

(No Model.)

F. H. RICHARDS.
METAL TURNING TOOL.

No. 307,227.

Patented Oct. 28, 1884.

Fig III,

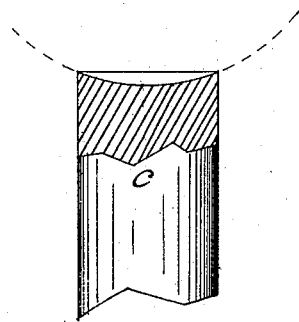


Fig I,

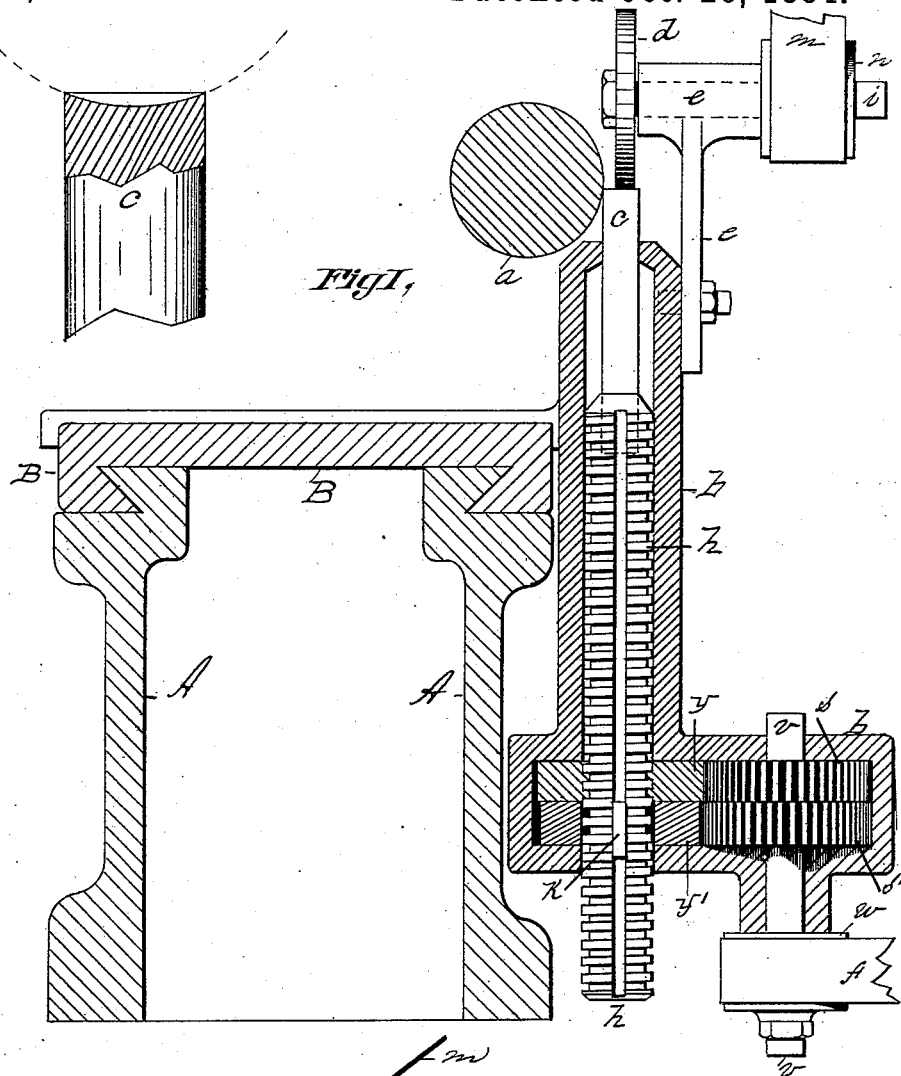
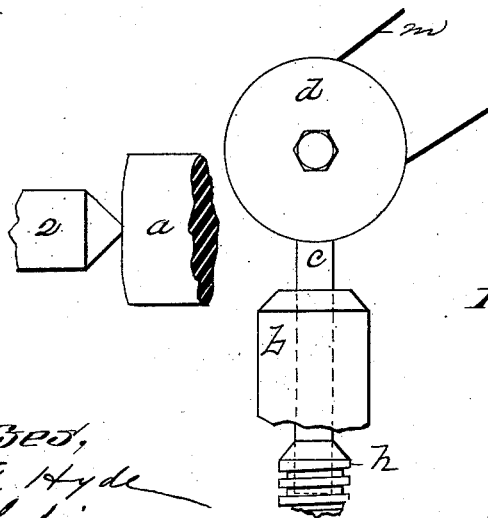


Fig II,



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASSACHUSETTS.

METAL TURNING TOOL.

SPECIFICATION forming part of Letters Patent No. 307,227, dated October 28, 1884.

Application filed September 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Tools, and Tool Supporting and Sharpening Devices for Turning and Shaping Machines, of which the following is a specification.

This invention relates to improvements in tools, tool-supporting, and tool-sharpening devices for turning, shaping, and planing machines; and it consists in the combination, with a cylindrical cutting-tool, of mechanism for supporting the same on the carriage of said machines in an operative position for rotating and moving said tool toward its work and sharpening it while it is cutting.

In the drawings forming part of this specification, Figure 1 is a transverse section of a turning-lathe bed and tool-carriage having attached thereto tool supporting and sharpening devices, embodying my invention. Fig. 2 is a rear view of portions of my improvements and of parts of a lathe, together with a section representing a portion of turned work therein. Fig. 3 is a side view, partly in section, of the turning-tool.

In the drawings, A represents the bed of a machine, and B the tool-carriage thereof. 2 2 indicate lathe-centers, and *a* a section of a piece being secured between said centers in a position to be turned. *b* is a case supported on carriage B. *c* is the cutting-tool. *h* is a tool-holder. *k* is a key in holder *h*. *y y' s s'* are differential gears. *v* is a gear-shaft. *w* is a driving-pulley on shaft *v*. *d* is a grinding-wheel secured on a shaft, *i*. *n* is a pulley on the latter. *e* is a support for shaft *i*, secured to the case *b*. *m* and *f* are belts.

The case *b* is secured to the carriage B, and is adapted to be carried along on the bed A of the machine as is an ordinary tool-holder. Said case is adapted to receive within it the threaded and key-slotted tool-holder *h*, which carries in its upper end the cylindrical cutting-tool *c*, the latter being rigidly secured to said holder in any suitable manner. The lower part of case *b* is constructed, as shown, to receive within it a series of differential gears, *y y' s s'*. Said gear *y* is screw-threaded and operates as a nut on the tool-holder *h*, and gear *y'*

has the key *k* fitted in it, which fits in the key-slot in the said tool-holder, as shown, whereby when gear *y'* is rotated it carries said holder around with it, but leaves the latter free to move up and down in it. The gears *s s'* are secured to the shaft *v* and engage with said gears *y y'*. Shaft *v* is driven by a belt, *f*, running on a pulley, *w*, on shaft *v*. A tool-grinding wheel, *d*, is secured on a shaft, *i*, and the latter runs in the support *e*, which is secured to the case *b*, as shown. A belt, *m*, running on the pulley *n* on shaft *i*, drives the latter and wheel *d*. The cylindrical cutting-tool *c* has a concave end, which is constantly kept in that form by its contact with the periphery of the grinding-wheel *d*, whereby its cutting-edge is kept continually sharp, as hereinafter set forth.

The operation of my improvements is as follows: The piece *a* to be turned is secured in the usual manner between the centers 2 2 of a lathe, and the cutting end of tool *c* is advanced to a proper position against said piece *a* to begin to cut when the latter is rotated. At the same time that the lathe is started the belts *m* and *f* are set running, starting the grinding-wheel *d*, whose periphery is in contact with the cutting end of tool *c* and the gears *s s'*, the latter rotating gear *y'* and holder *h* and the tool *c*, and the former slowly turning and carrying tool *c* and said holder upward. The said differential gears are proportioned, and run in such a manner that while the cutting-edge of tool *c* as it is ground off by wheel *d* is kept at a proper height relative to the piece *a*, which it is cutting, it is slowly rotated to keep a portion of its freshly and constantly resharpened edge in contact with the piece *a*, whereby the cut of the tool is smooth and even and the appearance of the turned work is uniform. Thus by the combined operation of the grinding-wheel *d* upon the end of tool *c* and the above-described devices for rotating said tool and moving it against said wheel as fast as it is ground off a freshly-sharpened cutting edge is constantly presented to the work, whereby the latter is turned to a more uniform diameter than by ordinary means, and its turned finish is much superior.

What I claim as my invention is—

1. The combination, with the lathe and its

tool-carriage, of the cylindrical bar or cutting-tool having a concave end, by which is formed a cutting rim or margin, and the mechanism described to impart rotation to said tool while
5 in operation, substantially as set forth.

2. The combination, with a cylindrical cutting-tool, and with mechanism, substantially as described, for rotating and moving said tool

toward its work, of a grinding-wheel, and operating mechanism, substantially as described, 10 to rotate in contact with the end of said tool while the latter is cutting, all as set forth.

FRANCIS H. RICHARDS.

Witnesses:

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