(No Model.)

W. C. JONES & W. S. ROGERS.

FEED FOR LATHES.

No. 377,761. Patented Feb. 14, 1888.

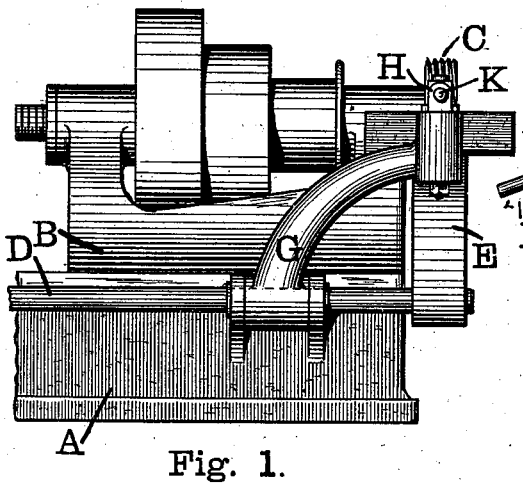

Fig. 1.

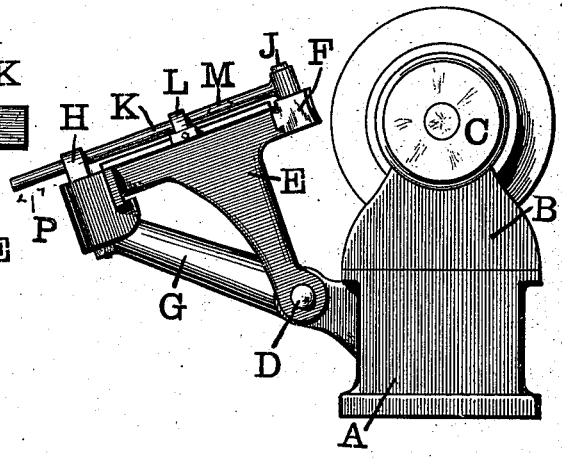

Fig. 2.

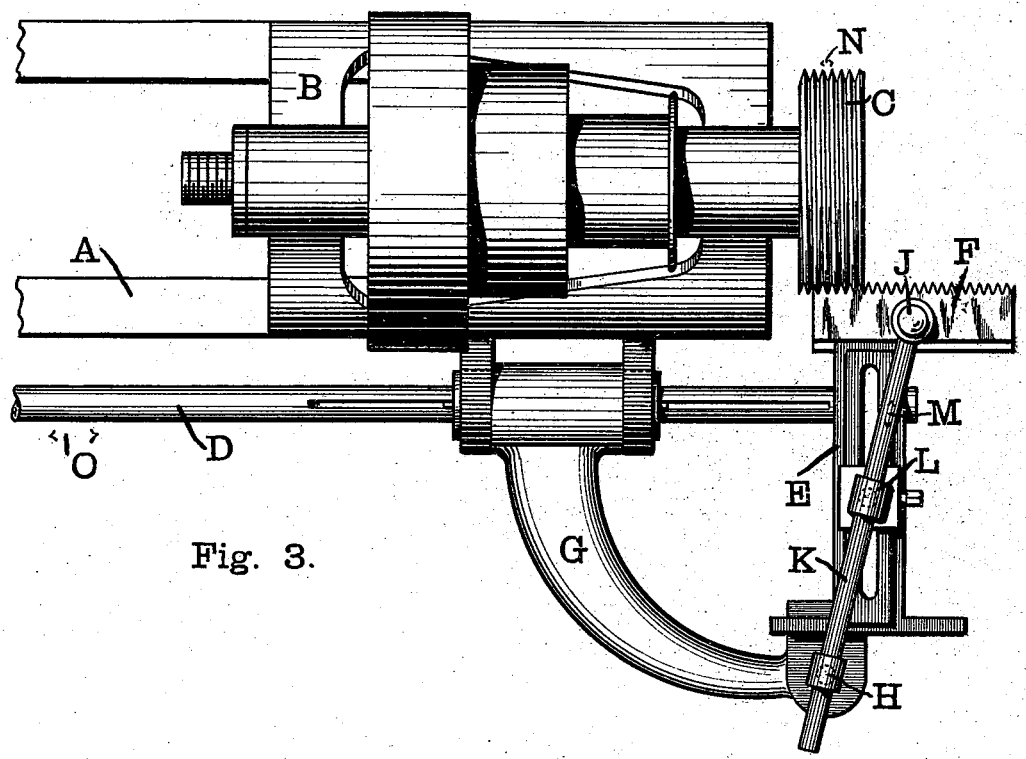

Fig. 3.

WITNESSES:

J. H. Woodrough

Jessie Barnett.

INVENTORS:-

Willis C. Jones

Winfield S. Rogers

by James N. See.

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIS C. JONES AND WINFIELD S. ROGERS, OF CINCINNATI, OHIO.

FEED FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 377,761, dated February 14, 1888.

Application filed August 19, 1887. Serial No. 247,358. (No model.)

To all whom it may concern:

Be it known that we, WILLIS C. JONES and WINFIELD S. ROGERS, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Lathes, of which the following is a specification.

This invention pertains to screw-cutting lathes, and relates particularly to the pitch-regulating mechanism of such lathes.

The improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is the rear elevation of the head-stock end of a chasing-lathe embodying our improvements; Fig. 2, an end view of the same with the leading-nut being shown as tipped backward out of engagement with the leading-thread, and Fig. 3 a plan of the same upon an enlarged scale.

A common type of chasing-lathe well known in the metal-working art is provided with a chasing-bar fitted to slide and partially rotate in bearings upon the back of the bed, this bar carrying at the head end of the lathe a sectional nut fitted to engage with a hob, properly pitched, secured to the outwardly-projecting end of the lathe-spindle, while a tool-rest is secured to some portion of the bar along the lathe-bed beyond the inner end of the lathe-spindle. While the sectional nut engages the hob, the chasing-bar, and consequently the tool-rest with its chasing-tool, will move longitudinally along the axis of the lathe, and be capable of cutting a thread identical in pitch with that of the hob. If the tool-rest be tipped backward the chasing-bar becomes oscillated and the sectional nut thrown out of engagement with the hob, thus permitting the tool-rest, chasing-bar, and sectional nut to be pushed back ready for a new engagement. Such lathes are common and well known, and we have chosen to exemplify our improvement in connection with a lathe of this well-known type.

In the drawings, A indicates the usual lathe-bed; B, the usual head-stock secured thereto and provided with the ordinary arbor or spindle; C, a threaded hob secured to the outer end of the lathe-spindle, as usual, except that ordinarily a separate hob is employed for each different thread-pitch to be cut, while in the present case the one hob serves for a large range of thread-pitches; D, the usual chasing-bar disposed to the rear of the lathe-bed and fitted to slide and oscillate in bearings supported thereby, it being the intention that this chasing-bar shall carry the usual tool-rest; E, a T-shaped arm rigidly secured to the outer end of the chasing-bar, the top of this arm being disposed at right angles to the chasing-bar and lying in a horizontal position when the hob is engaged by its nut; F, a sectional nut adapted to engage the thread of the hob and fitted to slide in the forward portion of the T-shaped arm in a line parallel with the chasing-bar; G, a bracket journaled to the lathe-bed in one of the bearings which support the chasing-bar, the chasing-bar being fitted to slide through the hob of this bracket, the two being arranged to oscillate together, as by means of a spline, the outer end of this bracket reaching to the rear of the horizontal portion of the T-shaped arm; H, a pivot journaled in the outer extremity of this bracket, the axis of the pivot being at right angles to the upper portion of the T-shaped arm, the upper end of this pivot projecting above the upper level of the T-shaped arm, and being provided with an eye for the reception of a sliding rod; J, a pivot upon the sectional nut F, its axis being parallel with the axis of pivot H; K, a rod fitted to slide through the eye in the pivot H, and having its inner end engaging the pivot J; L, a pivot journaled to the T-shaped arm E and fitted to adjust along the upper surface of said arm and be secured at any point thereon, the axis of this pivot being parallel with the axes of the pivots J and H, and the upper end of this pivot being, like the pivot H, provided with an eye engaging the sliding rod K; M, the distance between the centers of pivots J and L; N, (not in the drawings,) the pitch distance of the hob; O, the distance of longitudinal movements of the chasing-bar for each revolution of the lathe-spindle, and P the distance between the centers of pivots H and J.

The letters M, N, O, and P are not intended to indicate parts, but will be used hereinafter in representing values in demonstrating formulas.

As the usual slide-rest is tipped so as to bring the chasing-tool into and out of engage-

ment with the work being operated upon, in the usual manner with this class of lathes, it is obvious that the chasing-bar will be partially rotated and the sectional nut F brought into and out of engagement with the hob C. In other words, if the sectional nut F were rigidly secured to the T-shaped arm E, instead of being fitted to slide upon it, and the rod K and appurtenances omitted, the device would operate precisely like ordinary chasing-lathes of the class previously referred to, and the longitudinal movement of the chasing-bar for each revolution of the lathe-spindle would correspond precisely with the pitch of the hob. In such case we would have a formula as follows: O equals N. The sectional nut F is fitted to slide freely along the front of the T-shaped arm E, and if it were not in some manner attached to that arm no longitudinal movement would be transmitted to the chasing-bar as the hub revolves, the only effect of the revolution of the hob in such case being to move the sectional nut along the T-shaped arm; but the sliding rod K has its inner end pivoted to the sectional nut and has its rear end fitted to slide through the eye of the pivot H. Thus, as the sectional nut slides along the front of the T-shaped arm, the inner end of the sliding rod will follow its movements, while its rear end will oscillate upon the axis of the pivot H, the axis of this pivot being held in a fixed position by means of the bracket G. As the sectional nut slides along, it is obvious that the distance between the centers of the pivots J and H constantly alters, and the result is that the rear end of the rod slides through the eye of pivot H. It will thus be seen that during the sliding of the sectional nut, produced in an obvious manner by the revolution of the hob, the pivot J has a movement of translation corresponding with the movement of translation of the sliding nut, while that point in the rod which is bisected by the axis of the pivot H has no movement of translation; and it is also obvious that all intermediate points along the length of the rod K have a movement of translation varying in value from zero at the pivot-point H to the maximum at pivot-point J.

The pivot L can be adjusted along the top of the T-shaped arm E, and there secured. Under such circumstances the pivot L will receive a motion of translation, in a line parallel to the axes of the lathe-spindle and chasing-bar, equal in value to the movement of translation of that point on the rod at which the pivot L is secured. The pivot L carries with it the T-shaped arm E, and, as a consequence, the chasing-bar will receive a motion of translation corresponding to the motion of translation of pivot L.

Assuming that the parts are so set that the sectional nut occupies its position of mid-stroke, and that the sliding rod is consequently at right angles to the nut and chasing-bar, and that the pivot L is so set upon the T-shaped arm that the distances from L to J and from L to H are equal, then it will appear that for each unit of distance moved by the sectional nut in a path parallel to the axis of the lathe-spindle the pivot L, and consequently the chasing-bar, will have moved one-half such distance, and that this proportion of movement will hold good throughout the travel of the sectional nut in either direction. Under such circumstances the chasing-tool controlled by the chasing-bar will have been able to chase a thread whose pitch would be one-half the pitch of the hob.

It will now be readily understood that the pivot L may be set at various points along the T-shaped arm, and thus permit of the chasing of threads of various pitches by the use of a single hob, it being understood, of course, that as the pivot L is an intermediate pivot, all threads chased will be of less pitch than the pitch of the hob.

From the operation of the device as thus illustrated we arrive at the following formula: As P is to M so is N to O. This gives us the pitch of the thread which will be chased from a given setting of the pivot L. The formula transposed will be: As N is to O so must P be to M. This enables us to fix the setting of the pivot L when a given thread is to be chased.

The T-shaped arm E may, if desired, be graduated and indexed, so as to permit of a ready setting of the pivot L for any desired thread to be chased, within the range of the device, of course, and it is obvious that if the range with one hob be exceeded the range may be indefinitely extended by the use of hobs with other pitches.

We claim as our invention—

1. In a screw-cutting lathe, the combination, substantially as set forth, of a threaded hob, a chasing-bar adapted to transmit motion of translation to the chasing-tool of the lathe, a T-shaped arm fixed to said chasing-bar, a sectional nut secured in sliding engagement upon said T-shaped arm and adapted to engage said hob, an adjustable pivot upon said T-shaped arm, a pivot upon said sliding nut, a rod journaled to said pivot on the sliding nut and fitted for sliding engagement with the pivot of said T-shaped arm, and a third pivot fitted for sliding engagement with said rod and supported in a fixed journal.

2. In a screw-cutting lathe, the combination, substantially as set forth, of hob C, chasing-bar D, arm E, sliding nut F, bracket G, rod K, and pivots H, J, and L.

WILLIS C. JONES.
WINFIELD S. ROGERS.

Witnesses as to Willis C. Jones:
CHARLES THACHER, 2d,
FREEMAN H. LOTHROP.
Witnesses as to Winfield S. Rogers:
S. B. DEAL,
HARRY S. WORTHMAN.