

No. 800,350.

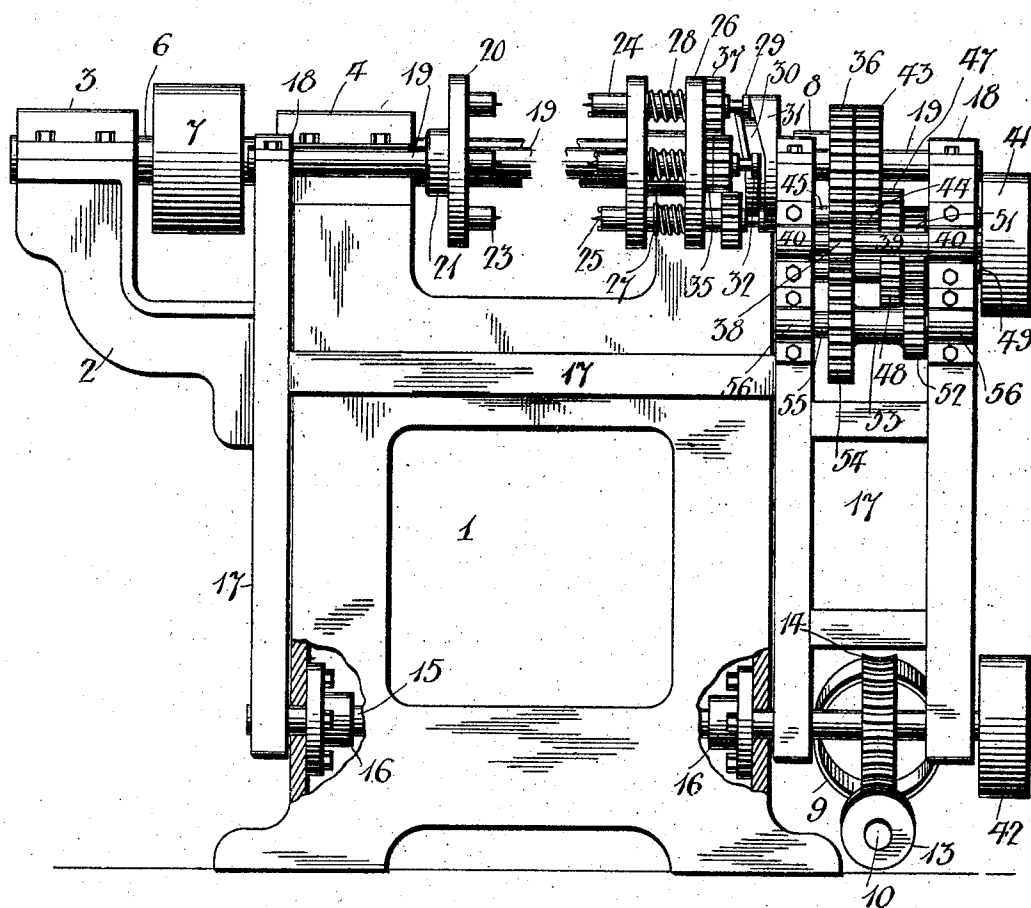
PATENTED SEPT. 26, 1905.

I. AASLAND.  
MULTIPLE LATHE.

APPLICATION FILED MAY 4, 1904.

4 SHEETS—SHEET 1.

FIG. 1



WITNESSES

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4 SHEETS—SHEET 2.

FIG. 2

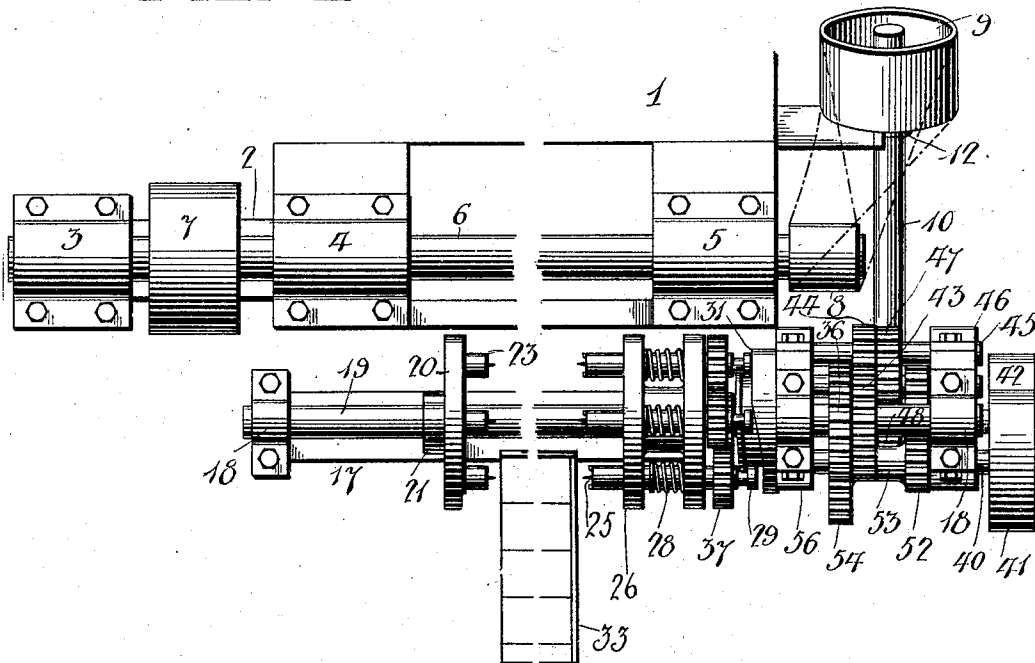
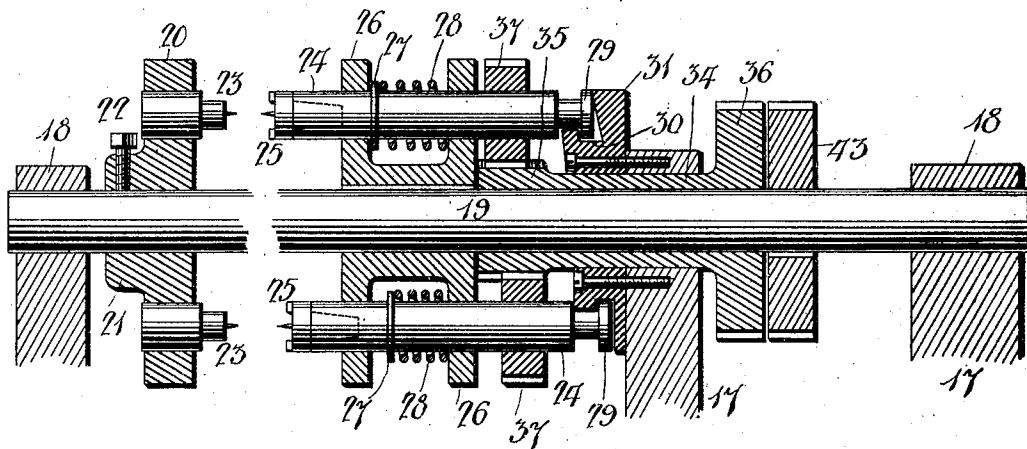


FIG. 3



WITNESSES

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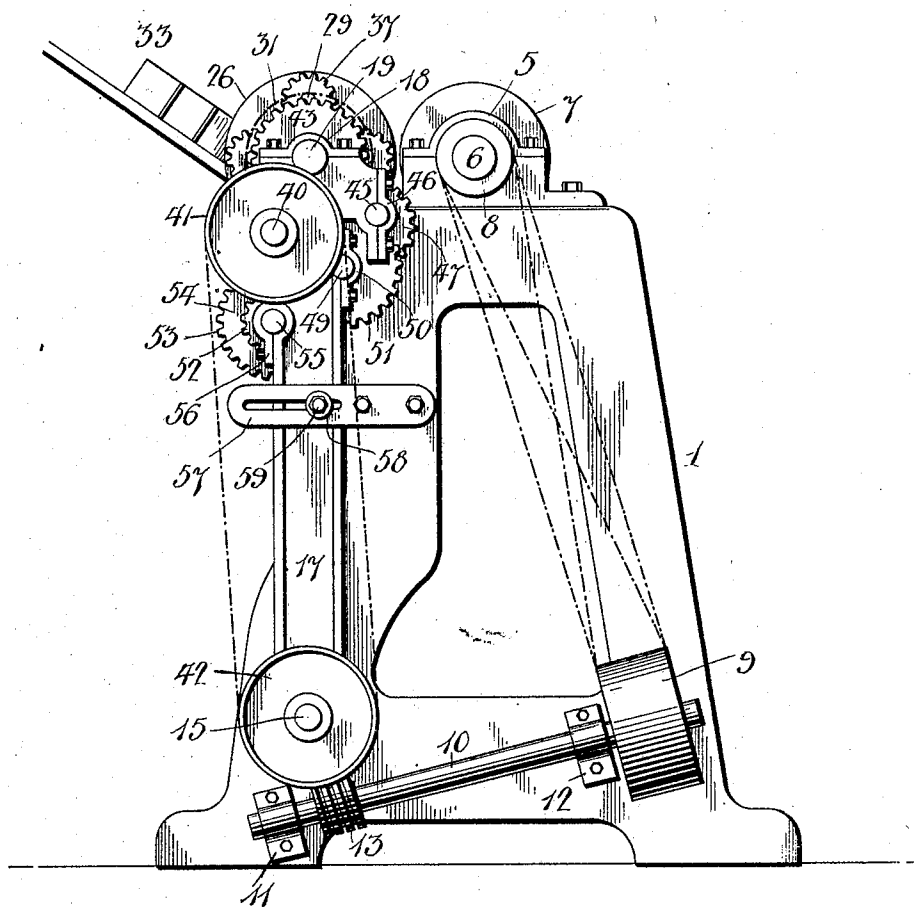
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4 SHEETS—SHEET 3.

FIG. 4



WITNESSES

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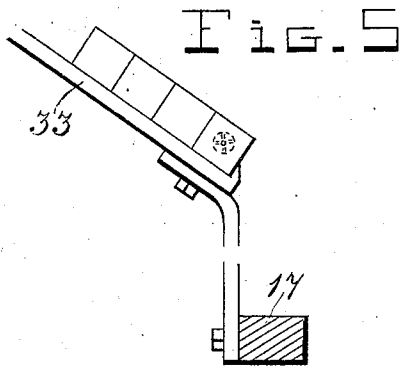
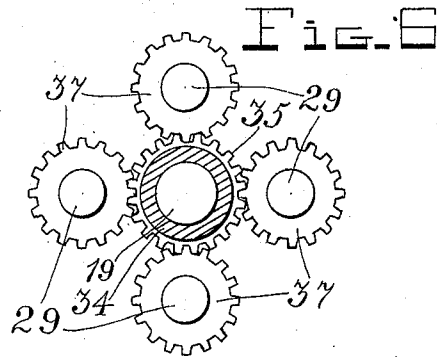
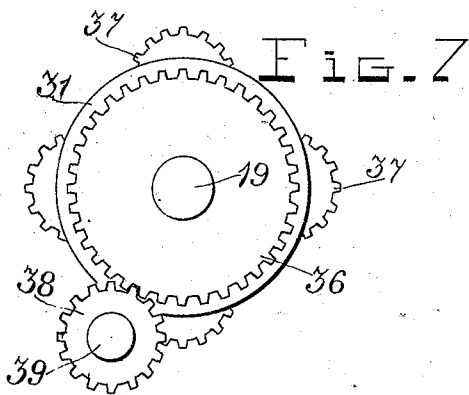
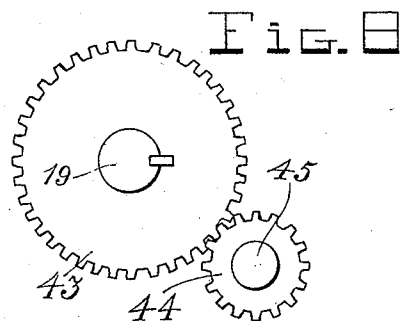
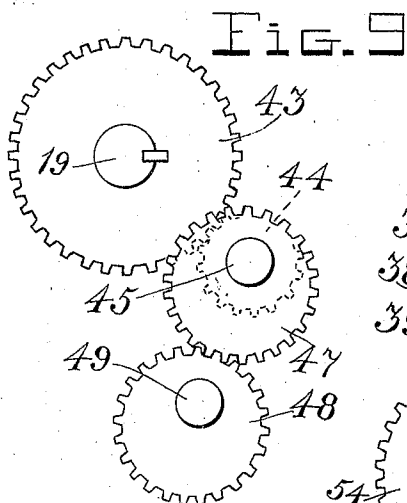
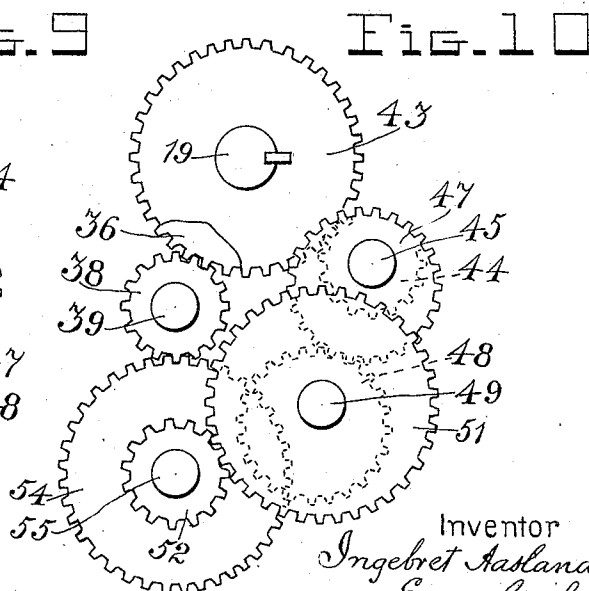
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MULTIPLE LATHE.  
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

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## MULTIPLE LATHE.

No. 800,350.

Specification of Letters Patent.

Patented Sept. 26, 1905.

Application filed May 4, 1904. Serial No. 206,349.

*To all whom it may concern:*

Be it known that I, INGBRET AASLAND, a citizen of Norway, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Multiple Lathes, of which the following is a specification.

My invention relates to multiple lathes, more particularly to wood-turning machines into which bars or blocks of wood, previously sawed, usually into like rectangular prisms, are fed one after another and automatically picked up by the mechanism, presented to formative cutters that are in rapid rotation, and, having received the shaping intended, are finally released or thrown out, enabling the parts concerned to seize another piece of wood, upon which the operation is repeated.

One object of my invention is to provide co-operating gears moving at definite speed with respect to each other by means of which each lathe-spindle will be rotated at a predetermined rate and the entire system of spindles revolved independently of the spindle rotation and at a variable rate of movement.

Another object of my invention is to produce a multispindle lathe in which the spindles and gearing mentioned are borne by a pivoted frame movable toward and from the cutter-shaft; and a still further object is to construct driving elements specially adapted to actuate gearing having the particular character and arrangement embodied in my invention.

Each constituent element is described in detail and its individual office, together with the mode of operation as a whole, fully explained herein.

I accomplish the objects stated by employing parts formed and associated as illustrated in the accompanying drawings, of which—

Figure 1 is a side view. Fig. 2 represents a fragmentary top plan view. Fig. 3 is a vertical section of the spindle-carrying parts and gearing for rotating the spindles, showing those parts which are fixed and those loose upon the concentric supporting-shaft. Fig. 4 is an end view of my invention from the right of the first figure. Fig. 5 represents a side view of the chute and its supports. Figs. 6, 7, 8, 9, and 10 are explanatory side views of succeeding portions of the gearing and illustrate the position and relation of each gear to that which it drives or by which it is driven.

Like numbers refer to like parts in the several views.

Considering the drawings, numeral 1 designates the machine stand or body, of any convenient form or weight, by which the various parts are supported. A bracket 2 (see Figs. 1 and 2) supports the outboard-bearing 3, and in line with it are two like bearings 4 and 5, rising from the top of the machine-stand. Driving-shaft 6 revolves in the bearings mentioned, being turned by suitable belting on the pulley 7. At the right-hand extremity of shaft 6 is a belt-pulley 8, and in Fig. 4 the broken lines indicate the belting, which twists slightly as it runs, connecting pulley 8 and belt-wheel 9 on inclined worm-shaft 10, journaled in bearings 11 and 12, secured low down on the end of the machine-stand. The twist of the belt from shaft 6 to shaft 10 is rendered necessary because the axes of those shafts are at right angles to each other, as shown.

Toward the lower end of shaft 10 is secured the worm 13, engaging the worm-wheel 14, fixed on horizontal shaft 15, which extends across the front of stand 1 and revolves in bearings 16 16, carried by the stand. Shaft 15 constitutes the pivotal support of the frame 17, and at the tops of the uprights of frame 17 are bearings 18 for the work-shaft 19, the axis of which is parallel with that of driving-shaft 6. On shaft 19 is an adjustable disk 20, having hub 21 and set-screws 22 or some other devices for securing it upon the shaft. Projecting from the inner face of disk 20 at quadrantal points near the periphery are the lathe-centers 23. In alinement with these centers are rotative spindles 24, tipped with head-centers 25, corresponding in number and position to the lathe-centers, and these spindles are movable lengthwise in a double disk 26, that is secured on the shaft 19. It will be noted here that the adjustment of disk 20 is toward or from the double disk 26, enabling longer or shorter pieces of wood to be received between centers and head-centers. Fig. 3 illustrates the parts carrying the spindles. Between the two plates of double disk 26 each spindle is provided with a fixed collar 27, and between the collars and the rear plate each spindle possesses an encircling coil-spring 28, acting normally to force the spindles forwardly—that is, toward adjustable disk 20. That tendency

of the spring is resisted by the engagement of the buttons 29, terminating the spindles at the rear, and the cam-groove 30 on the periphery of the stationary flat cylinder 31. Cylinder 31 is secured to frame 17 and does not revolve. When shaft 19 is revolved, the buttons are compelled to follow the direction of the front wall of the cam-groove, and the spindles are withdrawn as each reaches the lowest position, (shown in Fig. 1,) allowing the work to drop out, and are shot forward again by the coiled springs when the step 32 in the front wall of the groove is met with. It is at this point that the work is caught between the centers from the chute 33 (shown in Fig. 4) or from some other suitable feeding device. It will be understood that chute 33 is attached to and moves with the pivoted frame, and therefore preserves a constant position with respect to the orbital path of the spindles. The block at the lower end of the chute is held in such position that when the head-centers are shot forward by the coiled springs, as explained, the block receives the point and chisels of the head centrally. Necessarily the position of the chute and the end piece that prevents the blocks from slipping off downwardly must be changed for blocks of different size. In practice a larger or smaller chute of like construction is substituted when required. When one block is taken up by the head-centers, the remaining blocks are slightly disturbed; but as the revolution or orbital movement of the system of centers is then very slow the disturbance is only temporary and the blocks remaining slide down the chute, the bottom one taking the place of the one just removed. (See Fig. 5.) In the customary manner the chute is arranged to hold the piece of wood about to be taken in position to be properly centered when caught between the closing lathe-centers. As the shaft 19 and disks continue to turn the springs 28 press the chisels of the head-centers firmly into the wood and hold it securely for the action of the cutter on driving-shaft 6. The front wall of the cam-groove advances forwardly after passing the step, and in order to avoid friction the buttons are not in contact with the groove after the work is once securely held until it becomes necessary to separate the centers again.

To rotate the spindles 24, and thereby revolve the pieces of wood to be turned in order that all sides of each piece shall be acted upon by the revolving cutters on driving-shaft 6, the geared spool 34 is introduced. It is loose on shaft 19 and has smaller and larger gears 35 and 36 at its ends. Smaller gear 35 meshes with pinions 37, secured to the spindles, and it will be noted here that gear 35 is thick enough to permit the pinions 37 to move back and forth with the spindles, as described, without losing engagement with the gear. The larger gear 36 of the spool teeth with the

pinion 38 on horizontal shaft 39, revoluble in bearings 40, supported by the frame 17. Shaft 39 is driven by a pulley 41 on its extremity outside the frame belted to a pulley 42 on shaft 15, already described as forming the pivotal support of the frame and located near the bottom of the machine. The worm device for shaft 15 has been described.

There now remain to be described the means for revolving the system of spindles with shaft 19 at variable speed in order that each piece of work may be brought within reach of the revolving cutter of shaft 6 and held to the cutter until completely turned into the desired shape. On shaft 19 is secured the gear 43, meshing with pinion 44 on short horizontal shaft 45, (see Fig. 2,) revolving in bearings 46, secured to swinging frame 17. (See also Fig. 4.) On the same short shaft 45 is secured a gear 47, eccentrically placed with respect to the shaft and engaging a similar eccentric gear 48 on a parallel short shaft 49. Of the bearings for shaft 49 but one is shown and marked 50 in Fig. 4. On shaft 49 is also secured gear 51, which appears in all the figures, and this gear 51 coacts with one end gear 52 of the geared spool 53, which has a second end gear 54 in engagement with the already-mentioned pinion 38 on shaft 39, from which spool 53 and relating gearing above described derives power. Spool 53 is secured to the short shaft 55, that turns in bearings 56, fixed on the front of the swinging frame. (See Fig. 1 and Fig. 4.)

It may be stated here that the spool-gear 34, described as loose on shaft 19, is restrained from displacement lengthwise between double disk 26 and gear 43, both of which are secured on shaft 19, as stated.

In Fig. 4 is shown a slotted bar 57, attached to the machine-stand, and through a washer 58 and the slot a screw 59 is let into the upright of the pivoted frame and serves to fix the position of the frame after adjustment of the spindles toward or from the shaft 6. The object of adjusting the spindles toward or from the shaft 6 by means of the pivoted frame is to enable work of smaller or larger diameter to be turned.

I do not limit myself to the comparative sizes of the gearing shown and may under certain circumstances desire to turn the spindles at a higher or lower rate of speed or modify the rate of revolution of the system of spindles.

With regard to the operation of my invention, it will be understood that while the spindles, and therefore the work, rotate steadily the system of spindles and work-shaft 19 rotate at variable speed by reason of the included eccentric gears 47 and 48. As the longer radii of gear 48 meet the shorter radii of gear 47 the latter is turned rapidly. When this part of the movement takes place, the work is being carried over from the feed-

chute to the cutters. As the shorter radii of gear 48 meet the longer radii of gear 47 the latter, and therefore the system of spindles, turns slowly and the work is advanced to the cutters by moving the swinging frame the requisite distance toward shaft 6. During the slowest periods of movement of the system, and there are four such periods corresponding to the number of spindles, the buttons 29 reach the step 32 of the cam-groove and the spindles are shot forward, taking up blocks from chute 33 one after another. The rate of revolution of the spindle system is more or less rapid in correspondence with the rotation of gear 47. It is also during the slower revolution of the spindles that the pieces of wood to be turned are caught up by the closing spindles, as already stated.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a multiple lathe, the combination with a driving-shaft, of a pivoted frame, one end of said frame being movable toward and from said driving-shaft, adjustable devices for securing the frame, a work-shaft journaled in said frame and arranged to lie parallel to said driving-shaft in all positions of the frame, lathe-centers arranged about the work-shaft and a support for the lathe-centers adjustably secured to the work-shaft, head-centers corresponding with the lathe-centers and revolving with the work-shaft, and gearing supported by the said frame and moving with it whereby the head-centers are continuously rotated at constant speed and the said work-shaft continuously rotated at variable speed.

2. In a multiple lathe, the combination with a driving-shaft, of a pivoted frame, one end of said frame being movable toward and from said driving-shaft, adjustable devices for securing the frame, a work-shaft journaled in said frame and arranged to lie parallel to the said driving-shaft in all positions of the frame, lathe-centers arranged about the work-shaft and revolving with the shaft, movable head-centers corresponding with the lathe-centers and revolving with the work-shaft, reciprocating devices arranged to operate the said head-centers, and gearing supported by the said frame and moving with it whereby the head-centers are continuously rotated at constant speed and the said work-shaft continuously rotated at variable speed.

3. In a multiple lathe, the combination with a driving-shaft, of a pivoted frame, one end of said frame being movable toward and from said driving-shaft, adjustable devices for securing the frame, a work-shaft journaled in said frame and arranged to lie parallel to the said driving-shaft in all positions of the frame, lathe-centers arranged about the work-shaft and revolving with the shaft, movable head-centers corresponding with the lathe-centers and revolving with the work-shaft, means for withdrawing and releasing the head-centers and springs arranged to shoot them individually forward when released, and gearing supported by the said frame and moving with it whereby the head-centers are continuously rotated at constant speed and the said work-shaft continuously rotated at variable speed.

4. In a multiple lathe, the combination with a driving-shaft, of a pivoted frame, one end of said frame being movable toward and from said driving-shaft, adjustable devices for securing the frame, a work-shaft journaled in said frame and arranged to lie parallel to the said driving-shaft in all positions of the frame, lathe-centers arranged about the work-shaft and revolving with the shaft, movable head-centers corresponding with the lathe-centers and revolving with the work-shaft, reciprocating devices arranged to operate the said head-centers, gearing supported by the said frame and moving with it whereby the head-centers are continuously rotated at constant speed and the said work-shaft continuously rotated at variable speed, and a chute arranged to feed blocks between the centers at a point of slowest revolution.

5. In a multiple lathe, the combination of a swinging frame, a work-shaft journaled in the said swinging frame, a driving-shaft parallel to said work-shaft, a pivot-shaft supporting the swinging frame and belted to said work-shaft, a worm-wheel on said pivot-shaft, and a transverse worm-shaft having a worm engaging the worm-wheel, said worm-shaft being belted to said driving-shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

INGEBRET AASLAND.

Witnesses:

F. H. GAHRE,  
JOHN BAIRD.