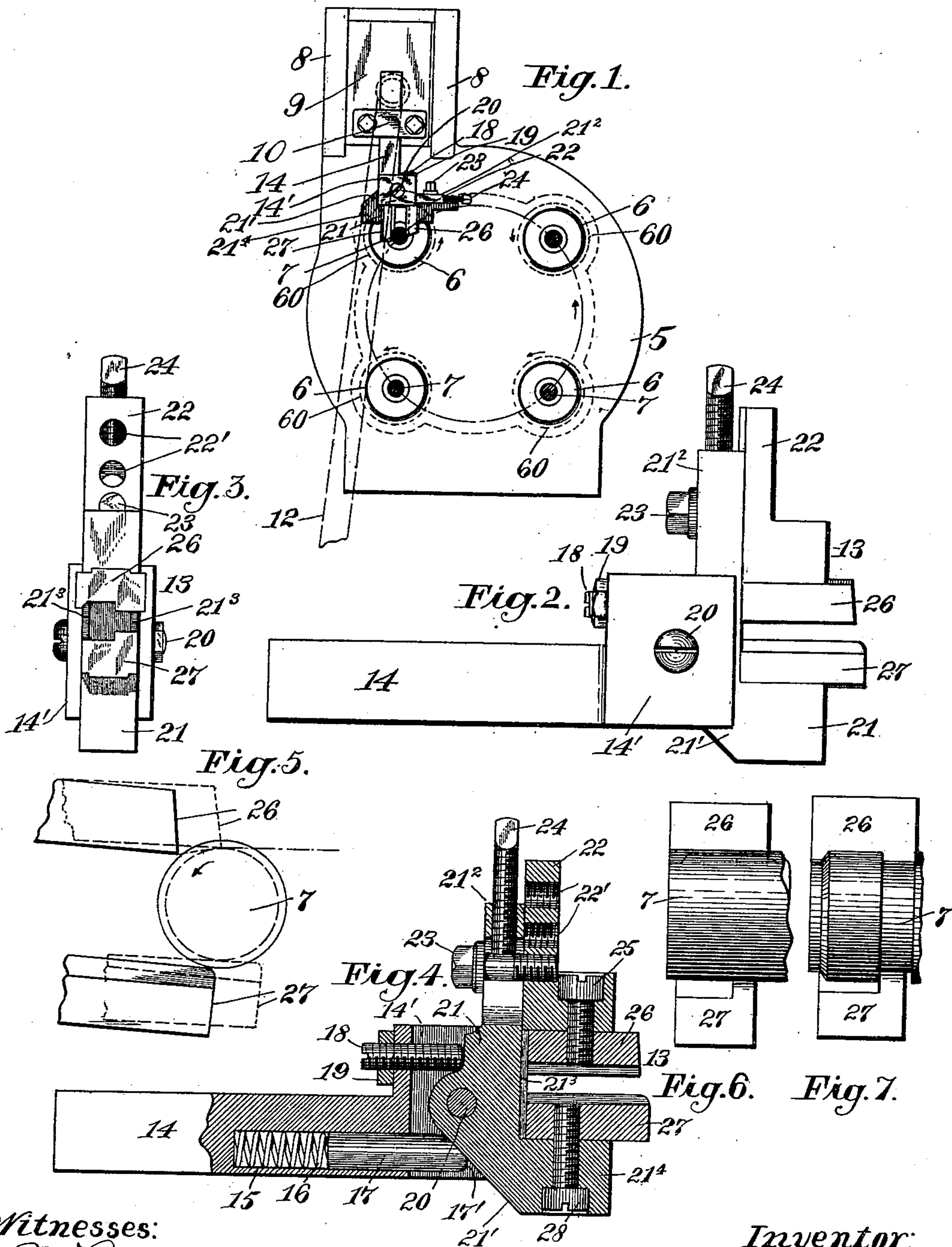


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E. C. HENN.
METAL TURNING TOOL.
(Application filed Oct. 19, 1900.)

(No Model.)



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METAL-TURNING TOOL.

SPECIFICATION forming part of Letters Patent No. 667,311, dated February 5, 1901.

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To all whom it may concern:

Be it known that I, EDWIN C. HENN, a citizen of the United States, residing in Bloomfield, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Metal-Turning Tools, of which the following is a specification.

This invention relates to metal-working tools, and more particularly to that class of those devices known as "sizing-tools" and which are employed for reducing a rod or bar and for simultaneously turning it to the desired configuration.

Primarily the object of the invention is the provision of a tool of such construction that when the tool advances the angle of the cutting-face thereof with relation to the work will automatically change from a position to form a relatively deep cut at the inception of the operation to a position for forming a shaving cut toward and at the end of said operation.

A further object of the invention is the provision of a metal-cutting tool having a guide movable with said tool, said guide acting against the work and governing the angular position of the working face of the tool with relation to said work, whereby the tool will cut deeper into the stock at the inception of its cutting stroke and will finish its work with a light or shaving cut.

A further object of the invention is the provision in connection with a metal-cutting tool of a guide which will engage the work in advance of the cutting-tool and will regulate the position of the cutting-face of said tool with relation to the work in such a way that a relatively deep cut will be taken by the tool at the inception of its stroke and a light or shaving cut at the end of said stroke.

A further object of the invention is the provision in connection with a cutting-tool and guide of a holder by which said parts are carried, said holder being mounted for movement in a direction transverse to the path of the cutting-stroke of the tool, in virtue of which the work regulates the position of the tool, and the latter is enabled to follow the work should it, as is frequently the case, be out of a true position during the cutting operation.

In the accompanying drawings, Figure 1 is a front elevation of my improved tool, showing it in place on the tool-head of a machine-frame, the work being represented in front of said head and the spindles carrying the work being illustrated by dotted lines. Fig. 2 is a side elevation of my improved tool. Fig. 3 is an end view of the tool. Fig. 4 is a longitudinal vertical section of the tool, a part of the shank thereof being shown in elevation. Fig. 5 is a diagram showing by full and dotted lines the manner in which the tool operates upon the work. Fig. 6 is an end view of the tool at the commencement of the operation—i. e., the position represented by full lines in Fig. 5; and Fig. 7 is a like view at the termination of the cutting operation, corresponding to the position represented by dotted lines in Fig. 5.

Similar characters designate like parts throughout the several views.

Referring to the drawings, the numeral 5 designates the tool-head of a machine, which may be of the kind set forth in United States Patent No. 530,180, granted R. Hakewessel December 4, 1894, in which are bosses 6, the work being marked 7. The work may be carried by spindles 60, (represented by dotted lines in Fig. 1,) mounted for rotation in a revoluble head, which is intermittently turned to bring the rods or bars carried in the spindles into contact with the sizing or reducing tool.

Arranged, as shown, in vertical guideways 8 of the head 5 is a slide 9, having a suitable fastening device 10, by which the shank of the improved reducing and forming tool is secured in position, and connected with this slide is a pitman 12 or other suitable device, which in practice will be operated by a cam or its equivalent on a shaft of the machine to cause the tool to be advanced toward and from the work at certain intervals.

Designated by the numeral 13 is my improved sizing and reducing tool, which in the exemplification given is composed of a shank 14, secured to the slide 9 by the fastening device 10, or it may be mounted in other ways, and this shank is provided at one end with a hollow head 14' and longitudinally of its body with a chamber 15, in which is placed a coiled

or other suitable spring 16 and a plug or bolt 17, having a chamfered head 17', said bolt being normally pressed outward by said spring.

Threaded into a wall of the head 14' is an adjustable screw 18, which is locked after adjustment by a jam-nut 19, and pivotally mounted upon a bolt 20 of said head is a stock 21, having in inclined wall 21', a slotted extension 21², a guideway 21³, and an angularly-disposed projection or seat 21⁴, the stock being approximately of L shape in cross-section. Fitted upon the inner face of the slotted extension 21² is an L-shaped block provided with a series of openings 22', having threaded walls, and passing through the slot of the extension 21² is a bolt 23, having an exterior thread adapted to be engaged with the threaded walls of any of said openings. A screw 24 passes through the end of the stock 21, its inner end bearing against the bolt 23, and on loosening said bolt and turning the screw the block 22, which carries the turning-tool, may be adjusted as desired in the guideway 21³, and after this adjustment has been accomplished the bolt is tightened securely to lock said block in position.

Secured by a screw 25, or it may be in any other suitable way, to the arm of the L-shaped block 22 is a metal-turning tool 26, having a cutting-face of any desired form, and fitted on the seat 21⁴ on the stock 21 is a guide 27, projecting slightly beyond the tool 26 and substantially conforming in shape to that of the tool, said guide being secured in place by a screw or other suitable device 28, passing loosely through the seat and threaded into the guide. The shank 14, with its chambered head, serves as a carrier for the turning-tool and guide.

While the slide 9 is illustrated in a vertical position, it is distinctly to be understood that the invention is not limited in this respect, for it may be arranged in horizontal or other positions, if desired.

In the operation of my invention when the head in which the work-carrying spindles 60 are mounted is rotated to bring one of said spindles in line with the sizing and reducing tool the slide 9, carrying said tool, is reciprocated, and the guide 27 will by contact with the work cause the stock 21 to swing on its pivot 20 against the pressure of the spring-actuated plug 17, thereby throwing the turning edge of the cutting-tool 26 to a position substantially as represented by full lines in Fig. 5. In this position of said tool as it enters the rotating work a relatively deep or "rank" cut will at first be made, and as the turning-tool advances the angle of the turning face thereof with relation to the work will decrease from the position where a comparatively deep or rank cut is made at the start to a position where a light or "shaving" cut will be made at the finish, as represented, by dotted lines in Fig. 5. This operation will be readily understood by reference to Figs. 5 and 6, by which it will be seen that the stock carrying

the turning-tool and the guide moves transversely of the work as the tool advances thereon. In other words, when the guide 27 first comes into contact with the work the stock is swung upon its pivot 20 to cause the tool 26 to enter the work at the angle represented by full lines in Fig. 5, and as the tool advances and the work is constantly rotated it will be seen that after the rank cut is made at the inception of its cutting stroke the guide 27, being in contact with the work, will follow and enter said cut, and thereby permit the stock 21 to be swung on its pivot by the spring-actuated plunger 17 to throw the tool 26 to the position represented by dotted lines in said Fig. 5, where the light or finishing cut is made. To enable this action of the stock to be readily accomplished, the rear wall of said stock is inclined at 21' to fit the chamfered end of the spring-actuated plug 17.

To limit as desired the oscillation of the stock upon its pivot 20, the screw 18 is provided, and the inner end of said screw bears against a portion of the stock at one side of said pivot.

To accommodate the tool to various diameters of work, the block 22 is made adjustable in the manner above described, and by withdrawing the bolt 23 from one of its threaded seats 22' in said block and inserting it in another of said seats a wide range of adjustment may be obtained.

A further advantage of the pivoted stock illustrated resides in the fact that the tool is enabled to conform to the work and to accurate turning, even if said work should be slightly out of its true position, for, as is obvious, when the guide 27 comes into contact with said work the stock will yield, and thus enable the work to be properly received between the guide and cutter.

Any suitable configuration may be given to the working face of the cutting-tool and to that of the guide, my invention not being limited in this respect.

By combining the cutting-tool with the guide, both tool and guide being located in the direction of the feed-stroke or of the advancing movement of the tool to the work, and so mounting said combined tool and guide that they are adapted for movement transversely of the advancing movement or stroke of the tool it will be seen that the work regulates the position of the cutting-tool and that the tool will always follow the work should it, as is sometimes the case, run somewhat out of true during the finishing cut. This peculiar coaction of the work with the tool and guide results in producing a high-class product and in materially reducing the difficulty and cost of manufacturing said product.

It will be seen that one part of the surface of the work (and only one part at a time) serves as a stop-face for controlling the cut being made on another part of the same general surface, whereby, as above stated, the turning-tool will first be caused to operate

upon the work with a deep or rank cut and will then be caused to finish the work with a light or shaving cut.

Many changes may be made in the details of the devices illustrated without departure from my invention, and the invention is not limited to the precise construction shown, but includes within its purview modifications capable of accomplishing the same result, although operating in a slightly different manner. Furthermore, my invention is not limited in use, for it may be applied to ordinary turning-lathes or to multiple-spindle lathes of other kinds than those set forth in the patent above mentioned.

Having thus described my invention, I claim—

1. The combination, with means for supporting the work, of a tool for turning said work, and means for causing said tool to operate upon the work at the inception of its stroke with a relatively deep cut and at the finish of said stroke with a light or shaving cut over the same surface.

2. The combination, with means for supporting and rotating the work, of a turning-tool; a guide coöperating with said turning-tool; and means for so mounting said guide and tool that they will move together transversely of the path of the cutting-stroke of said tool during said stroke, whereby said tool will operate upon the work first with a relatively deep cut and then with a light or shaving cut.

3. The combination, with means for supporting and rotating the work, of a movably-mounted stock; a turning-tool carried by said stock; a guide also carried by the stock and coöperating with the turning-tool; and means for advancing the guide and tool together toward and from the work, whereby said tool will operate upon the work first with a relatively deep cut and then with a light or shaving cut.

4. The combination, with a rotating spindle, of a slide movable toward and from said spindle; a turning-tool and a guide carried by said slide; and a pivoted stock in which said turning-tool and guide are mounted, movable transversely of the spindle.

5. A metal-working tool comprising a carrier adapted for movement toward and from the work; a stock pivoted in said carrier; a turning-tool adjustably mounted in said stock; and a guide carried by the stock and located opposite said turning-tool.

6. A metal-working tool comprising a carrier; a stock pivoted in said carrier; a spring-actuated plug bearing against the rear wall of said stock; a turning-tool adjustably mounted in the stock; and a guide having its

end projecting beyond said turning-tool and located opposite to said tool.

7. A metal-working tool comprising a carrier; a stock pivoted in said carrier and having a slotted extension; means for permitting said stock to yield upon its pivot; a block adjustably mounted in the stock; a turning-tool secured to the block; and a guide having its end projecting beyond said turning-tool and also carried by the stock.

8. A metal-working tool comprising a shank having a chambered head; a stock pivoted in said head and having a slotted extension; a block; means passing through the slot of the extension and serving adjustably to secure said block thereto; a turning-tool mounted on the block; and a guide carried by the stock and located opposite the turning-tool.

9. A metal-working tool comprising a carrier having a shank and a chambered head; a stock pivoted in said head; a spring-actuated plug against which said stock bears; a block adjustably mounted on the stock and carrying a turning-tool; and a guide carried by the stock and coöperating with said turning-tool.

10. A metal-working tool comprising a shank having a longitudinal chamber; a spring-actuated plug seated in said chamber; a stock pivoted to the head of said shank and bearing against said plug; a turning-tool carried by said stock; and a guide also carried by the stock and located opposite said turning-tool.

11. A metal-working tool comprising a carrier; a turning-tool pivoted therein; and a guide having its end projecting beyond the turning-tool and movable therewith, the construction being such that the tool will first operate upon the work with a relatively deep cut and then operate upon said work with a light or shaving cut.

12. A metal-working tool comprising a shank having a chambered head; a stock pivoted in said head and having a seat; a guide secured to said seat; a block adjustable in the ways of the stock; and a turning-tool carried by said block.

13. A metal-working tool comprising a shank and a chambered head; a stock pivotally mounted in said head; yielding means for normally pressing the stock outward upon its pivot; a block adjustable in ways of the stock and carrying a turning-tool; and a guide located opposite said turning-tool and also carried by the stock.

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Witnesses:

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