



(No Model.)

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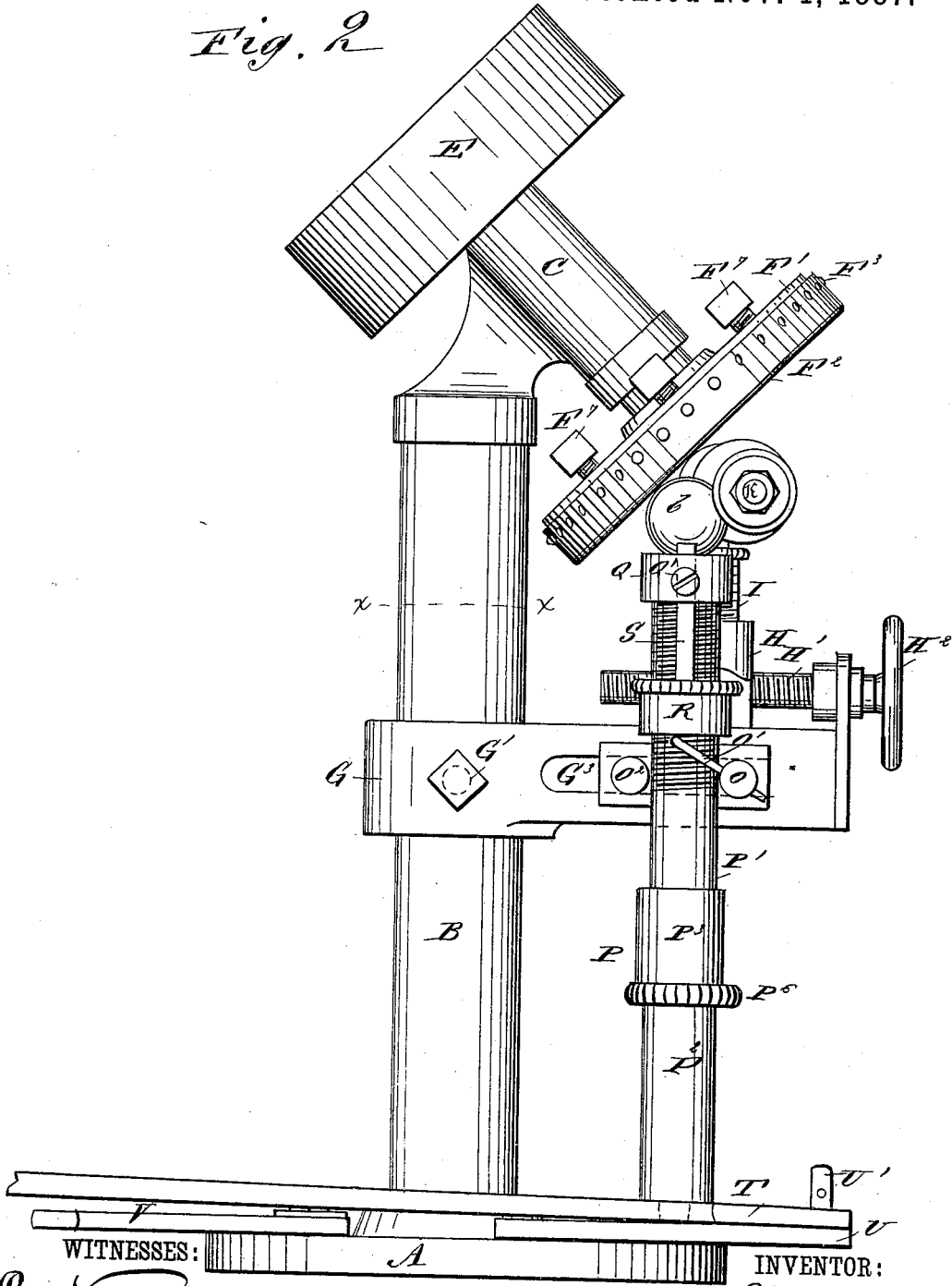
T. DRAPER.

BALL TURNING LATHE.

No. 372,460.

Patented Nov. 1, 1887.

*Fig. 2*



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

INVENTOR:

*T. Draper*

BY

*Munn & Co.*

ATTORNEYS.



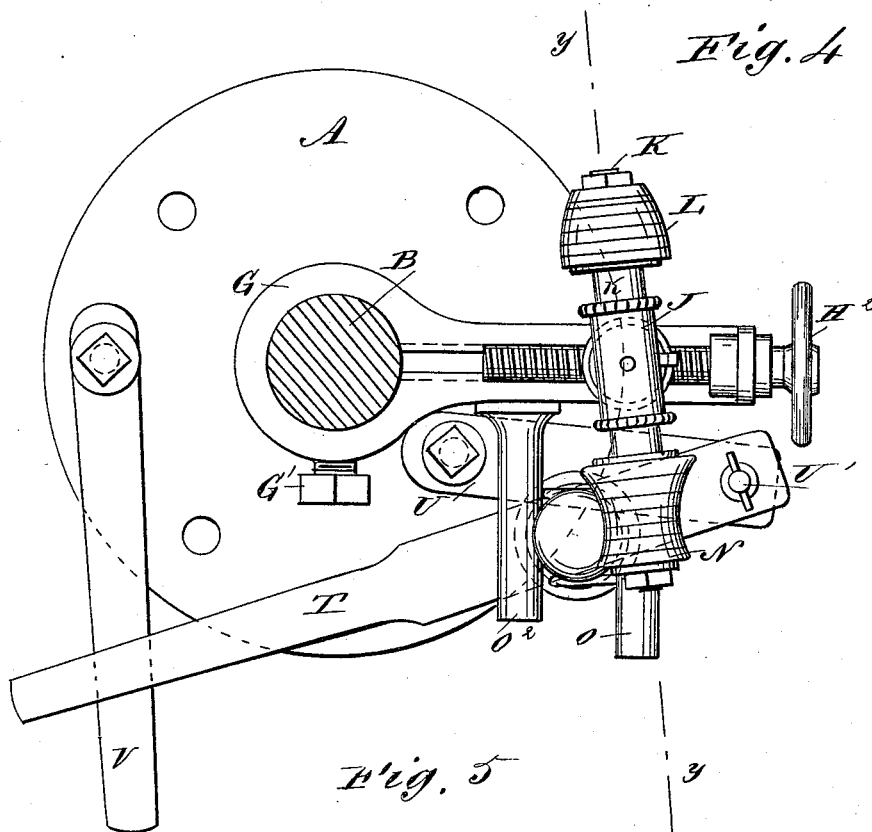
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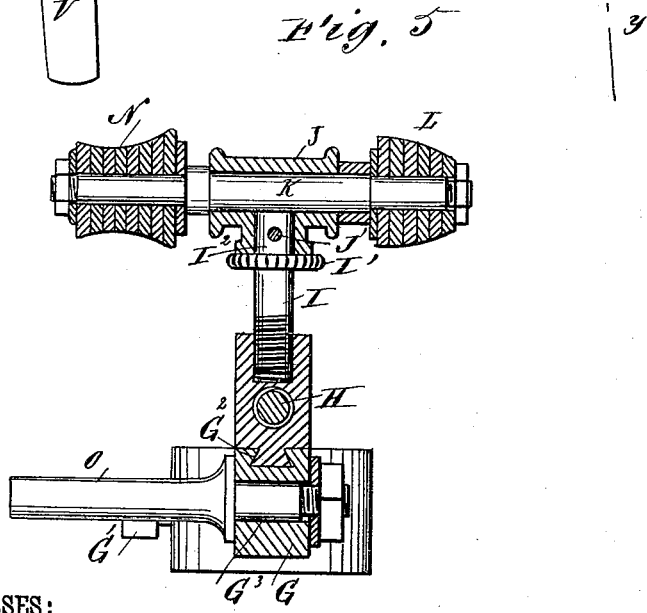
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*Fig. 4*



*Fig. 5*

WITNESSES:  
*C. Neveu*  
*bedgwick*

INVENTOR:  
*T. Draper*  
 BY *Munn & Co*  
 ATTORNEYS.

(No Model.)

5 Sheets—Sheet 5.

T. DRAPER.  
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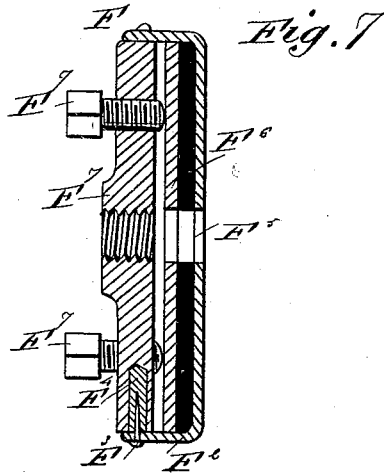
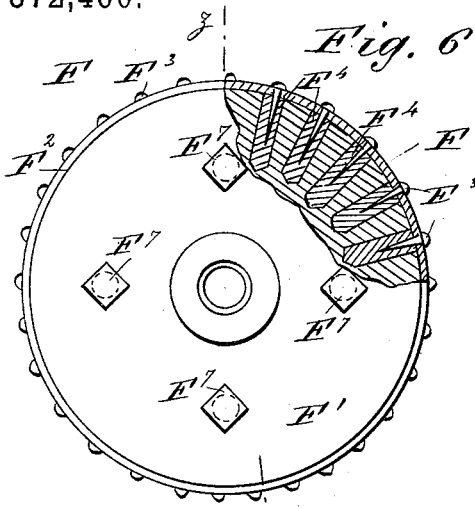


Fig. 8

Fig. 9

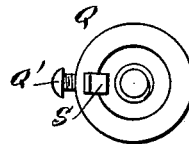
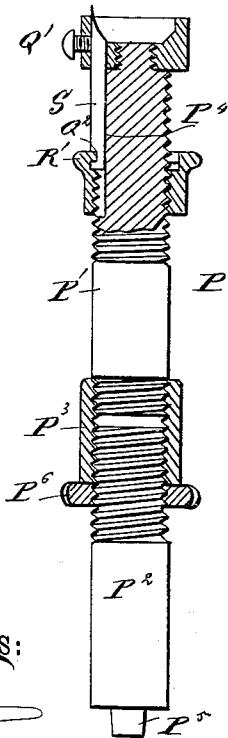


Fig. 10

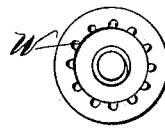
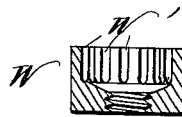


Fig. 11



WITNESSES:  
*C. Neveu*  
*G. Sedgwick*

INVENTOR:  
*T. Draper*  
 BY *Munn & Co*  
 ATTORNEYS.

# UNITED STATES PATENT OFFICE.

TRONSON DRAPER, OF PETROLIA, ONTARIO, CANADA.

## BALL-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 372,460, dated November 1, 1887.

Application filed April 19, 1887. Serial No. 235,337. (No model.)

### *To all whom it may concern:*

Be it known that I, TRONSON DRAPER, of Petrolia, in the Province of Ontario and Dominion of Canada, have invented a new and Improved Ball-Turning Lathe, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved lathe for turning a ball.

The invention consists of a face-plate covered with leather and backed by an elastic material, means for stretching the leather cover, and means for holding the ball to be turned in contact with the leather-covered plate.

The invention also consists in the construction and arrangement of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improvement adapted for turning balls having a stem. Fig. 2 is a side elevation of a modification of the same for turning balls without a stem. Fig. 3 is a front elevation of the same. Fig. 4 is a plan view of the same on the line  $xx$  of Fig. 2. Fig. 5 is a sectional elevation of the same on the line  $yy$  of Fig. 4. Fig. 6 is a rear face view of the face plate, parts being in section. Fig. 7 is a sectional side elevation of the same on the line  $zz$  of Fig. 6. Fig. 8 is a side elevation, partly in section, of the holder for supporting the balls without stems. Fig. 9 is a plan view of the ball-holding cup. Fig. 10 is a plan view of a modified form of the ball-holding cup; and Fig. 11 is a sectional elevation of the same.

In a suitable base-plate, A, is fastened the standard B, supporting at its upper end the angular bearing C, in which is adapted to turn the lathe-spindle D, provided at its lower end with the hollow reduced portion D', provided with an outer thread and an inner thread. On the upper end of the spindle D is secured a driving-pulley, E, for imparting a rotary motion to said spindle D. The reduced portion D' of the spindle D supports the face-plate F, provided with the metallic disk F', screwing on the outer thread of the reduced portion D'.

On the rim of the disk F' is secured a leather cover, F<sup>2</sup>, by means of nails or screws F<sup>3</sup>, passing through the leather cover F<sup>2</sup> and into wooden pins F<sup>4</sup>, secured in apertures formed radially in the rim of said disk F', as is plainly shown in Figs. 6 and 7. The leather cover F<sup>2</sup> extends in front and is backed by a disk, F<sup>5</sup>, of rubber or other elastic material, which is pressed against the leather cover F<sup>2</sup> by a disk, F<sup>6</sup>, held in the rear of the disk F<sup>5</sup>, and pressed against the latter by screws F<sup>7</sup>, screwing into the rear of the metallic disk F'. By adjusting the screws F<sup>7</sup>, I am enabled to stretch or slacken the leather cover F<sup>2</sup> to any desired degree. The said disk F<sup>6</sup> and its adjusting-screws form what may be broadly termed a "stretcher," as by operating the screws as just stated the leather may be stretched to any desired extent.

On the standard B is held, to slide, an arm, G, fastened to said standard at any desired height by means of a set screw, G', or other suitable means. In the top of the arm G is formed a dovetailed groove, G<sup>2</sup>, in which is held, to slide, a carriage, H, moved forward and backward on said arm G by a screw, H', passing through said carriage and held in an extension of the arm G, being also provided at its outer end with a hand-wheel, H<sup>2</sup>, for turning said screw, so as to move the carriage H forward and backward on the arm G. The carriage H is provided with a vertically-extending threaded aperture, in which screws the screw-rod I, provided with a knurled head, I', and with an extension, I<sup>2</sup>, above said knurled head.

On the extension I<sup>2</sup> is held the spindle-holder J, resting with its lower end on the knurled head I'. The holder J can be secured to the extension I<sup>2</sup> by a pin, J', passing through suitable apertures in said holder J and the extension I<sup>2</sup>, as shown in Fig. 5. In the holder J is mounted, to turn, the horizontal spindle K, carrying on one outer end the cone-shaped leather wheel L, adapted to be held in contact with the leather cover F<sup>2</sup> of the face-plate F. To the other end of the spindle K is fastened a wheel, N, of leather or other suitable material, which is provided with a concave rim.

The arm G is provided with the cross-slot G<sup>3</sup>, in which is held adjustably a pin, O, having a series of apertures, in which can be placed

pins O', so as to form a fork on said pin O. In the cross slot G<sup>3</sup> is also held adjustably a second pin, O<sup>2</sup>, by which, in connection with the pin O and the said pins O', is loosely held the cup-holder P, consisting of two parts, P' and P<sup>2</sup>, united by a nut, P<sup>3</sup>, so as to regulate the height of said holder P by screwing on said nut P<sup>3</sup>, which is held in place by the jam-nut P<sup>4</sup>. The upper end of the part P' of the holder P is reduced and screw-threaded, and on this screw-threaded end is held the cup Q, for supporting the ball to be turned. The part P' is also provided near its upper end with a screw-thread, on which screws the nut R, which, in connection with the cup Q, supports the cutting-tool S, held in a slot, P<sup>1</sup>, formed in the part P' and passing through a corresponding slot in the cup Q.

At the lower end of the tool S is a tongue which passes into an annular groove, R', formed in the nut R, so that when the latter is turned the tool can be adjusted up or down, so that the upper pointed end of said tool extends a suitable distance above the cup Q. The tool S can then be fastened in position by a set-screw, Q', screwing in the rim of the cup Q against said tool S. The lower end of the part P<sup>2</sup> of the cup holder P is provided with a pivot, P<sup>5</sup>, fitting into an aperture in the arm T, pivotally held on the pin U', which is secured to the arm U, the latter being pivoted or secured at its inner end on the base A of the machine. The outer end of the arm T rests on an arm, V, also pivoted on the base A, on the opposite side to the fulcrum of the arm U.

Instead of using the cup Q at the upper end of the cup-holder P, I may employ the cup W, (shown in Figs. 10 and 11,) which cup W is provided with a cutting-edge, W', which may be plain or scalloped, as illustrated in Figs. 10 and 11. If this cup is used I dispense with the tool S.

For turning balls with a stem, I employ a pair of tongs provided at their outer ends with cups Y, similar in shape to the cup shown in Figs. 10 and 11, and having a cutting edge of plain or scalloped shape.

The operation is as follows: For turning balls *a* with the stem, I swing the arm G to one side and remove the face-plate F from the spindle D. The screw-threaded stem of the ball *a* is screwed into the threaded aperture of the reduced part D' of the spindle D, as shown in Fig. 1. The spindle D is then rotated by the driving-pulley E, and the operator takes hold of the tongs X and presses the steel cups Y over the ball *a*, as shown in Fig. 1, and then moves the tongs X from side to side, upward and downward, at the same time pressing the prongs together, so that the cutting-edges of the cups Y come in contact with the surface of the ball *a*, and thus round off the same. The stem of the ball *a* is then carefully cut off by a hand-tool or the usual lathe-tool, so as to complete, as nearly as possible, the spherical surface of the ball *a*. The threaded stem of the ball *a* is then removed from the

reduced part D', and the face-plate F is then screwed upon the outer thread of the part D', as shown in Figs. 2 and 3. The arm G is swung to the front and fastened at a suitable height, and then the cup-holder P is placed in position between the pins O and O<sup>2</sup>, (so as to prevent the cup-holder from moving sidewise,) and then the pins O' are inserted into the respective apertures in the pin O, on each side of the cup-holder P, to prevent the latter from moving sidewise. A ball, *b*, without the stem, is then placed in the cup Q, and the tool S is adjusted by the nut R according to the size the ball *b* is to be turned. The carriage H is then adjusted forward or backward on the arm G, and the spindle-holder J is adjusted up or down by turning the knurled head I', so as to screw the rod I up or down in said carriage H. The holder J, when in the proper position, is fastened to the extension I<sup>2</sup> by the pin J', so as to prevent the holder J and its spindle K from turning on the extension I<sup>2</sup>. The holder J is placed in such a position that its leather wheel L is in frictional contact with the leather covering F<sup>2</sup> of the face-plate F, and the concave rim of the wheel N is held in close contact with the ball *b*, which is also held in contact with the leather cover F<sup>2</sup>. Now, it will be seen that when the face-plate F is rotated it imparts a rotary motion to the ball *b*, and at the same time to the wheels L and N, so that the ball *b* is turned by the tool S and rotated by the leather cover F<sup>2</sup> and the leather wheel N. The operator, by taking hold of the lower part of the cup-holder P, supported on the arm T, the pivot P<sup>5</sup> being inserted in the corresponding aperture in said arm T, can move the cup-holder upward, thus pressing the ball *b* with more or less power against the leather cover F<sup>2</sup>, the wheel N, and the tool S, so as to increase or diminish the turning and revolving of the ball. When the balls *a* and *b* have thus been roughened, by either the tongs X or the tool S on the holder P, then the latter is removed from the machine and the cup Q and the tool S are removed from the holder P. The cup W (shown in Figs. 10 and 11) is then screwed or otherwise fastened on the upper end of the holder P, and the ball is then again placed on top of said cup W, after which the holder is again placed in position between the pins O and O<sup>2</sup>. The pivot P<sup>5</sup> of the holder P is now inserted in the corresponding aperture in the arm T, so that the holder is supported on the said arm T. The operator now takes hold of the arm T with one hand, and with his other hand he takes hold of the holder P and presses the latter upward and sidewise, so that the ball held in the cup W is pressed against the face-plate F and the wheel N, the ball being thus rotated by the leather cover F<sup>2</sup>, and the leather wheel N is smoothed by the cutting-edge of the cup W.

It will be seen that a ball rotates in one direction and over part of its surface only; and in order to bring the entire surface in contact

with the face plate F, the wheel N, and the cutting-edges of the cup W, the operator moves the cup-holder P downward and changes the position of the ball in the cup W, so that a new part of the surface of the ball is presented to the cutting-edges.

It will be seen that by these means I am enabled to turn balls of any material, such as ivory, metal, composition, or other suitable material. The adjustability of the carriage H and the spindle-holder J permits of turning balls of almost any size. The cutting-edges of the cup W remove all inequalities on the balls.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a ball-turning lathe, the combination, with a leather-covered face-plate, of a stretcher for stretching the leather cover on the face-plate, substantially as set forth.

2. In a ball-turning lathe, a face-plate consisting of a disk adapted to be screwed to the lathe-spindle, a leather covering secured to the rim of said disk, a disk, of rubber or other elastic material, placed at the back of said leather cover, and a stretcher acting against the rear face of the rubber backing to force it against the leather, substantially as and for the purpose set forth.

3. In a ball-turning lathe, the combination, with a metallic disk adapted to be screwed to the spindle of the lathe, of a leather cover secured to the rim of said metallic disk, a disk of rubber or other elastic material used as a backing at the rear of said leather cover, a disk placed between the metallic disk and said elastic disk, and set-screws screwing in the metallic disk against the disk placed between the metallic disk and elastic disk, so as to stretch or slacken the leather cover, substantially as shown and described.

4. In a ball-turning lathe, the combination, with a leather-covered face-plate, of a leather wheel held in contact with the said face-plate and rotated by the latter, a second leather wheel having a concave rim and held on the same spindle as said wheel, in contact with the face-plate, a cup-holder, and a cup supported at the upper end of said cup-holder and having a cutting-edge, substantially as shown and described.

5. In a ball-turning lathe, the combination, with a leather-covered face-plate, of a leather wheel held in contact with said face-plate and rotated by the latter, a leather wheel having a concave surface and held on the same spindle as said wheel in contact with the face-plate, a cup-holder, a cup held at the upper end of said holder, and a cutting-tool held in said cup and projecting with its cutting-edges slightly above said cup, substantially as shown and described.

6. In a ball-turning lathe, the combination, with a cup-holder, of a cup held at the upper end of said holder, a nut screwing on said holder, and a cutting tool held in the recess in said holder and passing through a slot in

said cup, and also being moved up and down by said nut screwing on said holder, substantially as shown and described.

7. In a ball-turning lathe, the combination, with a cup-holder, of a cup held at the upper end of said holder, a nut screwing on said holder, and a cutting-tool held in a recess in said holder and passing through a slot in said cup, and also being moved up and down by said nut screwing on said holder, and means for fastening said tool in place on said cup, as set forth.

8. In a ball-turning lathe, the combination, with a leather-covered face-plate, of a wheel held in frictional contact with said face-plate, a spindle carrying said wheel, a holder in which said spindle rotates, and means, substantially as described, for raising and lowering said spindle, as set forth.

9. In a ball-turning lathe, the combination, with a leather-covered face-plate, of a wheel held in frictional contact with said face-plate, a spindle carrying said wheel, a spindle-holder in which said spindle rotates, a screw-rod secured to said spindle-holder, and a horizontally-adjustable carriage in which screws said screw-rod, substantially as shown and described.

10. In a ball-turning lathe, a standard, a lathe-spindle supported in a bearing on said standard, and a leather-covered face-plate held on said lathe-spindle, in combination with a wheel held in frictional contact with the face of said face-plate, a spindle carrying said wheel, a holder in which said spindle turns, a screw-rod extending from said holder, a carriage in which said screw-rod screws, and an arm held adjustably on said standard and supporting said carriage, substantially as shown and described.

11. In a ball-turning lathe, a standard, a spindle supported in a bearing on said standard, and a leather-covered face-plate held on said lathe-spindle, in combination with a wheel held in frictional contact with the face of said face-plate, a spindle carrying said wheel, a holder in which said spindle turns, a screw-rod extending from said holder, a carriage in which said screw-rod screws, an arm held adjustably on said standard and supporting said carriage, and means, substantially as described, for moving said carriage forward and backward on said arm, as set forth.

12. In a ball-turning lathe, a standard, a lathe-spindle supported in a bearing on said standard, and a leather-covered face-plate held on said lathe-spindle, in combination with a wheel held in frictional contact with the face of said face-plate, a spindle carrying said wheel, a holder in which said spindle turns, a screw-rod extending from said holder, a carriage in which said screw-rod screws, an arm held adjustably on said standard and supporting said carriage, a screw-rod screwing in said carriage and held in suitable bearings on said arm, and a wheel fastened on said

screw rod for turning the same, substantially as shown and described.

13. In a ball-turning lathe, a base, a standard supported on said base, a bearing formed  
5 on said standard, a lathe-spindle held in said bearing in an angular position, and a leather-covered face-plate held on said spindle, in combination with a wheel held in frictional  
10 spindle supporting said wheel, a leather wheel held on said spindle and having a concave rim, a vertically-adjustable holder supporting

said spindle, a carriage supporting said holder and having a sidewise motion, an arm supporting said carriage and held adjustably on  
15 said standard, a cup-holder held in forks secured to said arm, cups held on the upper end of said holder, and means, substantially as described, for raising said wheel and moving it sidewise, as set forth.

TRONSON DRAPER.

Witnesses:

JOHN A. WEBSTER,  
GEO. MONCRIEFF.