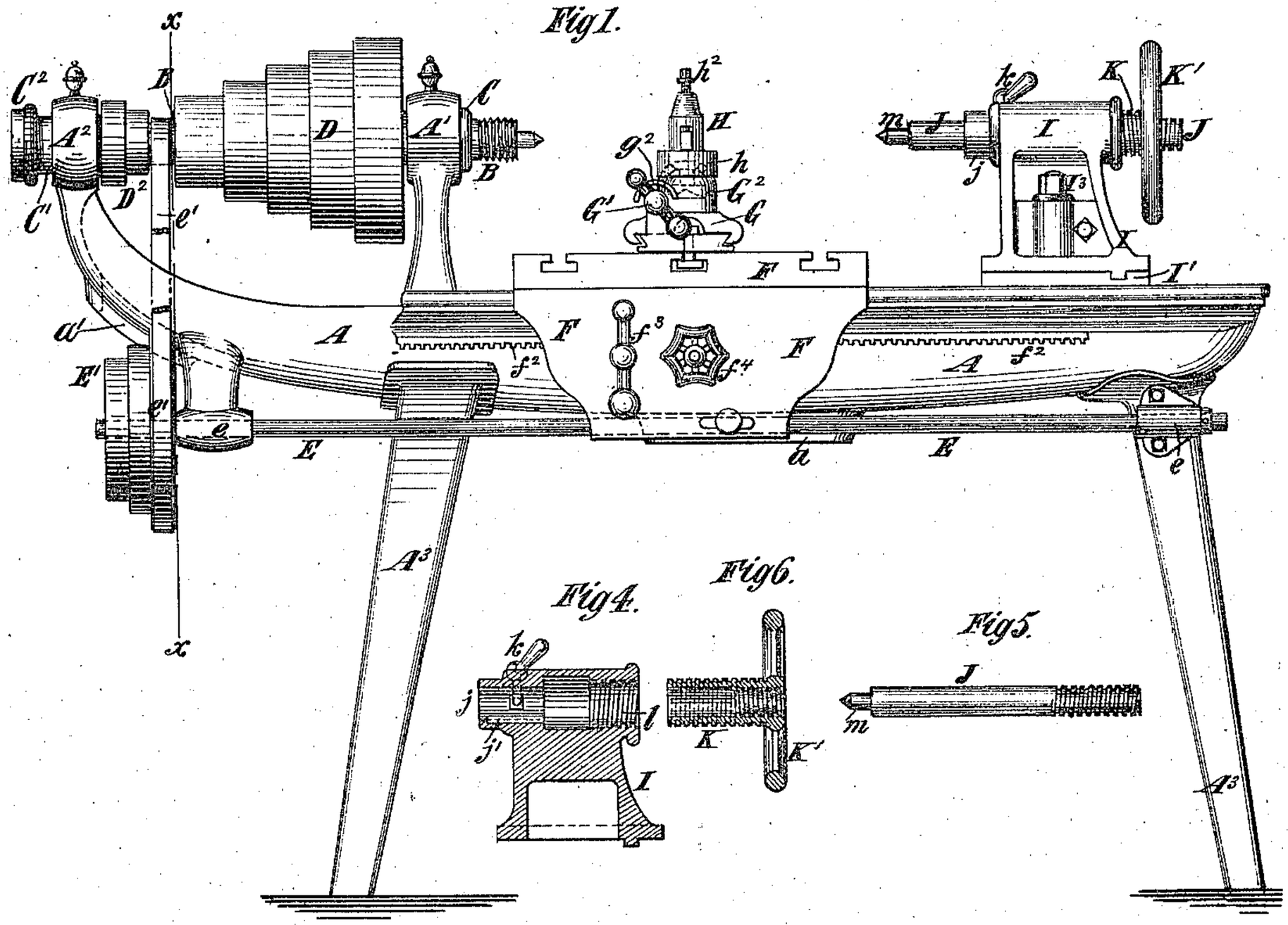


Fig 4.

Fig 6.

Fig 5.

Fig 2.

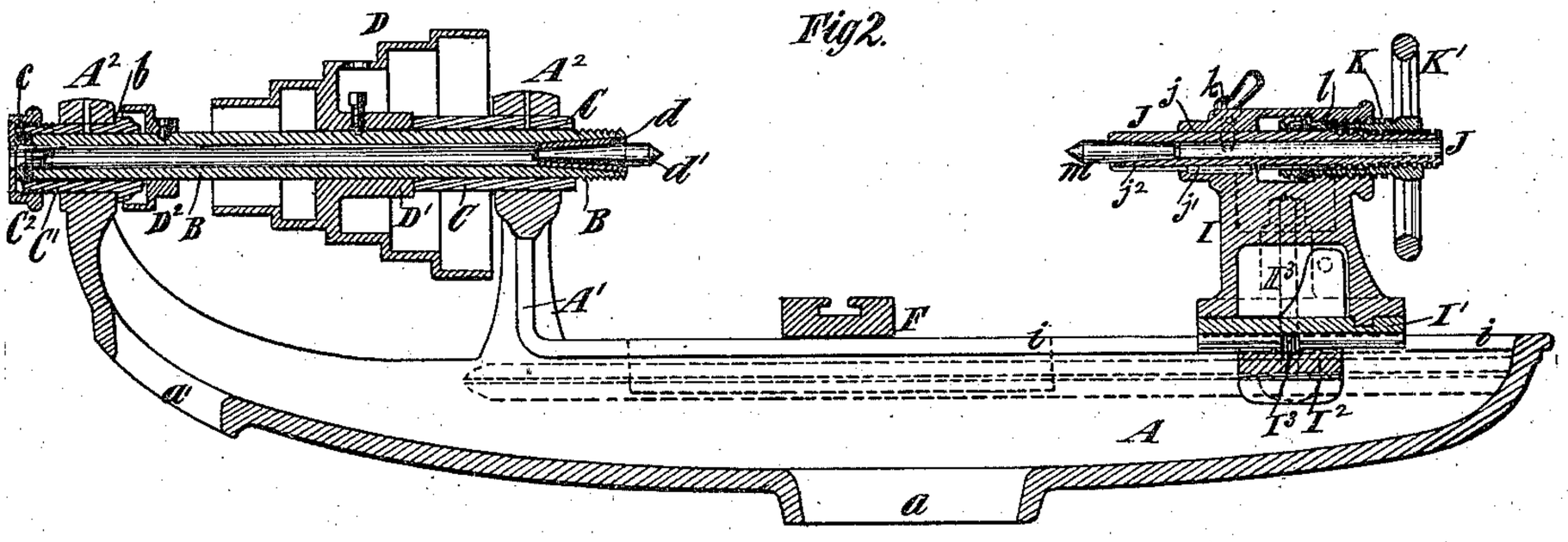


Fig 3.

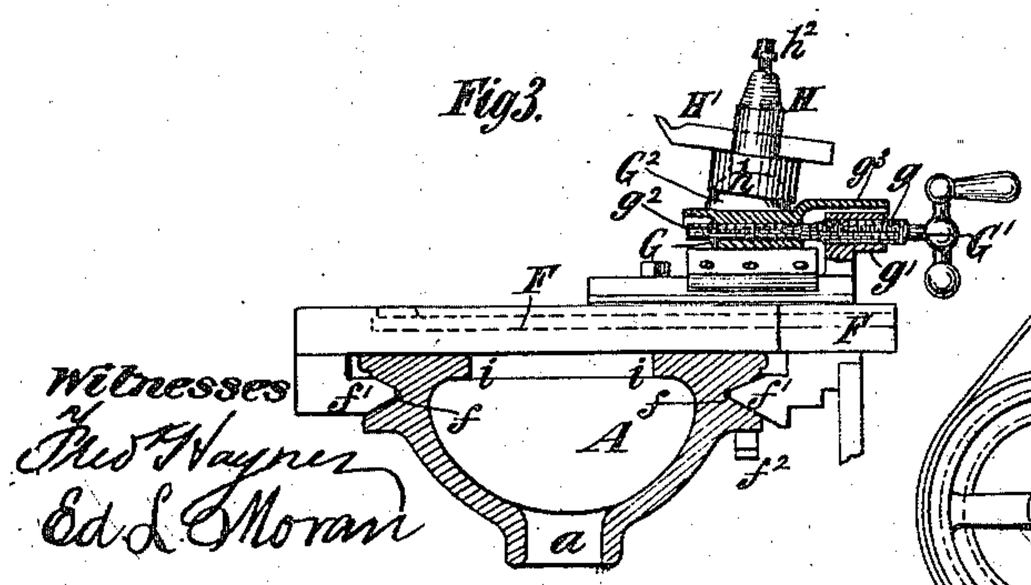


Fig 2.*

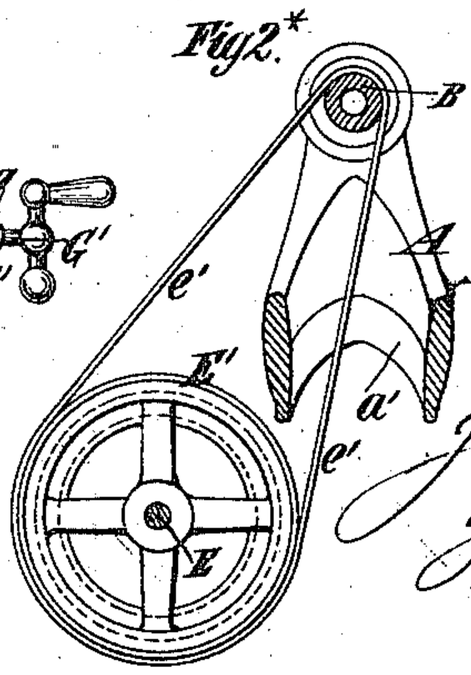
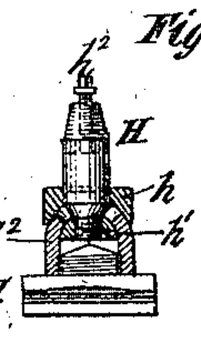


Fig 7.



Witnesses
Theo. F. Wagner
Ed. L. Moran

Inventor
John E. Atwood
by his Attorneys
Brown & Brown

UNITED STATES PATENT OFFICE.

JOHN E. ATWOOD, OF STONINGTON, CONNECTICUT.

METAL-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 291,971, dated January 15, 1884.

Application filed June 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. ATWOOD, of Stonington, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Metal-Turning Lathes, of which the following is a specification.

My invention consists in a lathe-bed of dish shape, closed at the bottom throughout the greater part of its length, so as to retain oil, dirt, chips, &c., and provided with an opening for the ready delivery thereof.

The invention also consists in a bed of the kind above described, having the bearings of the head-spindle projecting separately therefrom and formed integral therewith.

The invention also consists in the combination, with the head-spindle and its bearings, of novel means for preventing end-play thereof and taking up wear.

The invention also consists in the combination, with the tail stock and spindle, of novel means for adjusting or moving the latter.

The invention also consists in other combinations of parts, hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of my improved lathe. Fig. 2 represents a longitudinal section thereof without the legs. Fig. 2* represents a transverse section on the dotted line *x x*, Fig. 1. Fig. 3 represents a transverse section of the lathe. Fig. 4 represents a longitudinal section of the tail-stock. Fig. 5 represents a side view of the tail-spindle. Fig. 6 represents a longitudinal section of an internally and externally screw-threaded sleeve for moving the tail-spindle, and Fig. 7 represents a vertical section of the tool-post rest and a side view of the post.

Similar letters of reference designate corresponding parts in all the figures of the drawing.

A designates the bed, which is of dish shape and closed at the bottom, and which inclines from all points toward a central opening, *a*. The bed thus constructed is light and strong, and its peculiar shape enables it to retain oil, dirt, and chips, which may be cleared out through the opening *a* and collected in a box or receptacle.

B designates the head-spindle, which is mounted in bearings or posts $A' A^2$, projecting upward separately from the bed and formed integral with the bed. In the front bearing or post, A′, is a bushing, C, which may be made fast therein in any suitable manner, and in the back bearing or post, A^2, is a similar bushing, C′, which is provided inside the bearing or post with a shoulder, *b*.

C^2 designates a screw-cap or cap-nut applied to the outer end of the bushing C′, and by which the spindle B is held against movement, one or two friction-rings or washers *c* being interposed between the cap-nut and spindle, as shown in Fig. 2.

D designates the driving-cone, secured on the head-spindle B, and the hub D′ of which is adapted to bear against the inner end of the bushing C.

It will be seen that by tightening up the cap-nut C^2 the shoulder *b* on the bushing C′ is held snugly against the bearing or post A^2, and at the same time the spindle B is pressed in the opposite direction, so as to hold the hub D′ of the cone D snugly against the end of the bushing C, as shown in Fig. 2. The spindle B is hollow or tubular, and the hole extending through it is of comparatively large diameter; and in order to enable a live-center of ordinary size to be used therein, I make the hole flaring at its inner end, and fit therein a bushing, *d*, which in turn receives the live-center *d′*. It will be observed that the inner end of the taper socket in the spindle B, which receives the bushing *d*, is of the same diameter as the bore or hole of the spindle, and hence there is no abrupt shoulder in the spindle. The cap-nut C^2 is provided with a hole in line with the hole in the spindle B, and through this hole and through the spindle a drift or rod may be inserted to drive out the center *d′*; and in using the lathe to cut off rods, or for similar work, rods of comparatively large diameter can be inserted through the spindle. When the bushing *d* is removed, the interior of the spindle can be readily cleaned out, because of the absence of any abrupt shoulders in the spindle.

A^3 designates the legs, which may be of any suitable construction, and E designates the feed-screw or the shaft thereof, which is mounted in bearings *e* and is provided at the end with a cone, E′.

Upon the spindle B is a small cone, D^2, and the feed-screw or the shaft thereof, E, is driven directly from the head-spindle B by a belt, e', running over the pulleys D^2 and E' within the outer bearing or post, A^2, and between it and the inner bearing or post, A'. The bed A is constructed with an opening, a', through which the upwardly-moving part of the belt e' is carried, as best shown in Fig. 2*. By this construction I am enabled to drive the feed-screw or shaft E directly from the head-spindle B without intermediate gearing, thereby greatly simplifying the lathe. The bed A is provided on the front and back and below the top with V-shaped ways or guides f, and F designates the slide-rest, which is mounted on the bed, and is provided with V-shaped gibs f', engaging with said ways or guides. The guides or ways situated as here shown are preferable to guides or ways on the top of the bed, as in ordinary lathes, because in this lathe they cannot readily be bruised and cannot become clogged with dirt. The bed A is provided with a rack, f^2, and the slide-rest F with a pinion engaging with the rack and adapted to be rotated by a handle, f^3, in the usual way, for moving the slide-rest by hand. The slide-rest is also provided with an adjustable nut of any suitable kind, which may be engaged with and disengaged from the feed-screw by a handle, f^4, in the usual way—these features forming no part of my invention.

Upon the slide-rest F is mounted the tool-post rest G, which may be moved toward and from the work by a hand-screw, G', having a right-hand thread, g, working in a nut, g', on the slide-rest, and a left-hand thread, g^2, working in a nut in the tool-post rest. By this right and left threaded screw, the tool-post rest may be moved very quickly. The tool-post rest G is constructed with a hood or shield, g^3, which covers the screw G' and nut g', and protects them against dirt, as shown in Figs. 1 and 3. The tool-post rest G has upon it a convex projection, G^2, which is hollow and concave internally, as shown in Fig. 7, and surmounting said projection is a washer or ring, h, concave upon the under side, so as to fit the convex surface of the projection G^2.

H designates the tool-post, which passes through the washer or ring h, and is provided within the projection G^2 with a nut, h', which is convex upon its upper surface to fit the concave interior surface of the projection, and may be considered as a head or flange on the post. The tool-post H is provided with the usual holding-screw, h^2, and when a tool, H', is inserted therein, and the screw set or turned down, it will be clearly seen that the washer or ring h will be forced down upon the projection G^2, while the nut h' will be forced upward, thereby clamping the tool-post securely to the projection G^2 on the tool-post rest G. When the screw h^2 is loosened, it will be understood that the tool-post H may be adjusted so as to hold the tool at any angle vertically or laterally. In order to bring the tool-post and tool low down, the hand-screw G' is placed at one side of the tool-post, as best seen in Fig. 1.

I designates the tail-stock, and I' the base-plate on which the same is adjustable transversely to turn taper. The tail-stock may be clamped securely in place on the bed A by a clamp or bar, I^2, projecting under the inwardly-projecting flanges i on the bed, and drawn up by bolts I^3, in the usual way.

J designates the tail-spindle, which is fitted in a bearing, j, in the tail-stock I, wherein it is prevented from turning by a spline, j', engaging a groove, j^2, in the spindle, as shown in Fig. 2. The spindle J may be held tightly after adjustment by a clamping-screw, k, in a well-known manner.

The tail-stock I has an internal screw-thread, l, and K designates a sleeve having a right-hand external thread, which engages with the screw-thread l, and a left-hand internal thread, which engages with a thread on the spindle J, as shown in Fig. 2. The sleeve K is provided with a hand-wheel, K', whereby it may be turned, and it will be seen that by this construction the spindle J is caused to have a longitudinal movement twice as great as the movement of the sleeve K, and is consequently moved very quickly. The tail-spindle J is made hollow or tubular, and the smaller or inner end of the socket for the removable tail or dead-center m is shown as of the same diameter as, and forms a continuation of, the hole in said spindle, so that when the center is removed an unobstructed opening will be afforded through the spindle.

By my invention I provide a very simple and strong lathe having few parts, and in which many of the defects inherent to lathes as heretofore made are overcome.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A lathe-bed of dish shape, closed at the bottom throughout the greater portion of its length, but having an opening toward which all parts of the interior have a downward inclination for the delivery of oil, dirt, and chips, substantially as described.

2. A lathe-bed of dish shape, closed at the bottom throughout the greater portion of its length, but provided at its lowest part with an opening for the delivery of oil, dirt, and chips, and having bearings or posts for the head-spindle projecting separately therefrom and made integral therewith, substantially as described.

3. The combination, with a head-spindle and its bearings, of a bushing for the front bearing, a bushing for the back bearing provided with a shoulder abutting against said bearing, a cone on the spindle abutting against the end of the front bushing, and a nut screwed upon the outer end of the back bushing, and against which the end of said spindle bears, substantially as and for the purpose described.

4. The combination of the hollow or tubular spindle B, the bearings A' A^2, the bush-

ings C C′, the latter provided with the shoulder *b*, the cap-nut C^2, having a hole through it, the cone D, the feed-cone D^2, and the bushing *d* and center *d′*, substantially as described.

5. The combination, with a slide-rest and a tool-post rest provided with nuts of opposite pitch, of a hand-screw provided with right and left hand threads engaging with said nuts, substantially as described.

6. The combination of a tail-spindle having a screw-thread, a tail-stock with which the said spindle engages by a spline and groove, and which is internally screw-threaded, and a sleeve having external and internal threads of opposite pitch, the former thread engaging with the thread in said stock, and the latter thread engaging with said screw-threaded spindle, substantially as and for the purpose described.

JOHN E. ATWOOD.

Witnesses:
E. E. BRADLEY,
WM. A. GILBERT.