April 2, 1946. L. H. HOWE 2,397,738

GAUGE FOR GRINDING TOOL BITS

Filed March 20, 1945

FIG. 1.

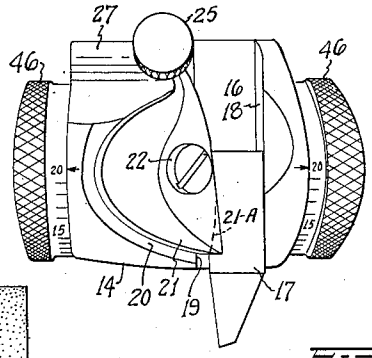


FIG. 10.

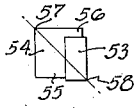


FIG. 2.

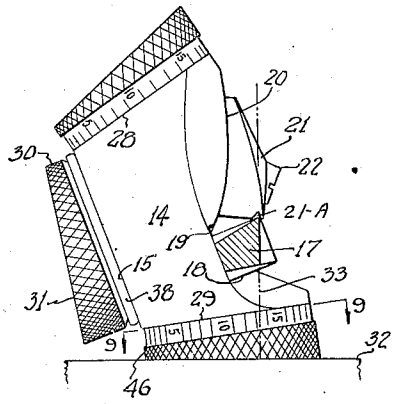


FIG. 5.

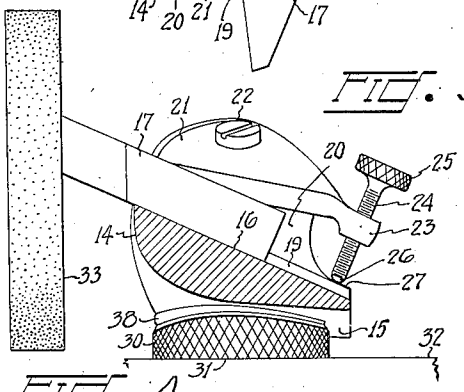


FIG. 8.

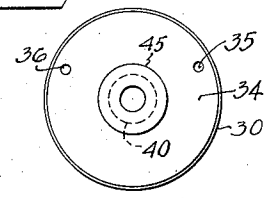


FIG. 4.

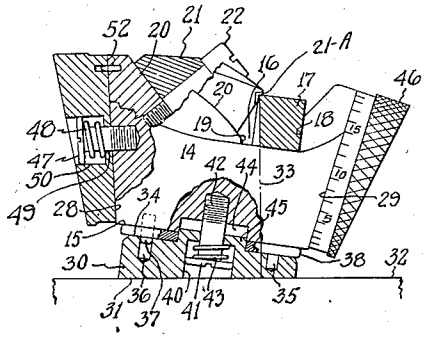


FIG. 3.

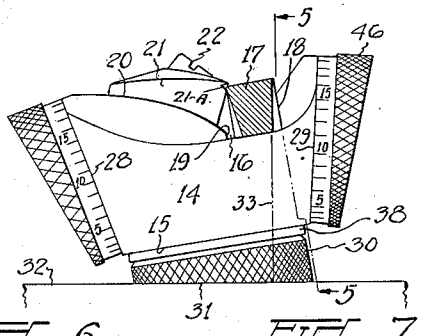


FIG. 6.

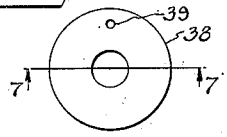


FIG. 7.

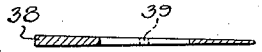
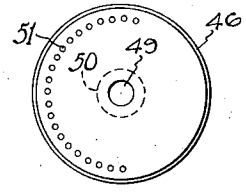


FIG. 9.



INVENTOR
L. H. HOWE

BY E. B. Richenbrenel

ATTORNEY

Patented Apr. 2, 1946

2,397,738

UNITED STATES PATENT OFFICE

2,397,738

GAUGE FOR GRINDING TOOL BITS

Louis H. Howe, Portland, Oreg.

Application March 20, 1945, Serial No. 583,792

5 Claims. (Cl. 51—220)

This invention relates generally to the art of tool grinding, and particularly to the grinding of bits for machine tools such as lathes, planers, shapers, etc.

The main object of this invention is to provide a gauge which will obtain all faces of a bit without removing from gauge, and clamping means for more than one size without set screws and wrenches.

The second object of this invention is to provide an exceedingly simple and efficient form of gauge for holding a tool bit during the grinding thereof whereby the side rake and side and end clearance angles may be established and maintained with the utmost precision by unskilled workmen not especially trained in the tool grinding art.

The third object is to construct a device of the class described which will reduce the tendency for errors in the setting thereof and which will make it possible to grind the various faces of the bit with a single setting of the bit in its holder.

The fourth object is to construct a device of the class described which operates with equal success in grinding right or left handed bits.

The fifth object is to construct a holder of the class described in which there is provided an effective clamping action which will securely hold bits of various sizes in place at all times and which is provided with an adapter whereby bits of square or rectangular cross section can be ground with equal degree of satisfaction.

The sixth object is to so construct the device that any desired angularity may be obtained in order to fit requirements for various types of work and materials by means of interchangeable bases of different angles and index hole positions and spacer washers of different tapers.

These and other objects are accomplished in the manner set forth in the following specification as illustrated in the accompanying drawing, in which:

Fig. 1 is a plan of the device.

Fig. 2 is a side elevation of the device showing same in a position for grinding the side rake of a bit.

Fig. 3 is a side elevation showing the device in position for grinding the side clearance on right hand bits.

Fig. 4 is a view similar to Fig. 1 showing the device set for grinding the side clearance angle on a left hand bit, with parts broken away in section to disclose the inner mechanism.

Fig. 5 is a section taken along the line 5—5 in Fig. 3, showing the parts in position for grinding side and end clearances.

Fig. 6 is a plan of the spacer washer.

Fig. 7 is a section taken along the line 7—7 in Fig. 6.

Fig. 8 is a plan of the base upon which the device rests in the position shown in Fig. 3.

Fig. 9 is a plan of the foot upon which the device rests in Fig. 2.

Fig. 10 is a transverse section through a bit of rectangular cross section showing my adapter therefor.

Similar numerals refer to similar parts throughout the several views.

Referring in detail to the drawing, there is shown a body 14 having the flat bottom face 15 and having a slot 16 formed therethrough to receive a maximum width of bit 17 intended to be held by the device. The side 18 of the slot is normal to the bottom face 15. The side 19 of the slot is parellel to the side 18 and of much lesser height, and merges at its upper edge with the inclined face 20 which is inclined at an angle of 45 degrees with relation to the side 18.

The clamping jaw is mounted on a 45 degree angle for the purpose of holding bits smaller than the maximum without the need of adapters or set screws and wrenches. Quick change from right to left feature is an advantage in grinding forming tools. Once the gauge is set for a machine and material being machined, resharpening is merely a matter of touching up as adjustments remain the same.

Mounted on the face 20 is a bit clamping arm 21 which is pivotal on the screw 22 and is provided with an extension 23 having the clamping screw 24 whose head 25 is preferably knurled. The point 26 of the screw 24 rests upon the ledge 27 formed near the bottom 15.

The sides 28 and 29 of the body 14 are inclined away from the normal relation to the bottom 15. Underneath the bottom 15 is disposed a base 30 which is in the form of a tapering washer whose under side 31 is intended to rest upon the table 32 of a grinder, the position of whose grinding wheel 33 is indicated in the drawing to show its relationship to the device.

The top side 34 of the base 30 is provided with two holes 35 and 36 adapted to register with the pin 37 which is seated in the bottom 15 of the body 14.

Since the base 30 is tapering it follows that the rotation of the base 30 with relation to the body 14 will change its angularity from left to right as shown in Figs. 3 and 4, the purpose being to ac-

commodate the device to the grinding of right and left hand bits.

Interchangeable bases and washers of various taper are provided for the purpose of changing the side and end angles to meet a given requirement.

One or more tapering washers 38 may be provided and any one of which, inserted between the base 30 and the bottom 15 for the purpose of varying the end clearance angle to meet a given requirement. The washer 38 is provided with one hole 39 only, since the taper of the washer 38 represents the amount of end clearance angularity which is added.

The base 30 is provided with a counter-bore 40 which receives the head 41 of a bottoming screw 42, which is threaded into the body 14. A spring 43 is inserted between the screw head 41 and the bottom of the counter-bore 40. The body 14 is provided with a recess 44 which receives a boss 45 surrounding the screw 42 and serves to center the base 30 with relation to the body 14.

The purpose of the spring 43 is to permit the base 30 to be drawn away from the body 14 sufficiently far to disengage the pin 37 from a hole 35 or 36 and permit the relative rotation of the members 14 and 30 for right and left hand side clearance grinding.

In Fig. 2 it will be noted that the device is turned over on its side. That is, a face 29 rests upon the calibrated tapering side-raker foot 46 having a screw 47 and spring 48 for yieldably holding the same against the face 29.

The foot 46 is provided with a central opening 49 for the screw 47 and the counter-bore 50 for the head of the screw 47. The foot 46 is also provided with an arcuate row of index holes 51 adapted to engage the index pin 52 which is mounted on the body 14 and projects from the face 29.

It can be seen that in this position, the side rake can be obtained and maintained with the utmost accuracy and no resetting of the bit is required for grinding the various faces.

In Fig. 10 there is shown a bit 53 of rectangular cross section. It follows that since the angle of the face 20 with relation to the face 18 is 45 degrees that such a bit could not be satisfactorily held with my device. I have therefore provided an adapter 54 which is in the form of an angle jaw whose side 55 is thicker than the side 56 so that the corner 57 will lie in a diagonal line running through the corner 58 of the bit 53. It is merely necessary to select a jaw 54 which when placed upon a given bit will form a square on the exterior faces of the jaw and bit.

It is desirable to curve the groove 21—A in the arm 21 as shown in Fig. 1 in order that the point of contact with the tool bit 17 may be held at an approximately fixed position with various bit sizes.

Attention is drawn to my Patent No. 2,365,759 over which the device described herein is an improvement.

I claim:

1. A device of the class described consisting of a body having means for clamping a tool bit therein, a revolvable tapering base mounted under said body having means for holding same in one of two positions, said body having opposite faces formed thereon inclined away from a line normal to the bottom of said body, each of said faces having a tapering foot revolvably mounted thereon, the taper on said foot and the inclination of its engaging base being equal, and means for indexing each of said feet through one-half of its circumference whereby the outer face of a foot may be turned to a plane normal to the bottom of said body or away therefrom at an angle double the degree of taper of said foot or in any indexed intermediate position.

2. A device of the class described consisting of a body having a tapering base revolvably mounted on the under side thereof, including means for limiting the relative positions thereof to one or the other of two opposite positions, means for clamping a tool bit across said body in inclined relation to the bottom thereof between its tapering sides, and a tapering spacer washer interposed between said body and base, with means for limiting said spacer washer to one position.

3. In a device of the class described, a body having a flat bottom side and having a slot formed therethrough, the bottom of which is inclined with relation to the bottom of said body, one side of said slot being inclined at an angle of approximately 45 degrees with relation to the bottom of said slot, and a clamping jaw pivotally mounted on said side, said clamping jaw having a clamping screw disposed thereon adapted to engage said body and cause the opposite end of said clamping jaw to engage a tool bit disposed within said slot, and to exert a pressure against same diagonally across opposite corners of said bit.

4. A clamp for a tool bit holder consisting of a body having a slot therein for the reception of a square bit, one side of said slot being inclined along a plane parallel to a plane which intersects the diagonally opposite corner of said bit, a clamping jaw pivotally mounted on said inclined face having one end notched to engage a corner of said bit and the opposite end provided with a clamping screw, the end of said clamping screw engaging said body whereby the tightening of said screw against said body will cause the notched end of said clamp to bear against said bit.

5. A holder for grinding tool bits consisting of a body having a flat underside, and having an inclined slot formed across same from the upper side, one side of said slot being normal to the plane of the underside of said body and the other side of said slot being inclined in a plane 45 degrees from the normal side of said slot, a clamping jaw pivotally mounted on the inclined side of said slot having a notch therein adapted to swing in a plane intersecting the junction of said normal side and slot bottom, the end of said clamping jaw opposite its grooved end having a clamping screw mounted thereon adapted to engage the lower portion of said body member.

LOUIS H. HOWE.