Sept. 11, 1951 N. CHRISTENSEN 2,567,319

VALVE SEAT GRINDER AND REFACING TOOL

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Fig. 1.

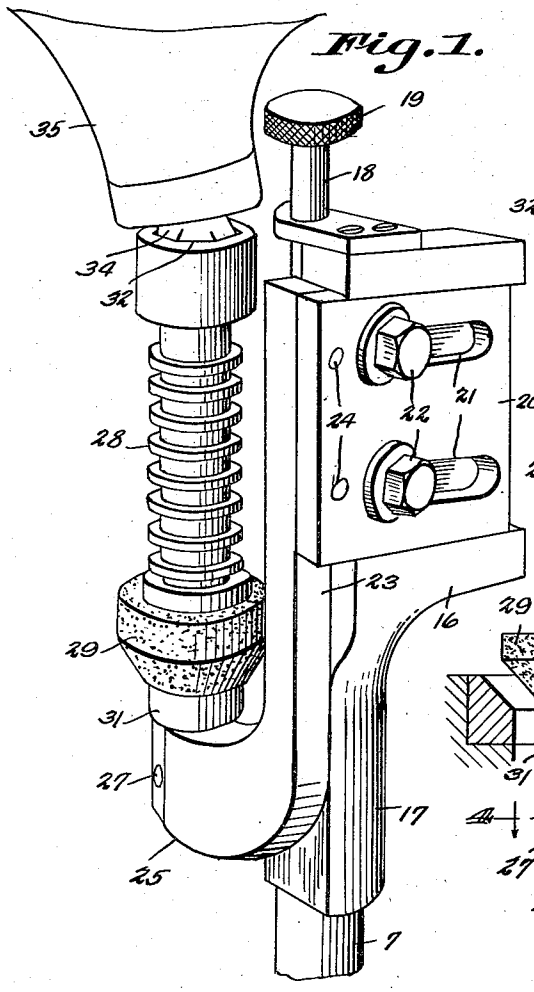


Fig. 2.

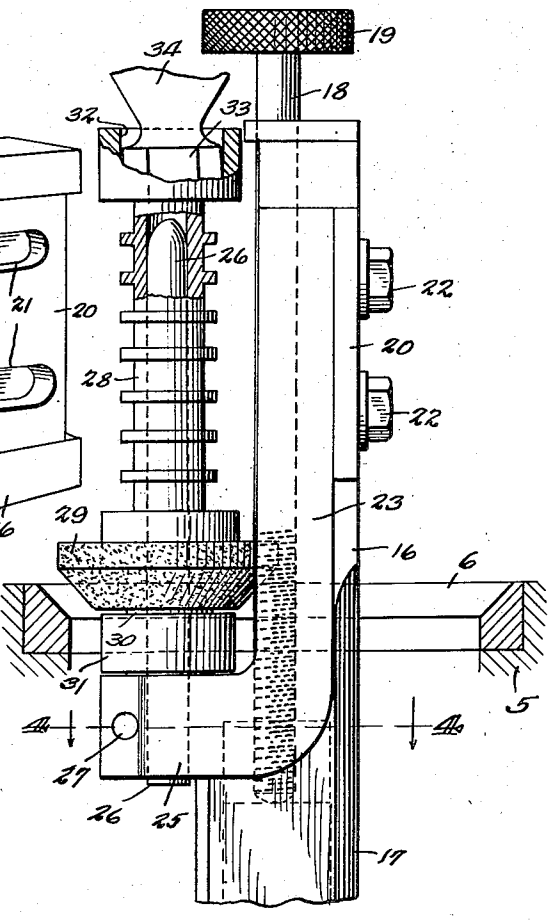
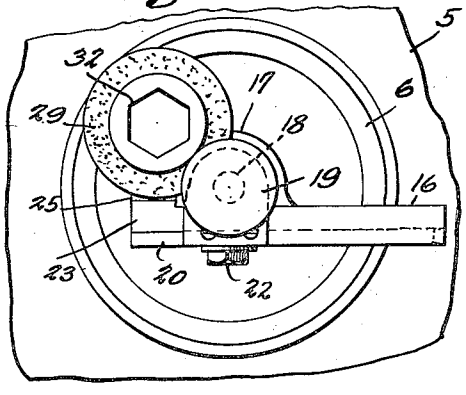


Fig. 3.



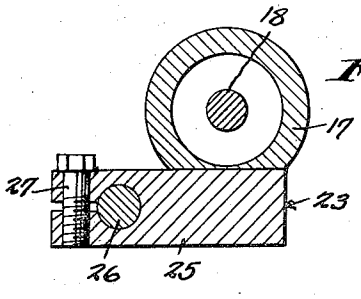


Fig. 4.

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Fig. 5.

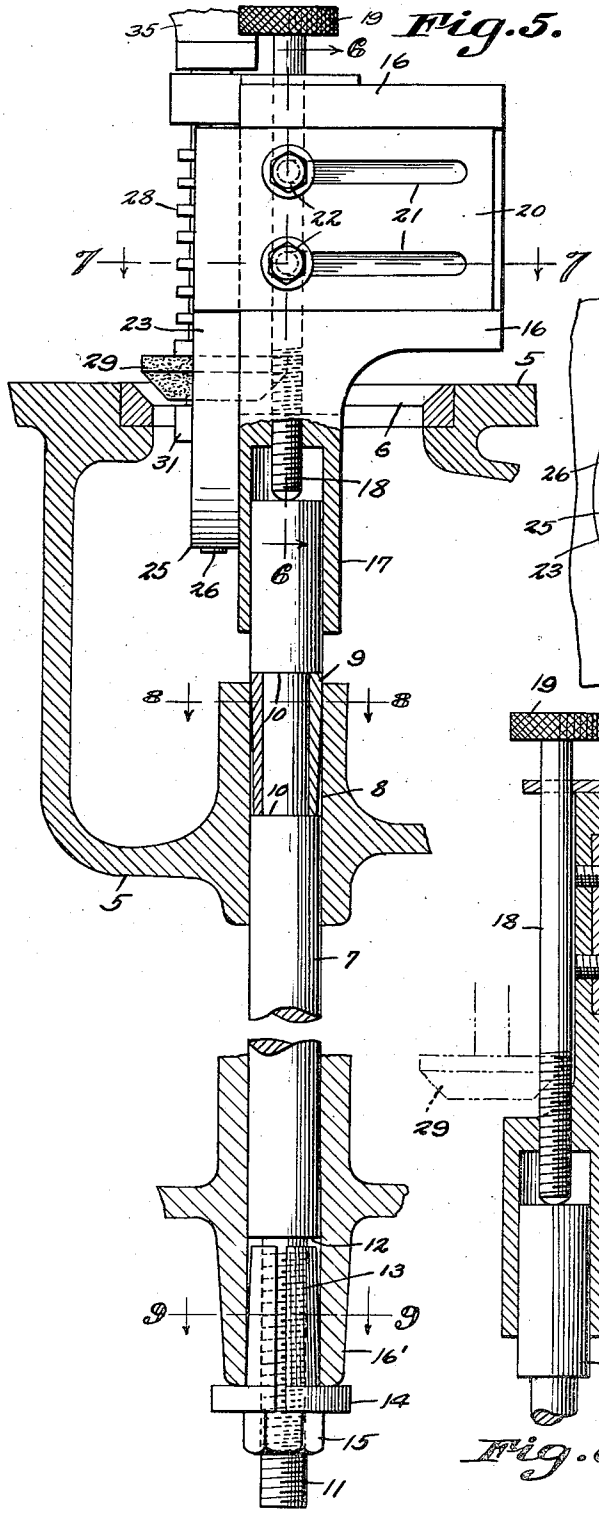


Fig. 7.

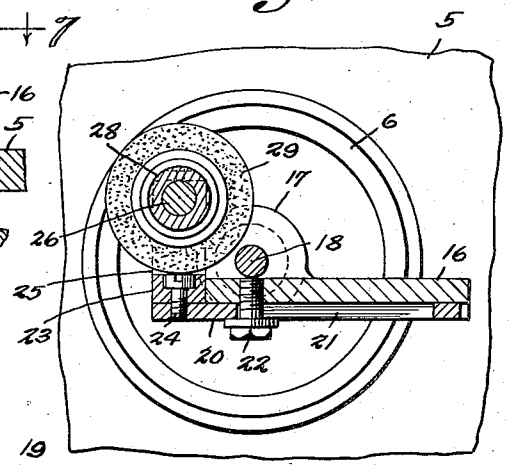


Fig. 8.

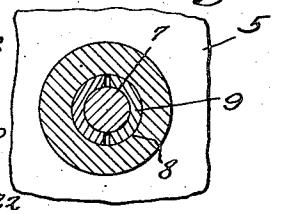


Fig. 9.

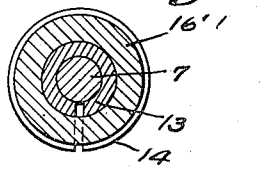


Fig. 6.

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UNITED STATES PATENT OFFICE

2,567,319

VALVE SEAT GRINDER AND REFACING TOOL

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Application February 23, 1950, Serial No. 145,766

3 Claims. (Cl. 51—241)

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This invention relates to valve seat grinders and valve seat refacing tools, the primary object of the invention being to provide a valve seat grinder of the motor driven type wherein a portable hand supported motor is detachably connected to the tool and used as the power element in rotating the grinding stone or facing tool.

An important object of the invention is to provide a valve seat grinding or refacing tool, which may be secured within the vlave guide of an engine block, in such a way that the grinding or refacing operation may be accurately accomplished, without the possibility of the tool moving laterally to cause an uneven grinding or refacing of the valve seat.

Another important object of the invention is to provide a tool wherein the motive power is applied direct, eliminating torque and vibrations incident to the indirect application of power to grinding tools of this character.

Still another object of the invention is the provision of means for adjusting the tool laterally, whereby the tool may be employed in refacing and grinding valve seats of various diameters.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings:

Figure 1 is a perspective view illustrating the upper portion of the tool.

Fig. 2 is a side elevational view thereof.

Fig. 3 is a plan view of the tool.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged sectional view through a portion of an engine block, illustrating the tool as positioned in the block.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5.

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

Fig. 8 is a sectional view taken on line 8—8 of Fig. 5.

Fig. 9 is a sectional view taken on line 9—9 of Fig. 5.

Referring to the drawings in detail, the reference character 5 indicates a section of a cylinder block, illustrating the usual valve seat 6 as disposed within the valve opening of the engine

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block. The tool, forming the subject matter of the present invention, comprises a rod 7 which constitutes the valve grinding tool support, the rod being positioned within the valve guide 8.

The rod 7 is formed with a recessed portion in which the cone shaped sleeve 9 is held, the sleeve 9 embodying spaced sections with the ends thereof resting against the shoulders 10. The lower end of the rod 7 is reduced and threaded at 11 providing a space 12 at the inner end of the split cone shaped member 13 the member 13 being formed with an annular flange 14 at its lower end, against which the nut 15 engages, the nut operating to force the cone shaped member into close engagement with the lower end 16' of the valve guide of the cylinder block. With this movement, it is obvious that the rod 7 will be drawn downwardly, causing the sleeve 9 to bind within the valve guide, securing the rod 7 in close engagement with the valve guide in which it is positioned, providing an exceptionally rigid support for the tool.

The tool also includes the body portion 16 which has a depending extension 17 that is hollow to fit over the upper end of the rod 7, as shown by Fig. 5 of the drawings. Extending through the body portion 16, is the adjusting screw 18, the adjusting screw passing into the extension 17, where it engages the upper end of the rod 7. At the upper end of the adjusting screw 18, is the knurled finger piece or head 19, which may be rotated to either elevate or lower the body portion 16 with respect to the supporting rod 7.

The body portion 16 is provided with a recess extending transversely thereof, in which the block 20 is positioned, the block 20 being provided with elongated openings 21 in which the securing bolts 22 operate, the securing bolts 22 being threaded in openings formed in the body portion 16, so that the block 20 may be adjusted longitudinally of the recess in which it is positioned.

This block 20 provides a support for the bearing arm 23 which is secured to the block 20, by means of the bolts 24.

The lower end of the bearing arm 23 extends forwardly as at 25 where it is split and provided with an opening, in which the shaft 26 is held, the split portion of the arm being drawn together by means of the bolt 27, securing the shaft 26 in position. The reference character 28 indicates the hollow shaft that provides the support for the grinding stone 29 which is secured to the lower end of the hollow shaft 28. The grinding stone rests directly on the bearings 30 con-

tained in the bearing housing 31 which is secured in position at the lower end of the supporting shaft 26, as clearly shown by Fig. 2 of the drawings.

The upper end of the hollow shaft 28 is provided with the socket 32 which is secured to the hollow shaft 28 to rotate therewith. This socket 32 accommodates the head 33 which is formed on one end of the motor shaft 34 forming a part of the hand supporting motor 35 of the usual and well known construction.

In the use of the grinder, the supporting rod 7 is positioned and secured within the valve guide of the valve seat to be ground, and the body portion 16 is positioned placing the hollow extension 17 over the upper end of the rod 7. The body portion provides the support for the tool, which is secured thereto, and by adjusting the screw 18, it is obvious that the tool or grinding stone of the device may be raised and lowered with respect to the valve seat 6 under operation. By this adjustment, the proper adjustment can be made for the accurate grinding or facing of the valve seat.

After the tool has been properly positioned, the electric motor 35 is set in operation, the operator holding the motor by the usual handle, whereupon the grinding stone is rotated on the seat to be resurfaced and moved or rotated in a horizontal plane insuring the proper grinding and facing of the seat.

In view of the foregoing detail disclosure, it is believed that further detail disclosure as to the operation and construction, is unnecessary.

Having thus described the invention, what is claimed is:

1. A portable engine valve seat grinding device, comprising a supporting rod, means for securing said supporting rod in an engine valve guide, a body portion having a hollow extension fitted over the upper end of said rod, means for adjusting the body portion vertically with respect to the supporting rod, said body portion having a recess disposed transversely in one side thereof, a block movable within the recess, said block having openings elongated longitudinally of the block, bolts threaded in the body portion disposed in said elongated openings, whereby said block is adjustable transversely of the body portion, and a rotatable grinding stone mounted on said block adjustable with the block, and said stone being movable against a valve seat grinding said valve seat.

2. A portable engine valve seat grinding device comprising a supporting rod, means for securing said supporting rod in an engine valve guide, a body portion having a hollow extension fitted over the upper end of said rod, means for adjusting the body portion vertically with respect to the supporting rod, said body portion having a recess disposed transversely in one side thereof, a block movable within the recess for adjustment transversely of said body portion, a vertical shaft mounted on the block, a tubular shaft positioned over the vertical shaft and being rotatable thereon, a head on the upper end of the tubular shaft, to which the shaft of a portable motor is directly connected, rotating the tubular shaft, said tubular shaft adapted to operate within the confines of a valve seat being ground, and a grinding stone secured to the tubular shaft adapted to grind a valve seat against which the grinding stone moves, resurfacing said valve seat.

3. A portable engine valve seat grinding device comprising a supporting rod, means for securing said supporting rod in an engine valve guide, a body portion having a hollow extension fitted over the upper end of said rod, means for adjusting the body portion vertically with respect to said rod, a block adjustably secured to the body portion, a bearing arm extending downwardly and laterally from said block, a vertical shaft secured to the inwardly extended end of said arm, a shaft mounted on the vertical shaft, a grinding stone secured to the lower end of said hollow shaft adapted to move into contact with a valve seat reconditioning the valve seat, and means for removably attaching a portable power element to said hollow shaft rotating said hollow shaft.

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