Dec. 15, 1942. C. E. ALLEN 2,305,230

TOOL GRINDER

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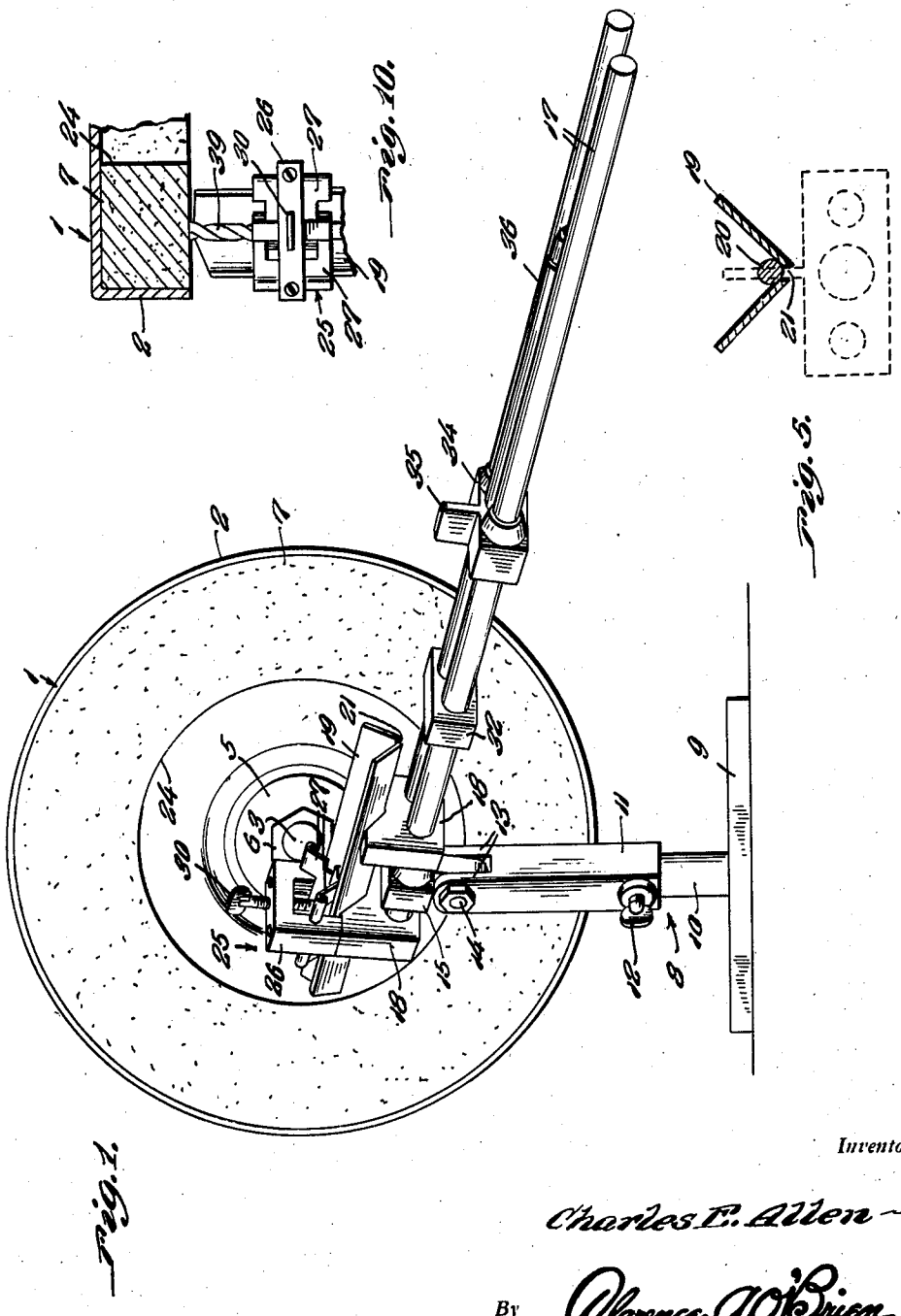


Fig. 1.

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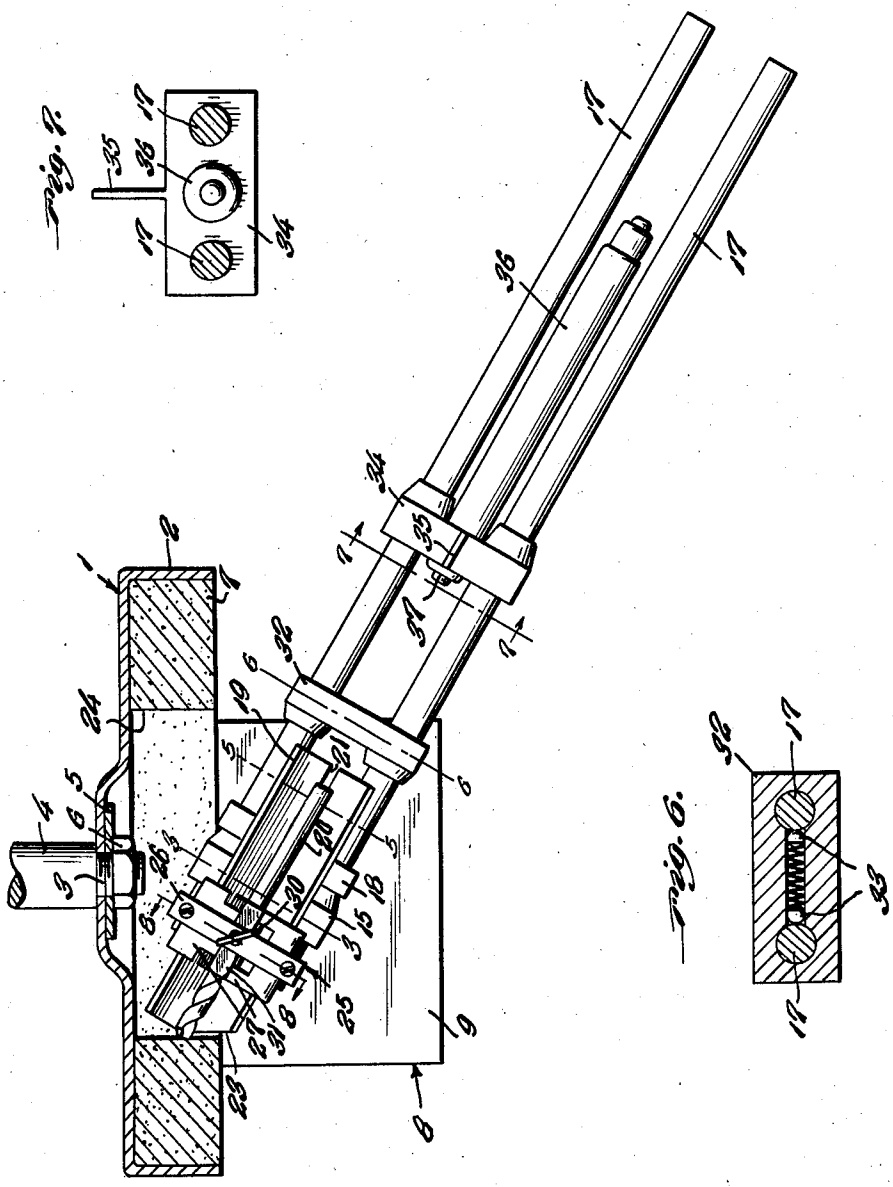


Fig. 4.

Fig. 5.

Fig. 6.

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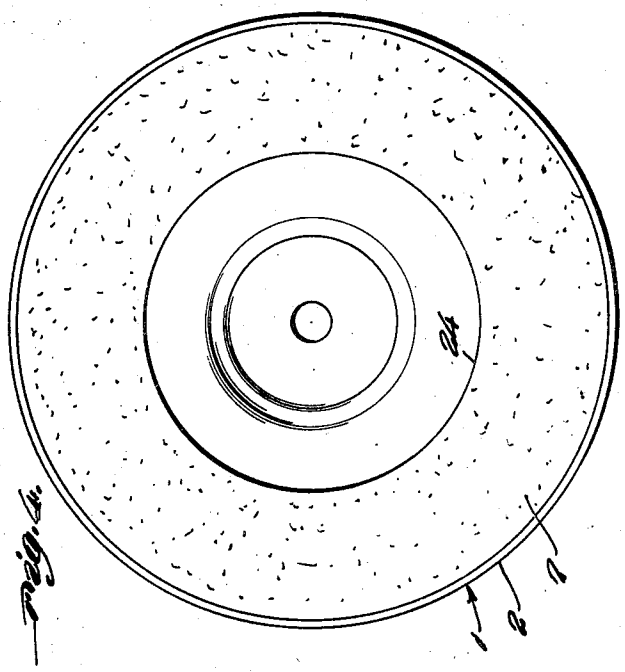


Fig. 1.

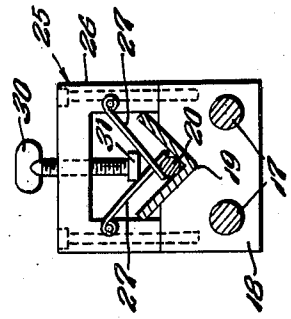


Fig. 2.

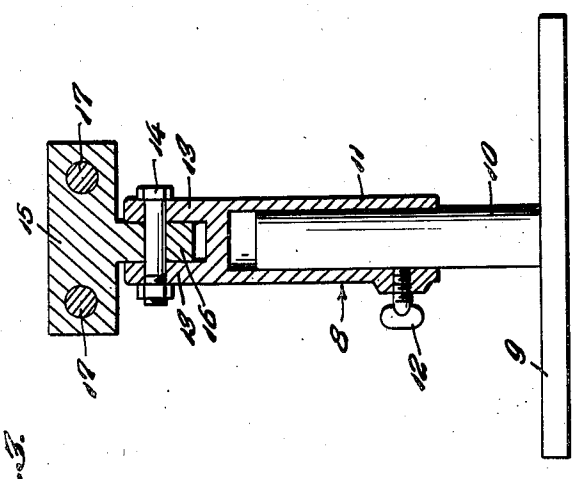


Fig. 3.

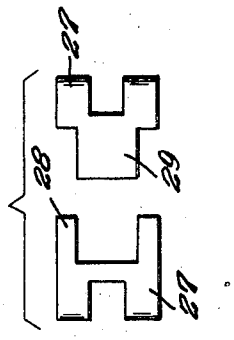


Fig. 4.

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UNITED STATES PATENT OFFICE

2,305,230

TOOL GRINDER

Charles E. Allen, Warren, Ohio

Application January 3, 1942, Serial No. 425,571

3 Claims. (Cl. 51—219)

The present invention relates to new and useful improvements in grinders for spot facers, end mills, drills and other tools having a plurality of cutting surfaces, and has for its primary object to provide, in a manner as hereinafter set forth, a machine of this character comprising a novel construction, combination and arrangement of parts whereby all of the surfaces may be ground uniformly.

Another very important object of the invention is to provide an apparatus of the aforementioned character comprising a grinding wheel of unique construction.

Still another very important object of the invention is to provide a grinding machine of the character described which embodies novel means for firmly securing the tool to be ground in position.

A still further important object of the invention is to provide a machine of the character set forth which is adapted to receive various sizes of tools and which may be readily adjusted to meet different conditions.

Other objects of the invention are to provide a tool grinder which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation of a tool grinder constructed in accordance with the present invention.

Figure 2 is a top plan view thereof, showing the grinding wheel in horizontal section.

Figure 3 is a cross-sectional view, taken substantially on the line 3—3 of Figure 2.

Figure 4 is a view in side elevation of the grinding wheel with the shaft omitted.

Figure 5 is a cross-sectional view, taken substantially on the line 5—5 of Figure 2.

Figure 6 is a cross-sectional view, taken substantially on the line 6—6 of Figure 2.

Figure 7 is a view in cross section, taken substantially on the line 7—7 of Figure 2.

Figure 8 is a view in cross section, taken substantially on the line 8—8 of Figure 2.

Figure 9 is a top plan view of the drill clamping jaws.

Figure 10 is a top plan view, showing another method of using the device, a portion of the grinding wheel being illustrated in horizontal section.

Referring now to the drawings in detail, it will be seen that reference numeral 1 designates generally a grinding wheel. The grinding wheel 1 includes a drum 2 of suitable metal which is firmly secured on the reduced, threaded end portion 3 of a shaft 4 by means including a washer 5 and a nut 6. Mounted in the drum 2 is an annular abrasive member 7.

Positioned adjacent the grinding wheel 1 is an adjustable stand which is designated generally by reference numeral 8. The stand 8 comprises a base 9 from which a post 10 rises. Adjustably mounted on the post 10 is a sleeve 11. A thumb screw 12 releasably secures the sleeve 11 in adjusted position on the post 10. At its upper end, the sleeve 11 terminates in upstanding, apertured ears 13 between which a bolt 14 extends.

Pivotally mounted for rocking adjustment on the bolt 14 is a crosshead 15. The crosshead 15 includes an integral, depending lug 16 which is journaled on the bolt 14. Extending through the crosshead 15 and fixed therein is a pair of spaced, parallel rods 17 of suitable metal.

Mounted for limited sliding movement on the rods 17, on opposite sides of the crosshead 15, is a pair of blocks 18. Fixed on the blocks 18 and projecting forwardly and rearwardly therefrom is a substantially V-shaped holder 19. The holder 19 is for the reception of the drill to be ground, as at 20. Extending longitudinally into the bottom of the holder 19 from the rear end thereof is a slot 21, the purpose of which will be presently set forth. The forward end of the holder 19 includes a beveled side portion 22 which facilitates projecting said holder into the grinding wheel 1 to a point closely adjacent the inner circumference 24 of the annular abrasive member 7. This is shown to advantage in Figure 2 of the drawings.

Mounted on the front block 18 is a drill clamp 25. The clamp 25 comprises an inverted yoke 26 which is rigidly secured on the front block 18 and which bridges the holder 19. Pivotally mounted on the legs of the yoke 26 is a pair of jaws 27 of the shape shown to advantage in Figure 9 of the drawings. It will be observed that one of the jaws 27 comprises, on its free end, a pair of spaced fingers 28 which receive therebetween a tongue 29 on the corresponding end of the other of said jaws. The free end portions of the jaws 27 are adapted to extend in opposite directions across the drill 20 in the holder 19 in the manner shown to advantage in Figure 8 of

the drawings. Threadedly mounted in the bight portion of the yoke 26 is a thumb screw 30. Swiveled on the thumb screw 30 is a foot 31 which is engageable with the jaws 27 for pressing said jaws downwardly on the drill 20 in the holder 19. In this manner the drill 20 is firmly secured in position.

Slidably mounted on the rods 17 is a metallic bar 32. Spring pressed balls 33 (see Fig. 6) in the bar 32 are engaged with the rods 17 for frictionally securing said bar in adjusted position on said rods.

Also slidably mounted on the rods 17 is what may be considered a tool feeder or follower 34. Rising from the follower 34 is a fin 35 which is adapted to enter the slot 21 in the holder 19 for engaging the drill 20 therein for moving said drill into contact with the annular abrasive member 7. When this is done, the holder 19, the blocks 18, et cetera, move forwardly on the rods 17. Extending through the follower 34 and fixed therein is an electric battery signal lamp 36 which is positioned between the rods 17. The signal lamp 36 includes, on its forward end, an insulated control contact 37 which is engageable with the bar 32 for illuminating said signal lamp.

Briefly, the manner of using the device is substantially as follows:

The drill 20 is properly positioned in the holder 19 for grinding one of the surfaces of said drill and secured by the clamp 25. The follower 34 is moved forwardly on the rods 17, the contact 37 engaging the bar 32 for moving said bar forwardly while at the same time lighting the signal lamp 36. Forward movement of the follower 34 is continued in a manner to engage the fin 35 with the rear end of the drill 20, said fin 35 entering the slot 21 in the holder 19. In this manner the forward end of the drill 20 is brought into contact with the inner circumference 24 of the annular abrasive member 7 and one surface of said drill is ground. The follower 34 is then retracted, leaving the bar 32 in the position to which it has been moved. The holder 19 is also retracted. If desired, a light spring may be provided for accomplishing this. The clamp 25 is then loosened to permit the drill 20 to be turned to position the other surface to be ground, after which said clamp 25 is again tightened. The follower 34 is now brought forwardly again on the rods 17, the fin 35 again entering the slot 21 for engaging the drill 20 and moving said drill into contact with the abrasive member 7. When this second surface of the drill 20 has been ground in a manner identical to the first surface, the contact 37 engages the bar 32 and the signal lamp 36 is again illuminated thereby indicating to the operator that the operation has been completed.

Of course, the drill holding structure or support may be positioned at any angle relative to the grinding wheel 1. In Figure 10 of the drawings, the holder is shown at right angles to the grinding wheel with the tool 39 mounted therein and engaged with the outer side or face of the annular abrasive member 7. When thus used, a single surface is ground at right angles on the end of the tool.

It is believed that the many advantages of a tool grinder constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. A tool grinder comprising a supporting structure, means for movably supporting a drill on said structure, a member movable on the structure, a follower movable on the structure and engageable with the member and with the drill for shifting said member and said drill, and a switch controlled signal lamp mounted on the follower and controlled by the member.

2. A tool grinder comprising a pair of spaced, parallel rods, a tool holder slidable on said rods, means for securing a tool in the holder, a follower slidable on the rods and engageable with a tool in the holder for shifting said tool, a member slidable on the rods and operable by the follower, an electric signal lamp mounted on the follower, and a contact on said signal lamp engageable with the member for illuminating said signal lamp.

3. A tool grinder comprising a stand, a pair of spaced, parallel rods adjustably mounted on said stand, a pair of blocks slidably mounted on said rods, a substantially V-shaped holder for the reception of a tool, fixed on said blocks, means for securing a tool in said holder, a follower slidable on the rods, a fin on said follower engageable with a tool in the holder for shifting said tool, said holder having a slot therein for the reception of the fin, a member slidable on the rods and operable by the follower, and an electric signal lamp mounted on the follower, said lamp including a contact engageable with the member for illuminating said lamp.

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