

(No Model.)

F. A. PRATT.
TOOL HOLDER.

No. 517,167.

Patented Mar. 27, 1894.

Fig. 1.

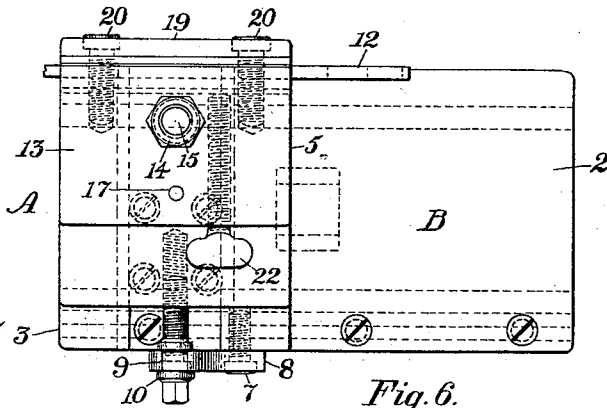


Fig. 5.

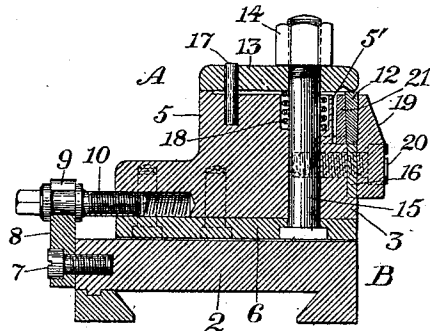


Fig. 6.

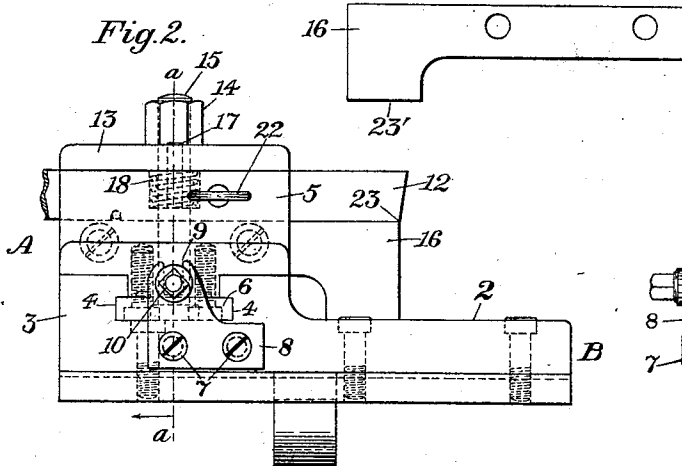


Fig. 7.

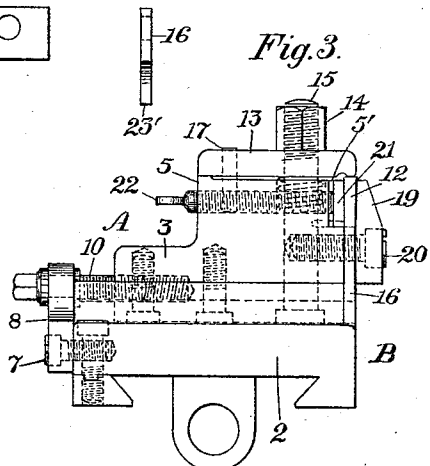


Fig. 2.

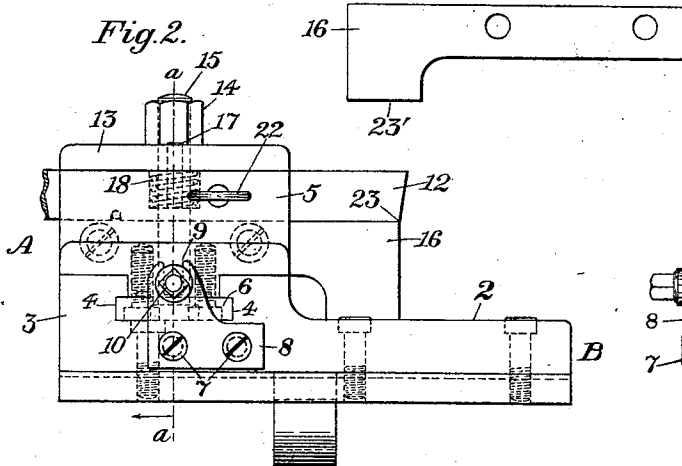


Fig. 3.

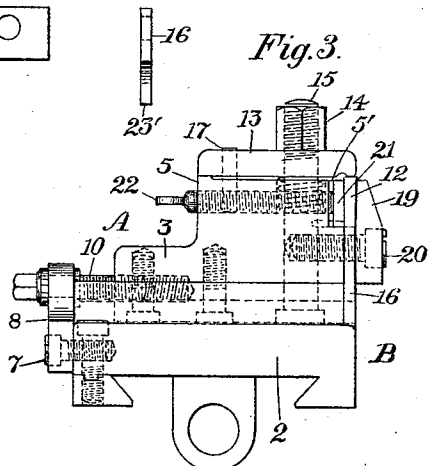


Fig. 4.

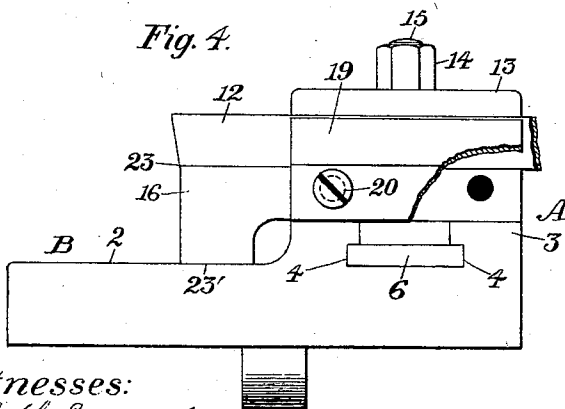


Fig. 8.

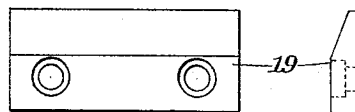


Fig. 9.

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UNITED STATES PATENT OFFICE.

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TOOL-HOLDER.

SPECIFICATION forming part of Letters Patent No. 517,167, dated March 27, 1894.

Original application filed January 23, 1893, Serial No. 459,417. Divided and this application filed July 5, 1893. Serial No. 479,572. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. PRATT, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tool-Holders, of which the following is a specification.

This invention relates to improvements in tool-holders for cutting-off machines, and has special reference to a tool-holder adapted for use in that class of cutting-off machines wherein the work being operated upon is revolved at varying speeds according to the nearness of the cutting-off tool to the axis of rotation of the work, and wherein it is necessary to always re-set the cutting-off tool in the same fixed position with relation to the movement of the carriage, for maintaining the proper relation of the tool to the axis of rotation of the work during the varying movements thereof.

The object of the present invention is to provide a simple, durable and effective tool-holder of such construction that the cutting-off tool will be supported approximately its entire length, and in which the bearing strain during the cutting operation will be carried, mainly, by the tool-block-carriage or rest, to thereby materially relieve the cutter from strain, and also to provide means whereby the said cutting-tool or blade may be quickly re-set in a proper position with relation to the carriage and the work to be operated upon, to correspond with the relative coincident movements thereof, and whereby the said cutting-tool may be removed for re-grinding and quickly re-set in substantially the same relative position to the carriage, so that it will approach the axis of the work with a movement that shall, at all times, bear the same relation to the increasing speed of said spindle.

This application is a division of my application, Serial No. 459,417, filed January 23, 1893, patented August 29, 1893, No. 504,171, for an improvement in cutting-off machines.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of a tool-holder embodying my improvements, the cutting-off tool or blade being shown in a fixed or operative position with

relation to the tool-block and tool-supporting gage. Fig. 2 is a side elevation of the same as seen from below in Fig. 1. Fig. 3 is an end view as seen from the right hand of Fig. 2. Fig. 4 is a side elevation of the same as seen from the right-hand of Fig. 3, a portion of the tool-brace being broken away. Fig. 5 is a vertical cross-sectional view taken on the dotted line $\alpha-\alpha$, and looking in the direction of the arrow in Fig. 2. Fig. 6 is a side elevation of the tool-supporting gage. Fig. 7 is an end view of the gage. Figs. 8 and 9 are side and end elevations, respectively, of the tool-brace.

Similar characters designate like parts in all the figures.

The tool-carrying apparatus is designated in a general way by A, and consists, essentially, of a tool-block carriage or rest, a tool-block supported by, and adjustable with relation to, said carriage, means for adjusting the tool-block with relation to the carriage, a tool-supporting gage carried by the tool-block and having a bearing at its end upon the carriage, a cutting-off tool supported by the tool-supporting gage, and tool-holding clamps and means for securing the cutting-off tool in a fixed position upon the tool-support, as will be hereinafter more fully described.

In detail, in the preferred form thereof herein shown, the tool-block carriage, designated in a general way by B, consists of any suitable sliding carriage capable of being supported upon the bed of the machine, not shown, to have the usual movements toward and from the axis of the work being operated upon, and comprises a main body, or table, 2, which extends beneath the cutting-tool and work being operated upon, and a head, 3, having suitable guides, 4, to receive a tongue, 6, upon the tool-block 5. This tool-block, 5, is supported upon the head, 3, of the carriage in any usual manner to have transverse movements with relation thereto, it having a tongue, 6, which slides between the guides, 4, of the carriage.

Secured to one side of the carriage, by means of lag-screws, as shown at 7, is a tool-block adjusting-screw-bearing-plate, 8, having a bifurcated or slotted upper end, as 9, which receives and supports a tool-block ad-

justing-screw, 10, which has a screw-threaded bearing at its inner end in the tool-block, and is adapted for adjusting the said tool-block laterally with relation to the carriage, the
 5 said adjusting-screw having collars which bear against the inner and outer faces of said bearing-plate. The upper inner edge of the tool-block is cut away as shown at 5', to form a recess for receiving the cutting-off blade 12,
 10 which blade may be of any suitable construction, it being shown in the drawings as a flat, thin blade suitably relieved on the side in a well-known manner, and projecting forward of the tool-block a distance equal to the greatest depth of the cuts to be made by the machine to which said tool-holding device is applied.

On the tool-block, 5, is placed the tool-clamp 13, which is adjustably secured to the tool-block by means of a nut, 14, of a bolt, 15, extending through the said tool-block and clamp, and having a bearing at its head against the under side of said block. This tool-clamp has a bearing at its end (the end shown at
 25 the right-hand in Fig. 5) upon the upper edge of the cutting-off tool, as clearly shown in Fig. 5, and is intended to tightly impinge the tool between it and a tool-supporting gage, 16, secured in a recess formed in the inner face of the tool-block substantially in a vertical line with said tool 12.

In the drawings I have shown but one bolt and nut for adjusting the clamping-plate. It will be obvious, however, that two or more
 35 bolts might be used, if desired. When only one bolt is used, the clamping-plate and tool-block will be vertically recessed at one side of said bolt to receive a pin, 17, which is seated therein to prevent movement of the clamping-plate during the operation of tightening the nut, 14, to secure the tool against vertical movement.

Interposed between the bearing-plate 13 and tool-block 5, is a spiral spring, 18, which
 45 surrounds the bolt 15, and is seated in a recess formed in the upper face of said block. This spring acts to elevate the clamping-plate and release the cutting-tool when the nut 14 is loosened, to permit the cutting-tool
 50 to be readily adjusted to position without removing the clamping-plate from the tool-block.

In the drawings I have shown a brace, 19, which is secured at the outer face of the tool-supporting gage 16 to the bearing-block by means of screws, 20, extending through said
 55 brace and having a screw-bearing in the tool-block. These screws, also, as shown, extend through the tool-supporting gage and secure it in a fixed position upon said block.

The cutting-off tool has a bearing at its outer face against the inner face of the brace 19, and is tightly clamped against lateral movement by means of a clamping-gib, 21,
 60 seated in the recess 5' and bearing against the inner face of said cutting-tool; a thumb-screw, 22, having a screw-bearing in the tool-

block and bearing at its forward end against the gib 21, being provided to tightly impinge the cutting-tool between said gib and brace, 70 the said screw having the usual thumb-piece, which is located outside the block and by means of which it may be turned to clamp the cutting-tool in an adjusted position.

The tool-supporting gage 16 is secured to 75 the outer face of the tool-block, as before stated, and will be of a thickness less than the thickness of the cutting-face of the cutting-tool, and preferably of a thickness coinciding substantially with the thickness of 80 the relieved lower edge of said cutting-off tool, and is projected beyond the inner edge of the tool-block a sufficient distance (substantially the distance of projection of the lower edge of the cutting-off tool) that its 85 outer end may act as a gage by which to locate and set the cutting-off tool in proper position with relation to the carriage. The cutting-off tool, in practice, will be set with its lower corner, 23, contiguous to the outer edge 90 of the supporting-gage, 16, as clearly shown in Figs. 2 and 4 of the drawings. The tool-supporting gage is depressed at its forward end and has a sliding bearing, as at 23', upon the upper face of the table 2 of the carriage, 95 as shown in Fig. 2. By this construction, the entire cutting strain upon the cutting-tool is practically borne by the carriage through the medium of the supporting-gage 16; and inasmuch as the cutting-tool is supported approximately its entire length, it is 100 subjected, in itself, to very little, if any, transverse strain, which is a matter of great import, as it not only obviates vibration heretofore common with tools supported by tool- 105 holders of ordinary construction, but materially obviates breakage consequent to bearing or cutting strains.

By means of my improved construction, it will be seen that the blade or cutting-off tool 110 may be always set, after it has been removed for re-grinding, in substantially the same position relative to the carriage; and when used with a machine wherein the carriage and spindle of the machine are connected to have 115 coincident movements, (as, for instance, in the machine described in my application, Serial No. 459,417, filed January 23, 1893, to which reference may be had,) it follows that by thus always setting the point of the cutting-off tool 120 at the same position of the carriage, the tool will always approach the axis of the work-holding spindle, or work being operated upon, with a movement that shall always bear the same relation to the increasing speed of said 125 spindle.

By recessing the outer face of the tool-block, as shown at 5', and providing the removable side-brace for the cutting-off tool, and clamping the tool-supporting gage between said 130 brace and tool-block, I am enabled, as is necessary, to apply supporting-gages of different thickness to correspond to the different thicknesses of cutting-off tools it is desired to use.

I do not, however, desire to limit myself to this particular construction and arrangement as shown in the drawings.

Having thus described my invention, I claim—

1. In a tool-holder for cutting-off machines, the combination with the carriage, the tool-block and the cutting-off tool carried by said block, of a tool-supporting gage upon said block below and supporting the cutting-off tool approximately the entire length of the projecting end and having a sliding bearing at its lower outer end upon the upper face of the carriage, substantially as and for the purpose described.

2. The improved tool-holder herein described, comprising a carriage adapted to be removably secured to the bed-plate of a machine, the tool-block adjustably secured to said carriage, the cutting-off tool carried by said tool-block, means for clamping said tool in position on said tool-block to prevent movement thereof, and a tool-supporting gage of a thickness substantially equal to the thickness of the relieved edge of the cutting-off tool and supporting said tool approximately its entire length and having a bearing at its outer end upon the upper face of the carriage and acting as a gage whereby the cutter-blade may be set in proper position with relation to the carriage, substantially as described.

3. In a tool-holder, the combination with the carriage and with the tool-block, of the cutting-tool removably secured to said tool-block with its cutting end projecting beyond the inner face of said block, a tool-support removably secured to said tool-block underneath said tool with its outer face in a vertical plane with and extending to the extreme lower outer edge 23 of said tool and having a sliding bearing at the lower outer end thereof upon the upper face of the carriage; means substantially as described whereby said tool may be gaged in its position with relation to

the carriage, and a clamping device for securing said tool in place, substantially as described and for the purpose set forth.

4. In a tool-holder for cutting-off machines, the combination with the carriage, the tool-block adjustable thereon and recessed, substantially as described, to receive the cutting-tool and tool-support, the cutting-tool adjustable in said recess, clamps to bear upon the upper edge and side of said cutting-tool to secure it in a fixed position, and a tool-supporting gage located below the cutting-tool and extending substantially the entire length of the lower edge thereof, which gage is carried by said tool-block and has a bearing at its outer end upon the carriage, substantially as and for the purpose described.

5. A tool-holder, comprising the carriage adapted to be adjustably supported upon the bed of the machine, and having the recess 5' substantially as described, the tool-block movably secured to the carriage, an adjusting device in connection with said carriage and tool-block to adjust the tool-block with relation to the carriage, the tool-supporting gage secured to the tool-block and extending outward therefrom a distance approximately the length of the cutting-tool supported thereby, the cutting-tool 12 having a bearing approximately its entire length, upon the said tool-support, the brace 19 bearing against the outer face of said cutting-tool, the clamping-gib 21 bearing against the inner face of said cutting-tool, and an adjusting-screw therefor, the clamp 13 to bear upon the upper edge of the cutting-tool, means for adjusting said clamp, and a spiral spring interposed between said clamp and tool-block to elevate said clamp when its adjusting device is loosened, substantially as and for the purpose described.

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