

(No Model.)

H. C. ALBEE.  
CONCENTRIC LATHE.

No. 302,644.

Patented July 29, 1884.

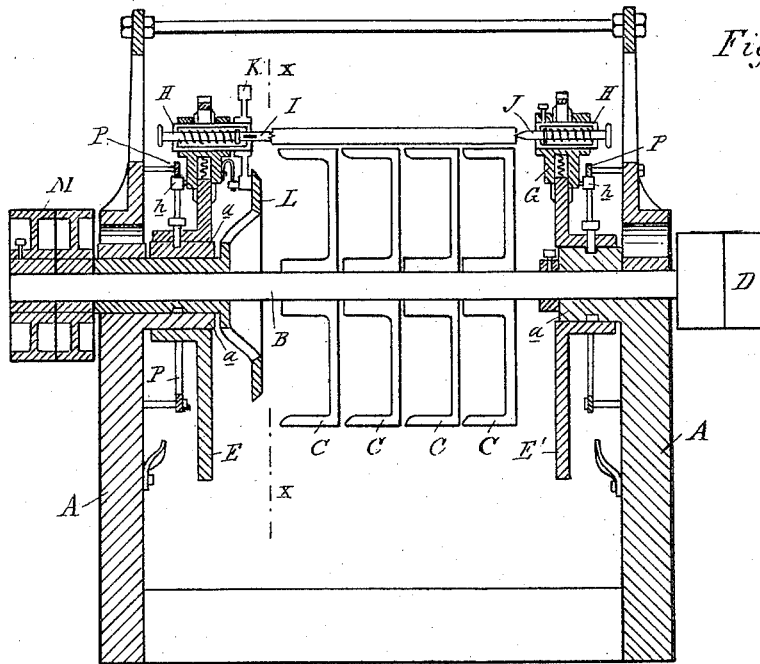


Fig. 1

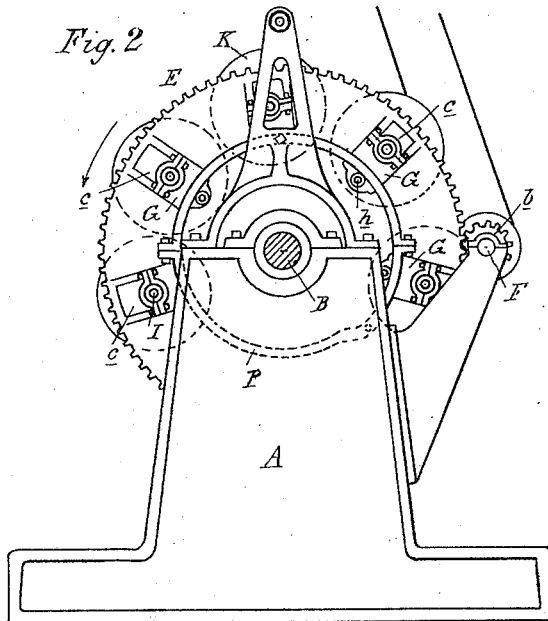


Fig. 2

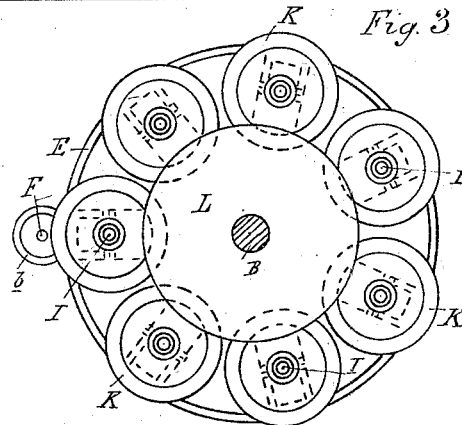


Fig. 3

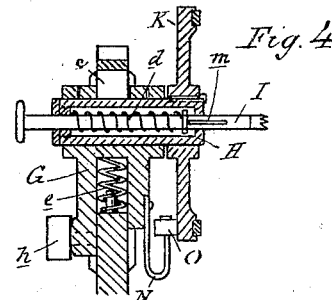


Fig. 4

Attest  
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# UNITED STATES PATENT OFFICE.

HARRY C. ALBEE, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO  
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## CONCENTRIC LATHE.

SPECIFICATION forming part of Letters Patent No. 302,644, dated July 29, 1884.

Application filed May 15, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY C. ALBEE, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Concentric Lathes; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in lathes for turning concentric forms, and the improvement has more special reference to that kind of lathe in which the lathe-spindles are mounted upon rotating disks and revolve around the cutters, which also rotate; and my invention consists, first, in the mechanical devices for revolving the live-spindles; second, in the mechanical devices by which the spindles are radially guided within radial slots of the disks on which they are mounted; third, in the mechanical devices for making the spindles axially movable; and, fourth, in the peculiar arrangement for conveying the power to the rotating disks and spindles, all as hereinafter more fully described.

Figure 1 is a vertical central section of my improved lathe. Fig. 2 is an end view thereof. Fig. 3 is a cross-section on line *x x*, Fig.

Fig. 4 is an enlarged and detached section of one of the live-spindles, showing its construction and the manner of revolving it.

In the drawings, A represents the frame, which supports all the operating parts of the lathe.

B is the main shaft.

C are cutter-heads secured upon the main shaft, and D is a pulley for revolving the main shaft and cutter-heads.

E E' are two like disks, provided with cogs around their periphery and sleeved upon the hubs *a*, which are either secured to or formed integrally with the frame.

F is a counter-shaft bearing two like pinions, *b*, which mesh with the cogs of the disks E E', and by means of which a corresponding motion is communicated to the disks E E'. The disks E E' are provided with a number of radial slots, *c*, in which the sliding blocks G are radially movable. The sliding blocks G have transversely journaled through them

the spindle-boxes H, in which the spindles I J are journaled, the former constituting the live-spindles and the latter the dead ones. Each of the spindle-boxes H contains a coil-spring, *d*, placed around the spindles, so as to force them against the ends of the sticks dogged between each pair. To prevent the live-spindles from revolving in their boxes they are provided with feathers *m*. A strong coil-spring, *e*, is interposed between each sliding block G and the inner end of the radial slot in which it moves. A small anti-friction roller, *h*, is secured to each sliding block G, and bears against the inner face of the guide-rail P.

The guide-rails P (one for each of the disk-wheels E E') are stationarily secured to the frame in any convenient manner. Their object is to retain and guide the sliding blocks G in their radial slots or sockets against the tension of the coil-springs *e*, which tend to push them radially outward.

Upon the inner ends of each of the spindle-boxes H, which contain the live-spindles, is secured a small disk, K, which is kept in frictional contact near its outer face with the friction-disk L, which is sleeved upon the shaft B, and has secured upon the free end of its hub the pulley M.

To insure frictional contact between the small disks K and the disk L, a spring, N, with an anti-friction roller, O, upon its free end, is made to press the disk K against the disk L; or other suitable devices for this purpose may be used.

The lathe shown in the drawings is mainly designed to turn such articles as broom-handles, &c., and in practice the shaft B is revolved with a relatively high speed, while the disks E E' are revolved with a slower motion, either in the same or in opposite directions thereto, and the blanks may be fed on one side of the machine and automatically tripped near the under side after having made nearly one complete rotation. Catches for automatically withdrawing the spindles to release the finished article, and pressure-arms for forcing the spindles into the blank, are arranged in the usual manner, and also carriers for carrying the finished articles away from the lathe. The live-spindles are revolved in the opposite di-

recession in which the cutter-heads revolve, and the proper speed is given to them to obtain smooth cutting. The guide-rails P are so arranged as to submit the blank to a gradual reduction until finished. The guide-track is therefore eccentric to the center of motion, so as to force the sliding blocks radially inward during the interval of reducing the blank. The guide-rails should be removably attached, so as to be easily exchanged for different work.

It will be observed that the operation of this lathe is so far different from other lathes of its kind, in that the motion of the spindles is not derived from the motion of the spindle-carrying disks—that is, the spindles may be run faster or slower (dependent upon the size of the pulley M) without a corresponding change in the speed of the disks. Another advantage of this machine is the positive manner in which the sliding blocks G are guided, as the guide-rails are so placed as to effectually counteract any tendency of the sliding blocks to move outwardly, owing to a lifting action of the cutter-knives or to the centrifugal force. The tension of the coil-springs *e* can be easily relied on to keep the sliding blocks in engagement with the rail.

The advantage of the friction-gearing for revolving the live-spindles is the facility for obtaining their free radial movement thereby.

Instead of securing the friction-disks K upon the spindle-boxes, they may be placed upon the live-spindles themselves, and engage therewith by means of a feather.

What I claim as my invention is—

1. In a lathe for turning concentric forms, in which the spindles are mounted in radially-movable bearings in revolving disks and rotated around revolving cutter-heads, the fixed guide-rails P, in combination with the coil-springs *e*, the former constructed to limit the outward movement of the spindles and gradu-

ally advance the same toward the center against the tension of said springs, substantially as and for the purposes described.

2. In combination with a series of revolving cutter-heads, rotating disks carrying independent radially-movable spindles around said cutter-heads, stationary guideways upon the main frame for limiting the radial movement of said spindles, the independently-rotated disk L, and the disk K, keyed to the live-spindle I, and in frictional contact with said disk L, for revolving the live-spindles independently of the other movable parts of the lathe, substantially as described.

3. The devices for revolving the live-spindles, consisting of the disks K, placed upon the spindle-boxes or upon the spindles, as described, and of the independently-rotated disk L, sleeved upon the main shaft and adapted to transmit its motion to the disks K by means of frictional contact therewith.

4. In a lathe for turning concentric forms, the combination of a series of cutter-heads which simultaneously work upon the stick, of the two corresponding disks, E E', one carrying a series of live-spindles and the other a corresponding series of dead-spindles, of the sliding blocks G, mounted in radial slots in the disks and radially guided therein, of the guide-rails P and coil-springs *e*, which control the radial movement of the spindles, the former controlling their inward and the latter their outward movement, of the spindle-boxes H, which secure the spindles retractibly in position, and of the friction-disks K and L, for revolving the live-spindles, all substantially as and for the purpose described.

HARRY C. ALBEE.

Witnesses:

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