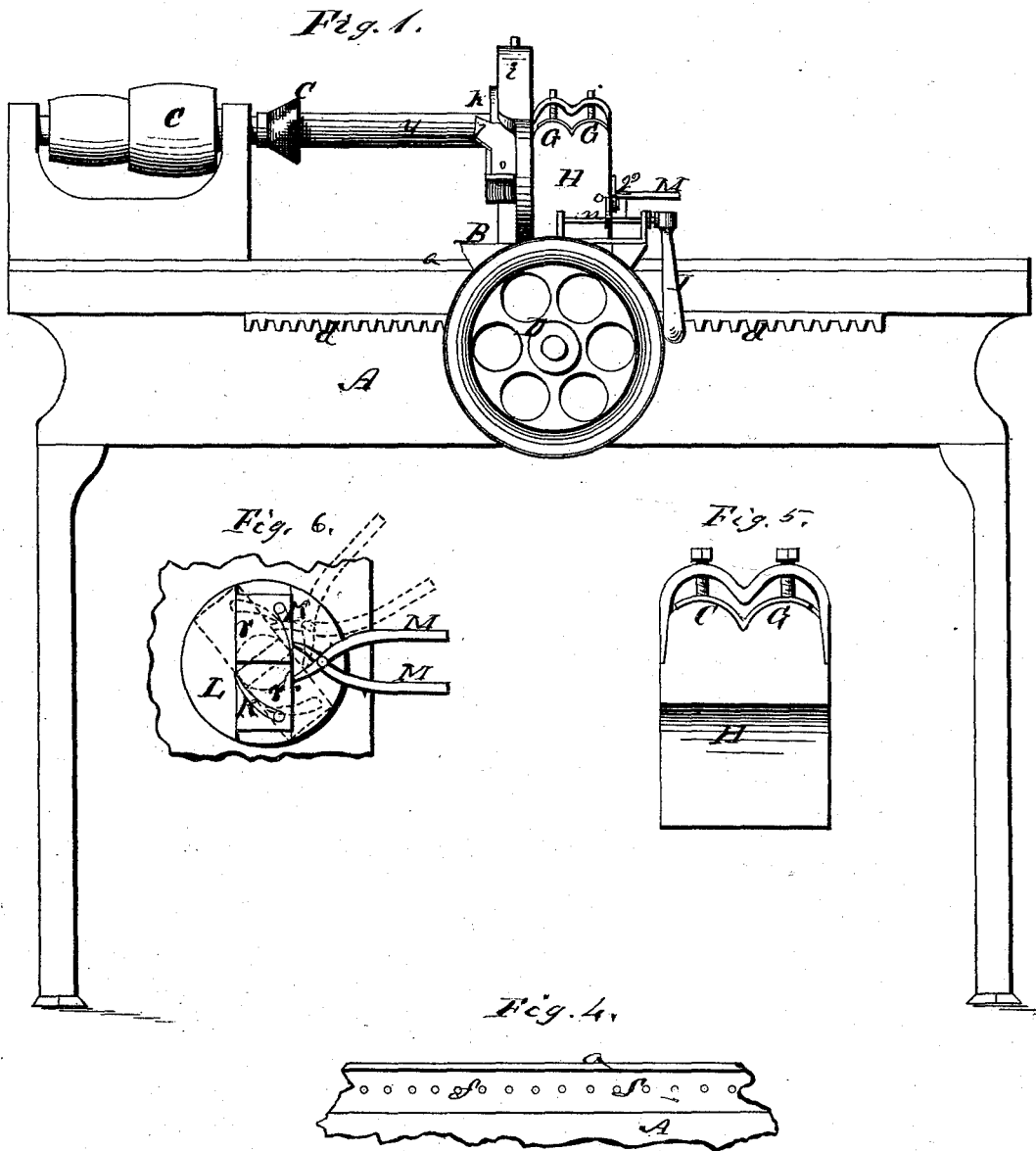


A. D. WAYMOTH.

LATHES FOR TURNING WOODEN BALLS.

No. 178,255.

Patented June 6, 1876.



WITNESSES
C. M. Gallaher.
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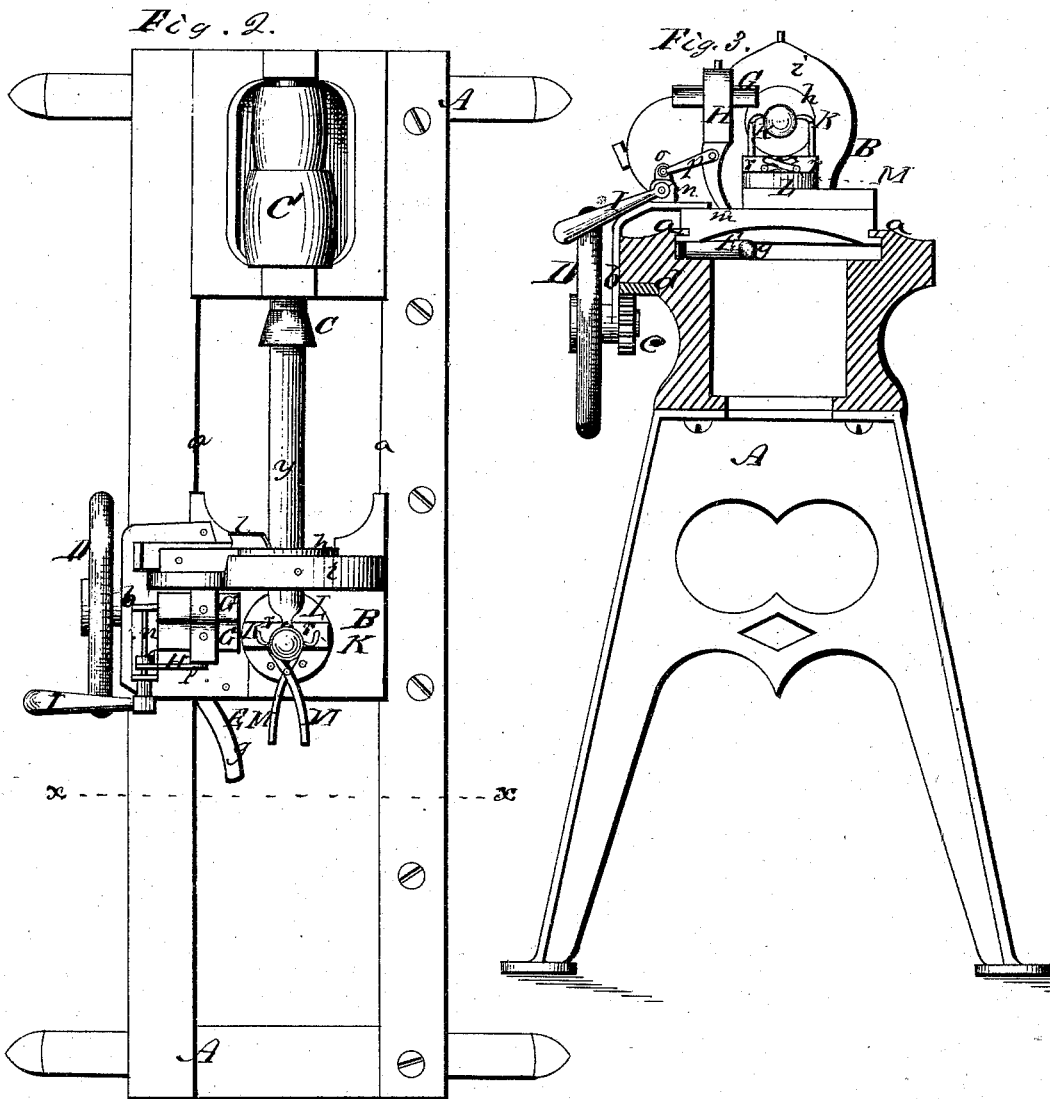
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Augustine D. Waymuth.
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UNITED STATES PATENT OFFICE

AUGUSTINE D. WAYMOTH, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN LATHES FOR TURNING WOODEN BALLS.

Specification forming part of Letters Patent No. 178,255, dated June 6, 1876; application filed November 12, 1875.

To all whom it may concern:

Be it known that I, AUGUSTINE D. WAYMOTH, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improvement in Lathes for Turning Wooden Balls; and I do hereby declare that the following is a full and exact description of the said process, and lathe for performing the same, reference being had to the accompanying drawings, making part of this specification—

Fig. 1 being a side elevation of the lathe; Fig. 2, a top view of the same; Fig. 3, a transverse vertical section thereof in a plane indicated by the line *x x*, Fig. 2; Figs. 4, 5, and 6, views of parts detached.

Like letters designate corresponding parts in all of the figures.

By this process, and with this improved lathe, balls are first roughly shaped, and then finished upon the free end of a stick from which they are made, and are finally cut off therefrom by the finishing-cutters, the balls being formed in succession upon the stick till it is used up.

My invention consists in this said process of turning balls, and in the novel devices attached to the lathe for performing the successive operations of the process, substantially as hereinafter specified.

All the operative parts of the turning devices are mounted upon a carriage, B, which slides on ways *a a* of the lathe-frame A, the said ways being as long as required for this purpose. The carriage B is moved along toward the driver C by means of a hand-wheel or crank, D, whose shaft is mounted in a part, *b*, of the carriage, and is provided with a pinion, *c*, which gears into a stationary rack, *d*, on the side of the frame, substantially as shown in Figs. 1 and 3. The carriage is moved along a distance equal to the length of so much of the stick as is required for making a single ball at each successive movement; and to limit the extent of these movements to the exact distance required, so as to call for no care in operation and produce no waste of material or imperfection of work, a spring-detent, E, is secured to the carriage to spring into a series of holes, *f f*, Fig. 4, or their equivalents, in the frame A, or one of the

carriage-ways *a a*. The detent is provided with a handle, *g*, conveniently located for lifting the detent from the holes when the carriage is to be moved along, but the detent springs automatically into the next succeeding hole.

The carriage is provided with a bearing, *h*, inserted and secured in a projection, *i*, thereof, in a position precisely concentric with the axis of revolution communicated to the stick from which the balls are turned. In this bearing the working end of the stick turns, being sufficient in diameter to admit a rounded stick of the required size. If the stick *y* were previously turned into cylindrical form of the exact diameter required, no further preparation thereof would be necessary than to put it in the lathe; but I provide for employing sticks in the rough, and turn them down to cylindrical form of the exact diameter required to fit the bearing *h* in the lathe itself. A cutter, *l*, for this purpose is secured to the carriage B at the rear end of bearing *h*, substantially as shown.

To turn the balls upon the stick by my method, two sets of cutters are employed— one set for roughing and shaping the balls nearly into form, and the other set for finishing and smoothing them.

The roughing and shaping cutters G G are each of curved form, the edge of each being nearly a quarter of a circle in extent of the proper curvature to shape the balls without traveling thereon, since they shape by notching into the stick, one cutter shaping the rear half of the ball to be first turned, and the other cutter shaping the adjacent part of the stick, to form the front half of the next ball in succession. They do not cut quite into the center of the stick, but leave sufficient wood between the shaped ball and the stick to hold the ball firmly for finishing. These cutters are mounted on a holder, H, which is pivoted to the carriage B, its pivot *m* being parallel with the center line of the revolving stick *y*. Thus the cutters can be held away from the stick, and brought to it for operation, when required.

A lever-handle, I, is employed to move the cutters to and from the work. It is pivoted by a shaft, *n*, to the carriage, and an arm, *o*,

projects from the said shaft, and is connected by a rod or link, *p*, with the holder *H*. When the handle *I* is in a position to throw the pivot-connection between the arm *o* and the connecting-rod *p*, out of line with the handle-shaft and the pivot-connection between the said connecting-rod and the holder *H*, the cutters *G G* are held away from the work, as indicated by full lines in Fig. 3; but when the handle is moved so as to bring the said three pivot-points toward a straight line, the cutters are moved toward their work, and when those points are brought into line the balls are shaped. The cutters then are drawn away and held back from the work by the weight of the lever *I*, or otherwise.

Other convenient and suitable means may be employed to move the cutters *G G* toward and from the work.

The cutters might be made as one cutter, though not so convenient in construction or use as separate cutters.

As soon as the roughing and shaping cutters leave their work and are withdrawn out of the way, the finishing and smoothing cutters *K K* are brought into action. They are mounted on a horizontal turn-table, *L*, the center of which is vertically under the axis of revolution of the piece from which the balls are turned, and vertically under the center of the ball which is being finished. The cutters are so shaped as to properly act on the ball being finished, and are situated, one on one side of the ball, and the other on the other side thereof, and so that one shall act on the front and the other on the back half of the ball.

The turn-table *L* has a quarter-circle turning movement on its vertical axis, to bring the cutters *K K* successively in contact with all parts of the ball's surface, that extent of movement being sufficient to effect the purpose.

The cutters are, respectively, mounted on blocks or holders *r r*, which have a sliding movement diametrically across the upper face of the turn-table *L*, and they are, respectively, connected, either directly or by connecting-rods, with a handle or handles, *M M*, pivoted to the turn-table, so that on separating the outer ends of the handles the blocks or holders will be moved radially outward away from each other, and when the handles are pressed toward each other the cutter-holders will be brought together, equidistant from

the center of the turn-table, and will hold their cutters equally to the ball, so as to finish the front and back halves of the ball to equal diameters, and precisely alike in appearance.

The construction and arrangement of the cutters and the turn-table are more clearly shown in Fig. 6.

The lever-handles *M M* also serve to turn the table by, the latter being ordinarily turned back, so as to hold the cutters ready to begin their finishing work; but the cutters being held separated from each other, so as to be out of contact with, and not interfere with, the stick and ball while being rough-shaped. But as soon as a ball is rough-shaped, the turn-table is turned forward by the handles *M M*, which, at the same time, are pressed together, thereby bringing the cutters to their work, and turning them through a quarter of a circle, so as to finish the ball. At the moment when a ball is completely finished it is severed from the stick by the rear finishing-cutter, and falls therefrom.

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

1. The method or process of turning balls successively from the free end of a stick by projecting portions of the stick successively through a sliding bearing, then bringing cutters transversely across the stick for partially shaping the balls, and then applying cutters by a turning movement around the end of the stick and the opposite side of the balls, to finish the same, and sever them from the stick, substantially as herein specified.

2. The two finishing-cutters *K K*, arranged on opposite sides of the balls to be turned, and to operate thereon by a turning movement, both longitudinal and transverse to the stick from which the balls are turned, substantially as herein specified.

3. The combination, upon a movable carriage, *B*, of the stick-bearing *b*, provided with a cutter, *l*, rough-shaping cutters *G G*, and the finishing-cutters *K K*, all arranged and operating in the manner and for the purpose herein specified.

4. The turn-table *L*, constructed with the sliding cutter-holders *r r*, and handles *M M*, substantially as and for the purpose herein specified.

AUGUSTINE D. WAYMOTH.

Witnesses:

JAMES GOODRICH,
CHARLES H. WAYMOTH.