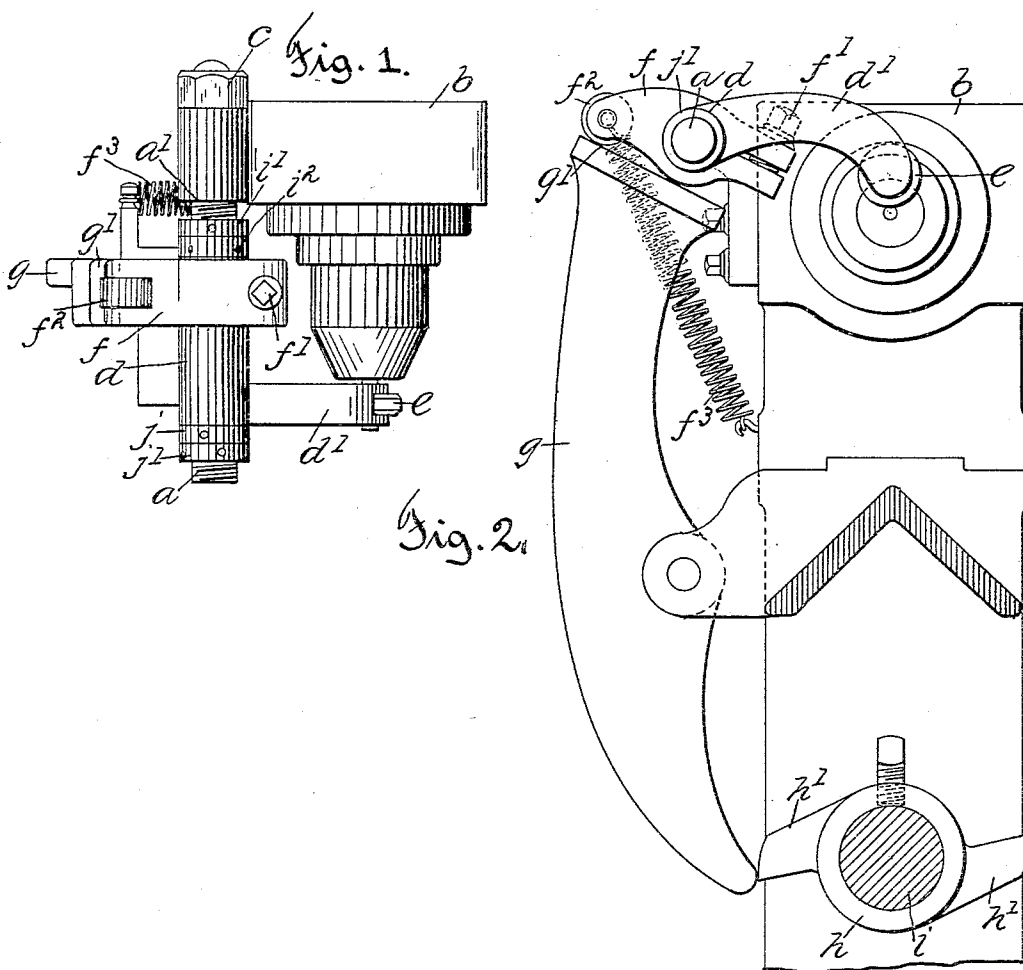


(No Model.)

G. E. WITHERELL.
KNURLING FIXTURE.

No. 504,769.

Patented Sept. 12, 1893.



Witnesses

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GEORGE E. WITHERELL, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
HARTFORD MACHINE SCREW COMPANY, OF SAME PLACE.

KNURLING-FIXTURE.

SPECIFICATION forming part of Letters Patent No. 504,769, dated September 12, 1893.

Application filed November 12, 1892. Serial No. 451,820. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. WITHERELL, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Knurling-Fixtures, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide a knurling tool that may be readily attached to any machine for the purpose of knurling a curved surface on a piece of any desired width or diameter, and to this end my invention consists in the details of the several parts making up the fixture as a whole, and in their combination, as more particularly hereinafter described and pointed out in the claims.

Referring to the drawings:—Figure 1 is a detail top view of a part of a screw machine to which the fixture is attached. Fig. 2 is a detail view in side elevation of the fixture showing parts of the screw machine in cross section.

In the accompanying drawings the knurling fixture is shown as used in connection with a screw machine, only such parts of the latter being shown as are necessary to an understanding of my invention.

In the accompanying drawings the letter *a* denotes a stud that is secured to the spindle head *b*, or other like fixed part of a machine, a narrow part of the stud projecting through an opening in a socket piece held between the shoulder *a'* on the stud and the nut *c* that is placed on the threaded end of the stud. On this stud the holder *d* is mounted, an arm *d'* supporting in a socket in its outer end the rotary knurling tool *e*. A lever arm *f* is adjustably secured to the holder as by means of a clamping bolt *f'* that passes through an opening in the slotted end of the lever and has a thread engaging a threaded socket in that portion of the lever on the opposite side of the slot, the shoulder on the head of the screw, when the latter is turned in the right direction, serving to draw the two parts together and bind the lever firmly upon the body part of the holder. The outer end of the lever supports preferably a friction roller *f²* that is held in contact with a movable cam *g'* by means

of a spiral spring *f³*, one end of which is secured to a fixed part of the machine and the other to the outer end of the lever, or to a pin projecting therefrom, as in the form shown in the drawings. This cam is arranged on a part so movable as to give to the knurling tool holder a rocking movement on the stem. In the form shown the cam is located on one end of the lever *g* that is pivoted to the frame of the machine and has its lower end arranged in operative relation to the cam arms *h'* that are borne on the cam *h* secured to the cam shaft *i* of the screw machine. The rotary movement of the cam shaft throws these cams *h'* at intervals into contact with the lower end of the lever and causes the latter to be oscillated on its pivot so as to move the cam *g'* inward toward the spindle, and by lifting the lever *f* throws the knurling tool *e* downward upon the work. The arm *f* is adjustably secured to the holder *d* in order to enable the knurling tool to be adjusted at any given distance from the axis of the work that may be required by the diameter of the latter. This adjustment may be called a radial adjustment of the cutter, as it is made in a direction in the line of the radius, and the lateral adjustment of the cutter is effected by means of clamping nuts *i' i²* and *j j'* that are arranged on threaded parts of the stem and on opposite sides of the knurling tool holder. By means of these two adjustments the knurling tool can obviously be arranged in any given position lengthwise of the work or laterally of the cutter that may be required, and also with the cutting edge at any desired distance from the axial center of the work at which the periphery may lie.

I claim as my invention—

1. In a knurling tool fixture, the combination of a fixed threaded-stem, a knurling-tool holder loosely mounted on the stem, collars on the stem to adjust the holder laterally, a radially adjustable lever on the holder, a rocking-lever to intermittently engage the lever on the holder, and means to rock the rocking lever.

2. In a knurling tool fixture, in combination with a fixed stem, a knurling tool holder loosely supported on the stem, clamping nuts

arranged on threaded portions of the stem
and on opposite sides of the holder, the arm
carrying the knurling tool, an adjustable le-
ver clamped to the holder, the cam lever piv-
5 otated to the frame and bearing a cam in opera-
tive engagement with the outer end of the le-
ver, the lever operating cams secured to the
cam shaft, and a spring arranged to hold the
outer end of the lever in operative engage-
10 ment with the surface of the moving cam, all
substantially as described.

3. In a knurling-tool fixture, the combina-

tion of a fixed support, a tool-holder on the
support formed with an arm, a knurling tool
 journaled in the end of the arm, a radially ad- 15
justable lever on the tool holder, a roller jour-
naled in the free end of the lever, a cam to
engage the roller and rock the lever, and a
spring to hold the lever and cam in contact.

GEORGE E. WITHERELL.

Witnesses:

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