Jan. 14, 1947. H. L. BLOOMINGBURG 2,414,285

WORK SUPPORTING ATTACHMENT FOR GRINDING MACHINES

Filed June 27, 1944 2 Sheets-Sheet 1

Fig. 1.

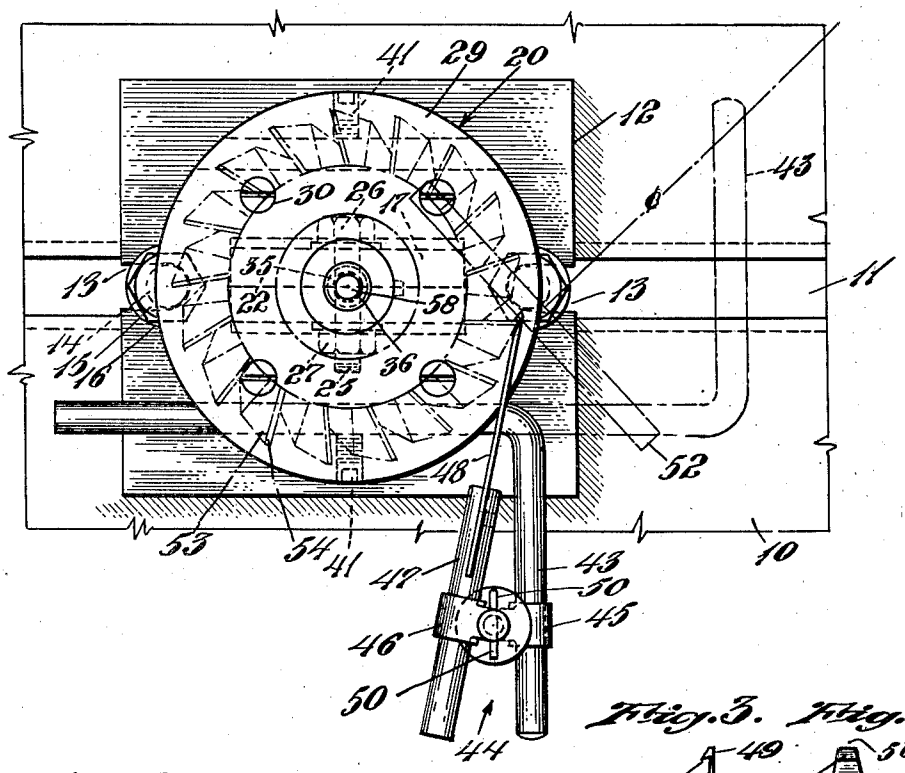


Fig. 2.

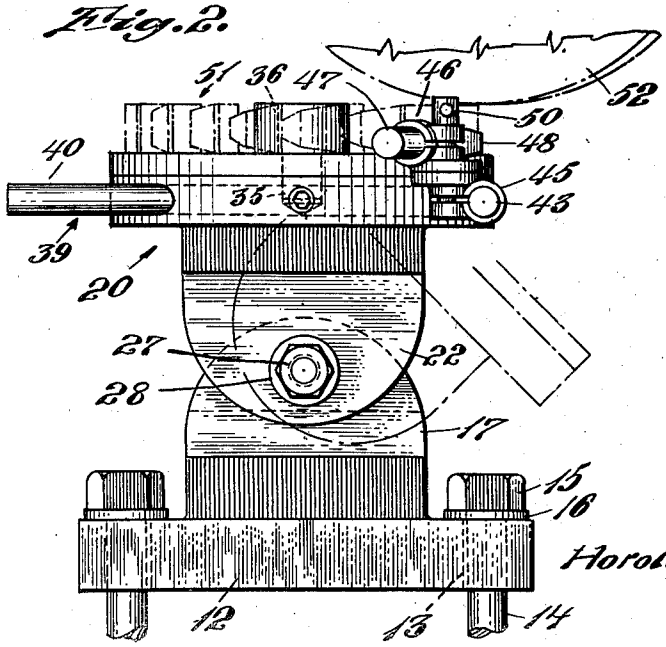
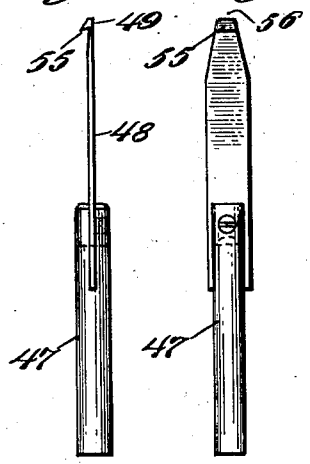


Fig. 3. Fig. 4.



INVENTOR
Harold L. Bloomingburg.
BY Barlow & Barlow
ATTORNEYS

Jan. 14, 1947. H. L. BLOOMINGBURG 2,414,285

WORK SUPPORTING ATTACHMENT FOR GRINDING MACHINES

Filed June 27, 1944 2 Sheets-Sheet 2

Fig. 5.

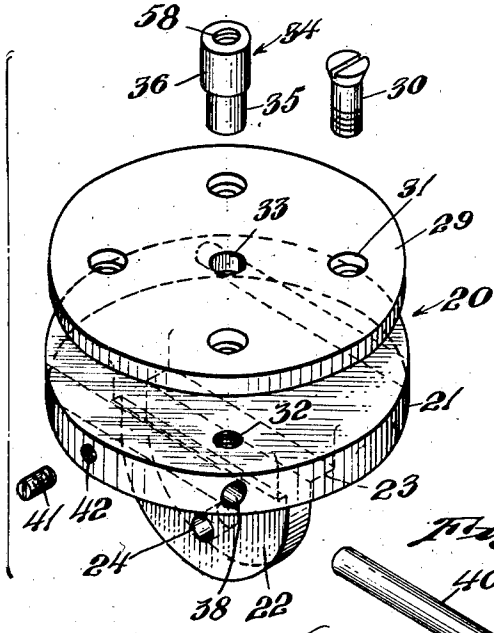


Fig. 7.

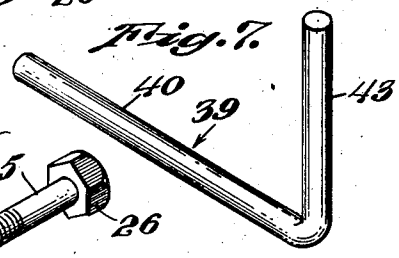


Fig. 6.

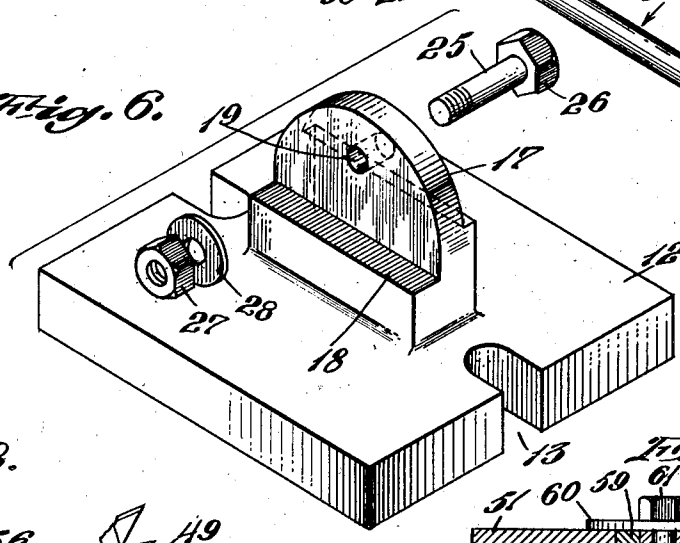


Fig. 8.

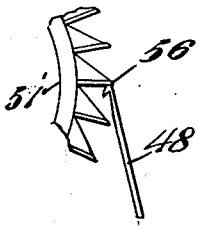


Fig. 9.

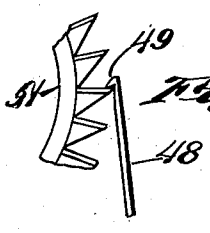
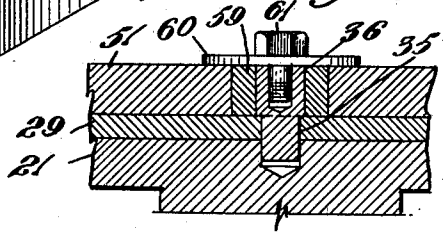


Fig. 10.



INVENTOR

Harold L. Bloomingburg

BY Barlow & Barlow

ATTORNEYS

Patented Jan. 14, 1947

2,414,285

UNITED STATES PATENT OFFICE

2,414,285

WORK SUPPORTING ATTACHMENT FOR GRINDING MACHINES

Harold L. Bloomingburg, Warwick, R. I., assignor to Lincoln Machine Co. Inc., a corporation of New York

Application June 27, 1944, Serial No. 542,397

3 Claims. (Cl. 51—225)

1

This invention relates to an attachment for supporting such work as a mill or cutter which is sharpened by a grinding operation.

A tool, mill or cutter requires frequent sharpening by a grinding operation and many adjustments are necessary in order that different shaped teeth may be properly backed off or ground. Further, an indexing of the cutter so that all of the teeth may be the same is necessary. Certain clearances are also needed and many machines do not have sufficient adjustability to permit of the grinding of such cutters without the use of an attachment on the machine.

One of the objects of this invention is to provide an attachment for mounting the work which will be of simple and economical construction and yet will permit the desired adjustments for operation upon the cutter teeth.

Another object of the invention is to provide an arrangement so that the work may be rotated to different indexed positions without disturbing any of the adjustments, thus requiring merely flexing of an index arm.

Another object of this invention is to provide an arrangement whereby the index arm will be adjusted with the work as it is adjusted to position.

Another object of the invention is to provide an index arm which may engage the work whether indexed in a clockwise or a counterclockwise direction, thus enabling the adjustment of the index arm to take place from the most convenient location.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a top plan view of the attachment which is the subject of this invention illustrating the work and grinding wheel in broken lines in position;

Fig. 2 is an elevation of the structure shown in Fig. 1 and illustrating in broken lines the work in position thereon and the grinding wheel in its relation to the work;

Fig. 3 is a view of the index arm;

Fig. 4 is an elevation thereof;

Fig. 5 is an exploded perspective view of the work carrying member;

Fig. 6 is an exploded perspective view of the base of the attachment;

Fig. 7 is a perspective view of a bracket for carrying the index arm;

Fig. 8 is a fragmental view illustrating work

2

of one shape as engaged by the end of the index arm;

Fig. 9 is a view similar to Fig. 8 illustrating work of a different shape engaged by the hook of the index arm; and

Fig. 10 is a sectional view of a modification showing a bushing for mounting the work.

In proceeding with this invention I provide a base and a member which is rockably mounted on that base, which member supports the work and may be adjusted to various positions with reference to the base. I also provide a bracket which is mounted in the work carrying member and is adjustable therewith and upon which bracket a flexible index arm is mounted, the arrangement being such that the work may flex the arm in moving from one indexed position to another, by which arrangement the work may be easily, quickly, and conveniently supported and moved to the different positions desired without loosening any of the parts after they have once been set in position. The attachment may be readily mounted upon the reciprocating table of a machine tool such for instance as a grinder.

With reference to the drawings 10 designates a fragmental portion of a reciprocating table of a grinder in which there is present an undercut or inverted T-shape groove 11. The base 12 of the attachment is notched as at 13 and may be clamped to the table 10 by bolts 14 extending up through these notches, the heads of which bolts are located in the groove 11 and which are provided with nuts 15 engaging washers 16. Integral with and projecting upwardly from the base 12 there is an arcuate mounting fin 17 provided with a shoulder 18 and which has a pivotal opening 19 therethrough.

A work carrying member designated generally 20 and shown in perspective in Fig. 5 has a plate portion 21 with an arcuate fin 22 projecting downwardly from this plate portion and provided with a shoulder 23 and pivotal opening 24. The openings 19 and 24 are in registry and receive the pivotal bolt 25 which passes through these openings and is provided with a head 26 at one end and engaged by a nut 27 and washer 28 at the other end to rockably mount the member 20 on the base 12. The shoulder 18 will engage the arcuate surface of the fin 22 to limit the pivotal movement of the work carrying member 20. The plate 21 has superimposed upon it a hardened plate 29 which is attached to the plate 21 by means of bolt 30 passing through opening 31 in the plate 29 and threaded into openings 32 in plate 21. A central opening 33 receives a stud 34,

having a portion 35 to fit the opening 33, while the portion 36 may receive bushings of varying diameters, such as 59 in Fig. 10, to accommodate the central opening of work which may vary in size.

At a point removed from the center of the plate 21 there is an opening 38 parallel to the surface of the plate 21 and parallel to the plane of the fin 22 and extending as a cord with reference to the circumference of the plate. A bracket, designated generally 39 and shown in perspective at Fig. 7, has one arm 40 in said opening and is held therein by a set screw 41 extending through the opening 42 in the edge of the plate 21. An arm 43 at right angles to the arm 40 provides an L-shape for the bracket 39 and serves as a suitable mounting for the clamp 44, see Fig. 1, which has a portion 45 engaging the arm 43 and a portion 46 for the reception of the index arm 47 which is equipped with a resilient work engaging blade 48 as a part thereof provided with a hook-shape end 49. By means of this member 44, the parts 45 and 46 which are swivelly mounted, may be clamped in position by a handle portion 50 of a nut whereby I am enabled to position the index arm in many varying positions which I may require. The bracket may be swung from the position shown in Fig. 1 in full line to the position shown in dotted line in Fig. 1 should it be desired to operate the index arms 47 from a different position.

The work is designated generally 51 and the grinding wheel is shown and indicated fragmentally or partially as at 52. The work in this particular instance is a mill or cutter and it may be assumed that it is desired to back off the teeth designated 53 along the surface 54 at the edge of each of the teeth. Although the member 20 may be adjusted about the rockable member 25 as shown in Fig. 2 in broken lines, for the particular operation which I have designated this adjustment will be required only to the extent that the teeth pitch from their outer point inwardly toward the center. To set up this work the cutter will be mounted upon the stud 34 with this inclination provided for. The work table 10 will then be reciprocated so that some point upon the wheel 52 will travel over the tooth in line with the edge of the tooth. The grinder wheel may then conveniently be dropped upon the work to hold it while the index arm is adjusted so as to engage the work such as shown in Fig. 1. In this particular instance the abutment portion 55 of the hook 49 will engage the face of the tooth which is to be worked upon. The grinding wheel itself will be adjusted so that the proper concavity will be provided for the surface ground and for this purpose will be located somewhat at an angle to the path of travel of the table 10. The table will then be reciprocated while the grinding wheel 52 is operating to take off small cuts until the proper surface is attained. It will then be merely necessary to rotate the work clockwise as shown in Fig. 1 that the hook will spring past the next tooth and may after springing past the tooth be rotated to engage the abutment surface 55 when the operation will be repeated

upon this tooth. In this manner all teeth will be treated the same and the proper back off provided.

In cases where a cutter 51' having teeth shaped in the opposite direction is to be ground the forward end of the blade 56, such as shown in Fig. 8, would be utilized to engage the face of the tooth for indexing and the cutter would be rotated in a counterclockwise direction from one tooth to the other as shown in Fig. 8 utilizing the flexing of the blade 48 for this convenient purpose.

It will be readily apparent that the base of the attachment may be readily secured upon the table of a machine tool, the work carrying member 20 adjusted to the proper angle while carrying the index arm and that the index arm may be conveniently positioned after this work is set up and held in position and operation immediately and in a simple manner commenced. Complicated adjustments of the index arm is avoided by reason of its being carried by the work carrying member. Further by having the index member resilient and provided with a hook the index member may be operated from a convenient location relative to the machine tool upon which the attachment is mounted and it is unnecessary to swing the bracket whether the cutters are right-hand toothed or left-hand toothed such as shown in Fig. 8 or 9 thus simplifying adjustment and speeding up operation and results.

If it is desired to place work having a size different than the stud 34, it will be merely necessary to place a bushing 59, see Fig. 10, about the stud to accommodate the work having a larger opening. If it is desired to secure the work in position it is merely necessary to place a washer 60 on the stud which will overlap the work and thread a bolt 61 into the stud which has a threaded opening 58 to receive it.

I claim:

1. A work supporting attachment comprising a base, a work carrying member rockably mounted on said base and carrying a stud for pivotally mounting the work, and an index arm for the work carried by said member to rock with the member in its adjustment on said base, said arm having a hook shaped end to engage the teeth of the work on the side distant from its support.

2. A work supporting attachment comprising a base, a work carrying member rockably mounted on said base and carrying a stud for pivotally mounting the work, and a resilient index arm for the work carried by said member to rock with the member in its adjustment on said base and permit the work to be rotated in one direction by flexing of said arm, said arm having a hook shaped end to engage the teeth of the work on the side distant from its support.

3. A work supporting attachment comprising a base, a work carrying member thereon, and an index arm for the work mounted thereon, said arm being resilient and having a hook shaped end to engage the teeth of the work on the side distant from its support.

HAROLD L. BLOOMINGBURG.