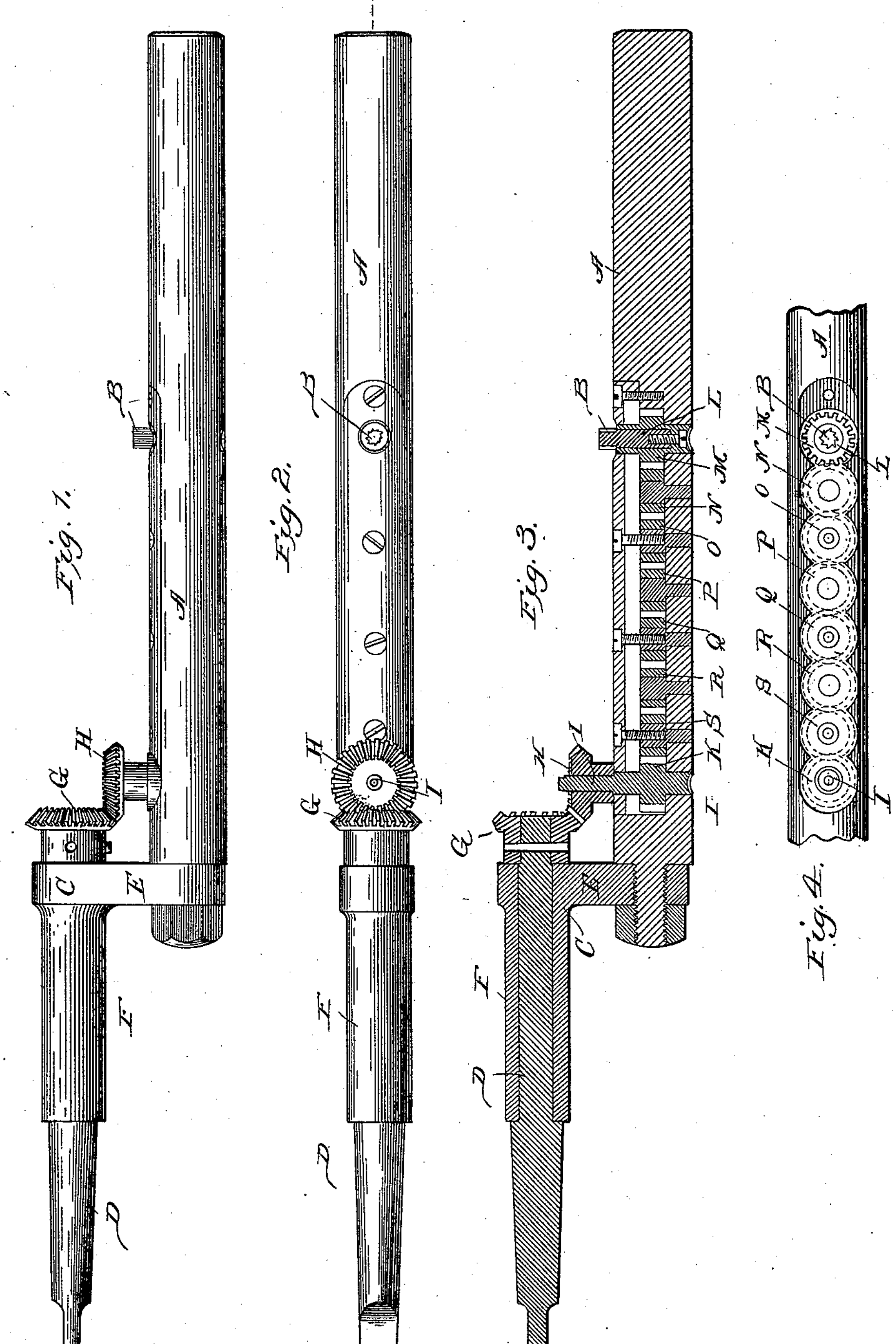
(No Model.) 2 Sheets—Sheet 1.

E. STIRLING.

GROOVE CUTTING TOOL.

No. 548,822. Patented Oct. 29, 1895.



Witnesses:
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W. E. Aughinbaugh

Inventor:
Edward Stirling
By H. W. Sterling, Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

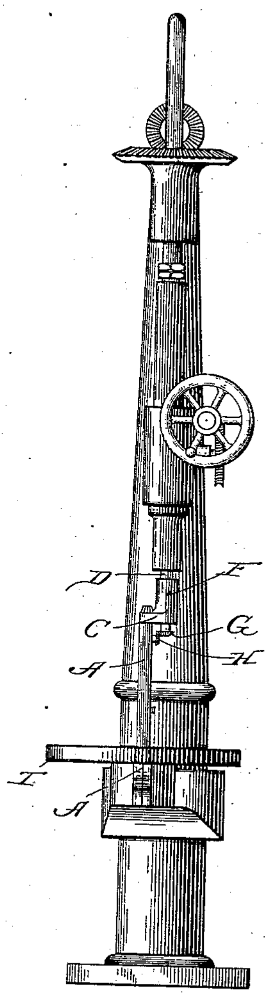
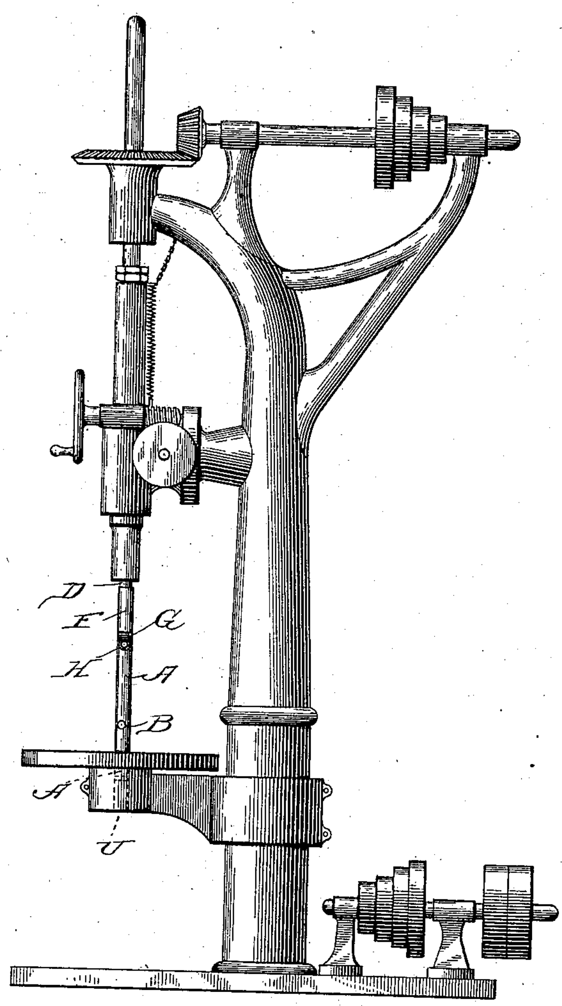


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD STIRLING, OF ALEXANDRIA, VIRGINIA

GROOVE-CUTTING TOOL.

SPECIFICATION forming part of Letters Patent No. 548,822, dated October 29, 1895.

Application filed March 23, 1894. Serial No. 504,889. (No model.)

To all whom it may concern:

Be it known that I, EDWARD STIRLING, a citizen of the United States, and a resident of Alexandria, in the county of Alexandria and State of Virginia, have invented a certain new and useful Improvement in Groove-Cutting Tools, of which the following is a description.

The herein-described invention relates particularly to that class of cutting devices constructed especially for cutting keyways in the hubs of wheels which are to be rigidly mounted upon shafts, and is designed for use as a tool attachment to a drill-press.

The objects of the invention are the construction of a tool for cutting with great facility the keyway or seat in wheel-hubs, which will be readily adaptable as an attachment tool for drill-presses and be operated thereby, which will be especially adapted for use in small wheels by reason of its form and the peculiarity of its construction, and which will have a great range of cutting movement whereby to make the same sufficient for all practical needs of wheels of various sizes.

It has been the further object to combine the above-mentioned advantages in a tool which is both simple in its parts and arrangement and inexpensive in its manufacture.

The invention consists of a groove-cutting tool adapted to be operated by a drill-press, and comprises a stock of preferably-cylindrical form adapted to extend through the hub of a wheel, a rotary cutter carried by the stock intermediate of its ends, a drive-shaft suitably supported on the stock, and gearing connecting the drive-shaft with the cutter.

The invention further consists in certain other novel features in the construction and arrangement of parts, all as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side elevation of the tool; Fig. 2, a top or plan view thereof; Fig. 3, a longitudinal vertical sectional view taken on the line 2 2 of Fig. 2; Fig. 4, a detail view of a section of the tool, showing the recessed portion with the cover removed and disclosing the gearing therein. Fig. 5 is a view, in front elevation, of a drill-press with the groove-cutter applied thereto; and Fig. 6 is a side elevation of the drill-press fitted with the groove-cutter.

Referring to the drawings by letter, A indicates the main body of the tool, which is preferably in the form of a cylindrical bar, and is designated herein as the "cutter-stock," owing to its function in carrying the cutter B. This cutter is of the rotary type, and is mounted in the cutter-stock A intermediate its ends and preferably about centrally of its length, placing it thereby a sufficient distance from the upper end of the stock, in order to give it the greatest practical range of cutting movement, which movement is measured by the distance between the cutter and the gearing at the top of the said stock. Upon the upper end of this cutter-carrying stock is provided a bracket C, which furnishes a support and bearing for a drive-shaft D. This bracket is preferably formed with an offset-arm E, having its bearing for the shaft D at its outer end and in the form of a sleeve F, through which the shaft D extends.

The drive-shaft D is provided at its lower end with bevel-gear G, rigidly mounted upon the shaft and so formed at its upper end as to fit within the spindle of a drill-press after the manner of a drilling-tool.

The shaft D forms the main driving mechanism of the tool, and is driven from the spindle of the drill-press, and by means of its offset arrangement on the stock A all tendency of the said shaft to impart rotary motion to the said stock is obviated thereby.

The interior of the stock A is recessed, as shown in Fig. 4, for the reception of a train of gears by which motion is imparted to the rotary cutter B from the shaft D. To effect this system of gearing the bevel-gear G meshes with the bevel-gear H, mounted rigidly on a shaft I, which in turn is mounted in the cutter-stock A directly below the support or bracket carrying the drive-shaft D. The shaft I extends through the recessed portion of the cutter-stock A, and is provided with a gear or pinion K within the recess. The shaft L, which turns the cutter B, extends through the recessed or hollowed-out portion of the stock and is provided with a gear or pinion M on its inner portion, bringing said pinion M within the recess. By the train of gears N, O, P, Q, R, and S, which are also located within the interior of the stock A upon the irrespective shafts, connection is made between gears

K and L and the motion of the spindle of the drill-press imparted to the rotary cutter through the drive-shaft D and the system of gearing shown. It will be seen by this interior arrangement of the gears that the outer face of the stock is left uniform for a considerable distance on both sides of the cutter and therefore permits its use in wheels having very small hubs.

The vertical movement of the tool is controlled by the drill-press, and to hold the stock against lateral displacement its lower portion is designed to work within a hole U in the table T of the drill-press; and for this purpose the stock is formed of sufficient length to extend through the table when the tool is set for operation, and by this engagement with the table it forms a guide to make the downward cutting course of the tool straight and positive.

It will be understood that great importance attaches to the cylindrical form of the stock, as in this form the tool can be made of the smallest size consistent with strength, and in this circular form corresponds in the main to that of the opening in the hub where the keyway is to be cut, which is advantageous, particularly for the reason that the cutter-stock should be brought into close proximity with the inner face of the wheel-hub.

The operation of the tool in conjunction with a drill-press may be briefly stated as follows: The shank of the drive-shaft of the tool is inserted in the spindle of the drill-press and the table of the machine adjusted so as to bring the stock of the tool in line with one of the openings therein, and through which the said stock extends and by which it is guided in its downward movement. When the table has been so adjusted as to receive the stock of the tool in one of its openings and to slide freely therein, the spindle of the drill-press is raised to carry the tool up from its operative position in order to permit the wheel to be operated upon to be properly arranged on the table with relation to the cutter. When the wheel is clamped firmly thereon and the tool lowered to its cutting position, the end of the stock not only extends through the hub but into the hole in the table arranged therefor.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a groove cutting tool, the combination with a non-rotatable stock having longitudinal movement and comprising a solid guide portion and a hollow portion, a rotary stationary cutter carried by the stock intermediate its ends and rotating independently of the movement of the stock, a bracket carried by the stock at one end, a drive shaft in the bracket, and gearing connecting the cutter and shaft.

2. In a groove cutting tool, the combination with a non-rotatable stock having longitudinal movement and comprising a solid guide portion and a hollow portion, a rotary cutter carried by the stock intermediate its ends and rotating independently of any movement of the stock, and having its carrying shaft provided with a pinion, a bracket on the stock, a drive shaft working therein and having a bevel gear at one end, a bevel gear in mesh with that on the drive shaft, having a pinion on its inner end, and a train of gears located within the recess of the stock and connecting the two pinions.

3. In a groove cutting tool, the combination with a stock having a part of its length solid to form a guide, the said stock being provided with a bracket at one end, and having its intermediate portion provided with a longitudinal recess, of a cutter carried by the stock, a drive shaft in the bracket, and gearing arranged within the said recess connecting the drive shaft and cutter.

4. In a groove cutting tool, the combination with a stock having a solid guide portion and a recessed portion, of a cutter carried by said stock, a bracket having an off-set arm mounted on one end of said stock, a drive shaft in said bracket, and gearing connecting the shaft and cutter.

5. In a groove cutting tool, the combination with a stock having a guiding portion and an intermediate recessed portion, of a cutter carried by said stock, a bracket formed on one end of the said stock, a drive shaft in the bracket, gearing connecting the shaft and cutter, and a cover for the recess.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EDWARD STIRLING.

Witnesses:
H. M. STERLING,
W. E. AUGHINBAUGH.