

T. H. MILLER.
NURLING TOOL.

(Application filed Mar. 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.

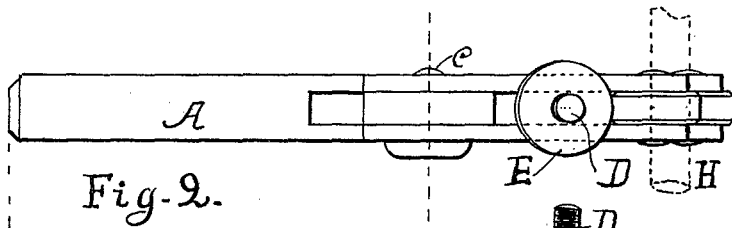


Fig. 2.

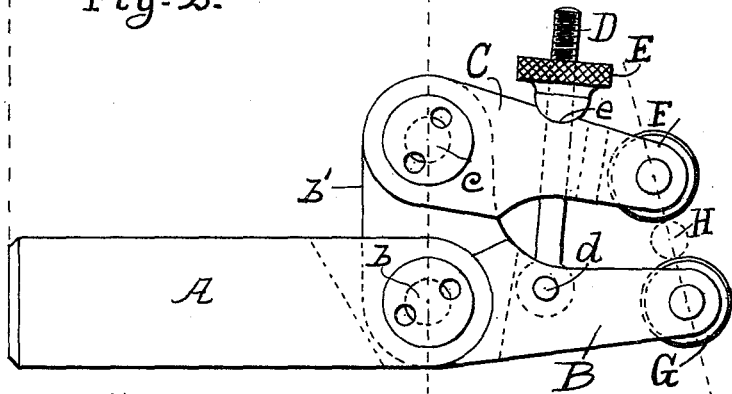


Fig. 1.

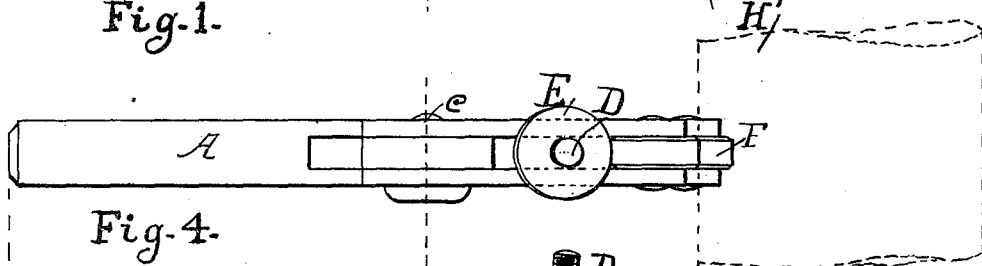


Fig. 4.

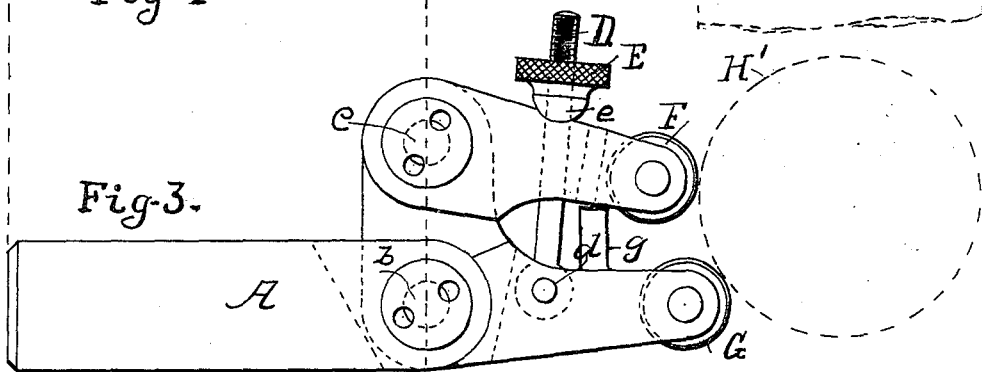


Fig. 3.

WITNESSES:

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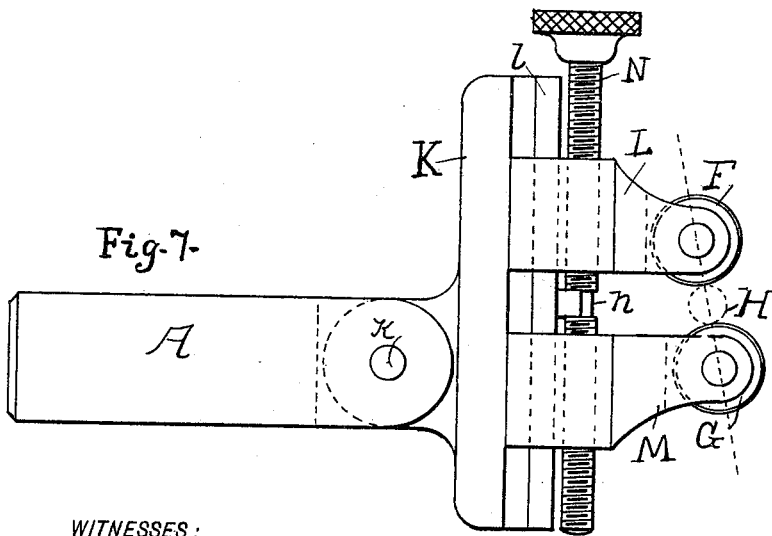
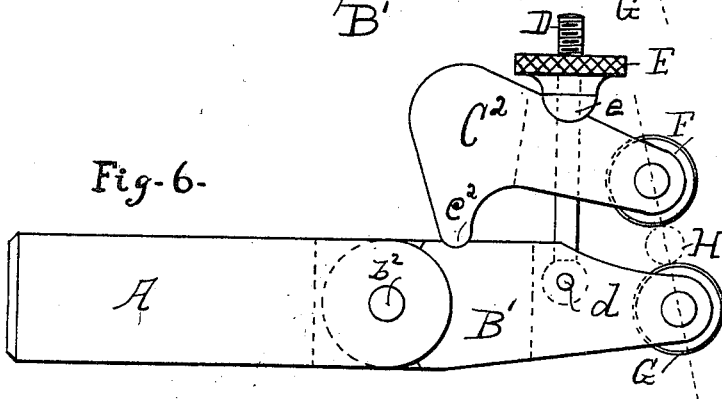
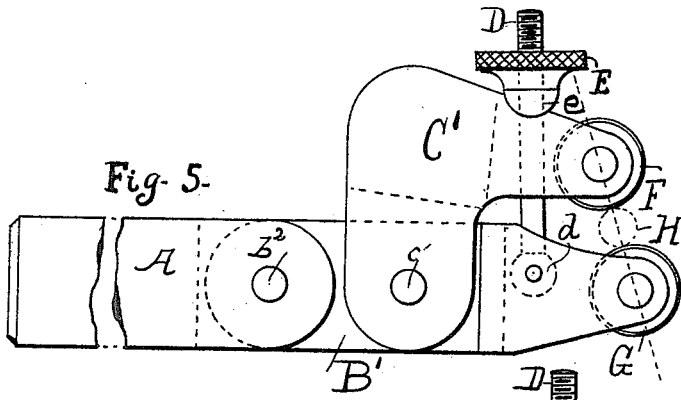
Walter Brown
his ATTORNEY.

T. H. MILLER.
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2 Sheets—Sheet 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

THEODORE H. MILLER, OF NEW YORK, N. Y.

NURLING-TOOL.

SPECIFICATION forming part of Letters Patent No. 632,358, dated September 5, 1899.

Application filed March 21, 1898. Serial No. 674,639. (No model.)

To all whom it may concern:

Be it known that I, THEODORE H. MILLER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Nurling-Tools, of which the following is a specification.

This invention relates to improvements in nurling-tools; and it is the purpose of the invention to provide such a tool that will be more effective on smaller work (and especially when the work is very long as compared with its diameter) than will existing tools. This advantage is attained by arranging the knurls in such a manner on arms which are capable of being moved toward or from each other that the knurls, assuming there are two, will bear on the work at diametrically opposite points. The arms are equipped with suitable means, such as nut and screw, for pressing the knurls on the work.

With this construction and arrangement of parts, no matter how small the work may be, the one knurl resists the pressure of the other, the work cannot spring away from the knurls, and the knurls may be forced with any desired pressure on the work. Suppose, for example, that the work is a small long rod or tube set up and rotated in a lathe in the usual manner, the nurling-tool being carried on the tool-post of the lathe-carriage. With existing nurling-tools, wherein the knurls, one or all, bear on the same side of the work, as the tool comes to the middle the work springs so much that the knurls become practically inoperative and good work cannot be done. With my tool, however, it is indifferent whether the work be long or short and as good work will be done at the middle of such a rod or tube as at the ends. My tool will also knurl smaller work than will any other tool, because the knurls can be approached until they actually touch each other without losing their effectiveness.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a side elevation, and Fig. 2 a plan, of the preferred form of my tool applied to small work. Fig. 3 is a side elevation, and Fig. 4 a plan, of the same tool applied to large work. Fig. 5 is a modification wherein the

lower arm is straight and the upper has a bell-crank shape. Fig. 6 is a modification wherein the end of the arm C² is so formed as to constitute a pivot for said arm. Fig. 7 is a modification wherein the arms which carry the knurls have a right-line motion on the guide of a head which is carried on the stock of the tool.

Referring to Figs. 1 to 4, inclusive, A is the stock, which is adapted to be fixed in any suitable machine, as in the tool-post of a lathe; B, a bell-crank arm pivoted thereon at *b* and carrying the knurl G; C, an arm carrying the other knurl F and pivoted at *c* on the web *b'* of said arm B; D, a screw pivoted on said arm B at *d* and passing through a slot between the cheek-pieces of said arm C, as shown, and E a nut on said screw D and provided with a rounded surface *e*, which is adapted to have a substantially equal bearing on said arm C whatever may be the angle of said screw D in the different positions of said arm.

When the work is sufficiently small to be inserted between the knurls F G, as shown in Fig. 1, the position of said knurls is such that they bear on the work at diametrically opposite points, and therefore the pressure of the knurls on the work may be raised to any desired degree by the nut E without any liability of springing the work. This is particularly advantageous when nurling a long rod or tube of small diameter, as has been hereinbefore explained. The work is of course revolved in any suitable manner, as by being placed in a lathe.

The common knurlwork being of a check-pattern, as indicated on the nut E, the face of the one knurl may be suitable for making the impressions on the work in the one direction, and the face of the other knurl suitable for making the cross-impression, or the entire pattern may be put on the faces of both knurls, and of course any pattern may be placed on the knurls.

The tool may be adapted to work that is too large to go between the knurls by placing a block *g* between the arms B C and screwing nut E home. The knurls are then applied to the work (indicated by H' in Fig. 3) as shown in that figure.

Referring to Fig. 5, the arm B', which is

now practically straight and pivoted on the stock A at b^2 , carries the knurl G, and the arm C', being now of bell-crank shape and pivoted on said arm B' at c' , carries the knurl F. The arrangement and purpose of the tool are the same as described in connection with Figs. 1 to 4.

Referring to Fig. 6, the bell-crank arm C² is not now pin-connected with the arm B', which is substantially straight, but has a rounded nose c^2 , which rests in a depression in the adjacent edge of arm B', and thus serves as the pivot of said arm C². The arrangement and operation of this screw D, nut E, and knurls F G are the same as hereinbefore described.

Referring to Fig. 7, on the stock A is pivoted at k a head K, provided with a guide-rib l . The arms L M, respectively carrying the knurls F G, work on said guide-rib and are approached toward or moved from each other by the screw N, which is positioned and held against longitudinal movement by the box n , carried on said head K. The arrangement and application of the knurls F G are the same as hereinbefore described.

It is now apparent that all the modifications of my tool are equally characterized by a plurality of knurls so positioned that the knurls can be brought to bear at diametrically opposite points of work that is small enough to go between the knurls, the knurls being carried on arms that are movable toward and from each other and provided with means for producing any desirable pressure of the knurls on the work, and this combination is generally my invention, however

the form and arrangement of the specific parts may be modified.

Now, having described my improvements, I claim as my invention—

1. A nurling-tool adapted to be used on a lathe or other suitable machine and characterized by a stock which is adapted to be fixed on the carriage of the lathe, and a plurality of knurls adjustably positioned on the said stock and adapted to bear on substantially diametrically opposite points of the work, substantially as and for the purpose described.

2. A nurling-tool adapted to be fixed in the tool-post of a lathe or other suitable machine and consisting of a stock for insertion in said tool-post, a plurality of knurls adapted to bear on substantially opposite sides of the work, a self-adjusting connection between said knurls and said stock, and means for moving said knurls toward or separating them from each other, substantially as described.

3. The combination in a nurling-tool of a stock A adapted to be secured in a suitable machine, arms B C carried movably on said stock, knurls carried by said arms B C, and a screw D and nut E for varying the distance between said knurls, substantially as described.

Signed at New York city, in the county of New York and State of New York, this 16th day of March, A. D. 1898.

THEODORE H. MILLER.

Witnesses:

H. L. ASCHOFF,
B. R. KENWORTHY.