Jan. 23, 1923. 1,442,804

H. H. HICKS.
VALVE SEAT REAMER.
FILED FEB. 11, 1919.

Fig. 1.

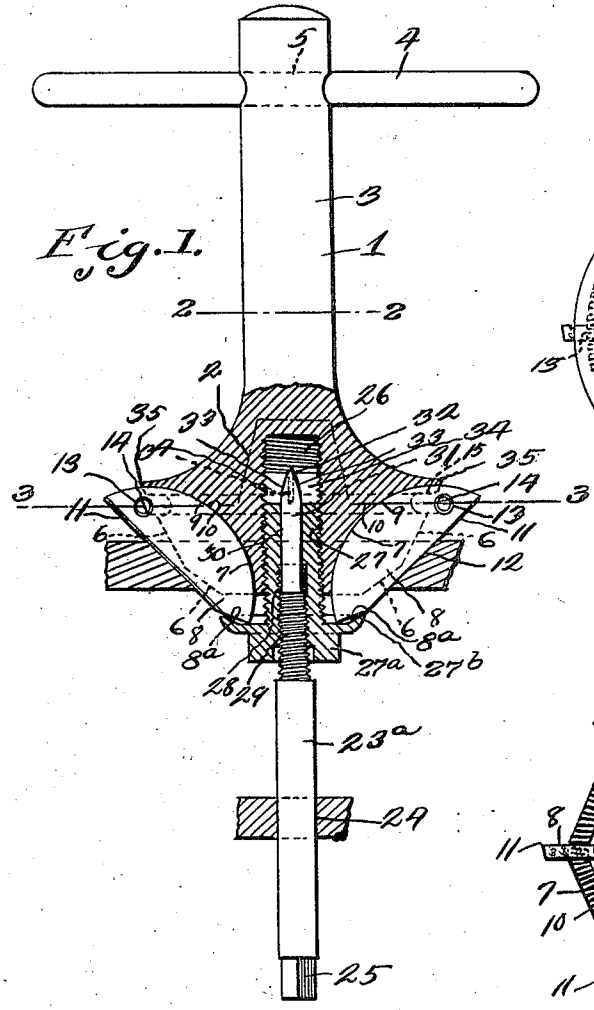
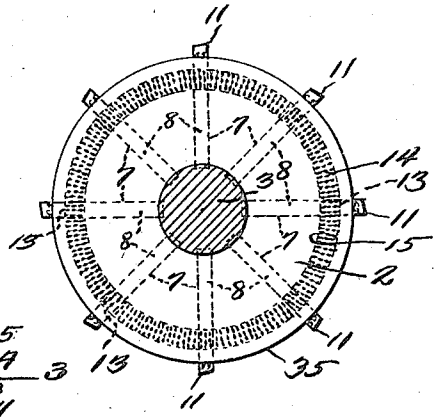


Fig. 2.



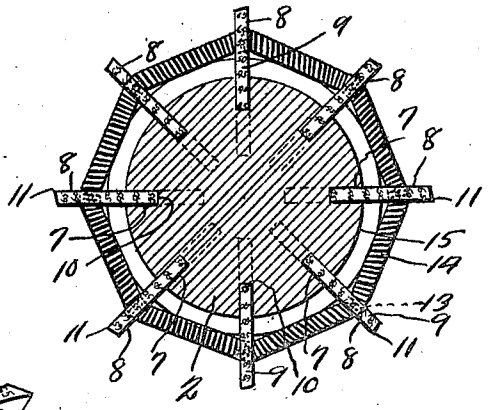


Fig. 3.

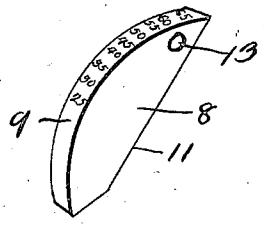


Fig. 4.

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UNITED STATES PATENT OFFICE.

HARRY H. HICKS, OF HELIX, OREGON.

VALVE-SEAT REAMER.

Application filed February 11, 1919. Serial No. 276,249.

To all whom it may concern:

Be it known that I, HARRY HERBERT HICKS, a citizen of the United States, residing at Helix, in the county of Umatilla, State of Oregon, have invented new and useful Valve-Seat Reamers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to adjustable reamers and has for its object to provide a reamer of this character, wherein it will be possible to adjust the cutters thereof so that they will ream or cut at various angles. This reaming at various angles is necessary particularly in valve seats of different types of internal combustion engines, when it becomes necessary to regrind and reseat the valves of the engine.

A further object is to provide an adjustable valve seat reamer having a body member adapted to be rotated, and to provide said body member with a series of radially arranged cutter blades slidably mounted in arcuate slots, the upper ends of the cutters being resiliently held by a spring and adjustable means contacting with the lower ends of the cutter blades so that the cutters may be forced upwardly, in the arcuate slots so as to change the angle of their cutting edges, also to provide the body member with a depending portion so that said portion when passed through the guide of the valve stem will guide the reamer at its proper angle during the reaming operation. The angle of adjustment of the cutters is generally from 25 to 65 degrees, therefore the cutters on their curved edges may be provided with graduations, whereby the angle of the cutting edges of the cutters may be easily and quickly adjusted.

With the above and other objects in view, the invention resides in the combination and arrangement of parts hereinafter described, shown in the drawings and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—

Figure 1 is a side elevation of the reamer, showing the same partly in section and in position for reaming a valve seat and its guide member in the valve stem guide.

Figure 2 is a sectional view through the reamer taken on line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view taken on line 3—3 of Figure 1.

Figure 4 is a perspective view of one of the cutters, showing the graduations on the edge thereof.

Referring to the drawings the numeral 1 designates the body of the reamer, which comprises the head 2 and the shank 3. A pin 4 passes through an aperture 5 at the upper end of the shank, said pin forming means to be grasped by the hands so that the reamer may be rotated during a reaming operation. The head 2 is preferably conical in shape so that its surface 6 will taper downwardly and inwardly. Arcuate slots 7 are provided in the head 2 and are radially disposed, there being preferably eight slots, however it is to be understood that the number of said slots may be increased or diminished as desired. Cutters 8 having curved edges 9 of the same curvature as the wall 10 of the arcuate slots are disposed in the slots 7. Each cutter 8 has a cutting edge 11 which is straight and adapted to be arranged at different angles so as to conform to the angle that it is desired to ream the valve seat 12 of the engine.

The cutters 8, near their upper ends are provided with apertures 13 and extending through said apertures is an endless coiled spring 14. However it is to be understood that instead of the coiled spring, a split spring wire spring may be used therefor.

The head 2 is provided with a threaded aperture 26 for the reception of a threaded extension 27 which is threaded therein and is provided with an adjusting member 27^a. Extension 27 of the adjusting member 27^a is provided with a partially threaded aperture 28, the threaded part of which receives the threaded portion 29 of the reamer guide 23^a. The upper end of the aperture 28 is not threaded and as shown at 30 and is adapted to receive the portion 31 of the guide 23^a. This portion 31 of the guide terminates in a point 32, which engages the walls 33 of the upper end of the portion 30 of the aperture 28. The upper end of the extension 27 is provided with slots 34 so that when the tapered end of the portion 31 is forced into engagement with the walls 33 of the split end of portion 27 said portion will be locked against rotation in the

threaded aperture 26. The adjusting nut 27^a is provided with a flange 27^b which engages the bevelled surfaces 8^a at the lower ends of the cutters 8, thereby forcing the cutters to slidably move in the arcuate slots 7 of the reamer head 2 against the action of the coiled spring 14 as the adjusting nut 27^a is screwed upwardly in the threaded aperture 26. When the adjusting nut 27^a is screwed downwardly the coiled spring 14 will cause the cutters to keep in contact with the flange 27^b of the adjusting nut 27^a.

When it is desired to ream a valve seat, the necessary angle of which is known, the adjusting member 27^a is adjusted upwardly or downwardly against or with the tension of the spring 14 which passes through the apertures in the upper ends of the cutters, the operator watching the graduation on the curved edge of the cutters, and when the desired graduation is in registration with the edge 35 of the reamer head 2 the adjusting of the adjusting member 27^a is stopped. It will be seen that by moving the adjusting member upwardly, said adjusting member 27^a will force the cutters to slide in the arcuate slots 10, against the action of the spring 14, this sliding changing the angle of the cutting edge of the cutters. Also that any downward movement of the adjusting member 27^a will allow the spring 14 to cause the cutters to move inwardly at their upper ends, thereby changing the angle of the cutting edge of the cutters in the other direction from that caused by an upward movement of the adjusting member 27^a.

The invention having been set forth, what is claimed as new and useful is:—

A reamer comprising a conically shaped head, segmentally shaped cutters radially disposed in segmentally shaped grooves in the conically shaped head, the upper ends of said cutters being spaced from the conically shaped head and provided with apertures, a coiled spring extending through said apertures and around the conically shaped head in registration with an annular groove in the head and adapted to be received therein, the lower ends of the segmentally shaped blades being provided with inwardly and downwardly extending surfaces, an adjusting screw threaded axially into the head, said adjusting screw being provided with an outwardly and upwardly extending flange, said outwardly and upwardly extending flange co-operating with downwardly and inwardly extending surfaces of the blades for adjusting said blades angularly in the arcuate slots against the action of the spring.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY H. HICKS.

Witnesses:
L. D. Smith,
Geo. W. Piper.