No. 622,625. Patented Apr. 4, 1899.

H. HILL.

CUTTING TOOL.

(Application filed Apr. 15, 1897.)

(No Model.)

Fig. 1.

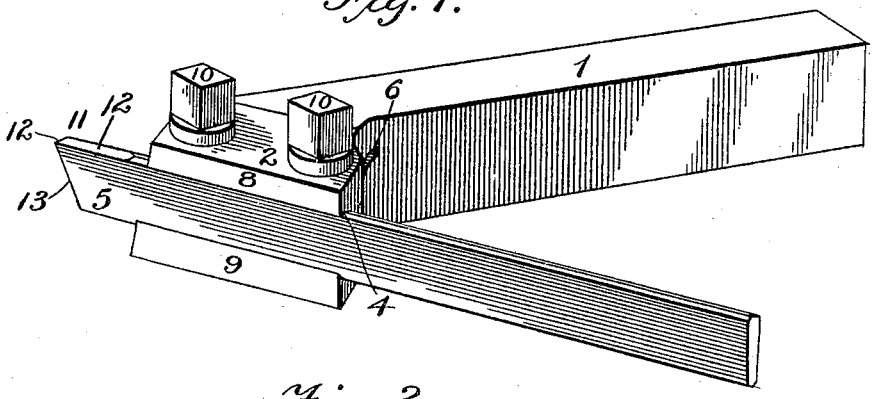


Fig. 2.

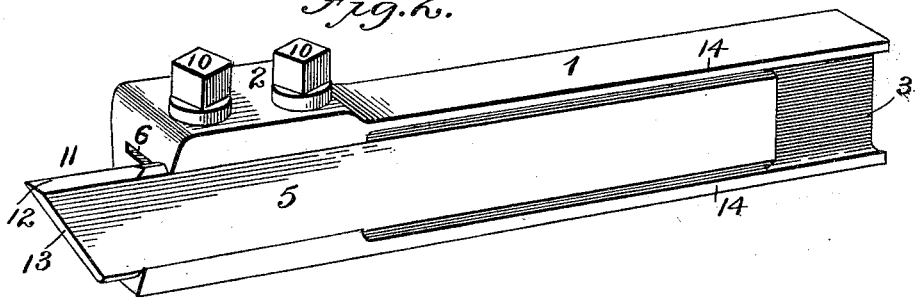


Fig. 3.

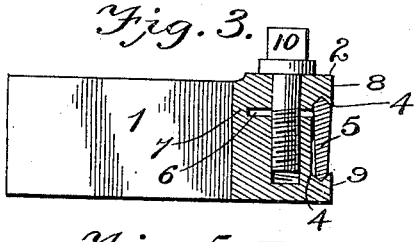


Fig. 4.

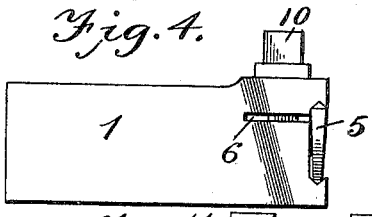


Fig. 5.

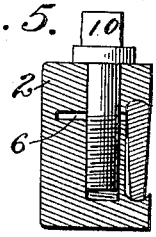


Fig. 6.

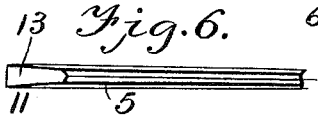
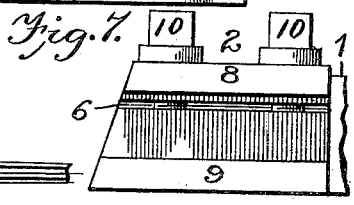


Fig. 7.



Inventor

Hugh Hill.

Witnesses

Edwin G. McKee By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

HUGH HILL, OF ANDERSON, INDIANA.

CUTTING-TOOL.

SPECIFICATION forming part of Letters Patent No. 622,625, dated April 4, 1899.

Application filed April 15, 1897. Serial No. 632,300. (No model.)

To all whom it may concern:

Be it known that I, HUGH HILL, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented a new and useful Cutting-Tool, of which the following is a specification.

My invention relates to cutting-tools for turning-lathes, and particularly to tool-holders which are so constructed with relation to the blades as to insure the rigidity of the latter when supported in the tool-post of a lathe, planer, or similar machine; and the object in view is to simplify and improve the construction of devices of this class, whereby a straight blade, reversible edge for edge and of the cross-sectionally-tapered self-clearing type, may be so held as to cut close to shoulders and chuck-jaws, the blade and holder being devoid of lateral projections, and also to provide a blade and relative construction of holder whereby either a straight or an angular holder may be used.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a perspective view of an angular or bent tool having a holder and blade constructed in accordance with my invention. Fig. 2 is a similar view of a straight tool. Fig. 3 is a transverse section of the blade and holder. Fig. 4 is an end view of the head of the holder, showing the blade-seat. Fig. 5 is a detail transverse section of the head of a holder, showing a slightly-modified construction of seat-walls. Fig. 6 is an edge view of a portion of the blade. Fig. 7 is a face view of the head of the holder.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The holder of the tool embodying my invention comprises a shank 1, adapted to be engaged with the tool-post of a lathe, planer, or similar machine, and a head 2, which may be arranged either at an angle to the line of the shank, as shown in Fig. 1, or in alinement therewith, as shown in Fig. 2, the latter construction, however, necessitating the channeling of the front side of the shank, as shown at 3, for a purpose hereinafter explained.

The head of the tool is provided in its face with a longitudinal blade-seat 4 for the reception of the blade 5, the opposite parallel walls of the seat having double-beveled centering-faces and being preferably concaved to suit the convex double-beveled-edge construction of the blade. This concavity of the walls of the seat may be either V-shaped in section, as shown in Fig. 3, or rounded, as shown in Fig. 5, according to the edge construction of the blade.

In order to secure the blade in the seat, it is necessary to provide a clamping action, which I attain by a relative lateral adjustment of the side walls of the seat, said walls being yieldingly held separated to release the blade and being adapted to be adjusted toward each other, after the insertion of the blade, to produce the necessary frictional contact of said undercut or concaved side walls with the edges of the blade. To accomplish this, the head of the tool-holder is provided with a longitudinal kerf 6, contiguous to the plane of one of said side walls, extending the entire length of the head and in depth approximately equal to that of the head, whereby only a comparatively thin web 7 remains to connect the otherwise separated jaws 8 and 9, which respectively carry said walls of the blade-seat. The inherent resistance and elasticity of the metal holds the jaws normally separated, with the walls or shoulders of the blade-seat at such an interval as to allow the blade to be inserted and removed freely, and in order to relatively adjust said walls or shoulders to clamp the blade when the latter is in the desired position I employ set-screws or collar-screws 10, engaging registering openings in the jaws and adapted to be turned by means of a wrench to properly fasten the blade preparatory to using the tool.

The blade which I prefer to employ in connection with the improved holder to complete the tool is constructed of self-hardening or tool steel, ground slightly narrower at its rear end than at its front end, or, in other words, tapered continuously and longitudinally in thickness from its front or operative end toward its rear end, and in addition to this longitudinal taper the improved blade is cross-sectionally or transversely tapered from its operative edge toward its back edge, or from

the edge at which the point 11 of the tool is arranged toward the opposite edge, and the said operative edge is ground flat contiguous to the point, as shown at 12. This construction of blade gives clearance in operation, and thus enables the tool to perform its function accurately and without unnecessary friction. In sharpening the tool it is simply necessary to grind the beveled face 13 thereof, and also slightly grind the edge contiguous thereto to remove the V or convexity which is provided for engagement with the contiguous wall of the blade-seat.

While, as above described, the blade is cross-sectionally tapered in construction and the walls or shoulders of the blade-seat are of equal projection, the object of the latter being to enable the blade to be reversed, so as to cut in either direction, the concaving of the faces of said walls or shoulders holds the blade accurately centered in the seat, with the exterior surface of the blade at its cutting edge flush with the flat face of the head, and hence the tool may be used for cutting close to a shoulder or to a chuck-jaw.

The construction of the straight tool illustrated in Fig. 2 is identical with that above described, with the exception that the flanges 14, at opposite sides of the channel 3, formed in the shank, are flush with the face of the head, the portion of the blade which projects in rear of the head being thus wholly countersunk in the channel and protected from contact with contiguous portions of the machine.

The object in forming the kerf of the head contiguous to the plane of one of the walls or shoulders of the blade-seat is to reduce the section of the web by which the jaws are connected, and thus enable the adjustment of the jaws to be accomplished with greater facility, and the set-screws extend loosely through the jaw of less section, which is preferably the upper jaw, and engage threaded sockets in the jaw of greater thickness. Furthermore, by arranging said kerf contiguous to one of the walls or shoulders of the blade-seat the necessary length of threaded socket may be formed in the other jaw to resist the strain of the threads of the set-screws without unnecessarily increasing the thickness of the head of the holder.

A specially-important feature of the above-described construction is the interlocking connection between the walls of the tool-seat and the contacting edges of the blade. It will be seen that either the cross-sectionally V-shaped or the cross-sectionally rounded construction of the seat-walls, with a corresponding construction of the blade edges, constitutes a means for transversely centering the tool in the seat and enables me to use tools or blades of different thicknesses and yet secure an accurate centering thereof in the seat. In other words, the seat-walls are transversely beveled to form transversely-centering faces in connection with the double-beveled edges of a blade arranged therein, and therefore the thin or feather edge of a cross-sectionally-tapered blade is as positively and securely held against lateral vibration as is the cutting or operating edge, and tools having different cross-sectional tapers or bevels may be used in the same tool-seat without losing the advantages above indicated. The special advantage of this double cross-sectional beveling of the walls of the tool-seat to receive the correspondingly-beveled edges of the blade resides in the fact that the exterior surface of the blade is thereby held flush with the surface of the tool-head.

I am aware that it is not broadly new to provide such a relative construction of blade and holder as to dispose the outer surface of the blade flush with the face of the holder or the head of the holder; but so far as I am aware it is new to provide such a relative construction of blade and holder as to maintain a cross-sectionally-beveled blade with the outer surface of its cutting edge flush with the face of the holder-head, that it is new to provide such a relative construction of parts that a blade of which the edges have an interlocking connection with the walls of the blade-seat is arranged flush with the face of a holder-head wherein the blade-seat is open-sided, and to provide a holder having an open-sided blade-seat and a reversible cross-sectionally-tapered blade having an interlocking connection with the walls of the seat, the outer surface of the blade at its cutting edge being flush with the face of the holder-head and the blade being reversible edge for edge.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

In a tool for lathes and similar machines, the combination of a holder provided with a head having in the flat face thereof a longitudinally-disposed blade-seat entirely open at its front side, the upper and lower walls of said seat consisting of relatively-movable jaws having formed in their opposing faces longitudinal centering concavities, clamping means for said jaws, and a cross-sectionally-tapered blade having a registering interlocking engagement at its side edges with the concavities of said jaws, said blade being reversible edge for edge, and, when in either of its reversed positions, having the outer surface along the line of its cutting-point flush with the flat face of the holder-head, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HUGH HILL.

Witnesses:
M. E. FITZ GERALD,
EARL REESE.