

(No Model.)

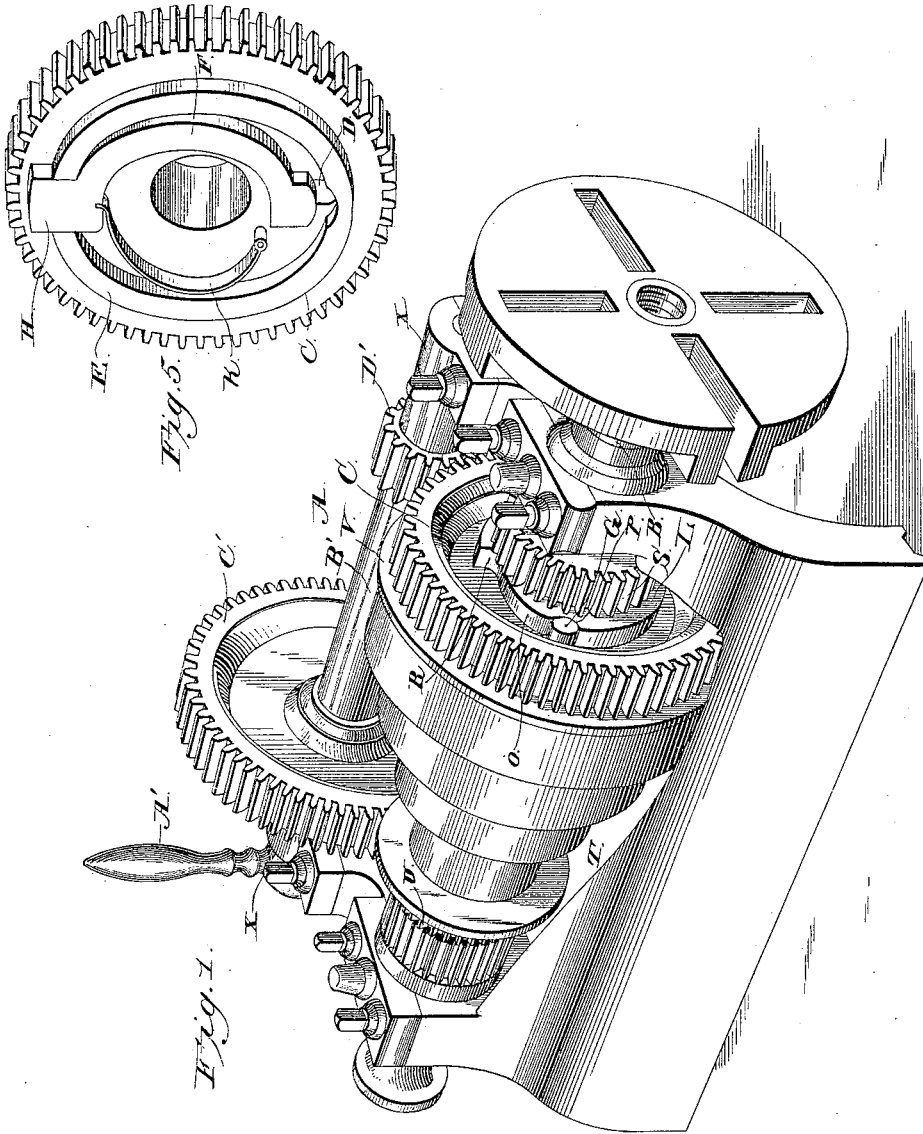
2 Sheets—Sheet 1.

J. R. BAKER.

BACK GEAR FOR TURNING LATHES.

No. 389,431.

Patented Sept. 11, 1888.



Witnesses
M. G. Fowler
J. G. Warner

Inventor
James R. Baker

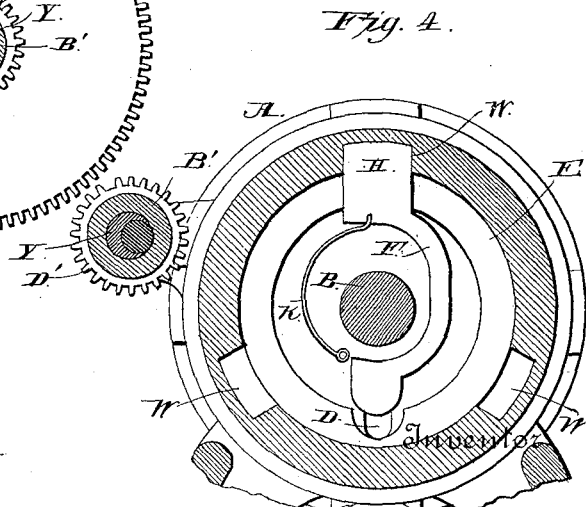
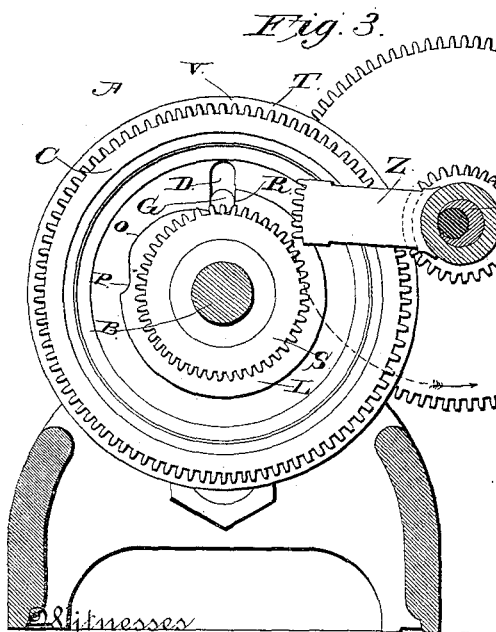
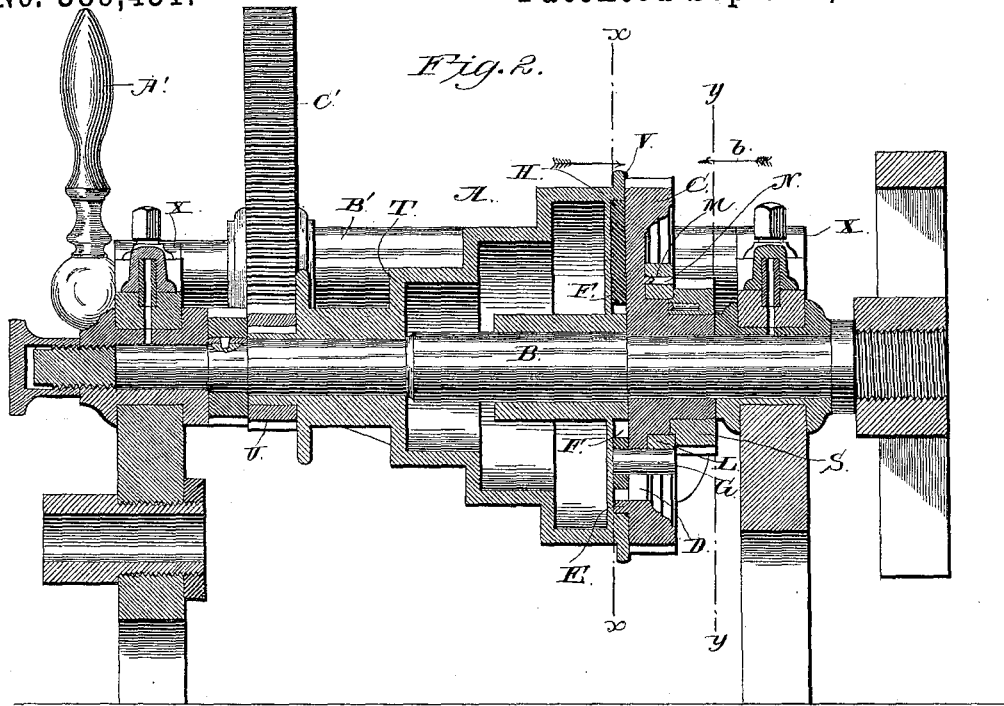
By his Attorneys
C. Fowler

J. R. BAKER.

BACK GEAR FOR TURNING LATHES.

No. 389,431.

Patented Sept. 11, 1888.



Witnesses
M. Fowler
J. W. Gann

By *his Attorneys*
 James R. Baker
C. Howard

UNITED STATES PATENT OFFICE.

JAMES R. BAKER, OF KENDALLVILLE, INDIANA.

BACK-GEAR FOR TURNING-LATHES.

SPECIFICATION forming part of Letters Patent No. 389,431, dated September 11, 1888.

Application filed February 16, 1888. Serial No. 264,195. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. BAKER, a citizen of the United States, residing at Kendallville, in the county of Noble and State of Indiana, have invented a new and useful Improvement in Back-Gears for Turning-Lathes, of which the following is a specification.

My invention relates to an improvement in back-gears for turning-lathes; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide means whereby the speed of the spindle of a lathe may be changed without altering the speed of the cone-pulleys, and whereby the rotation of the lathe-spindle may be arrested without arresting the rotation of the cone-pulleys, and these objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of a lathe provided with my improvements. Fig. 2 is a longitudinal vertical sectional view of the same. Fig. 3 is a vertical transverse sectional view taken on the line *x x* of Fig. 1. Fig. 4 is a similar view taken on the line *y y* of Fig. 2, and looking in the direction of the arrow *b* on said Fig. 2. Fig. 5 is a detail perspective view of the driving-wheel.

A represents the head-stock of the lathe, in which is journaled the spindle B in the usual manner. On the said spindle is rigidly secured a driving gear-wheel, C, which is provided on one side with a radial slot, D.

F represents a yoke, which is arranged on the inner side of the wheel C and is provided at one end with a stud, G, that extends through the slot D and projects beyond the front face of the wheel, and on the opposite side or end of the said yoke is formed a bolt, H, which fits in a recess in an annular flange, E, on the inner side of the wheel C.

k represents a spring, which has one end pivotally secured to the inner side of the wheel C, and has its free end engaging a recess on the inner end of the bolt portion of the yoke.

L represents a cam, which is loosely secured on a sleeved hub of wheel C and bears against the outer side of the wheel C. The said cam is provided on its inner side with a segmental

slot, M, in which works a pin, N, that projects from the outer side of wheel C. On one side of this disk is a peripheral segmental cam, O, which has recesses P and R at opposite ends, the said recess R being deeper than the recess P. By reason of the segment-slot and the pin which engages the same, the disk is adapted to be partly rotated on the spindle independently of the wheel C.

S represents a pinion, which is rigidly secured to the disk and is loosely mounted on the sleeved hub. The stud G of the yoke engages the peripheral cam of the disk, and the spring which presses on the said yoke keeps the said spring in engagement normally with the said cam.

T represents a cone-pulley, which is loosely mounted on the spindle, is provided at its smaller end with a pinion, U, and has at its larger end an annular flange, V, which is provided with three radial recesses, W, arranged equidistant apart and adapted to receive the bolt on the spring-actuated yoke.

On the rear upper side of the head stock are formed a pair of projecting brackets or arms, X, in which is journaled the shaft on which is arranged eccentrically the sleeve B'. Rigidly secured to the said shaft near the inner end thereof is a sector or arm, Z, which is provided with spurs or teeth adapted to engage the pinion S. To the opposite end of the said shaft is secured a handle or lever, A'.

B' represents a cylindrical sleeve which is journaled loosely on the eccentric shaft and has rigidly secured to one end a pinion, C', and has a spur-wheel, D', rigidly secured to the opposite end thereof. The said pinion and spur-wheel may be formed integrally with the said sleeve, or they may be formed separately therefrom, as preferred.

The operation of my invention is as follows: By grasping the handle A' the eccentric shaft may be turned so as to move the sleeve toward or from the spindle. When the lathe is in position, (illustrated in Fig. 1,) with the stud G of the bolt in engagement with the recess P of the cam-disk, and with the pinion D' of the sleeve in engagement with the driving-wheel C, and the gear-wheel C' of the sleeve in engagement with the pinion U, the bolt is withdrawn from the cone-pulley and the latter is loose on the spindle. Consequently the rotation

of the cone-pulley is imparted through its pinion U and through the large wheel C' to the sleeve B', causing the latter to rotate slowly, and the said sleeve, by reason of its small pinion D' meshing with the large driving-wheel C, causes the latter to rotate still more slowly and thereby turn the spindle at a very slow rate of speed. In order to cause the rotation of the spindle to be arrested while the cone-pulley is still in motion, it is only necessary to turn the handle A' rearward far enough to cause the eccentric shaft to disengage the gears of the sleeve from the pinion of the cone-pulley and from the driving-wheel and cause the teeth of the sector or arm Z to engage the pinion S. The stud G of the bolt remaining in position in the recess P of the cam-disk to lock the bolt in position when withdrawn from a recess in the cone-pulley, the latter is left free to rotate on the spindle without communicating motion thereto.

When it is desired to cause the spindle to rotate at the same rate of speed as the cone-pulley, the operator by grasping the lever or handle A' partly rotates the eccentric shaft and causes the sector or arm Z to engage the pinion S and partly turn the said pinion on the spindle in the direction indicated by the arrow in Fig. 3. Inasmuch as the said pinion S is loose on the spindle, and inasmuch as said pinion is rigidly connected to the cam disk and the latter is free to partly rotate on the spindle, this movement of the pinion S causes the cam-disk to partly rotate therewith, and the stud G of the spring-actuated bolt is thus disengaged from the recess P and slips down the eccentric face of the cam-disk until it reaches the recess R. While the said stud U is moving on the eccentric face of the cam, it is also moving inwardly in the radial slot in the driving-wheel and causing the bolt to be moved outward by the corresponding motion of the spring-actuated bolt until the said bolt engages one of the recesses in the cone-pulley and thereby locks the cone-pulley rigidly to the spindle, when the latter will be caused to rotate at the same rate of speed with the cone-pulley, as will be very readily understood.

Having thus described my invention, I claim—

1. In a lathe, the combination of the spindle, the cone-pulley loose thereon, the sliding bolt to lock the cone-pulley to the spindle or release it therefrom, and the cam to operate the said bolt, substantially as described.

2. The combination, in a lathe, of the spindle, the cone-pulley journaled loosely thereon and having the pinion U, the wheel C, rigidly secured to the spindle, the bolt adapted to lock the cone-pulley to the spindle or release it therefrom, the cam to operate said bolt, the eccentric shaft, the sleeve journaled loosely thereon, having the wheel C' to engage pinion U and pinion D' to engage wheel C, the lever to partly rotate said eccentric shaft, and connections between the latter and the cam to operate the bolt, substantially as described.

3. The combination, in a lathe, of the spindle having gear-wheel C, the cone-pulley loose on said spindle and having the pinion U, means, substantially as set forth, to lock the cone-pulley to the spindle or release it therefrom, the eccentric shaft, the lever to partly rotate the same and the sleeve journaled loosely on said shaft, and having the wheel C' to mesh with pinion U and pinion D' to mesh with wheel C, substantially as described.

4. The combination of the spindle having the rigid wheel C, the cone-pulley loose on said spindle, the bolt to lock said cone-pulley to the spindle and disengage it therefrom, said bolt having the stud G, the loose pinion S on the spindle, the cam attached to said pinion and engaging the bolt G, for the purpose set forth, and the sector or arm Z to partly rotate pinion S and thereby operate the cam and the bolt, substantially as described.

5. The combination of the spindle having gear C, the cone-pulley loose on the spindle and having pinion U, the spring-actuated bolt adapted to engage the cone-pulley and lock the same to the spindle, the eccentric cam engaging said bolt to operate the same, said cam being loose and having pinion S, the eccentric shaft having the lever or handle and the sector or gear Z to engage pinion S, and the sleeve loose on said eccentric shaft and having the pinion D' to engage wheel C and the gear-wheel C' to engage pinion U, substantially as described.

6. In a lathe, the spindle, the pinion S, loose thereon, the sector or arm Z to engage the pinion, and the eccentric shaft on which the sector or arm Z is mounted, said eccentric shaft having the handle A', as set forth.

7. In a lathe, the combination of the spindle, the pulley loose thereon, the spring-actuated bolt to lock the cone pulley to the spindle and release it therefrom, the pinion S, loose on the spindle to actuate the bolt, the sector or arm Z to engage the pinion, and the eccentric shaft having the handle, and on which the sector or arm is mounted, substantially as described.

8. In a lathe, the spindle, the cone-pulley loose thereon, devices to lock the cone-pulley to the spindle or release it therefrom, the eccentric shaft having handle A' and sector or arm Z, and the cam actuated by the sector or arm to unlock the said locking devices for the pulley, as set forth.

9. In a lathe, the combination of the spindle, the cone-pulley loose thereon, the bolt to lock the pulley to or unlock it from the spindle, the cam to operate the bolt, and the eccentric shaft having handle A' and arm Z to actuate the cam, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES R. BAKER.

Witnesses:

N. WILLIAMS,
J. L. BAKER.