No. 803,116. PATENTED OCT. 31, 1905.

D. C. LEWIS.

LATHE ATTACHMENT FOR TURNING CRANK SHAFTS.

APPLICATION FILED DEC. 8, 1904.

3 SHEETS—SHEET 1.

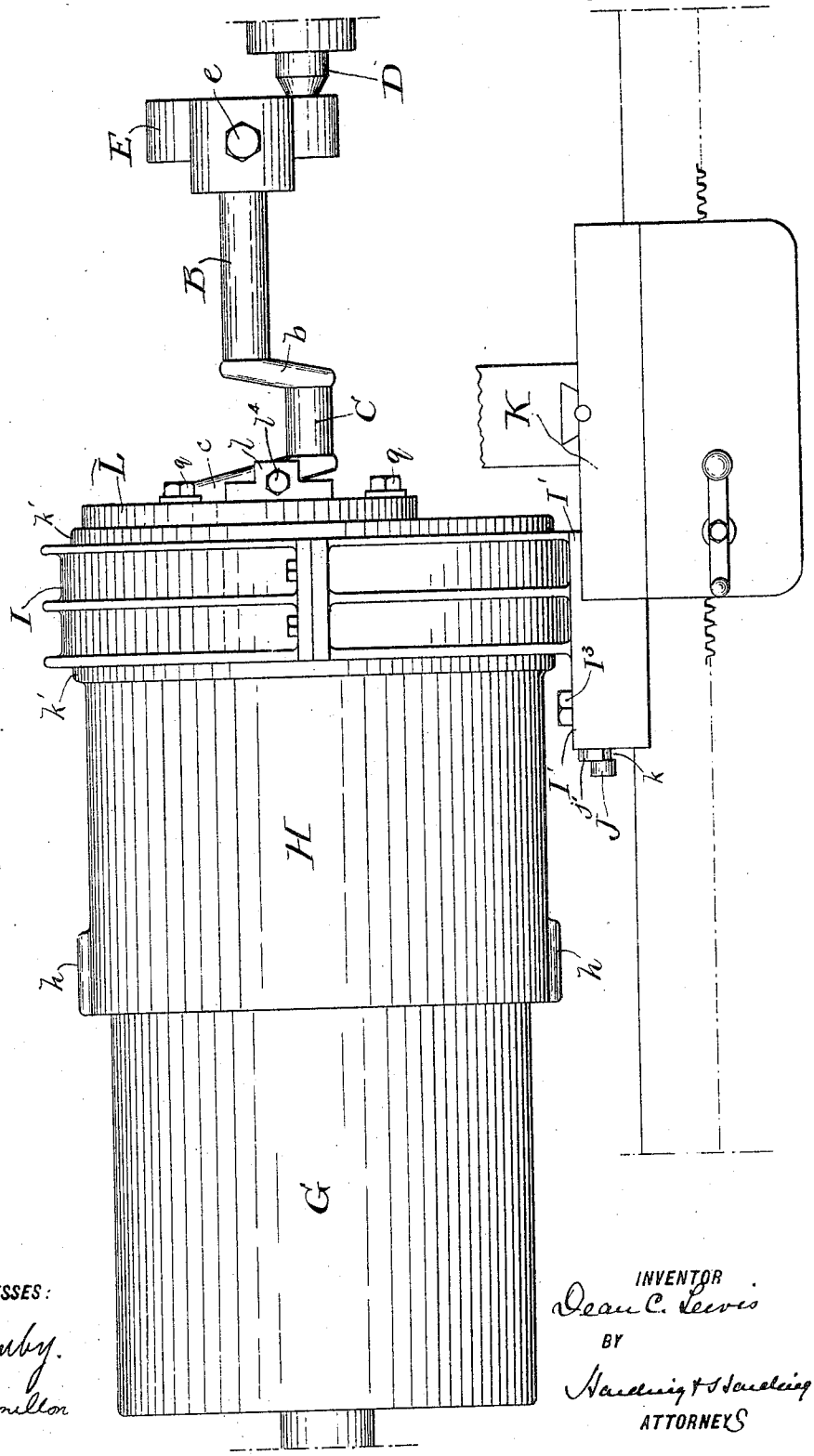


Fig. 1.

WITNESSES:

W. W. Leauby.

M. M. Hamilton

INVENTOR

Dean C. Lewis

BY

Harding & Harding

ATTORNEYS

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 803,116. PATENTED OCT. 31, 1905.

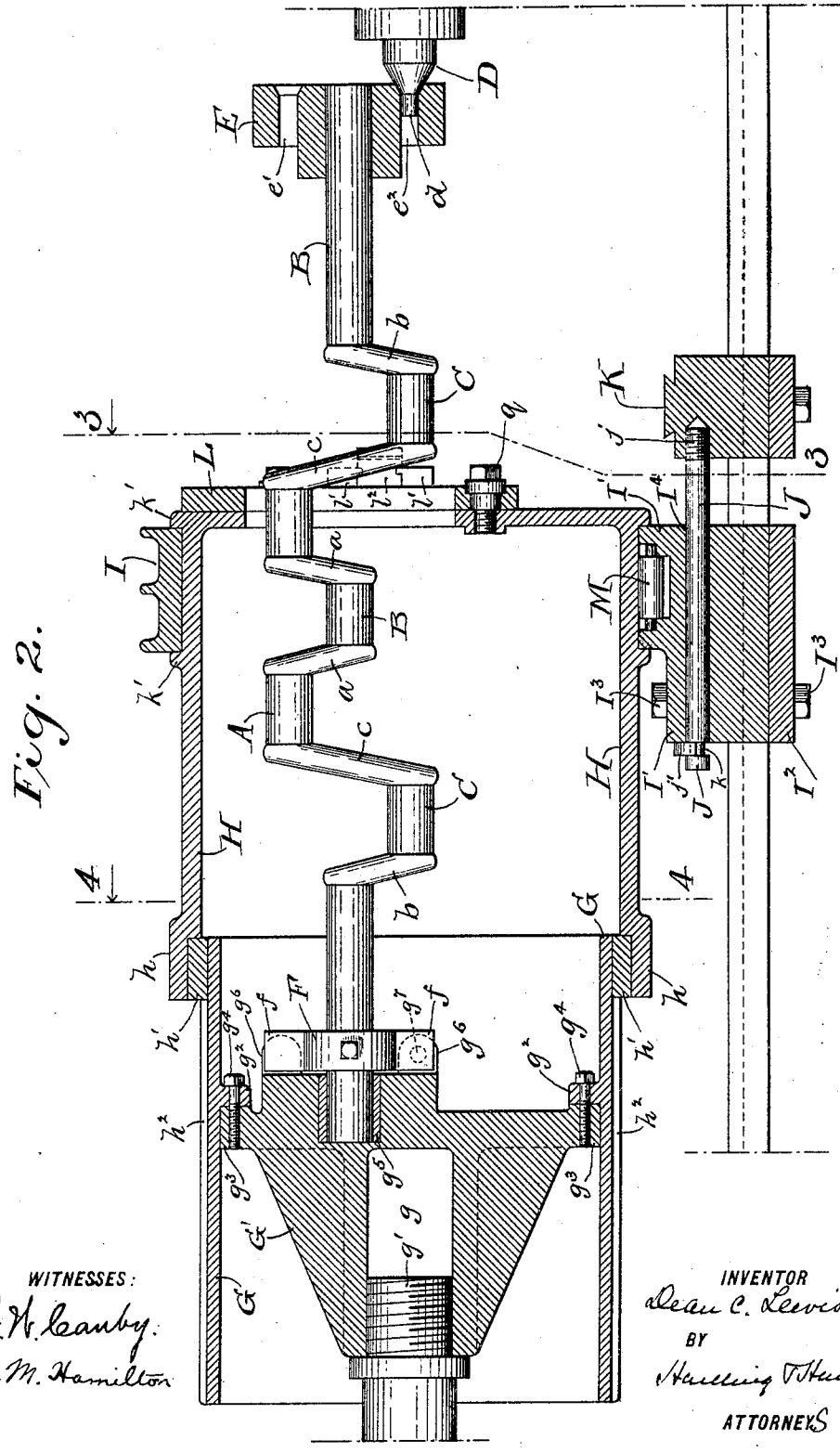
D. C. LEWIS.

LATHE ATTACHMENT FOR TURNING CRANK SHAFTS.

APPLICATION FILED DEC. 8, 1904.

3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

H. H. Canby.

M. M. Hamilton

INVENTOR

Dean C. Lewis

BY

Hunting & Hunting

ATTORNEYS

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 803,116. PATENTED OCT. 31, 1905.

D. C. LEWIS.

LATHE ATTACHMENT FOR TURNING CRANK SHAFTS.

APPLICATION FILED DEC. 8, 1904.

3 SHEETS—SHEET 3.

Fig. 3.

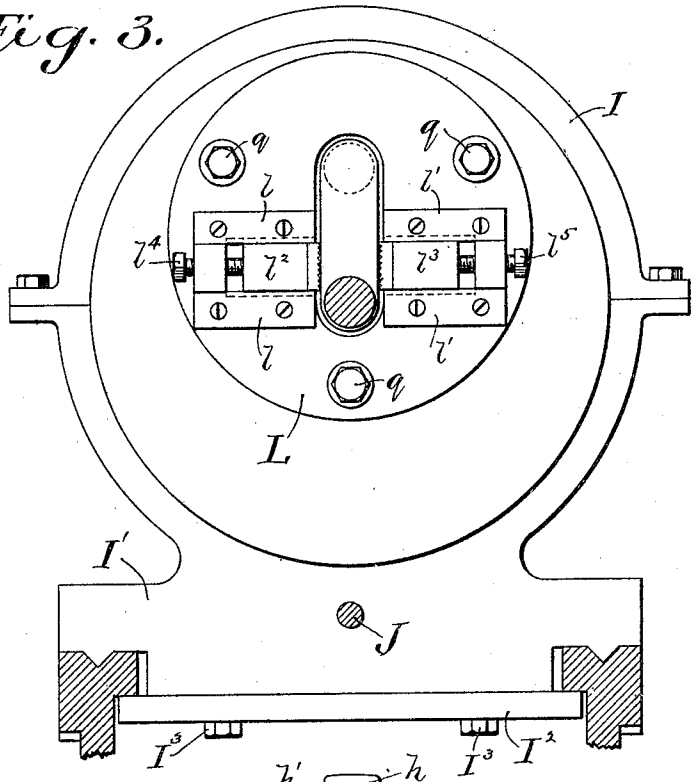


Fig. 4.

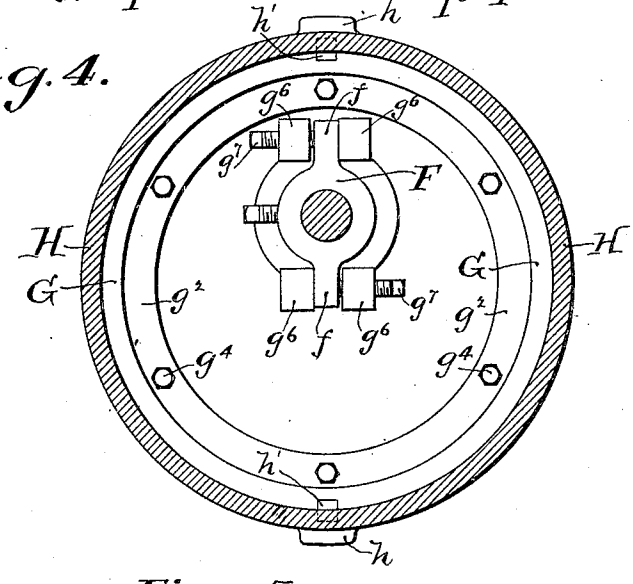
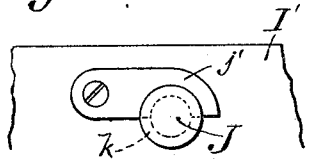


Fig. 5.



WITNESSES:

N. W. Leauby.

M. M. Hamilton

INVENTOR.

Dean C. Lewis

BY

Harding & Harding

ATTORNEYS

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DEAN C. LEWIS, OF ARDMORE, PENNSYLVANIA, ASSIGNOR TO THE AUTO-CAR COMPANY, OF ARDMORE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

LATHE ATTACHMENT FOR TURNING CRANK-SHAFTS.

No. 803,116. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed December 8, 1904. Serial No. 235,995.

To all whom it may concern:

Be it known that I, DEAN C. LEWIS, a citizen of the United States, residing at Ardmore, county of Montgomery and State of Pennsylvania, have invented a new and useful Improvement in Lathe Attachments for Turning Crank-Shafts, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The great difficulty of turning crank-shafts in a lathe is due to the fact that as the shafts or the cranks thereof turn eccentrically they are subject to torsional strains which are excessive if the shaft be supported only at its extreme ends and tending to turn or distort the shaft.

My invention has for its object an attachment to the lathe whereby the shaft may be supported close up to the point of application of the tool, and thus the torsional strains avoided.

I will first describe the embodiment of my invention illustrated in the accompanying drawings and then point out the invention in the claims.

In the drawings, Figure 1 is a side elevation of my lathe attachment, showing the apron, head and tail stock of an ordinary lathe, and a crank-shaft in position to be turned. Fig. 2 is a longitudinal section through center of Fig. 1. Fig. 3 is a section taken on line 3 3, Fig. 2. Fig. 4 is a section taken on line 4 4, Fig. 2. Fig. 5 is an enlarged detail of latch.

The crank-shaft to be turned when in the position illustrated in Fig. 2 has the upper section A, the middle section B, and the lower section C, the upper and middle sections being connected by the cranks a, the middle and lower sections by the cranks b, and the upper and lower sections by the cranks c. As shown, the parts are in position for the tool to operate upon one of the lower sections C.

D is the tail-lathe spindle, having the center d. Surrounding this end of the shaft and clamped thereto by clamps e is the bushing E, having the orifices e' e^2, spaced apart a distance equal to the distance between the center of section A and center of section C. The center d rests in the orifice e^2. The other end of the shaft has secured to it the two-tailed drive F, having the tails f f.

G is a cylinder in the interior of which is the face-plate G′, having the cored portion g internally threaded, in which is secured the threaded end or projection g' of the lathe-head spindle. From the interior of the cylinder G projects the flange g^2, through which and the corresponding flange g^3 in the face-plate G′ pass the bolts g^4, thus securing the face-plate and cylinder together. In the face-plate is the socket g^5, eccentric to the axis of the cylinder and in which the end of the shaft rests and is secured by bolts g^7, passing through ears or lugs g^6 on the face-plate and clamping against the tails f f.

H is a second cylinder of larger diameter than the cylinder G and overlapping the same and having the flange portion h, to which is secured a key h', which rests in a groove h^2 in the cylinder G. The cylinder H is movable along upon the cylinder G, the key h' maintaining connection between the two cylinders so that they rotate together. The opposite end of cylinder H is surrounded by guide-frame I, formed in two parts bolted together. The interior of this frame I conforms to the exterior of cylinder H, but in which cylinder H can rotate. The lower end of the outer side of this frame is broadened to form a base I′, which in turn is cut away to dovetail with the shears of the lathe-bed. It is secured to the shears by the plate I^2 and bolts I^3. This base I′ has through it the orifice I^4, through which passes the rod J, threaded at its end and engaging threads in an orifice j in the tool-carriage K. A portion of this rod at k is cut away. j' is a latch pivoted to frame I and adapted to swing over the cut-away portion k and lock the rod from moving in the orifice. Upon the outer face of the cylinder H is secured a floating plate L, having an elongated slot or orifice, one portion of which is concentric with the lathe-axis, wide enough to admit the shaft-sections and of length equal to or greater than the distance between the shaft-sections A and C. This plate also carries the plates l l l' l', forming guideways in which respectively move the clamping-blocks l^2 l^3, operated by the screws l^4 l^5.

As may be seen, the shaft extends from the tail-spindle to the face-plate G′, to which it is secured. It also passes through the cylin-

ders H and G, and by moving the blocks l^2 l^3 the shaft may be secured at this point also.

Upon the outer surface of the cylinder H are the circumferential projections k', between which is the frame I. As the frame I is secured to the tool-carriage it moves with it in a fixed relation upon the lathe-bed, and as the movement of the frame I also moves cylinder H the clamping-blocks l^2 l^3 clamp the shaft close up to the point of application of the tool, thus avoiding any torsional strains. As shown, the cylinder H is in its most extended position and it may be moved inward to follow the work and successively clamp different portions of the shaft close up to the point of application of the tool.

In order to reduce friction between the cylinder H and the frame I, I support in the base I' a roller M, which projects through a cut-away portion of the frame into contact with the cylinder H. By saturating this roller with a lubricant it is fed to the cylinder H.

To remove the cylinder H from the lathe-bed, the plate I^2 is removed, the latch j' elevated, the pin J withdrawn, the cylinder G disconnected from the lathe-head spindle, when the cylinders with frame I may be lifted off.

The floating plate L is secured to the end of cylinder H by bolts q, which pass through orifices in the head and plate, the orifices in the plate being somewhat larger than the bolts but smaller than the bolt-heads, so that in practice I first secure the clamps l^2 and l^2 and then clamp the floating plate to the cylinder, which enables the floating plate to, as it were, adjust itself with respect to the axis of the cylinder.

By my improved construction among other things it will be seen that there is no gearing connected with the cylinder which carries the plate which receives and holds the shaft in position for work being done upon it by the tool. It is driven by means of its connection with the other cylinder, upon which it is capable of moving longitudinally. By this arrangement, and thus avoiding any gear upon the cylinder carrying the shaft-holding plate, I avoid any defect in the turning of the shaft which might be produced where gears are used, due to the unequal wearing of the gears and the tendency to backlash.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In a lathe for turning crank-shafts, in combination, a head-spindle, a face-plate, secured to the head-spindle, having an orifice, to receive the shaft, eccentric to the lathe-axis, a tail-spindle, a bushing having a central orifice adapted to receive the shaft and orificed portions, in one of which at an angle thereto and to each other the tail-spindle is adapted to rest, a rotatably-mounted plate intermediate of the head and tail spindles, said plate, having an elongated orifice, extending from the center thereof, said plate carrying clamping devices.

2. In a lathe for turning crank-shafts, in combination, a head-spindle, a face-plate secured to the head-spindle, having an orifice, to receive the shaft, eccentric to the lathe-axis, a tail-spindle, a bushing having a central orifice adapted to receive the shaft and orificed portions, in one of which the tail-spindle is adapted to rest, a rotatably-mounted and longitudinally-movable plate intermediate of the head and tail spindle, said plate having an elongated orifice, extending from the center thereof, said plate carrying clamping devices.

3. In a lathe for turning crank-shafts, in combination, a face-plate having an eccentric orifice to receive one end of shaft, a two-tail drive adapted to surround the shaft and having means for securing it thereto, clamping devices on opposite sides of said orifice, adapted to clamp the drive to the face-plate, a tail-spindle, a bushing having a central orifice to receive the other end of the shaft, and orificed portions in one of which the tail-spindle is adapted to rest.

4. In a lathe for turning crank-shafts, in combination, a face-plate having an eccentric orifice to receive one end of shaft, a reversible driving means adapted to be secured to the shaft and devices diametrically opposite said orifice for connecting the plate, and driving means together, a tail-spindle, a bushing having a central orifice to receive the other end of the shaft and diametrically opposite eccentric orificed portions in one of which the tail-spindle is adapted to rest.

5. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder.

6. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder, and means to support said cylinder so as to be longitudinally movable.

7. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of

which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder, a tool-carriage and connection between said second cylinder and the tool-carriage, whereby said second cylinder moves longitudinally with said tool-carriage.

8. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder, a frame having a cylindrical portion surrounding said second cylinder, means to hold said surrounding frame from lateral movement upon the second cylinder, said frame resting and movable upon the tool-carriage shears, means to revolve said cylinders.

9. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder, a frame having a cylindrical portion surrounding said second cylinder, means to hold said surrounding frame from lateral movement upon the second cylinder, said frame resting and movable upon the tool-carriage shears, a tool-carriage and connection between said tool-carriage and frame, means to revolve said cylinders.

10. In a lathe for turning crank-shafts, in combination, a cylinder, a second cylinder, said second cylinder being movable along, but secured to rotate with, the first cylinder, a head for the second cylinder having a radially-extending elongated orifice, one portion of which is concentric with the axis of the lathe, clamping members carried by said head, means to revolubly support the second cylinder, a frame having a cylindrical portion surrounding said second cylinder, means to hold said surrounding frame from lateral movement upon the second cylinder, said frame resting and movable upon the tool-carriage shears, a tool-carriage, there being an orifice in said frame and carriage, a pin passing through the orifice in the frame, and secured in said carriage-orifice, and means to lock said pin from longitudinal movement, means to revolve said cylinders.

11. In a lathe for turning crank-shafts, in combination, a cylinder, a face-plate secured in the interior of the cylinder, having an orifice, adapted to receive the end of the shaft, eccentric to the axis of the lathe, a second cylinder secured to rotate with the first cylinder, but movable longitudinally thereon, a head secured to said second cylinder, having an elongated radial orifice, one portion of which is concentric with the axis of the lathe, clamping devices carried by said head, and means to revolubly support said second cylinder.

12. In a lathe for turning crank-shafts, in combination, a cylinder, a face-plate secured in the interior of the cylinder, having an orifice, adapted to receive the end of the shaft, eccentric to the axis of the lathe, a second cylinder secured to rotate with the first cylinder, but movable longitudinally thereon, a head secured to said second cylinder, having an elongated radial orifice, one portion of which is concentric with the axis of the lathe, clamping devices carried by said head, means to revolubly support said second cylinder, a tool-carriage and connection between said tool-carriage and cylinder, whereby said cylinder moves with the tool-carriage.

13. In combination, a cylinder, means to rotate said cylinder, a second cylinder carrying a plate to receive and hold the shaft in the desired position, said second cylinder being connected to rotate with the first cylinder but longitudinally movable with reference thereto.

In testimony of which invention I have hereunto set my hand at Ardmore, Pennsylvania, on this 2d day of December, 1904.

DEAN C. LEWIS.

Witnesses:
WM. J. SCOTT,
E. W. MILLER.