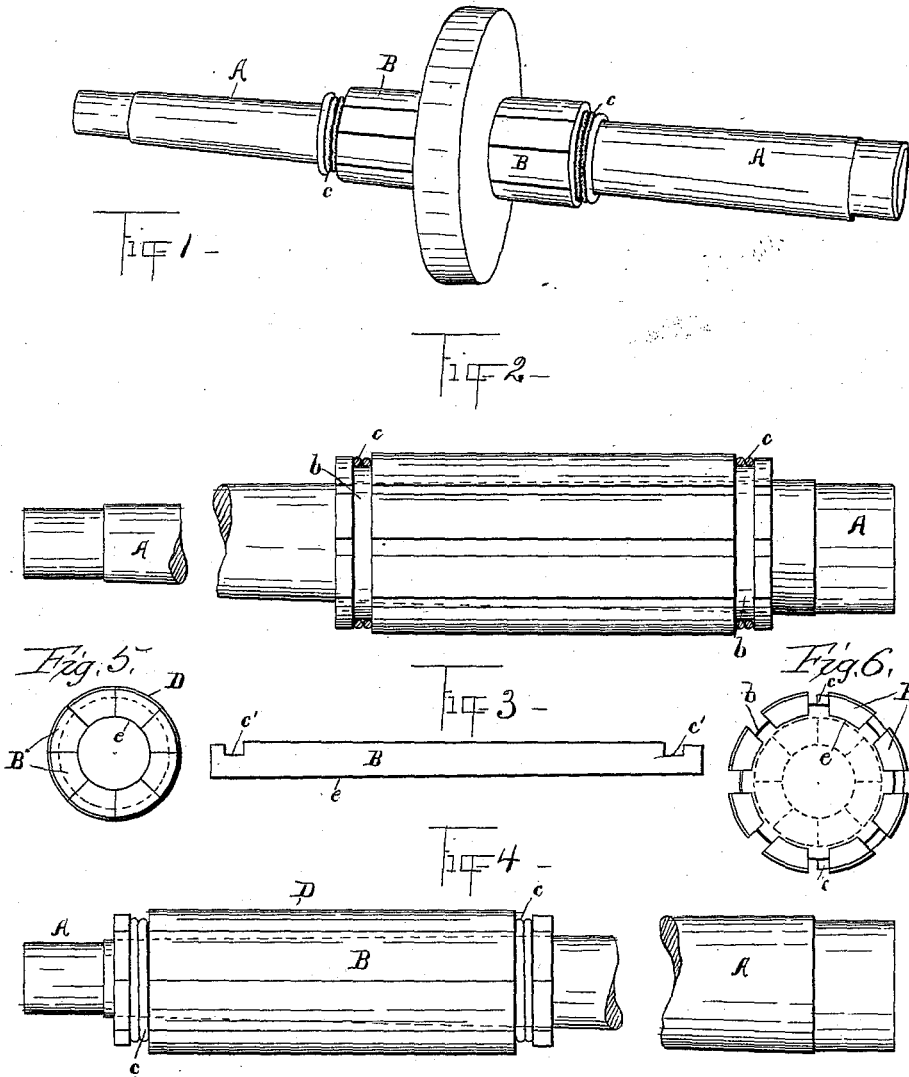


(No Model.)

L. H. BRIGHTMAN.  
EXPANDING LATHE MANDREL.

No. 420,616.

Patented Feb. 4, 1890.



Witnesses  
N. H. Fay  
J. D. Fay

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By his Attorney  
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# UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF CLEVELAND, OHIO.

## EXPANDING LATHE-MANDREL.

SPECIFICATION forming part of Letters Patent No. 420,616, dated February 4, 1890.

Application filed March 30, 1889. Serial No. 305,353. (No model.)

*To all whom it may concern:*

Be it known that I, LATHAM H. BRIGHTMAN, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Expanding Lathe-Mandrels, of which the following is a specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

My invention has for its object an improved form of expanding lathe-mandrels that shall be cheap, easily and quickly adjusted, and have great expansion as well as great holding power.

Figure 1 is a perspective view of the lathe-mandrel with the work in position. Fig. 2 is a plan view of the mandrel in open position, the spiral spring being in section. Fig. 3 is a side elevation view of a segment removed from the cylinder. Fig. 4 is a plan view of the mandrel in contracted position. Figs. 5 and 6 are respectively end views of the mandrel-cylinder in contracted and expanded position.

A is a milled tapered arbor of the usual form, preferably made of steel and having hardened ends. A series of segments B, each of keystone shape in cross-section, are bound together at either end by the rubber bands *b* and by spiral springs *c*, said bands and springs respectively fitting in the transverse recess or rabbet *c'*, formed at both ends of each of said segments. Said segments are of taper or wedge-shaped form—that is, they are thicker at one end than at the other—to correspond inversely with the taper of the arbor, and as said segments are located with their thicker ends adjacent to the smaller ends of the arbor the increased size of said ends of the segments equalizes the decreased size of the arbor, and thus the outer longitudinal faces *d* of the segments, taken collectively, form a cylinder D. The inner faces *e* of the segments are curved and their collective diameter is substantially equal to the diameter of the smaller end of said arbor, whereby the longitudinal edges only of each segment engage with the arbor when said segments are in engagement with the larger end of said arbor,

the said inner faces or arbor-engaging faces of each segment having plane and unbroken surface, as does also the arbor, whereby said cylinder may be longitudinally slid up and down said arbor. By "plane and unbroken surface" I mean notscrew-threaded, although the arbor might be octagonal or of other cross-sectional form, or the form of the arbor-engaging faces of the segments might be angular instead of curved, or one or both might be somewhat roughened; but so long as the engaging faces of segments and arbor permit longitudinal sliding movement of one against the other I would consider them plane faces, and the term is here used with that meaning. Thus as the mandrel is expanded and moved toward the larger end of the arbor the segments are separated from each other and the smaller curve of the inner face of each segment (as compared with the circumference of that portion of the arbor on which they rest) causes the two inner longitudinal edges of each segment to engage and grip the circumference of the arbor.

The operation is as follows: The work to be turned up is slipped over the segments, and the latter are then forced upward toward the larger end of the arbor as far as they will go. The arbor may be turned with its large end down and jarred lightly on the floor. This will sufficiently tighten the work to cause it to hold. To free the work from the mandrel, jar the small end on the floor or tap it lightly with a hammer.

The foregoing description and accompanying drawings set forth in detail mechanism in embodiment of my invention. Change may be made therein, provided the principles of construction respectively recited in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In an expanding lathe-mandrel, the combination, with an arbor, of a segmental cylinder engaging therewith, the engaging face of one of said two portions being plane and unbroken, whereby said cylinder may be longitudinally slid upon said arbor.

2. In an expanding lathe-mandrel, the combination, with a plane-faced tapering arbor, of a series of cylinder-segments tapering to

correspond with the taper of the arbor, the  
 collective diameter of the inner faces of said  
 segments substantially equal with the diam-  
 eter of the smaller end of said arbor, whereby  
 5 the longitudinal edges only of each segment  
 engage with the arbor when said segments  
 are in engagement with the larger end of said  
 arbor, the inner arbor-engaging faces of each  
 segment having a plane and unbroken sur-  
 10 face, whereby said cylinder may be longitudi-

nally slid upon said arbor, substantially as  
 set forth.

In testimony that I claim the foregoing to be  
 my invention I have hereunto set my hand  
 this 27th day of March, A. D. 1889.

L. H. BRIGHTMAN.

Witnesses:

J. B. FAY,  
 N. H. FAY.