Sept. 14, 1948. T. ECKERT 2,449,459

PERFORATOR GRINDING FIXTURE

Filed March 30, 1946 3 Sheets-Sheet 1

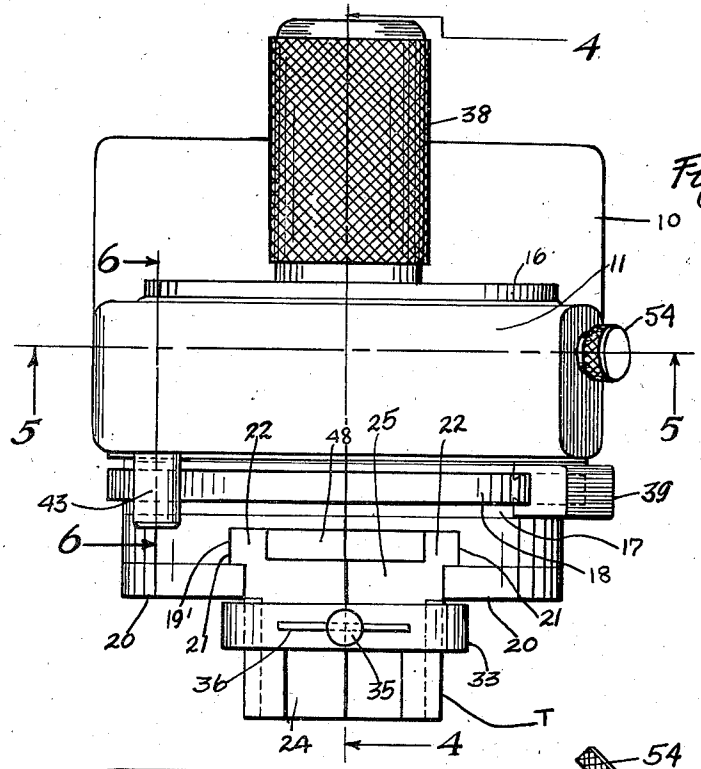

Fig. 1.

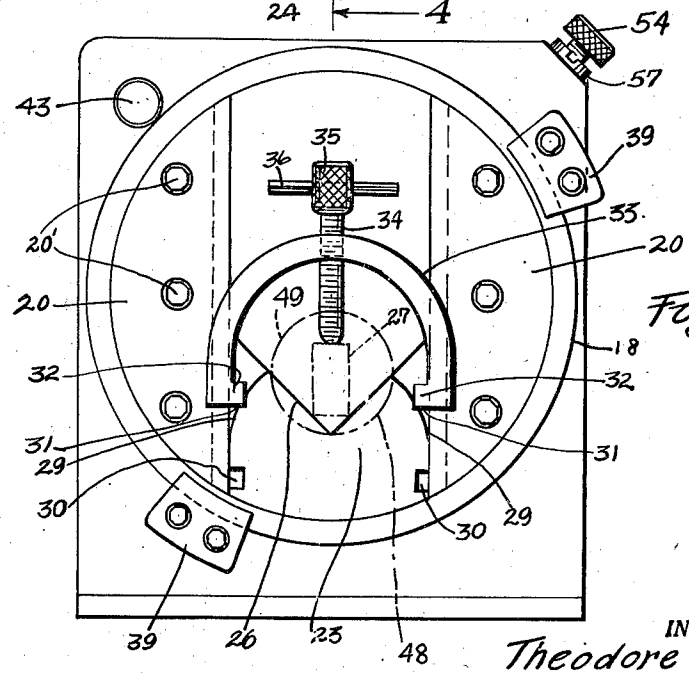

Fig. 2.

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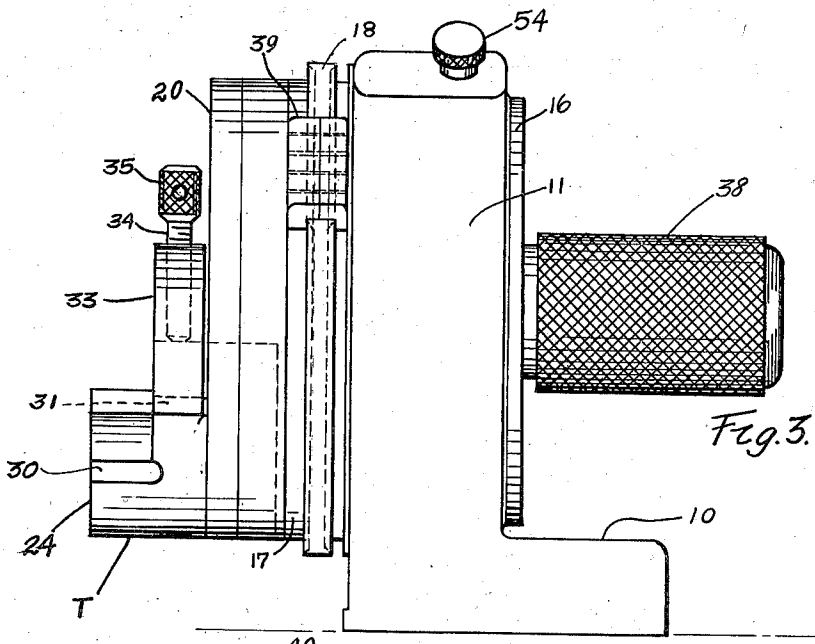

Fig. 3.

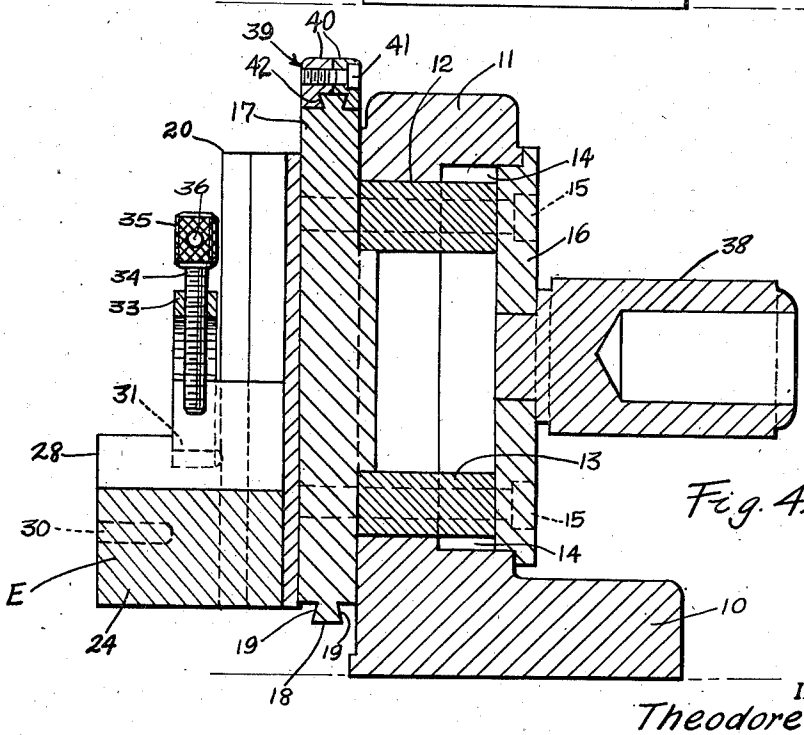

Fig. 4.

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PERFORATOR GRINDING FIXTURE

Filed March 30, 1946 3 Sheets-Sheet 3

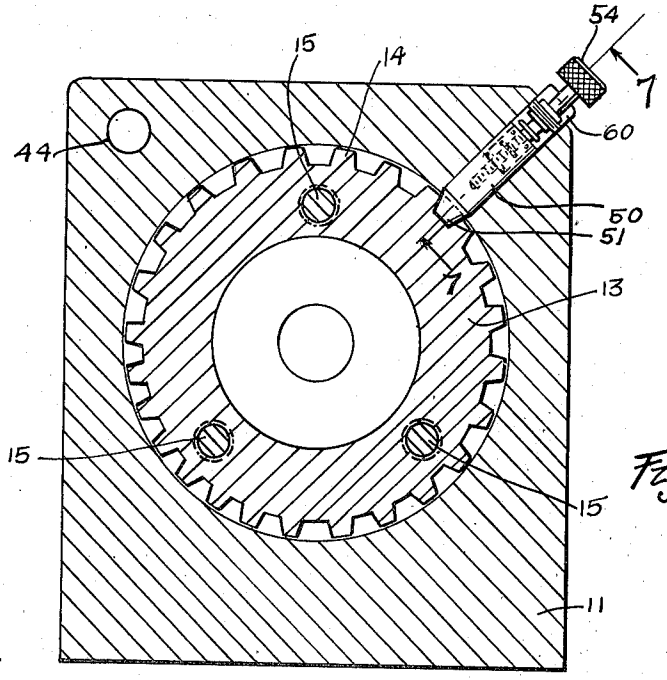

Fig. 5.

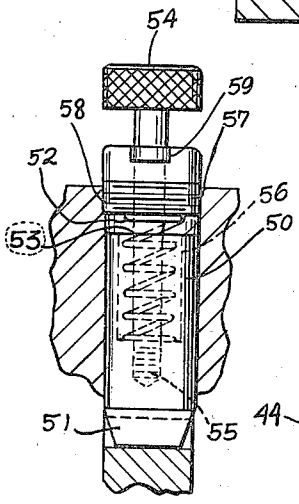

Fig. 7.

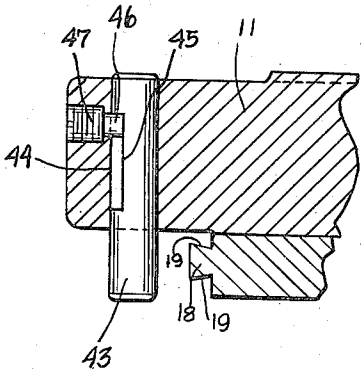

Fig. 6.

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2,449,459

UNITED STATES PATENT OFFICE

2,449,459

PERFORATOR GRINDING FIXTURE

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Application March 30, 1946, Serial No. 658,529

2 Claims. (Cl. 51—217)

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This invention relates to certain new and useful improvements in a perforator grinding fixture and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

Among the salient objects of the invention is the provision of a fixture for holding a perforator tool in grinding relation with respect to a grinding wheel for shaping the tool to the desired form wanted for the perforating operation. It is aimed to accomplish this object by a fixture which is simple in construction, of easy operation, and capable of mounting upon the table of a grinding machine in a manner such that the operator may with the maximum degree of accuracy grind the tool to the desired form.

A still further and equally important object of the invention is the provision of means affording mounting of the tool in the fixture with the minimum degree of effort upon the part of the operator.

In grinding a perforator tool to the proper shape or configuration, the tool must of necessity be turned in different positions about its long axis. If this is done by holding the tool in the hand or upon a rest, with the tool in contact with the grinding wheel, the result is invariably a configuration which in spots is distorted, broken down, or uneven. By the use of the fixture embodying this invention, the tool is not only securely held in place during the grinding operation, but it is also capable of being revolved or rotated to bring the surfaces thereof into contact with the grinding wheel so that the surfaces may be properly ground to conform to the desired configuration. For example, it may be desired to bevel the long edges of the tool, or it may be desired to round these edges or otherwise grind them to a shape to conform to the desired shape of the perforation. By the use of my fixture, the perforating tool may, with the minimum degree of effort on the part of the operator, be revolved into any one of a number of positions to grind the tool to a proper shape or configuration.

A still further and equally important object of the invention is the provision of a gauging device to facilitate grinding or beveling the edge of the perforator tool to a desired degree, and which gauging device may be optionally operated during the grinding operation.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

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The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a plan view of the perforator grinding fixture embodying the invention;

Fig. 2 is an elevational view of the same;

Fig. 3 is an elevational view of the same opposite to that shown in Fig. 2;

Fig. 4 is a sectional detail view taken substantially on line 4—4 of Fig. 1;

Fig. 5 is a sectional detail view taken substantially on line 5—5 of Fig. 1;

Fig. 6 is a fragmentary sectional detail view taken substantially on line 6—6 of Fig. 1;

Fig. 7 is a fragmentary sectional detail view taken substantially on line 7—7 of Fig. 5.

The several objects of my invention are accomplished by the preferred form of construction shown in the accompanying drawings.

In this connection, my improved perforator grinding fixture includes a base plate 10 which is adapted to be mounted upon a magnetized table of a grinding fixture and held firmly thereby in proper grinding relationship with respect to the grinding tool or wheel.

This base plate 10 has extending upwardly therefrom a mounting plate 11 within which there is mounted a tool holding mechanism now to be described. This mounting plate 11 has its central portion removed to provide a transverse opening 12 within which is rotatably arranged an index plate 13, the peripheral edge of which is provided with a plurality of teeth 14 for reasons hereinafter set forth. Projecting through this index plate 13 are bolts 15 which connect a back plate 16 to a face plate 17, the peripheral edge of which is provided with a rib 18 and the sides 19 of which rib are undercut to provide opposite dovetailed grooves. This face plate 17 is provided with a vertical recessed portion 19', and this face plate 17 provides, together with clamping plates 20, opposite parallel vertical grooves 21 which are adapted to receive the rib portions 22 of a work holder generally indicated at T, the said plates 20 being secured to the face plate 17 by screws 20'.

The work holder comprises a vise structure 23 comprising a bed plate 24 having an inner end portion 25 providing the rib portions 22 hereinbefore referred to. This bed plate 24 has a V-shaped valley 26 formed in its top surface, and in which valley the tool 27 to be ground is positioned. The outer end portion E of the bed plate 24 is reduced as at 28 for reasons which will be more apparent hereinafter.

On each side 29 of the bed plate 24, there are provided spaced parallel grooves 30 and 31 to receive the inturned end portions 32 of a holding yoke 33. This yoke 33 provides a clamping screw 34 having a head 35 provided with a finger bar 36 whereby to facilitate screwing the clamping screw 34 relative to the yoke 33 against the tool 27 to be ground.

In Fig. 2, the inturned ends 32 of the yoke 33 are shown mounted in the upper of the grooves 31. Should a tool of relatively short height or width be placed upon the bed plate 24, in order to bring the clamping screw 34 into contact therewith, the end portions of the yoke 33 may be slid out from the grooves 31 and mounted in the grooves 30, thus disposing the yoke in close proximity to the work mounted on the reduced portion 28 of the bed plate 24.

To the back plate 16 is secured a handle 38 whereby to rotate the work holder T axially with respect to the mounting plate 11 and in order to provide means for limiting the rotation of the work holder T, I provide suitable limiting or locating blocks 39. These blocks 39 comprise complementary sections 40 secured together by means of bolts 41 and providing together a dovetailed groove 42 adapted to receive the rib 18. Cooperating with these limiting or locating blocks 39 is a blocking pin 43, more clearly shown in Fig. 6. This pin 43 is slidable in a transverse opening 44 formed in the mounting plate 11 and is provided with a groove 45 extending longitudinally of the pin 43. Engaging in this groove 45 is the stud 46 of a set screw 47, the arrangement being such that the set screw 47 may be utilized to clamp the blocking pin 43 in an operative position in the path of movement of the limiting or locating blocks 39. On the other hand, when it is not desired to employ the limiting or locating blocks 39, the pin 43 may be projected through the opening 44 out of the path of the blocks 39 and be clamped in this inoperative position by the set screw 47.

To complete the work holder T, I provide at the inner end portion thereof a recess 48, which recess is adapted to accommodate the head 49 of the perforating tool being subjected to the grinding operation.

In Figs. 5 and 7, I have illustrated a latch structure for latching the index plate 13 against rotation so that the index plate 13 and the work holder may be latched in a predetermined position. Any form of latching means may be employed for this construction, but for the purpose of this disclosure the present latching means comprises a latch bolt 50 having a tapered end portion 51 adapted to fit in the space between adjacent teeth of the teeth 14 as shown in Fig. 5. This latch bolt 50 is projected in such position by means of an expansion spring 52 embracing the shank 53 of a head-bearing screw 54, the screw 54 being threaded into the latch bolt 50 as at 55. This spring 52 is seated in a counterbore 56 formed in the bolt 50 and the upper end portion thereof bears against a plug 57 threaded into the upper end portion of the opening 58 in which the latch bolt 50 operates, the opening 58 being formed in the mounting plate 11. This plug 57 on opposite sides of the shank 53 provides notches 59 which are adapted to receive the end portions of a crossbar 60 formed as an integral part of the shank 53. The arrangement is such that when the latchbolt 50 is projected into operative engagement with the index plate 13, the crossbar 60 will be disposed

in the transverse notches 59 provided by the plug 57. On the other hand, when it is desired to release the index plate 13 for free rotation, the latch bolt 50 is moved outwardly relative to the mounting plate 11 against the action of the spring 52 so as to permit partial rotation of the shank 53 to dispose the ends of the crossbar 60 in the notches 59, whereby to releasably latch the latch bolt 50 from engagement with the index plate 13, thereby permitting the index plate 13 to be rotated freely by manipulation of the handle 38.

It is intended that the adjacent center lines between the teeth be equivalent to 1 degree of a circle, so that the index plate 13 may be rotated through any number of degrees of a circle. For example, should it be desirable to bevel the edge of a perforating tool at an angle of 45°, the index plate may be rotated to a position to rotate the edge thereof to project the tool into operative engagement with the grinding wheel at the desired angle, and in such position the index plate 13 will be latched through the medium of the latch bolt 50.

In using the perforating grinding fixture as illustrated in the drawings and as described herein, the yoke 33 is elevated with respect to the bed plate 24 in the desired position by mounting the inturned ends 32 in either of the grooves 30 or 31. The work 27 is then mounted in the valley of the bed plate 24 with the head, if any, thereof positioned in the recess 48. The clamping screw 34 is then manipulated through the finger bar 36 to bear down upon the work 27 and firmly clamp the work 27 upon the bed plate 24. The fixture is now moved in position to engage the grinding wheel and, if required to bring the work 27 into grinding operation with respect to the grinding wheel, the work holder T may be adjusted vertically with respect to the clamping plates 20 and clamped in a proper elevated position with respect to the grinding wheel.

Assuming that it is required to round the opposite long edges of the work 27, to accomplish this operation the operator releases the index plate 13 for free rotation and by manipulating the handle 38 rotates the work holder about its axis so as to bring into operative relation with the grinding wheel the edge to be rounded.

Assuming that it is desirable to taper the long edge of the tool 27 at a predetermined degree, the operator in such case will then adjust the index plate 13 to the desired degree, latching it in that adjusted position by means of the latch-bolt 50. In the grinding operation, the rotation of the work holder may be limited by the cooperation of the blocks 39 and the blocking pin 43, the limit of rotation of the work holder T being governed by the position of the blocks 39 upon the rib 18. The foregoing are examples of the use to which my improved perforated grinding fixture may be put.

From the description herein, taken in connection with the accompanying drawings, it will be seen that the fixture is of a simple construction, of easy operation, and that it affords the maximum accuracy in the shaping or grinding of the perforating tool.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such varia-

tions and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A perforator grinding fixture including a base plate for mounting the fixture on the table of a grinding machine, a mounting plate extending upwardly from the base plate and having a transverse opening formed therein, an index plate rotatably mounted in said opening, a face plate secured to said index plate, a back plate secured to said index plate, a work holder adjustable relative to said face plate, a handle on the back plate for rotating said index plate and said work holder about an axis transversely of said mounting plate, means for limiting the degree of rotation of said index plate and said work holder, said last-named means including limiting blocks adjustably carried by the face plate and a blocking pin movably carried by the mounting plate and movable into the path of movement of said limiting blocks.

2. A perforator grinding fixture including a base plate for mounting the fixture on the table of a grinding machine, a mounting plate extending upwardly from the base plate and having a transverse opening formed therein, an index plate rotatably mounted in said opening, a face plate secured to said index plate, a back plate secured to said index plate, a work holder adjustable relative to said face plate, a handle on the back plate for rotating said index plate and said work

holder about an axis transversely of said mounting plate, means for limiting the degree of rotation of said index plate and said work holder, said last-named means including limiting blocks adjustably carried by the face plate and a blocking pin movably carried by the mounting plate and movable into the path of movement of said limiting blocks, and means for latching said index plate and said work holder against rotation relative to said mounting plate.

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