W. KRUTZSCH.

Gear-Cutting Attachment.

No. 166,705. Patented Aug. 17, 1875.

Fig. 1.

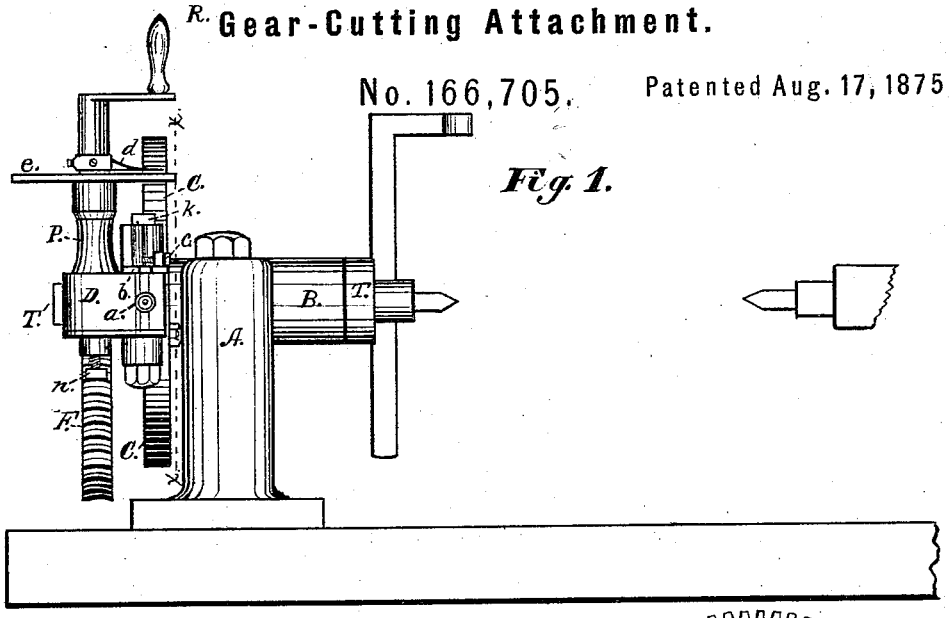


Fig. 2.

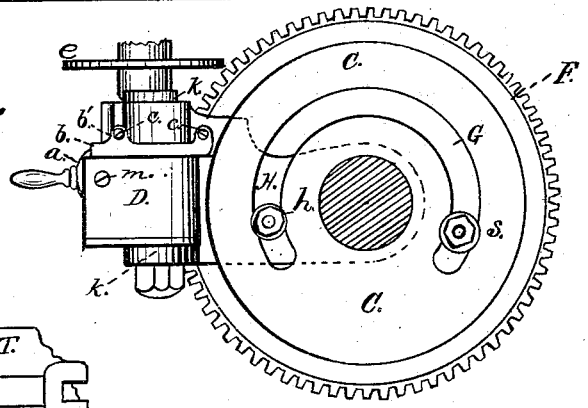


Fig. 3.

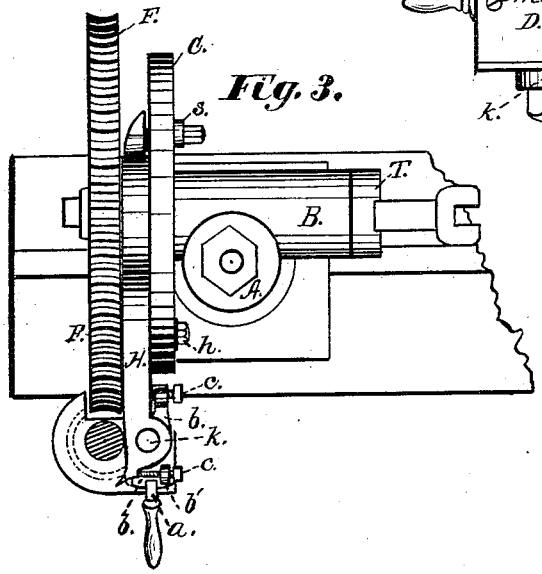
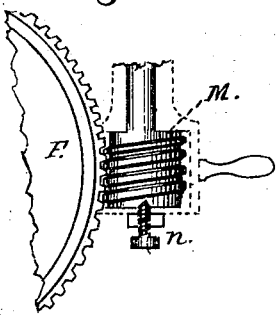


Fig. 4.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM KRUTZSCH, OF DAYTON, OHIO, ASSIGNOR TO GEO. W. HOGLEN AND CHARLES E. PEASE, OF SAME PLACE.

IMPROVEMENT IN GEAR-CUTTING ATTACHMENTS.

Specification forming part of Letters Patent No. **166,705**, dated August 17, 1875; application filed April 15, 1875.

To all whom it may concern:

Be it known that I, WILLIAM KRUTZSCH, of Dayton, in the county of Montgomery and State of Ohio, have invented new and useful Improvements in Gear-Cutting Attachments for Milling-Machines, of which the following is a specification:

The object of my invention is to provide an improved apparatus, to be secured upon the platen of the machine in the usual manner, and having its parts so arranged with reference to each other that much time can be saved in the operation of the machine, and the proper adjustment of its parts can always be insured, as will hereafter be more fully explained.

In the accompanying drawing, Figure 1 is a front elevation of so much of the machine as is necessary to illustrate my invention. Fig. 2 is a side elevation of the same through the line *x x* of Fig. 1. Fig. 3 is a top view of Fig. 1. Fig. 4 represents the worm applied to the worm-wheel.

The same letters of reference refer to like parts.

With the standard A are cast the spindle-bearing B and a disk, C, at right angles to the bearing, and having a circumferential guide-slot, G, occupying a position about halfway from the center to its circumference. F is a worm-wheel upon the end of the spindle T, actuated by a worm, M, in the bearing-box, D. An arm, H, in which the bearing-box is pivoted at *k*, fits snugly between the disk C and the worm-wheel, embracing the spindle loosely, so as not to interfere with its action. A set-screw, *h*, with a washer, passes through the slot in the disk, and is embedded in the arm H, so that upon tightening the screw the arm can be clamped to the disk. A latch, *a*, pivoted in the box D at *m*, engages with the slot in the adjustable plate *b* pivoted upon the same axis as the bearing-box. This plate is adjustable by means of two set-screws, C, passing through bearings *b'* on each side of the axis, and working against fixed shoulders upon the supporting-arm H, as seen in Fig. 3. By this means the position of the detaining-slot in the plate *b* can be changed to throw the worm more effectually into gear with the wheel F, or to loosen it, as may be desired. A set-screw, *n*, Fig. 4, passing through a bearing in the bottom of the box D, forms the pivot on which the worm M turns, and, by means of this screw, the worm can always be properly adjusted, and any wear compensated for. Formed with the box D is the worm-shank bearing P, supporting an index plate or disk, *e*. A pointer, *d*, upon the shank, is used, in connection with the scale upon the disk, for the customary purpose. The shank is provided with a crank, R, by which the operator is enabled to revolve the spindle T, and with it the work to be milled, which is chucked in the usual manner.

Supposing the blank in which it is desired to cut teeth to be properly adjusted in my apparatus upon a milling-machine, I would thus describe its operation: The blank is brought under the cutter, and the first incision made. Now, the scale upon the disk *e* enables the operator to know just what part of a revolution, or how many revolutions, it is necessary to give the worm to bring the blank into position for the second incision, forming the first tooth. When the blank is very small, and but few teeth are to be cut, the arm H is brought into use in the following manner: A bolt, *s*, in the slot G, whose head is provided with a pointer that extends upward to the periphery of the disk C, and always points radially, can be clamped at any position in the slot indicated by a scale upon the periphery of the disk. The latch *a* is then disengaged, and the bearing-box D turned upon its pivot, throwing the worm out of gear. The arm carrying the worm and its appointments is then turned upon its axis until it strikes the head of the bolt *s*. The worm is then thrown into gear, and the arm brought to its former position, causing the spindle to revolve to an extent ascertained by means of the index upon the disk. This operation is repeated as often as may be necessary, and saves the time that would be lost in employing the crank R to cause the same result.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a gear-cutting apparatus, the arm H, arranged as described, to which is pivoted the worm and its bearings, in combination with a fixed slotted disk, C, and indicating-bolt *s*, substantially as herein set forth.

2. The adjustable pivoted plate *b*, provided with the set-screw *c*, in combination with the arm H and latch *a*, in the manner and for the purpose specified.

3. The combination of the standard A, bearing B, disk C, spindle T, arm H, worm-wheel F, and worm M, the whole arranged substantially as described, and for the purpose specified.

Witness my hand this 2d day of April, A. D. 1875.

WILLIAM KRUTZSCH.

Witnesses:

J. P. WHITMORE,

CHAS. M. PECK.