(No Model.)

D. ROCHE.

BALL TURNING LATHE.

No. 588,914. Patented Aug. 24, 1897.

Fig. 1,

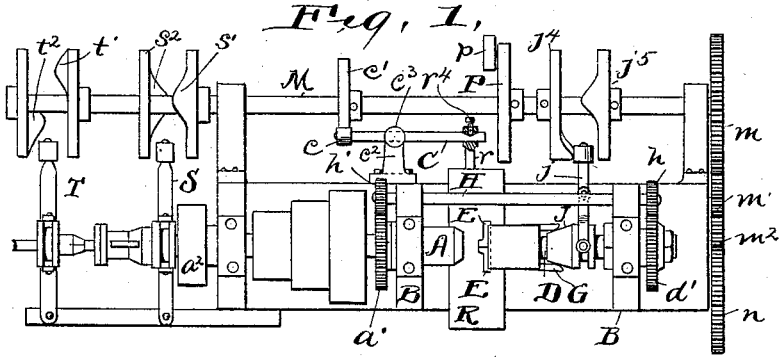


Fig. 2,

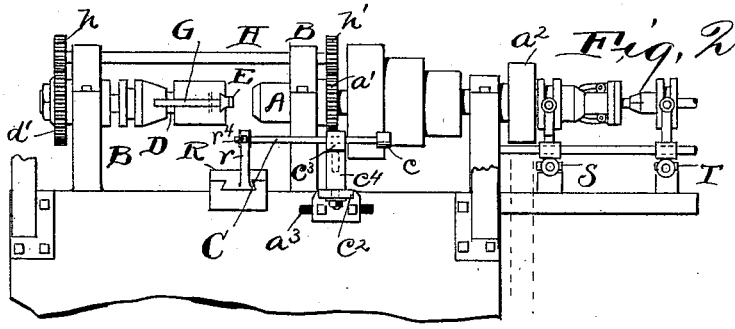


Fig. 3,

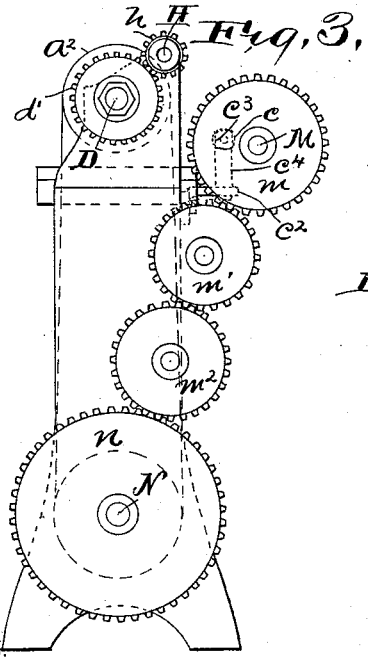


Fig. 4,

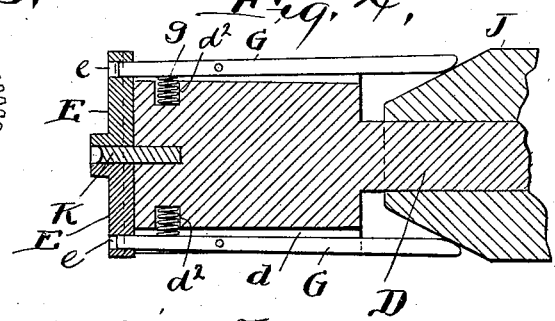
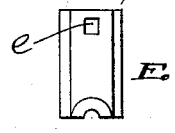


Fig. 5,



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UNITED STATES PATENT OFFICE.

DAVID ROCHE, OF CLEVELAND, OHIO, ASSIGNOR OF SEVEN-EIGHTHS TO F. H. KELLY, T. M. WARNER, AND A. G. HARBAUGH, OF SAME PLACE.

BALL-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 588,914, dated August 24, 1897.

Application filed December 1, 1896. Serial No. 614,152. (No model.)

To all whom it may concern:

Be it known that I, DAVID ROCHE, a subject of the Queen of Great Britain, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ball-Turning Lathes; and I do hereby 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.

The invention hereinafter described is an improvement upon the class of lathes which have a tubular live-spindle, a chuck therein for grasping the stock which passes through it, and means for periodically feeding the stock forward. In fact, the parts constituting my invention may be regarded as attachments for such a lathe, and the object of such attachments is to adapt the lathe to automatically turn and cut off from a rod of stock balls which are nearly perfect.

The invention consists in the construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of a lathe of the character described when provided with my improvements. Fig. 2 is a rear elevation of said lathe when the shaft M is removed. Fig. 3 is an end elevation. Fig. 4 is a longitudinal sectional view of the steady-rest, and Fig. 5 is an end view of one of the steady-rest jaws.

As before stated, the lathe shown belongs to the class which has a tubular live-spindle A and suitable means for periodically feeding the stock through it and for holding the stock while it is being cut. These parts of the machine are old and it is not thought necessary to describe them.

In line with the live-spindle is a steady-rest D, which is mounted in a standard B. Its end d has an axially-placed stop-pin K, fixed in the end which faces the live-spindle. Two radially-movable jaws E are mounted upon the same end of the steady-rest, and their proximate ends, which are grooved, embrace this stop-pin. Two levers G G lie, respectively, in longitudinal slots in the steady-rest to which they are pivoted. One of the ends of each lever enters a slot e in the corresponding jaw E. The other end of each lever extends rearward into engagement with a cone J, which is movable upon the spindle D. Springs g, which lie in recesses d^2 in the enlarged end of the steady-rest spindle, thrust outward against the levers G.

The steady-rest spindle is revolved at the same rate as the spindle A by means of a shaft H and two gears h h' thereon, which respectively mesh with a gear a' on spindle A and a gear d' on spindle D.

The cone J is moved forward and backward by a fork-lever j, pivoted to the bed-plate, and the lever is actuated by two cam-disks j^4 j^5, which are secured to a shaft M. This shaft is suitably mounted and is driven through a train of gears m, m', m^2, and n, the latter being secured to a shaft N, which is driven by a belt which passes around a pulley a^2 on the live-spindle. When the cone J moves forward, the levers G G are operated so as to close the jaws E. When it is moved in the contrary direction, the springs g open said jaws.

The tool-slide R is mounted in transverse ways on the bed-plate. It is slowly moved in one direction back to an invariable starting-point by the pressure against its end of a cam which is in the form of a roller p, which is mounted eccentrically on a disk P, carried by shaft M. It is moved in the contrary direction by means of a pivoted lever C, one end of which enters a slot in a post secured to the slide. The other end, bearing a friction-roller c, is engaged by a cam c', adjustably secured to shaft M. The slide R is moved in the cutting direction by the lever C, and the extent of this movement may be varied to suit the work by changing the fulcrum of the lever. This is effected by changing the position of the bracket c^2, to which lever C is pivoted. The lever passes loosely through a slot in a stud c^3, which is swiveled on the post c^4, this post being part of bracket c^2.

The bracket c^2 is attached to the side of the machine-frame by bolts which pass through a slot a^3. The movement of the lever in the post r is prevented by a pointed set-screw r^4, which screws into the post r and engages with a notch in lever C.

The levers S and T, by which the stock-

feeding device and the chuck are operated, may themselves be operated by cams $s' s^2$ and $t' t^2$ on shaft M, and the operation of the old and new parts is timed so that they operate substantially as follows: The chuck and jaws E E are opened simultaneously. The stock is then fed forward until the half-finished ball on its end strikes the stop-pin K. Then the jaws E, which project about half the diameter of the balls beyond the stop-pin, close upon the partly-finished ball, which is steadily held between them while the ball is finished. The chuck closes when the jaws do, and then the tool-slide is moved forward by the lever C and its operating mechanism. The ball in the grasp of the jaws is finished and cut off and another ball partly finished. The fact that the ball is held by the steady-rest jaws makes it possible to cut the ball off cleanly, leaving little or no bur at the point of severance. The tool-slide is moved back to its starting-point while the stock is being fed forward and while the jaws are opened to release the ball.

Having described my invention, I claim—

1. In a lathe of the character described, in combination, a revolving steady-rest, means for revolving it in unison with the live-spindle, an axial stop-pin in the end of said steady-rest, two radially-movable jaws grooved on their inner ends, and mounted upon the end of the steady-rest, and means for operating said jaws, substantially as and for the purpose specified.

2. In a lathe of the character described, in combination, a revolving steady-rest, means for revolving it in unison with the live-spindle, an axially-placed stop-pin in one end of the steady-rest, two radially-movable jaws mounted upon the same end of the steady-rest, and having grooves in their inner ends and slots near their outer ends, two levers pivoted to said steady-rest, and a cone for operating said levers, substantially as and for the purpose specified.

3. In a lathe, in combination, a transversely-movable tool-slide, a horizontally-adjustable bracket, a lever pivoted on an adjustable fulcrum, a slotted arm secured on the slide with which said lever engages, a cam for operating said lever, and a cam engaging with the slide for moving it in the opposite direction to that in which it is moved by the said lever, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID ROCHE.

Witnesses:
E. L. THURSTON,
F. P. MILLER.