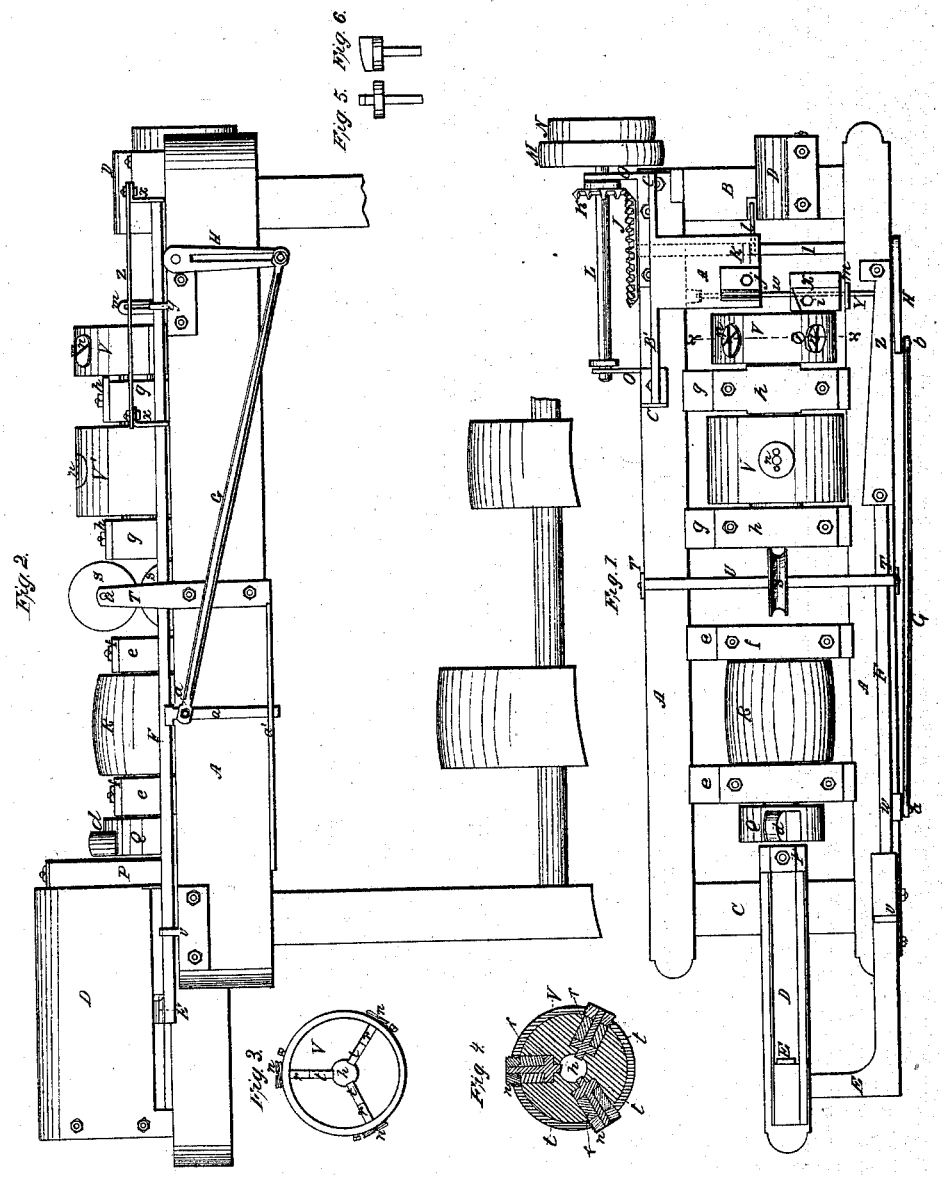
R. W. George,

Gage Lathe,

No. 49,516. Patented Aug. 22, 1865.



Witnesses:
N. Ames.
Walker.

Inventor:
R. W. George.

UNITED STATES PATENT OFFICE.

R. W. GEORGE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN WOOD-TURNING LATHES.

Specification forming part of Letters Patent No. **49,516**, dated August 22, 1865.

To all whom it may concern:

Be it known that I, R. W. GEORGE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Automatic Lathe; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top view. Fig. 2 is a side elevation. Fig. 3 is an end view of the lathe-head; and Fig. 4 is a transverse section of the same in the line *x x* of Fig. 1, and Figs. 5 and 6 are different views of the yielding clamps.

Like parts are indicated by the same letters in all the drawings.

The nature of my invention consists, first, in giving a rotating motion to the rounded stock as it is passed through the rotating lathe-head V′ V, by means of adjustable yielding clamps or springs *t′*, arranged at suitable points around the bore or axis of said lathe-head, which clamps shall bear sufficiently hard upon the stock to keep it revolving against the cutter or cutters *i* and *j*, but not so hard as to prevent it from being forced longitudinally through the head by means of the feeding-slide E or its equivalent; second, in combining the lathe-head, constructed as described, with an automatic intermittent or reciprocating feeding apparatus and pattern, Z, and a sliding cutter, *i*, guided by said pattern, for the purpose of cutting swells, tapers, and curves on the stock as it passes through the lathe-head; third, in the employment of a vibrating plate, A′, provided with an adjustable knife, or a series of knives, *j*, to be brought at the proper time against the revolving stock by means of a cam, *l*, or its equivalent, for the purpose of automatically cutting beads or creases, and also partially or nearly severing the stock after the turning has been completed and the longitudinally-progressive (but not the rotary) motion of the same has ceased; fourth, in arranging a hollow auger or rounding apparatus, Q, in a line with the lathe-head V′ V, constructed as described, so that the rounded stock may be forced directly through from the first-mentioned apparatus to the second, automatically or otherwise, thus avoiding the necessity of handling over the stock in converting it from the square strips into the turned and finished articles, such as stair-balusters and handles for hoes, brooms, rakes, &c.

To enable others skilled in the art to make and use my improvement, I will now proceed to describe the construction and operation of the same.

A A are the two sides of a wooden frame of any required length, and B C are the ends of the same, the whole being supported at a convenient height on legs.

D is the box or hopper, arranged at the back end of the frame, as represented in Figs. 1 and 2, for the reception of the square strips of stock to be rounded and turned. The sides of this box are cut away at the bottom, as seen in Fig. 2, forming a slot in which reciprocates the end of the feed-plate E, which is a flattened continuation or arm of the rod F, the latter sliding freely in the guide-bearings *v y*, and kept from turning by means of the arm *w*, confined thereto, and extending downward, so as to play in a slot in the cleat *a′* at the bottom of the frame A, as represented in Fig. 1. A reciprocating motion is communicated to the bar F and its appendages by means of the rod G, one end of which is pivoted at *a* to the arm *w*, and the other connected with the crank H by means of the pivot *b*, the said crank being slotted so that the pivot *b* may be adjusted any required distance from the axis I, for the purpose of giving more or less motion to the feed-plate E, according to the length of the articles to be turned.

J is a beveled gear fast to the shaft I and actuated by means of the smaller gear K, the shaft L of the latter turning in suitable bearings in the arms O O and driven by a belt on the pulleys M or N.

Through the stud P is a square hole, through which the squared strips of stock are forced from the hopper D by the feed-plate E into the hollow auger Q, which, provided with the usual cutter, *d*, turns in suitable boxes, *f f*, attached to cross-beams *e e*, being actuated by means of a belt passing from the pulley R over another pulley on the driving-shaft below, as represented in Fig. 2. Through the hollow auger Q the rounded stock is forced between the grooved rollers S S, whose axles U are or may be so arranged as to spring apart to accommodate stock of different diameters. The design of these rollers is to prevent the stock from rotating in the hollow auger after it (the square

stock) has passed out of the square hole in the stud P, and also to guide the same into the hollow rotating lathe-head. When the distance between the hollow auger and the lathe-head, however, is considerable, as in a machine calculated for turning rake-handles, &c., I propose to make use of a tube or rings in the intermediate space to operate as a guide to the stock.

V V′ are the lathe-heads, whose axis turns in suitable bearings, *h h*, in the cross-beams *g g*, as shown in Figs. 1 and 2. Over the pulley V′ is passed a driving-belt from a suitable pulley below, as represented in Fig. 2. Through the axis of V V′ is a hole, *h′*, (see Figs. 3 and 4,) through which the rounded stock is passed, *t t t* being metallic blocks (the shape of which is clearly shown in Figs. 4, 5, and 6) arranged in corresponding holes in the heads V and V′, around the said axial hole *h′*, and projecting into the same, as represented in Figs. 3 and 4. These blocks are forced inward with the requisite pressure by means of the rubber or other springs *r r r* and the adjustable screw-plugs *n n n*. By the friction of these blocks *t t t* upon the rounded stock it is clamped sufficiently tight to be rotated against the outside cutters, *i j*, while at the same time it is driven longitudinally through the lathe-heads by means of the feed-plate E, or (in case the latter is removed) by any other obvious means, as by feed-rolls, or in some cases by hand. The screw-plugs *n* in the head V′ over which the belt is passed are intended always to be below the periphery of the same. In the head V, however, they may extend beyond the periphery, if desirable. In the drawings these heads V and V′ are represented as made in two parts—an external pipe and a central core—to facilitate the cutting of the slots for the reception of the blocks or clamps *t t t*. It is obvious, however, that they might be constructed of a single piece.

Z is the pattern or guide, the inner edge of which has the same contour as an elevation outline of the article, a fac-simile of which is to be turned by the machine. This pattern is confined by screws to the upper ends of the arms *x x*, whose lower ends are fast to the rod F, as represented in Figs. 1 and 2.

W is a sliding rod one end of which bears against the pattern Z, being guided by the fixed rest *m*, the opposite end being supported and forced toward the said pattern by means of a spring. (Represented by dotted lines in Fig. 1.) Fast to the top of this slide W is a slotted plate, X, to which is confined, by means of a screw, the adjustable cutter *i*. More than one cutter *i* may however be used, if required. Thus it will be seen that the distance of the knife or knives *i* from the axis of the rounded stock to be turned will be regulated by the pattern Z, and as the feed-plate E and the said pattern are a fixture on the same sliding rod F the stock will be cut (as it is forced through the lathe-head) the exact shape of the pattern.

D is a tubular rest attached to the frame B, as shown in Figs. 1 and 2, in the line of the axis of the lathe-head, its object being to steady long pieces of stock after the turning is completed. After the stock has been turned the proper shape it is often required to "bead" or crease the same at certain points, or nearly sever one portion from another, and this object I accomplish in the following manner:

A′ is a plate one end of which is fast to the rod B, the extremities of which turn in suitable bearings in the arms C′C′, attached to the frame, as represented in Fig. 1. The free end of this plate A′ is provided with a slot, *k*, and to it may be attached and properly adjusted, by means of screws, one or more cutters of any desired form for beading or creasing. When the cutter or cutters *i* are operating on the stock which is being passed through the lathe-head the free end of the plate A′, with its cutters *j*, rests upon the bar W below the stock; but after the knife *i* has shaped the stock, and as the feeder E and pattern Z are receding, and the progressive motion of the stock has stopped, the free end of the plate A′ is elevated, by means of a cam, *l*, on the shaft I, so as to bring the cutter or cutters *j* up against the said stock, thereby beading or creasing the same, or, if desirable, partially, nearly, or entirely severing it.

By means of my improvements swells, tapers, curves, and beads or creases on turned work can be made with the greatest accuracy and dispatch.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The yielding friction clamps or springs, arranged around the bore or axis of the lathe-head for the purpose of rotating the rounded stock as it is forced through the head against the cutter or cutters, substantially as described.

2. The intermittent or reciprocating feed-plate E and pattern Z, in combination with the sliding cutter or cutters *i* and lathe-head V V′, constructed and operating substantially as described.

3. The hinged plate A′, provided with one or more adjustable cutters, *j*, in combination with the cam *l*, intermittent or reciprocating feed-plate E, and lathe-head V V′, substantially as set forth, and for the purpose described.

4. The combination and arrangement of the hopper D, hollow auger Q, lathe-head V V′, and self-adjusting cutters *i* and *j*, substantially as set forth, and for the purpose described.

R. W. GEORGE.

Witnesses:
N. AMES,
W. A. ASHE.