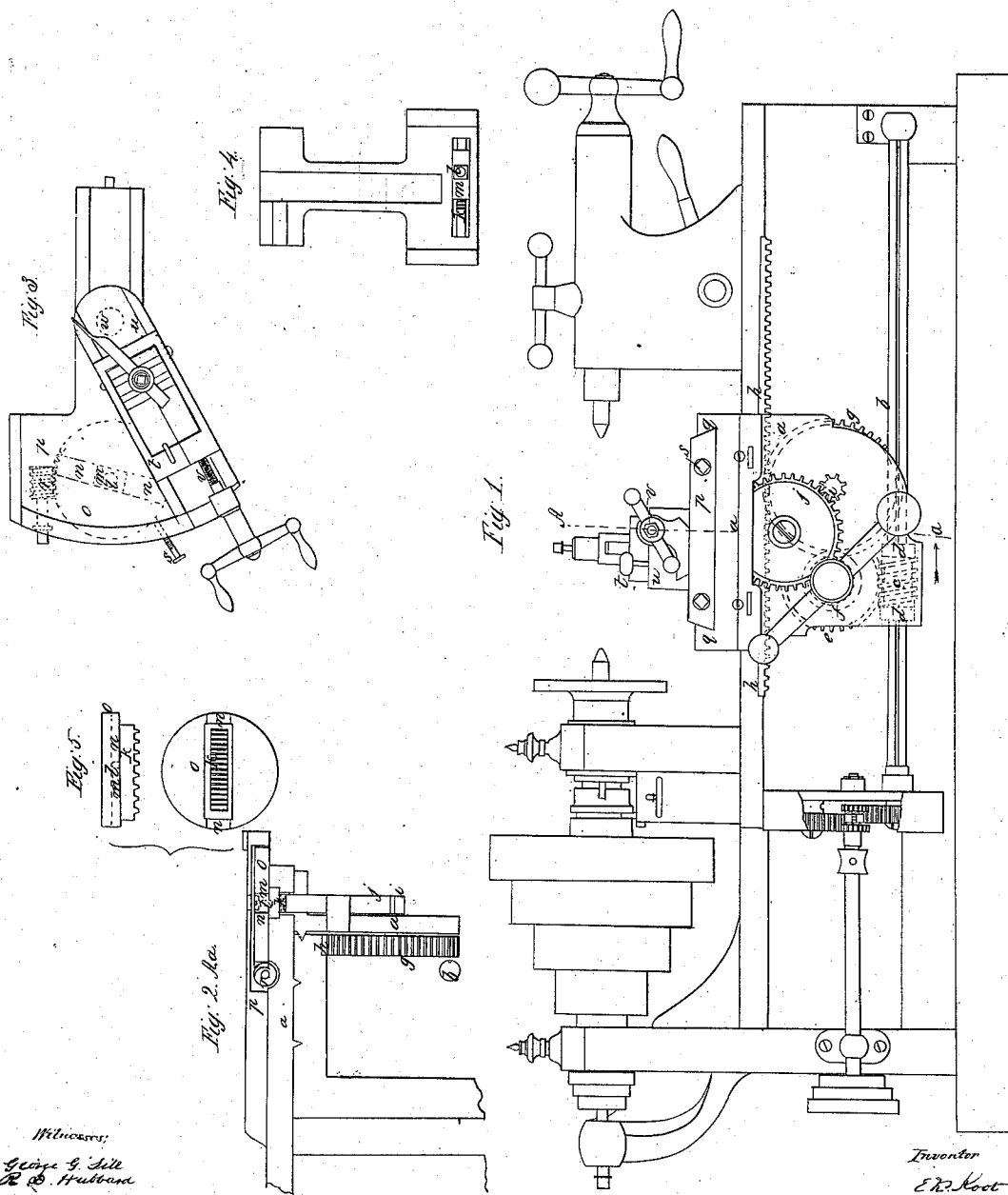


E. K. ROOT.  
SLIDE LATHE.

No. 12,874.

Patented May 15, 1855.



Witness:  
George S. Hill  
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Inventor  
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# UNITED STATES PATENT OFFICE.

E. K. ROOT, OF HARTFORD, CONNECTICUT.

## SLIDE-LATHE.

Specification of Letters Patent No. 12,874, dated May 15, 1855.

*To all whom it may concern:*

Be it known that I, E. K. Root, of Hartford, in the State of Connecticut, have invented a new and useful Improvement in Slide-Lathes Adapted to Turning Cones, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a front elevation of my improved lathe; Fig. 2, a cross vertical section taken at the line A, *a*, of Fig. 1; Fig. 3, a separate top view of the cutter post and slide; Fig. 4, a separate top view of the cutter carriage; and Fig. 5, an elevation and inverted view of the rack and grooved wheel for giving the required motion to the cutter slide for turning tapers or cones.

The same letters indicate like parts in all the figures.

In turning tapers or cones in slide lathes as heretofore constructed the taper is obtained by shifting the poppet, which carries the center, forward or back of the line of the axis of the mandrel. This is defective, particularly when several pieces are to be turned in succession of the same taper, for the reason that the slightest variation in the length of the pieces to be turned, or of the center in the poppet from the center on the mandrel, or from the face of the chuck, which cannot be well prevented, produces a variation in the taper, so that the several pieces, thus turned, will vary in the taper, a defect which is seriously objectionable in many kinds of work.

The object of my invention is to give the taper in slide lathes by the motion of the tool head slide so that the taper will be the same in any number of pieces to be turned, however their length or the distance between the two centers may vary. And to this end, my invention consists in giving to the tool post slide a motion toward or from the line of the axis of the mandrel as the tool carriage makes its traverse motion by means of a sliding rack in the carriage and receiving motion from the feed motion or from some other source but bearing a certain relation thereto, the said rack having a wrist pin which travels in a groove in the face of a plate in the tool post slide, which plate can be turned and set to give the groove any desired inclination with the line of motion of the carriage, so that as the tool carriage traverses longitudinally to give the

feed motion the said rack moving with a velocity having a determined relation thereto, its wrist pin will travel in the groove of the adjustable plate in the tool post slide, and thus in proportion to the oblique position of this groove, determined by the set, cause the slide with the tool post gradually to approach or recede from the line of the axis of the mandrel; the two motions, when the parts are set, always have the same relations the one to the other, so that the same taper may be repeated any number of times without reference to the length.

The accompanying drawings represent a slide lathe of a well known construction not necessary to be described, but in which the feed motion is given to the tool carriage (*a*,) by a line shaft *b*, feathered from end to end, which carries and turns a worm *c*, connected by a collar *d*, with the carriage *a*. This worm imparts motion to a train of wheels *e*, *f*, *g*, in the carriage, and one (*g*) of which engages the cogs of a fixed rack *h*, attached to the frame.

The arbor of the wheel *g*, passes through to the front of the carriage and there carries a pinion *i*, which engages a wheel *j*, the cogs of which engage the cogs of an auxiliary rack *k*, fitted to slide longitudinally in a recess in the carriage. There is a wrist pin *l*, projecting from the top of this rack, and fitted to a block of metal *m*, which is in turn fitted to slide accurately in a groove *n*, made in the under face of a circular plate *o*, fitted to turn accurately in a recess in the bottom of the tool post slide *p*, which slides accurately between ways *q*, *q*, on the top of the carriage and at right angles to the motion of the carriage. The periphery of the plate *o*, has spurs which are engaged by a worm *r*, the arbor of which passes to the front of the tool post slide where it can be turned by a key to turn the said plate so as to give the groove *n*, any desired inclination to the line of motion of the carriage, and when the required inclination has been obtained, which may be determined by any suitable means or by graduations on the face of the plate and the slide, it is firmly held in place by a set screw *s*.

The tool post *t*, is mounted in the usual manner in a block *u*, adjustable, for the depth of cut, by an adjusting screw *v*, and the bed plate on which the block *u* slides is connected with the slide *p*, by a wrist pin *w*, at the forward end, so that the bed can

be turned to give any angle desired to the tool.

From the foregoing it will be seen that as the carriage is moved from end to end by the feed motion the auxiliary rack  $k$ , will be caused to move by a motion having a fixed relation to the feed motion of the carriage, and as the wrist pin  $l$ , of this rack  $k$ , with its sliding block, slides in the groove  $n$ , of the circular plate  $o$ , if that groove has an inclination to the line of motion of the carriage a motion will be given to the tool post slide  $p$ , toward or from the line of the axis of the mandrel, the ratio of which to the feed motion of the carriage will depend upon the motion of the auxiliary rack  $k$ , relatively to the feed motion, and the inclination of the groove  $n$ , to the line of motion of the carriage; and as the motion of the auxiliary rack  $k$ , has a fixed relation to the feed motion, it follows that by determining the inclination of the groove  $n$ , to the

line of motion of the carriage, any determined taper can be turned.

It will be obvious from the foregoing that when the groove  $n$ , in the circular plate  $o$ , is set parallel with the line of motion of the carriage that the lathe will operate like the ordinary slide lathe to turn cylinders.

What I claim as my invention and desire to secure by Letters Patent, for turning tapers on slide lathes, is—

Giving to the tool post slide a motion toward or from the line of the axis of the mandrel, by means substantially as herein described, or any equivalent therefor, in combination with the longitudinal feed motion of the carriage, and derived therefrom or bearing a certain relation thereto, substantially as described.

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Witnesses:

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