Oct. 11, 1949. M. J. LEIMAN 2,484,574

DIAMOND POLISHING ADJUSTING DEVICE

Filed July 10, 1947

FIG. 1.

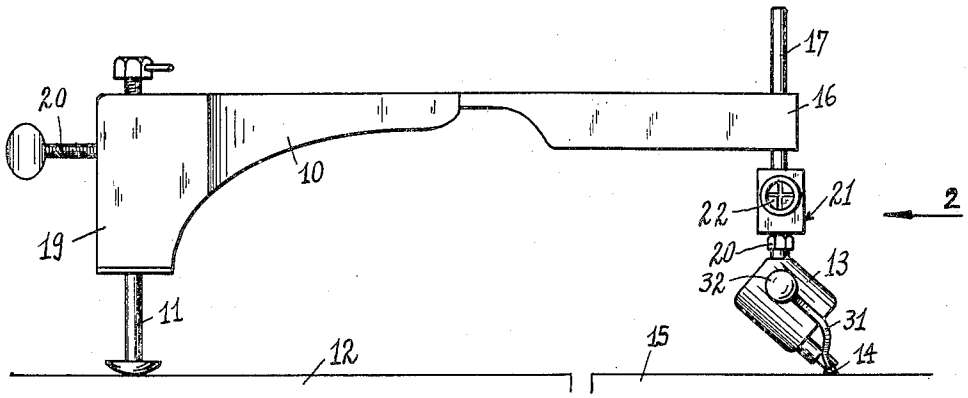


FIG. 2.

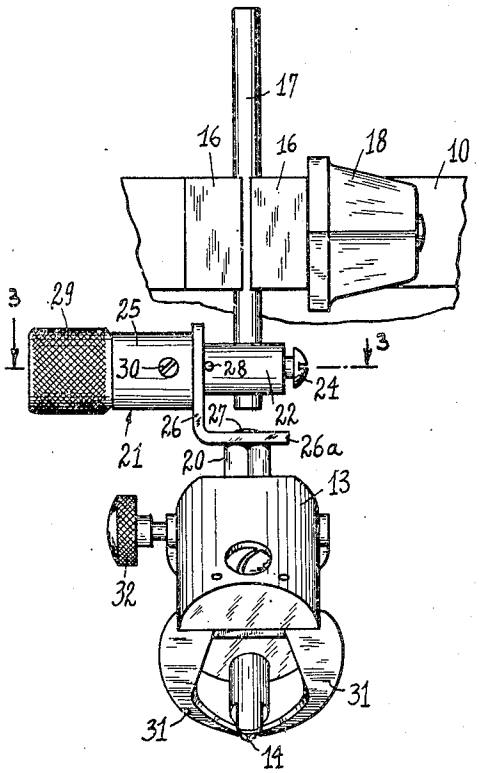
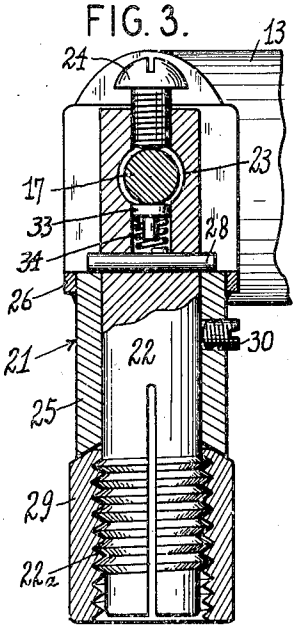


FIG. 3.



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DIAMOND POLISHING ADJUSTING DEVICE

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3 Claims. (Cl. 51—229)

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This invention relates to diamond grinding devices, and has for its main object to provide improved means for setting the diamond in the two desired directions for the angle of the face to be ground, and for the grain along which the grinding is to be done, which two settings to-day require either an elaborate complicated device, or are arrived at by a great number of tedious, time consuming, trials and tests.

Another object of this invention is to provide a device as indicated hereinbefore, which will be readily adapted to be inserted into the equipment used at present by diamond grinders.

Still other objects of this invention will be apparent as the specification of the same proceeds, or will be pointed out therein, and, among others, I may mention: to provide a device of the character mentioned, which will be simple in construction, inexpensive to manufacture, easy to apply and use, readily and completely fitting into hand operating grinding methods involving no change in the operation of hand grinding, with the exception of the great advantage in the novel setting of the two angles through my invention.

In the drawings forming a part of this specification and accompanying the same:

Fig. 1 is a side view of a usual diamond grinding arm, or "tong" as it is called in this art, showing my invention applied thereto;

Fig. 2 is a fragmentary front view thereof, as indicated by the arrow 2 in Fig. 1, and on a larger scale than Fig. 1;

Fig. 3 is a sectional view thereof, the section being taken on the line 3—3 of Fig. 2 and being on a still larger scale.

Referring now to the drawings, more in detail by characters of reference, the numeral 10 indicates a usual grinder arm or tong as used by the diamond grinders to-day, the same having adjustable legs 11, by which the inner end thereof may rest on an appropriate support, like a working table 12, while at the outer end thereof it carries the usual diamond receiving chuck 13, called in the trade the "dop."

The diamond is indicated at 14, secured in said chuck, as it is well known and as it will be explained hereinafter, and is engaged by the rotating grinder disk or wheel 15.

As has been indicated hereinbefore, the tong 10 and the dop 13 are the usual devices now used by diamond grinders. However, diamond grinders now have a different way of securing the dop 13 at the outer end 16 of the tong than the one illustrated herein and invented by me.

To-day the diamond grinders simply have a

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flexible, but still considerably resistant, copper rod or heavy wire instead of a rigid, stiff, steel or similar rod 17, shown in my device. The copper rod now used by the diamond grinders will be secured into the outer end 16 of the tong 10 in any appropriate manner, and so will be my rigid pin or rod 17, one method of which is shown in the drawing, and will be obvious to those versed in this art, by inspecting the same.

The outer end 16 of the tong is forked or slotted, the two parts being adapted to move against one another, and such a movement being executed by an adjusting screw device 18, as will be understood. The copper rod, or my rod 17, will be caught and pressed between the fork ends of the tong 16, and so secured in a desired position, but it may be adjusted upwardly or downwardly by releasing the screw 18 and moving the rod 17 upwardly or downwardly as desired, and then tightly locking it between the two parts of the tong end 16. In this manner the rod 17 may be adjusted upwardly or downwardly and secured in any desirable position.

The supporting legs 11, two of them being used at the two sides of the inner end 19 of the tong, will also be adjusted as to height, and secured in their position, as by the set screws 20, first, however, the tong 10 being carefully levelled, both, in the longitudinal and in the transverse directions, all this being well known to those versed in this art.

The diamond grinding will be executed by the grinder holding the tong 10 in its adjusted position.

As it is also well known, the diamond 14 must be adjusted as to its position, angularly, both vertically and horizontally. By its adjustment through rotating on a horizontal axis, the angle of the grinding can be set, while an adjustment thereafter horizontally, by rotating on a vertical axis, is necessary to find the so-called "grain" of the diamond, and to set it according to the direction of the grain.

At present, the grinder simply bends the flexible copper rod, called in this art, the stalk, which is in the position of my rigid rod 17 and directly carries the dop 13 at its lower end, as by its lower end being screw threaded, and the dop having a screw threaded socket or nut 20 secured thereon. By such bending in the desired direction, the grinder first sets the angle of grinding, that is, the angle of the surface to be ground to the vertical axis of the device, and then he sets the direction of grinding for the grain by another bending of the copper rod. It will be obvious, and it is a

fact, that practically numberless trials are necessary, and back and forth bendings, before the right position of the diamond with respect to the angle to be ground, and the direction in which the diamond is to be ground, is finally attained.

According to my invention, a rigid, non-flexible, rod 17 will be secured in an adjustable manner into the slotted or forked end 16 of the usual tong, but a novel adjusting device, generally indicated by the numeral 21, will be interposed between the rod 17 and the dop 13, said device 21 permitting an easy and accurate adjusting of the dop in the two desired directions, that is, permitting the rotation of the dop on a horizontal axis, whereby the angle of the surface to be ground can be set, and then permitting a rotation of the dop, without disturbing its horizontal angular setting, around the rod 17, or on a vertical axis, whereby the diamond, after one or two trials, is set to the best direction for grinding with the grain.

In my double adjusting device 21, horizontal pin 22 will be secured at the lower end of the rod 17, as by having a vertical bore 23 through which said rod may pass, and it will be adapted to be secured in any desired position on the rod by the set screw 24.

A sleeve 25 is rotatable around the middle portion of the pin 22, the inner end of said sleeve carrying a vertical plate element 26 secured thereon, as by welding but permitting a rotation of the same on the horizontal pin 22.

The vertical plate 26 is continued in a horizontal plate 26*a*, the two forming an angular member rotatable with the sleeve 25, and the diamond chuck or dop 13 is secured on said horizontal plate 26*a* in a removable manner by any appropriate means, well known in this art. The means indicated in the figures are a screw 27 secured into said horizontal plate 26*a* and adapted to be threaded into the nut or socket 20 which usually is provided on the dop 13 and is a part thereof. Indeed, normally there are two such receiving sockets or nuts 20 on a dop so as to permit the dop to be secured at the lower end of a rod 17 in two different positions, as desired.

A cross pin 28 is provided across the horizontal pin 22 in front of the vertical plate 26 thereby providing an inner limit for the rotating sleeve 25. The outer end 22*a* of the horizontal pin 22 is screw threaded and a knurled sleeve nut 29 is threaded thereon, and it will be seen that by rotating the sleeve nut 29 in one direction, the same will advance and will press the sleeve 25 against the cross pin 28 thereby locking the same against rotation. To further secure the sleeve 25 in its inner position, a set screw 30 may be employed.

The diamond 14 is set in the dop or clutch 13 in any of the usual manners, the one shown in the drawings comprising two pivoted arms 31, which are movable inwardly or outwardly, simultaneously, as by the operating screw 32, and they will either release the diamond or clamp it between their inner ends. This device is well known in the art.

The use and operation of my invention will practically be obvious from the herein description, but I want to offer the following further explanations relating thereto.

After the diamond is secured in the dop 13, the two angles thereof have to be adjusted, and first the operator will turn the sleeve nut or knob 29 in an opposite direction to the one where the sleeve 25 was locked, first, of course, releasing the set screw 30. After knob 29 thus loosens the sleeve 25, the angle plate 26, 26*a*, will be turned in one or the other direction, and carries the dop 13 and the diamond 14 with it, whereby the dop will rotate on the horizontal axis of the pin 22 and the grinding angle of the diamond will be set, as desired.

After said setting, the knurled sleeve nut 29 will be tightened as well as the securing set screw 30.

By adjusting the legs 11, the tong is levelled in both directions, the diamond 14 resting on the grinding wheel, whereupon the dop will be moved on a vertical axis around pin 17, to find the "grain" of the diamond.

For this purpose the set screw 24 will be released so as to permit a horizontal rotation of the pin 22 and all the devices associated therewith, like the angle plates 26, 26*a*, and the dop 13. Indeed, as a rule, the set screw 24 will be set with a moderate but reliable pressure on the vertical rod 17, so as to permit a rotation of the described devices on a vertical axis, that is, around the pin 17, but still have friction enough to retain the said devices in any position arrived at.

In the embodiment shown, an inner pressing head 33 is employed opposite to the set screw 24, pressed outwardly by a spring 34 to insure a yielding but still reliable frictional securing of parts on the pin 17.

The mentioned second rotation, on the vertical axis, of the pin 17, is, as mentioned, for the purpose of finding the grain of the diamond in which to perform the operation, and this may be found after a few trials.

It will be understood that my device is adapted to be used with any other dop and securing means for the diamond than the one described. So, for instance, it is readily adapted to be used for the so-called industrial diamond dop.

While I have shown a preferred embodiment of my invention, it is to be understood that changes and variations may be resorted to in the elements, combinations and operation of my invention, and I reserve my rights to such changes and variations as are within the spirit of this specification, and the scope of the claims hereunto appended.

What I claim as new and want to protect by Letters Patent of the United States, is:

1. In a device for adjusting a diamond for the two angles required in the usual grinding thereof, said device having a dop into which the diamond is secured and a tong by the use of which the diamond is ground, said tong having a substantially vertical rigid stalk at the outer or grinding end of the tong, and means to upwardly and downwardly adjust said stalk in said tong, the combination, of a horizontal pin rotatable around said stalk, a sleeve rotatable on said pin, an angular plate having a vertical and a horizontal leg, the vertical leg thereof being secured on said sleeve and rotatable therewith, and means to secure said dop on the horizontal leg thereof whereby said dop with the diamond therein may be rotated in the axis of the stalk or on an axis perpendicular thereto.

2. In a device for adjusting a diamond for the two angles required in the usual grinding thereof, said device having a dop into which the diamond is secured and a tong by the use of which the diamond is ground, said tong having a substantially vertical rigid stalk at the outer or grinding end of the tong, and means to upwardly and downwardly adjust said stalk in said tong, the combination, of a horizontal pin rotatably se-

cured at the lower end of said stalk, a sleeve rotatable on said horizontal pin, an inward limit on said horizontal pin for said sleeve, the outer end of said horizontal pin being screw threaded, a screw threaded nut engaging said outer end whereby said rotatable sleeve may be pressed against said limit and so secured in its position, or may be released and permitted to rotate, an angle plate having a vertical and a horizontal leg and being secured on said sleeve by its vertical leg, a screw projecting from its horizontal leg, and a screw threaded nut secured on said dop whereby said dop may be secured on said screw.

3. In a device, as set forth in claim 2, said horizontal pin being upwardly and downwardly slidable on said stalk, and means to secure said pin in any of its positions.

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