(No Model.) 2 Sheets—Sheet 1.

B. D. WHITNEY & H. W. HOWE.

COMPOUND LATHE CHUCK.

No. 302,456. Patented July 22, 1884.

Fig. 1.

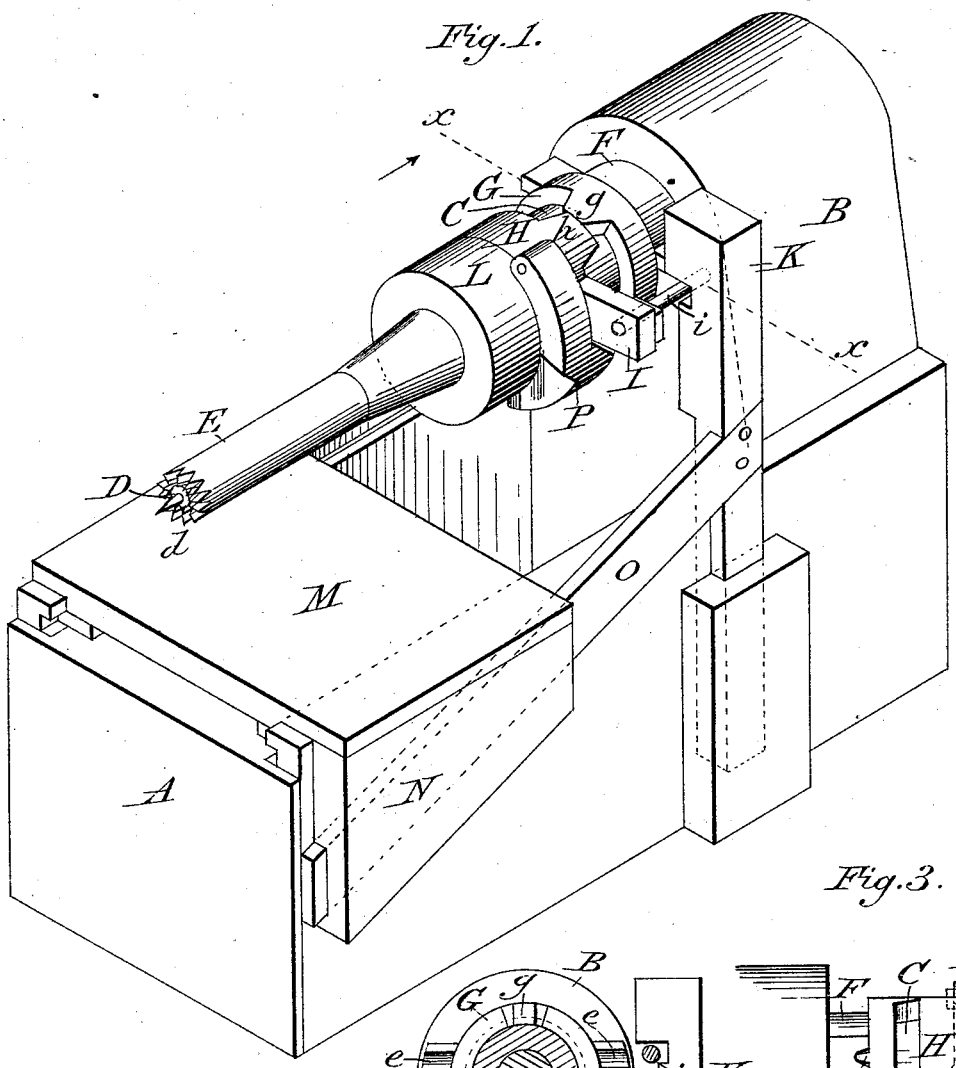


Fig. 3.

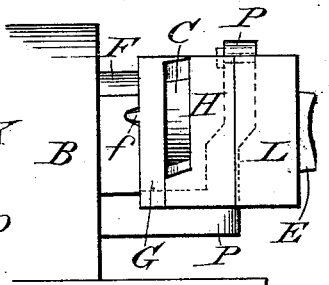
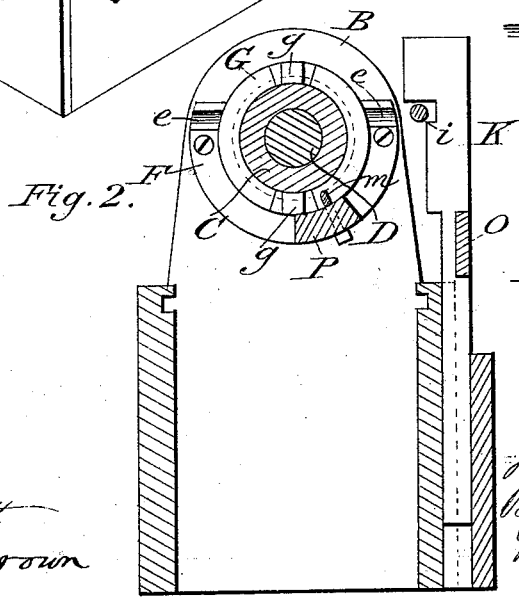


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

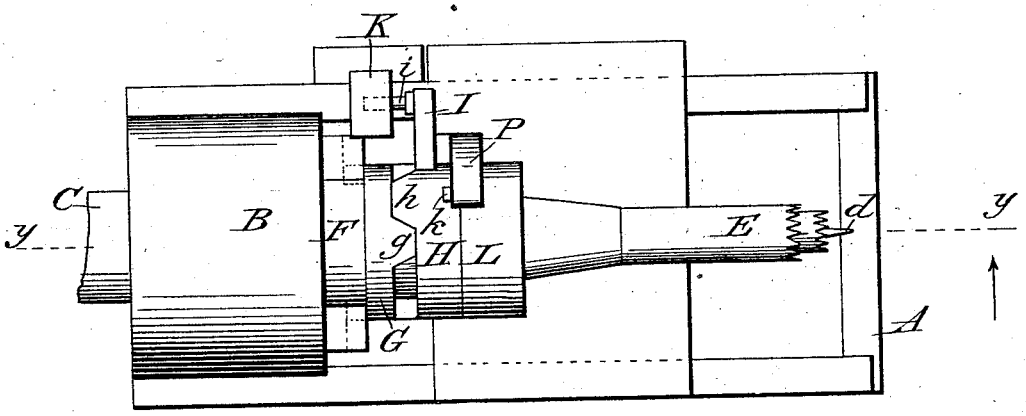


Fig. 5.

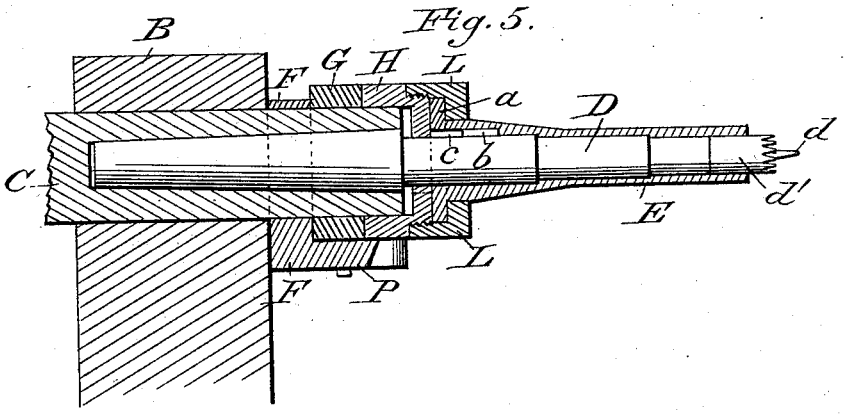


Fig. 6.

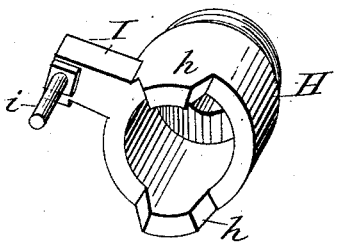
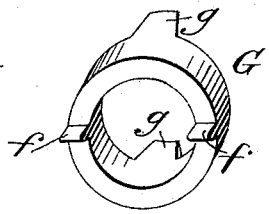


Fig. 7.



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UNITED STATES PATENT OFFICE.

BAXTER D. WHITNEY, OF WINCHENDON, AND HERBERT W. HOWE, OF HUBBARDSTON, MASS.; SAID HOWE ASSIGNOR TO SAID WHITNEY.

COMPOUND LATHE-CHUCK.

SPECIFICATION forming part of Letters Patent No. 302,456, dated July 22, 1884.

Application filed March 6, 1884. (No model.)

To all whom it may concern:

Be it known that we, BAXTER D. WHITNEY and HERBERT W. HOWE, citizens of the United States, residing, respectively, at Winchendon and Hubbardston, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Wood-Turning Lathes; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

In turning articles of wood which in some portions of their length are considerably larger in diameter than at the ends where they are held by the driving-spur, it is sometimes difficult, if the spur is limited to the size of the finished end, (as it must be to allow the finishing-cutter to act the entire length of the piece,) to obtain sufficient strength of grip to carry the stick while the first or roughing cut is reducing it to nearly its finished dimensions, and if a larger spur is used it generally necessitates a stud or butt to be cut off, which wastes material and labor which might profitably be saved by working to the extreme end of the piece, providing the requisite strength can be had for driving the piece to be turned during the roughing and reducing process, which is usually the most resistful part of the work.

To effect this and obviate the difficulties above mentioned is the object of my invention, which consists in making a compound spur of sufficient size to carry the stick while it is being reduced nearly to form when an annular exterior portion thereof is made to recede and leave only the central portion of the spur of proper size to allow the finishing cut to be made. Its construction and operation will more fully appear by reference to the drawings and the description hereinafter continued.

In the drawings, Figure 1 is a perspective view of a portion of a lathe with the improved spur center and devices for operating same attached. Fig. 2 is a transverse section on line *x x* of Fig. 1. Fig. 3 is a partial elevation of side opposite Fig. 1. Fig. 4 is a plan. Fig. 5 is a longitudinal section on line *y y* of Fig. 4; Figs. 6 and 7, details to be hereinafter described.

Like parts are designated by similar letters of reference.

The letter A represents a lathe-bed; B, a head-stock, and C the mandrel or arbor which carries the spur-center for piercing and carrying the sticks to be turned. This spur as made to embrace our improvements is composed of a central portion or spindle, D, having a projecting center point, *d*, to centrally pierce the end of the article to be turned, (to aid in determining its diametrical position,) and a surrounding forked serrated or spur-shaped body of such diameter as may be suited to the nature of the work to be done, or as large as may be consistent with the proper action of the finishing-cutter. Surrounding this central part, D, is an annular exterior shell or tubular portion, E, which may be moved longitudinally on spindle D, so that its end, which is forked, serrated, or provided with spur-points, will contact with the stick to be turned, and, together with the central portion, D, will so pierce the stick and engage with it as to afford a firm grip for revolving it during its reduction to nearly the desired form, when the exterior part, E, is made to recede from the stick to permit the completion of the work, which may be effected by the action of the central spur alone. The exterior part, E, is made to revolve with the central part, D, by means of a feather, *b*, which works in a groove, *c*, which allows it to slide endwise, as may be necessary to engage with the stick to be turned so as to give place to the cutter when the extreme end of the article is to be finished.

In the construction of spindle D for turning articles of comparatively small end diameters, we make it at intervals of diminishing diameters, or stepped, as shown in Fig. 5, in order to provide a form that will give the spindle increased strength and overcome the tendency to vibration, deflection, or undue weakness between its working-point and its bearing;

also, the spur part *d'* may be made detachable, so that it can be replaced by other sizes to suit different diameters of articles to be turned, exterior spurs, E, of varying diameters being applied and used according to circumstances, the stepped form of the spindle D allowing such variation of size to the extent of the difference between the diameters of its outer and inner ends. The longitudinal movement of part E may be effected by any suitable means which will hold the spur firmly in its position and allow it to revolve firmly while engaged with the piece being turned, and withdraw it at the proper time. We will describe mechanism therefore as used in connection with a "gage-lathe," or a lathe having a system of cutters, &c., as shown in Letters Patent No. 29,534, to B. D. Whitney, dated August 7, 1860, to which it is particularly applicable, for which use the exterior spur, E, is made with a tubular sleeve of sufficient length to allow the roughing-cutters and encircling rest of the traveling slide to pass over same before it withdraws from the stick, its exterior being of course somewhat less than the internal capacity of the first cutter and ring-rest, although as much larger than the second or following cutter as the difference between the largest diameter and the reduced end diameter of the article to be turned will admit. At the end of this tubular sleeve or part E opposite to its spur end we have a ring, collar, or flange, *a*, which makes connection with its operating mechanism by means of an encompassing-collar, with cam mechanism for changing its position, of which F represents a bearing-plate, which may be affixed to the head-stock B. It has in it on opposite sides of the spindle two notches or recesses, *e e*, in which are seated a pair of knife-edged projections, *f f*, of a gimbal-ring, G, which surrounds the spindle C, having upon its opposite face (at point midway between the knife-edged bearings *f f*) two cam-shaped projections, *g g*, which correspond to and act with two similar cams, *h h*, upon a stop-collar, H, which bears against the end of sleeve E and makes a step-bearing for holding it in position. A cap, L, being attached to it by a screw, overhangs the flange or ring *a* for withdrawing the external spur from the work. This arrangement of the bearings *f f* and cams *g g* on the ring G equalizes the pressure upon the step-collar H, so that it bears evenly upon the end of the revolving spur-sleeve E, and when the cams are in the position of summit contact the spur E will be thrown forward to correspond with the spur of spindle D, and to engage with the stick placed in the lathe; but when by a partial rotation of H the cams are thrown out of direct or summit contact, so that their inclined side faces can slide by each other, the collar H withdraws the spur E from the work.

Attached to collar H is an arm, I, having a pin, *i*, connecting with a vertically-moving standard, K, which is actuated by the slide-rest *m*, having an inclined way, N, which at proper times is made to engage with an inclined bar, O, which, being forced downward, carries with it the standard K, thereby giving a partial rotation to collar H and its cams *h h* for actuating the sleeve E, a cam-shaped bracket or standard, P, being provided to strike against arm I for giving the receding motion to sleeve E. It also has a pin or stud, K, which acts as a stop to arrest the movement of arm I when the return of the slide-rest M sets the cams *h h* into the position to throw spur E into contact with the work in the lathe.

The utility of an auxiliary spur for dogging and carrying the unturned stick, which is to be considerably reduced at its end in contact with the driving-spindle, is apparent, and the advantages of the devices which we have described as our invention over other mechanism for that purpose will be found in the facilities for adaptation and interchange of parts, and in operating them without inconvenience or hinderance to the other parts of the lathe.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a wood-turning lathe, the combination, with the mandrel C, of a compound spur-center, consisting of the spindle D, having a serrated end and a projecting center point, *d*, the surrounding shell E, provided with a serrated end, and means for revolving the shell with the spindle and for sliding it longitudinally thereon, substantially as described.

2. In a wood-turning lathe, the combination, with the spindle D and surrounding-shell E, having flange *a*, of the rings or collars G H, provided with cams *g g h h*, and the cap L, substantially as described.

3. In a wood-turning lathe, the combination, with the mandrel C, spindle D, shell E, and connections, of the bearing-plate F, having notches *e e*, and the equalizing-ring G, provided with bearings *f f*, substantially as described.

4. In a wood-turning lathe, the combination of the mandrel C, spindle D, shell E, having flange *a*, the notched bearing-plate F, equalizing-ring G, having bearings *f f*, and cams *g g*, the collar H, having cams *h h*, the cap L, and actuating mechanism, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

BAXTER D. WHITNEY.
HERBERT W. HOWE.

Witnesses:
BENJ. R. DAY,
GEO. M. WHITNEY.