J. P. T. Lang,

Ornamenting Metals,

No. 79,767, Patented July 7, 1868.

Fig. 1.

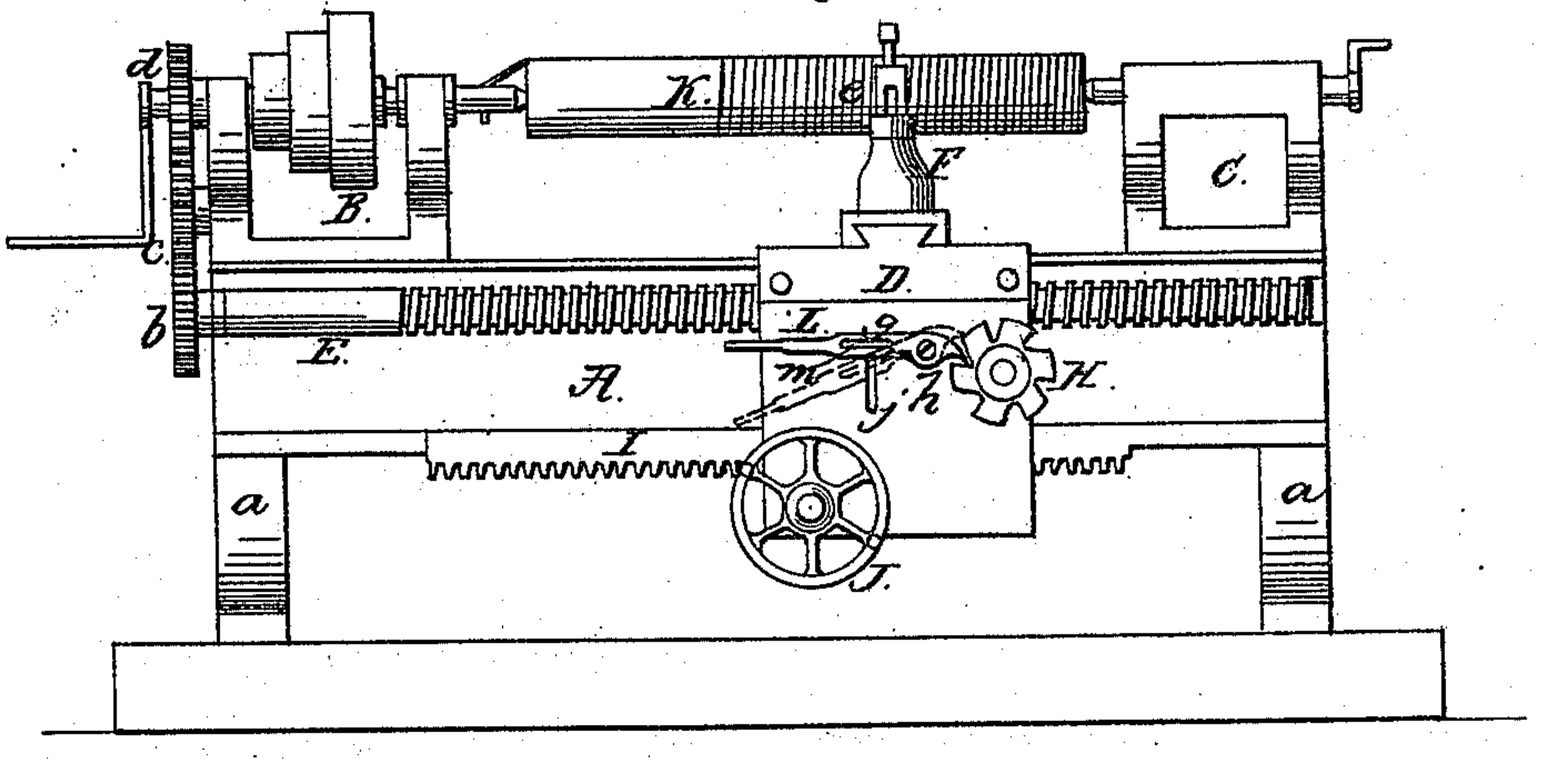


Fig. 2.

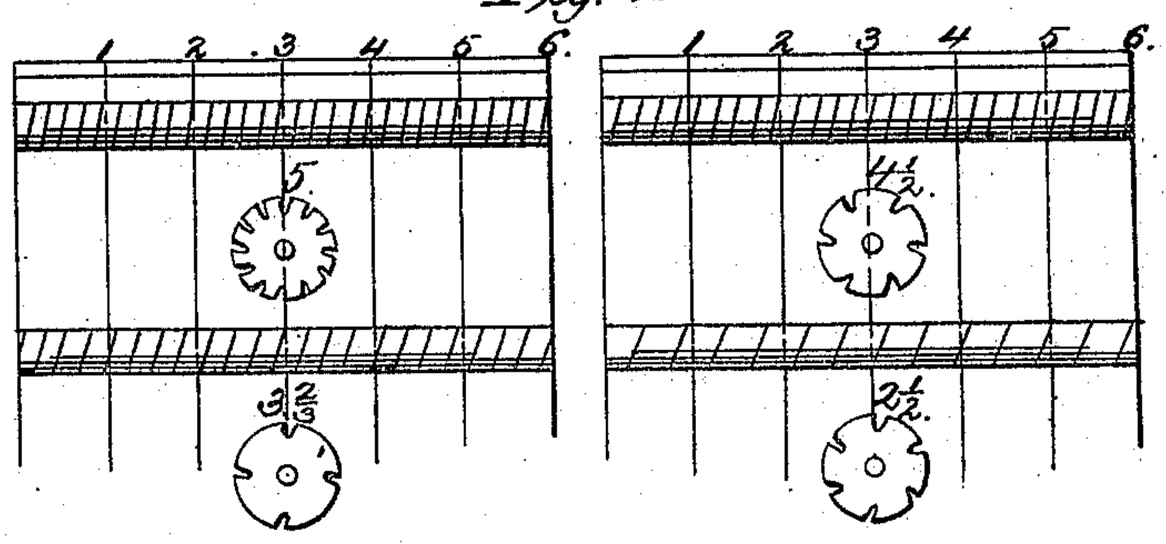
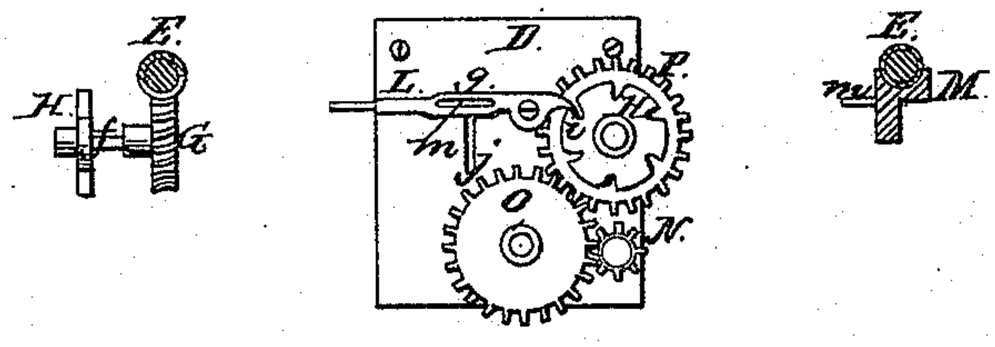


Fig. 3.



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Letters Patent No. 79,767, *dated July* 7, 1868.

IMPROVEMENT IN SCREW-CUTTING LATHES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. P. THEODORE LANG, of the city and county of Washington, in the District of Columbia, have invented a new and improved Lathe for Cutting Screws; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon in which like parts are designated by like letters in the several figures.

The nature of my invention consists in so constructing a lathe for chasing screws as to secure the machinery against unnecessary wear, as well as accident, and secure the operating machinist against any mistakes in chasing over the same thread, and at the same operation, saving a great deal of time.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the drawings—

Figure 1 represents an elevation of my improved lathe.

Figure 3 is a modification of the governor, as shown in fig. 1, with certain details annexed, to be hereafter described; and

Figure 2 represents screws with different threads, each having its respective governor.

A represents an ordinary lathe-bed, supported as usual by legs, *a*.

B is the head and C the tail-block.

D is the carriage, moved by the lead-screw E, operated as usual by gear-wheels, *b*, *c*, and *d*.

F is the tool-post, on carriage D, carrying the chasing or cutting-tool *e*.

Fastened to the carriage D, and gearing into the lead-screw E, is a worm-wheel, G, back of D, a side view of which is seen in fig. 3. This is connected by a stud, *f*, with the governor H.

To the lathe-bed A is attached a rack, I, in which a pinion works, operated as usual by a hand-wheel, J, which moves the carriage when it is disconnected with the lead-screw E.

K represents a rod of any desired material, to be threaded or made into a screw, secured between the lathe-centres, and motion imparted to it as usual.

L is a lever, having a slot, *g*, and pivoted at *h* to the carriage D, the hooked or curved end, *i*, made to catch into notches in the governor H.

j is a slot in the front plate of carriage D, in which works a small pin, *m*, which is fastened to a nut, M, and which pin passes through the slot *g* in lever L.

The nut M has a thread to gear with lead-screw E.

The operation of my lathe is as follows. After the rod K is secured between its centres, and motion imparted to it as usual, and the cutting-tool *e* adjusted, the lever L is moved in the position as shown in black lines in fig. 1. By means of pin *m* and slots *g* and *j*, the nut M, by this operation, is thrown into gear with lead-screw E, and in this way the carriage D is moved, and the work of chasing is commenced and carried on.

When a sufficient length has been cut, the tool *e* is withdrawn from the rod K, and the lever L is pushed down into the position as shown by red lines in fig. 1. This disconnects the nut M from lead-screw E, and the carriage D becomes stationary, when, by means of hand-wheel J and its pinion in gear with rack I, the carriage is easily and rapidly run back by the machinist.

As soon as the nut M is disconnected from the lead-screw E, the worm-wheel G, which has been at rest, is now revolved by the lead-screw E, and with it the governor H. This governor is provided with a number of notches on its rim, which, in a certain position, will allow the curved end, *i*, of lever L to slip into the same.

By this means the said lever is brought into its first or normal position, necessary to start the carriage anew, by bringing the nut M in gear with screw E. To effect this, the machinist must press up the lever

L, so that its point, *i*, bears against the rim of H whilst it is revolving, until one of the slots mentioned comes into the desired position, and point *i* passes into the interior corner of it.

The number of these slots in governor H depends upon the proportion of threads in screws K and E; also upon the number of teeth in worm-wheel G. For instance, if the lead-screw E has four threads to the inch, and the worm-wheel G has forty-eight teeth, it is evident that one revolution of G will be equal to twelve inches length on lead-screw E. If I now make twelve notches in the governor H, the distance between each of them will be equal to one inch length on lead-screw E. Consequently, with this governor I can cut any whole number of threads to one inch, providing that I have changed the wheels *b* and *d* so that their respective numbers of teeth are in the same proportion as the respective numbers of threads on the rod K and lead-screw E.

If, under the same circumstances, I wish to cut four and a half threads to the inch, which makes nine threads to two inches, I make the number of notches such, that the distance between each will correspond to two inches length on the lead-screw E. The number in this case would be six, and it is to be understood that it would be necessary to change the wheels *b* and *d*, as before mentioned, and, as is always done, without the governor.

If desirable to cut a screw with three and two-thirds threads to the inch, the wheels *b* and *d* would be changed accordingly, and there would be eleven threads on rod K, corresponding to three inches on lead-screw E; consequently there would have to be four notches in governor H.

Following the same rule, for a screw of two and one-fifth threads to the inch on rod K, it would be necessary to use a worm-wheel, G, with one hundred and twenty teeth, and a governor, H, with six notches, because we would have eleven threads on rod K to five inches length on lead-screw E, which is equal to twenty threads. Six times these answer to the six notches in the governor H.

Figure 1, in the drawing, illustrates a case in which the rod K has the same number of threads to the inch as lead-screw E, which is eight; consequently, wheels *b* and *d* must have each the same number of teeth, the worm-wheel G having twenty-four teeth, and the governor H six notches. The distance between the notches, in this case, in governor H will answer to one-half inch length on lead-screw E. Now, by simply changing the wheels *b* and *d* to answer my purpose, I can cut any whole number of threads to the half inch on rod K.

The difficulty of constructing very large worm-wheels, necessitated by fractional threads, as, for instance, in the case mentioned before, of two and one-fifth threads to one inch, can be overcome by a modification, shown in fig. 3. Here the governor has a number of notches corresponding to one inch length on lead-screw E, say, six notches in governor H, and twenty-four teeth on worm-wheel G. This worm-wheel is rigidly connected with the pinion N, which, by means of an intermediate gear-wheel O, moves another wheel, P, to which the governor H is fastened.

The numbers of teeth on wheels N and P must bear the same proportion to each other as the numbers of threads on K and E, or the numbers of teeth on *b* and *d*.

This modification can be substituted at pleasure for the first-described method.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

The lever L, governor-plate H, and worm-wheel G, in combination with the feed-screw E, as and for the purpose set forth.

J. P. THEODORE LANG.

Witnesses:

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