Nov. 7, 1939. C. P. NIEDER ET AL 2,178,937

TOOL SHARPENER

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Fig. 1.

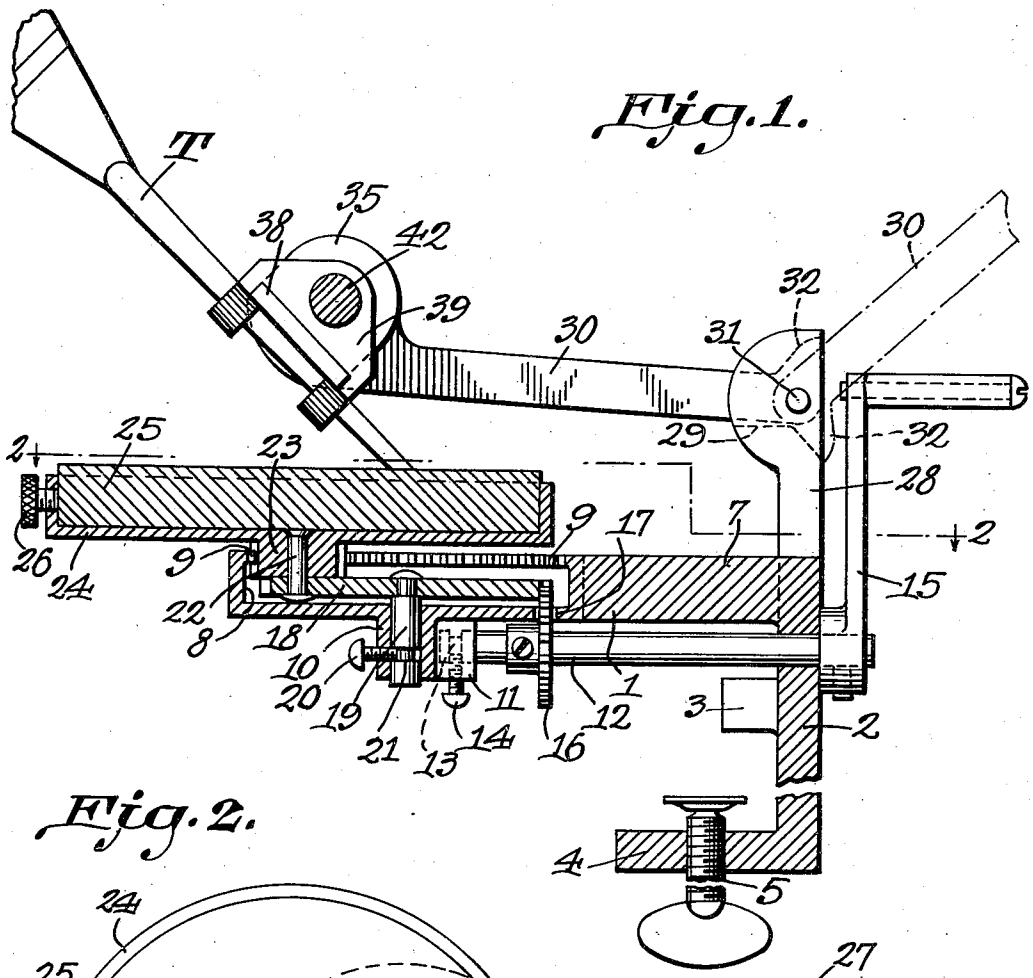
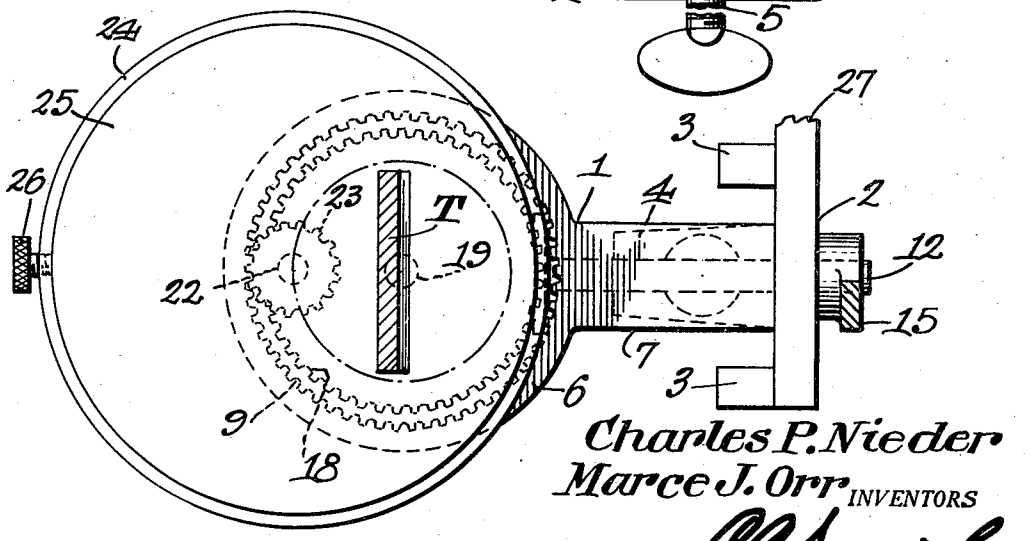


Fig. 2.



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Fig. 3.

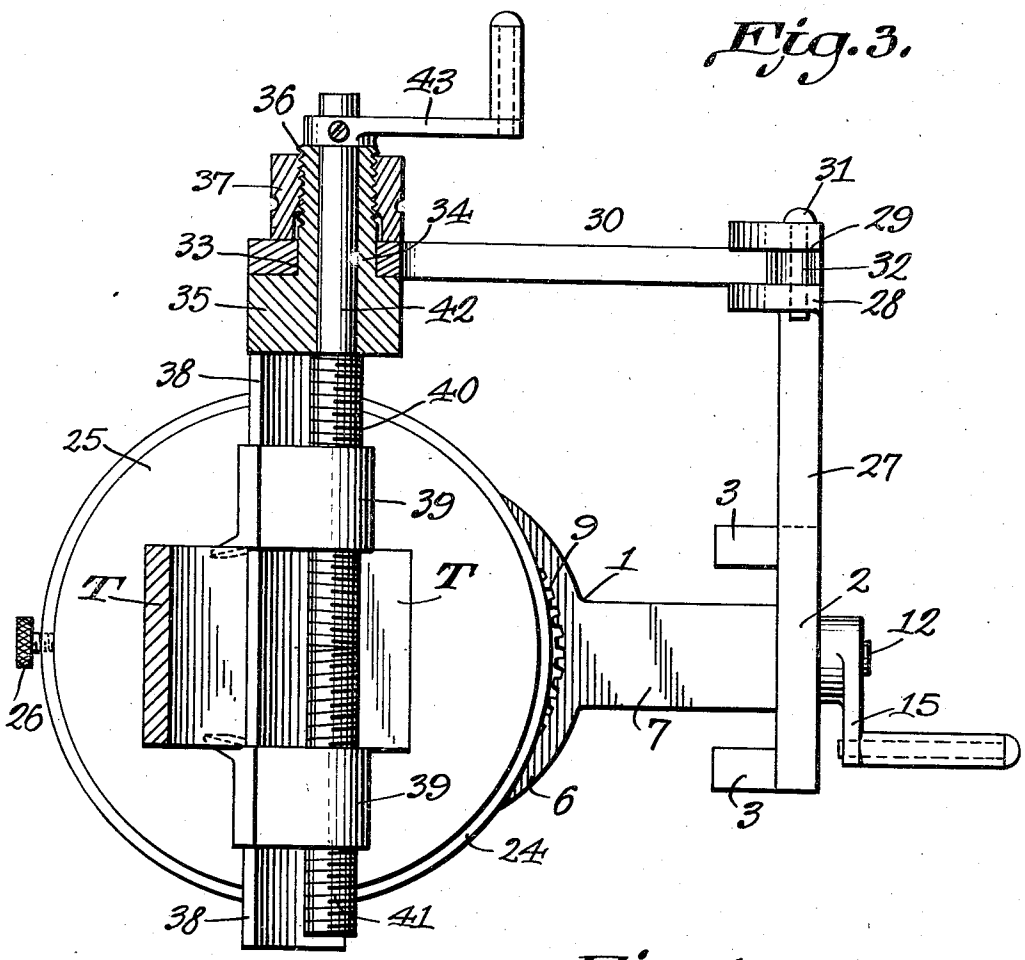
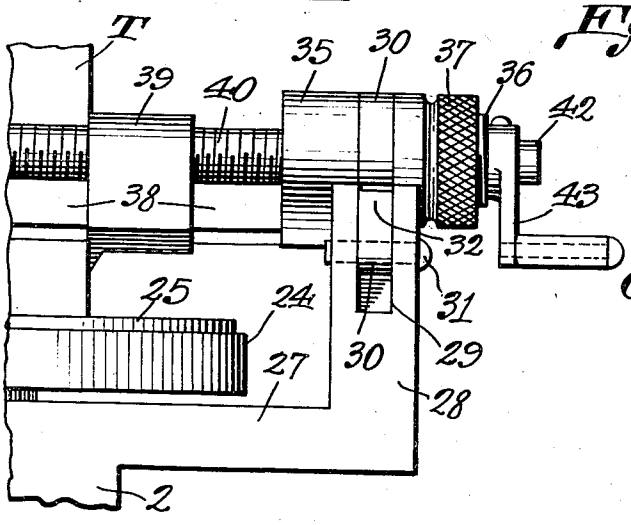


Fig. 4.



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TOOL SHARPENER

Charles P. Nieder and Marce J. Orr, Miami, Fla.

Application July 19, 1938, Serial No. 220,080

2 Claims. (Cl. 51—120)

This invention relates to a device for use in grinding, honing and polishing tools and is designed primarily for acting on chisels and like edge tools.

An object of the invention is to provide a sharpening element mounted to travel in a circle and at the same time rotate upon its individual axis whereby the tool-engaging surface will not become grooved or scarred through use but will have the wear distributed over a considerable area.

A further object is to provide a sharpening element which can be reversed to bring either of two surfaces into contact with the tool under treatment, it thus being possible to provide the element with two different kinds of surfaces for getting different results.

A further object is to provide a device of this character which is simple and compact in construction and can be connected readily to a supporting bench or the like.

A further object is to provide a novel form of tool holder whereby the tool, during the sharpening operation, can be held at the proper angle relative to the sharpening surface.

A still further object is to provide a tool holder which can be readily moved into and out of proper position and which can be adjusted readily to properly position the tool while being acted on.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is a vertical section through the device.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a view partly in plan and partly in horizontal section showing the two gripping means.

Figure 4 is an elevation of a portion of the tool gripping means, viewed from the right in Figure 3.

Referring to the figures by characters of reference, 1 designates a plate constituting the body of the device, this plate being located at the upper end of a standard 2 having spaced lugs 3 extending from one side thereof while an ear 4 is extended from the same side of the standard at the base thereof and carries a clamping screw 5. Thus by placing the ear 4 under the edge of a bench or the like and locating said edge beneath the lugs 3, the screw 5 can be employed for binding the device tightly to said bench so that it will be held fixed during the sharpening operation.

Body 1 includes a substantially circular portion 6 connected to standard 2 by an integral neck portion 7. The circular portion 6 is formed with a circular recess 8 the wall of which carries the teeth of an internal gear 9 while extending downwardly from the center of the recess is a sleeve 10. On this sleeve is an extension 11 in which is journalled one end of an operation shaft 12, said shaft being formed with an annular groove 13 for the reception of a pin 14 or the like for holding the shaft against withdrawal from the extension. The other end portion of the shaft is journalled in standard 2 and carries a crank arm 15 or the like whereby the shaft can be rotated readily by hand or otherwise. Obviously if the shaft is to be driven by power a wheel could be substituted for the crank arm.

An operating gear 16 is secured to the shaft 12 and extends upwardly through a slot 17 in the bottom of recess 8 where it meshes with a gear 18 having a central shaft 19 which is journalled in sleeve 10 and is held against withdrawal therefrom by a pin 20 or the like extending into an annular groove 21 in the shaft.

A wrist pin 22 is carried by gear 18 near its periphery and mounted on this wrist pin is a gear 23 which meshes at all times with the internal gear 9. Gear 23 is carried by and extends downwardly from the center of a cup 24 in which is removably mounted a sharpening element 25 which is held in place by a set screw 26 or the like. This sharpening element is preferably in the form of a disk having upper end lower abrasive surfaces which, if desired, can differ in their degrees of coarseness so that under certain conditions one surface could be supported uppermost while under other conditions the other surface could be supported uppermost. Under any conditions the sharpening surface is above the level of the cup.

An arm 27 is extended laterally from the upper portion of standard 2 and is provided at its outer end with a short post 28 which is forked as shown at 29 so as to receive one end of an arm 30, said end being pivotally mounted on a pin 31 extending transversely of the fork. The

arm may be formed with a projecting nose 32 at its pivoted end adapted, when the arm is swung upwardly and outwardly past dead center, to bear downwardly against the bottom wall of the fork 29 so as thus to support the arm in an inclined position as shown by broken lines in Figure 1.

The free end of arm 30 has an opening 33 in which is seated a sleeve 34 extending from a block 35.

The end of the sleeve is screw threaded as shown at 36 for engagement by a nut 37 and this nut and the block 35 are designed to cooperate to clamp on the apertured end of arm 34 so as to hold the block 35 against rotation about the longitudinal axis of the sleeve after the block has been adjusted angularly to a predetermined position.

A flat guide blade 38 is carried by and extends laterally from the block 35 and is of such length to project entirely across the cup 24. Opposed jaws 39 are slidably mounted upon and guided by the blade 38 and these jaws are engaged by the oppositely screw threaded portions 40 and 41 respectively of a shaft 42 which is journalled in block 35 and sleeve 34 and is adapted to be rotated by a crank arm 43 or the like. When the crank arm and its shaft are rotated in one direction the jaws 39 will be moved apart along the guide plate 38. When the shaft 42 is rotated in the opposite direction, however, the oppositely pitched threads 40 and 41 will cause the jaws 39 to move toward each other.

In the drawings the tool to be sharpened has been indicated at T and in the present instance is a chisel. Before the sharpening operation is proceeded with, a sharpening element 25 having the desired abrasive qualities is secured in the cup 24. The chisel or other tool to be sharpened is then placed between the jaws 39 and said jaws are adjusted towards each other so as to grip the chisel between them and hold it flat against the under surface of the blade 38. Said blade is then adjusted angularly with block 35 to cause the end of the tool to rest at the proper angle on the surface of the sharpening element. Thereafter the block 35 and the parts carried thereby is tightened against rotation relative to arm 30 and with the end of the tool resting on the sharpening element 25, the device is ready for use. The operator rotates the shaft 12 and thus motion is transmitted from gear 16 to gear 18 and the small gear 23 carried thereby will be caused to travel in a circle along the internal gear 9 while at the same time being rotated by said gear. Thus the cup 24 and the sharpening element 25 held therein will not only be caused to move about the axis of shaft 19 but will also be rotated about the axis of shaft 22. As a result of this compound movement the abrasive action will be distributed over a wide area on the surface of the sharpening element with the result that the formation of grooves or furrows will be avoided and the action of the abrasive element on the tool will be more efficient. When it is desired to inspect the tool it is merely necessary to swing the arm 30 upwardly and backwardly to the position shown by broken lines in Figure 1. The tool can thereafter be returned into engagement with the sharpening element merely by swinging the arm back to the full line position shown in said figure.

It will be noted that the blade 38 constitutes means for receiving thrust from the held tool and for maintaining it at the proper angle to the sharpening element, it being possible readily to change this angle, as will be obvious.

What is claimed is:

1. The combination with support gripping means and a plate carried by and overlying the same, said plate including a circular recess and an annular series of gear teeth on the wall of the recess, of a gear mounted for rotation in the recess, a second gear mounted for rotation on said first named gear adjacent to the periphery thereof and positioned for rolling engagement with the gear teeth in the recess, a cup carried by and rotatable with said second gear for detachably holding a grinding element, a shaft connected to and extending under the plate, a gear thereon in constant mesh with the first named gear within the recess, means for rotating the shaft to impart a planetary movement to the cup and the grinding element carried thereby, and means for supporting a tool in contact with and at a predetermined angle to a supported grinding element.

2. The combination with a plate having a circular recess and an annular series of gear teeth on the wall of the recess, and means for fastening said plate to a support, of a drive gear extending into the recess, a driven gear concentric with and rotatable within the recess and in constant mesh with the drive gear, a gear rotatably mounted on the driven gear about an axis adjacent to the periphery of the driven gear, and in rolling engagement with the teeth in the recess, a cup carried by and rotatable with the last mentioned gear, a grinding element removably mounted therein and rotatable therewith, the exposed grinding surface of said element being constantly extended across the lines of the axis of the driven gear and the gear thereon, and means for supporting a tool to be sharpened with one end in constant contact with said grinding surface.

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