July 14, 1959 E. A. TINTINGER 2,894,504

VALVE SEAT STONE DRESSER

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Fig. 1

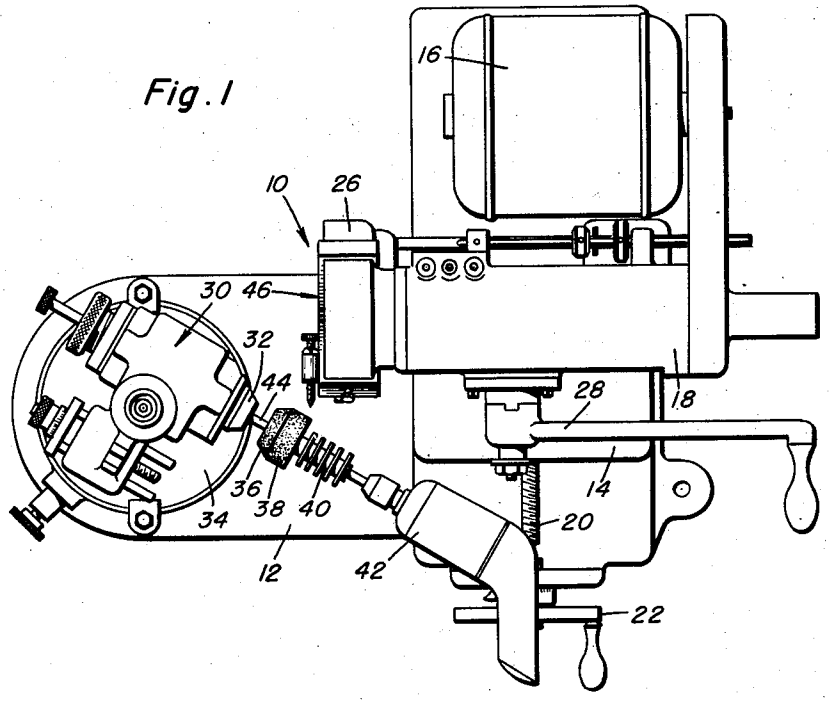


Fig. 2

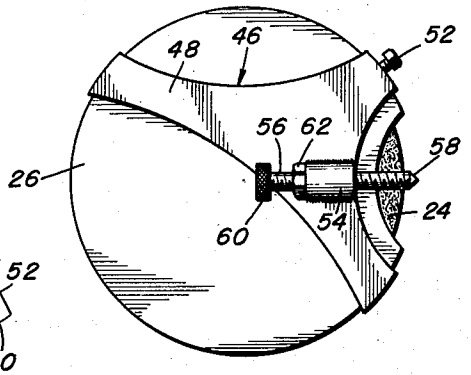
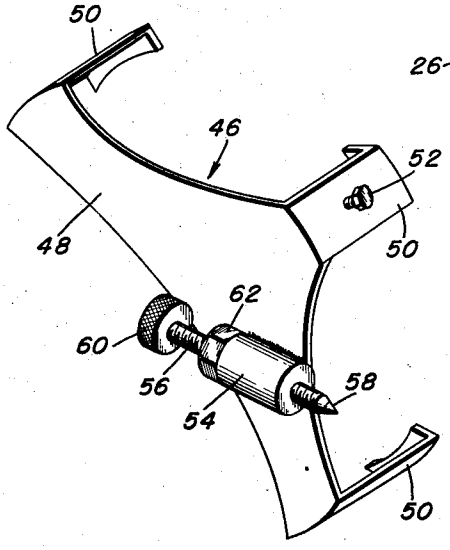


Fig. 3



Emmett A. Tintinger
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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VALVE SEAT STONE DRESSER

Emmett A. Tintinger, Vancouver, Wash., assignor of twenty percent to O. R. Clawson, Vancouver, Wash.

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7 Claims. (Cl. 125—11)

This invention relates in general to new and useful improvements in tools for internal combustion engines, and more specifically to an improved valve seat stone dresser.

In the construction of internal combustion engines, there are provided valve seats formed either in the block or in the head against which heads of valves seat. In the average internal combustion engine, the face of the head of the valve and the valve seat are ground at an angle of 45°. However, in some internal combustion engines other angles, such as 30°, are utilized. Irrespective of the particular angle used, both the angle of the face of the head of the valve and the angle of the valve seat are to be identical.

The primary difficulty with present day equipment is that one machine is used for refacing valves and another machine is used for grinding the valve seats. As a result, there are two separate grinding stages, each of which is variable. As a result, the angle of the face of the valve head may vary slightly from the angle of the valve seat. This results in an improper fit between the valve head and the valve seat inasmuch as there should be a continuous mating surface between the face of the valve head and the valve seat, this mating surface being annular and having a width in the vicinity of three thirty seconds of an inch.

It is therefore the primary object of this invention to provide a valve seat stone dressing tool which is so constructed whereby it may be mounted on the valve refacing machine so that the valve seat stone may be dressed to the same angle as the angle which the face of the valve is ground.

Another object of this invention is to provide an improved attachment for valve refacing machines, the attachment including a clamp for clamping a stone dressing tool on a guard of the grinding wheel assembly of the refacing tool and a pilot mountable within a chuck of the driven chuck of the refacing machine whereby a seat dressing stone mounted on the pilot is aligned with the dressing tool identically with the alignment of the valve with respect to the grinding wheel of the grinder part of the refacing tool.

A further object of this invention is to provide an improved attachment for refacing machines, the attachment being in the form of a mounting bracket secured to a guard for a grinder wheel of the refacing machine and there being provided suitable means on the mounting bracket for the adjustment mounting of the dressing stone.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a top plan view of a conventional type of valve refacing machine and shows mounted on the same

the valve seat stone dressing attachment which is the subject of this invention, a valve seat dressing stone being illustrated in position for a dressing operation;

Figure 2 is an enlarged fragmentary view showing the manner in which the dressing stone for the valve seat grinding stone is mounted on a guard for the grinding wheel of the valve refacing machine; and

Figure 3 is an enlarged perspective view of the mounting bracket assembly of Figure 2.

Referring now to the drawings in detail, it will be seen that there is illustrated in Figure 1 a conventional type of valve refacing machine, such machine being the subject of Patent No. 2,120,198, granted on June 7, 1938.

The valve refacing machine **10** includes a suitable base **12** which has mounted thereon for transverse sliding movement a slide plate **14**. Carried by the slide plate **14** is an electric motor **16** which is drivingly connected to a spindle assembly **18**. The entire unit is adjusted transversely of the base **12** by means of an adjusting screw **20** and a hand wheel **22**.

The spindle assembly **18** includes a grinding wheel **24** which has a major portion thereof encased within a suitable guard **26**. The grinder wheel **24** and the guard **26** are moved together as a unit longitudinally of the base **12** by means of a feed assembly **28**.

Also mounted on the base **12** is a chuck assembly which is referred to in general by the reference numeral **30**. The chuck assembly **30** includes a chuck **32** for receiving a stem of a valve. If desired, the chuck assembly **30** may include an electric motor for driving the chuck **32**.

In the normal operation of the valve refacing machine **10**, a stem of a valve is chucked into the chuck **32** and is so mounted whereby it may even be driven in response to driving of the chuck **32** or may be free to rotate. The chuck assembly **30** is provided with a suitable base **34** which is rotatably mounted on the base plate **12**. By rotating the base **34** and fixedly securing it to the base plate **12**, the desired angle between a head of a valve (not shown) with respect to the grinder wheel **24** may be obtained.

After the chuck assembly **30** has been set at the desired angle, a stem of a valve to be refaced is chucked into the chuck **32**. Then the grinder wheel **24** is advanced transversely of the base plate **12** so that it is at the proper position with respect to the face of the valve to be refaced. Then the grinder wheel **24** is fed back and forth longitudinally of the base plate **12** over the face of the valve to reface it through a grinding operation.

The above described method of refacing a valve determines the angle of such face of the valve. The angle of a valve seat is determined by the angle of a grinding surface **36** of a seat grinding stone **38**. The seat grinding stone **38** is removably carried by a grinding sleeve **40** which has releasably attached thereto a motorized head **42**. The sleeve **40** is mounted on a suitable spindle or pilot (not shown) normally carried by a valve guide (not shown) of the internal combustion engine for centering the stone **38** with respect to the valve seat to be ground.

In order to dress the grinding face **36** of the stone **38** at the desired angle, a suitable dressing stand, such as the dressing stand of Patent No. 1,999,435, granted on April 30, 1935, is utilized. The angle of the grinding face **36** is determined by inserting the particular dressing tool. It is readily apparent that the angle of the grinding face **36** may vary from the angle between the head of the valve and the grinding stone **24** so that the face of the valve may be ground at a slightly different angle from the valve seat.

In order to overcome the above mentioned deficiency, it is desired that the dressing face **36** of the stone **38** be dressed in the same manner as the face of the valve is ground for the seat to which the stone **38** is to be

applied. The stone **38** is retained in the same position as the head of the valve refaced by the valve refacing machine **10** by means of a special spindle or pilot **44** which is chucked in the chuck **32**. The sleeve **40** is then passed over the spindle **44** and the stone **38** is ready for rotation by the head **42** in the customary manner.

Referring now to Figure 3 in particular, it will be seen that there is illustrated a valve seat stone dressing tool which is referred to in general by the reference numeral **46**. The valve seat stone dressing tool **46** includes a mounting bracket **48** having a plurality of circumferentially spaced clamp fingers **50** which are engageable over the grinding stone guard **26**. In order that the mounting bracket **48** may be clamped on the guard **26**, at least one of the clamp fingers **50** is provided with a set screw **52**.

Carried by the mounting bracket **48** is an internally threaded member **54**. The internally threaded member **54** has an axis which is disposed parallel to the plane of the grinding wheel **24**. Threadedly engaged in the internally threaded member **54** is an elongated screw threaded member **56** which is provided at one end with a diamond **58** and at the opposite end with a knob **60** to facilitate setting of the screw threaded member **56**. A lock nut **62** is mounted on the screw threaded member **56** for locking it in position relative to the internally threaded member **54**.

In the operation of the attachment for dressing the stone **38** on the valve refacing machine **10**, the stone **38** is mounted in the position illustrated in Figure 1 and the valve seat stone dressing tool **46** is clamped on the guard **26**, as is best illustrated in Figures 1 and 2. The diamond **58** is advanced to a point whereby it projects beyond the grinding wheel **24**. Then by advancing the grinder wheel **24**, the guard **26** and the valve seat stone dressing tool as a unit, the diamond **58** is positioned that it will lightly engage the dressing portion **36** of the stone **38**. With the head **42** operating, the valve seat stone dressing tool is moved longitudinally of the base plate **12** by means of the feed mechanism **28**. The diamond **58** is moved back and forth over the dressing portion or dressing face **36** of the stone **38** and the diamond **58** is fed slowly into the stone **38** by means of the feed screw **20**. This is continued until the dressing portion **36** of the stone **38** has been properly dressed. The angle of the dressing face **36** of the stone **38** is then identical to the angle of the face of the valve head. Thus a valve seat ground with the stone **38** will have an angle identical to the angle of the face of the valve for which it is intended.

Although, the invention has been illustrated as being attached to a machine of the type wherein the grinding wheel is moved relative to the valve being refaced, the application of the invention is not so limited. If desired, the diamond holder may be used in conjunction with machines which are so constructed to move the valve relative to the grinding wheel.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a valve refacing machine of the type including a grinder having a grinding wheel and a guard, and a valve stem chuck, a valve seat stone dressing tool including a dressing stone mounted on said guard, and a valve seat dressing tool pilot carried by said chuck, said dressing stone facing said pilot for dressing a valve seat stone mounted on said pilot.

2. In combination with a valve refacing machine of the type including a grinder having a grinding wheel and a guard, and a valve stem chuck, a valve seat stone dressing tool including a mounting bracket secured to said guard, a dressing stone carried by said mounting bracket, and a valve seat dressing tool pilot carried by said chuck, said dressing stone facing said pilot for dressing a valve seat stone mounted on said pilot.

3. In combination with a valve refacing machine of the type including a grinder having a grinding wheel and a guard, and a valve stem chuck, a valve seat stone dressing tool including a mounting bracket secured to said guard, a dressing stone carried by said mounting bracket and a valve seat dressing tool pilot carried by said chuck, said dressing stone facing said pilot for dressing a valve seat stone mounted on said pilot, said mounting bracket including a plurality of clamp fingers, a set screw carried by at least one of said fingers.

4. For use in combination with a valve refacer of the type including a grinding wheel and a guard for the grinding wheel with the guard having an end wall surface disposed parallel to the plane of the grinding wheel, a valve seat stone dressing tool comprising a mounting bracket having a flat face adapted to be disposed in face to face engagement with an associated grinding wheel guard end wall, mounting means on said mounting bracket for attachment to the grinding wheel guard, a dressing stone, and support means on said mounting bracket adjustably supporting said dressing stone, said support means including an elongated holder disposed parallel to said flat face and projecting beyond said mounting bracket.

5. For use in combination with a valve refacer of the type including a grinding wheel and a guard for the grinding wheel with the guard having an end wall surface disposed parallel to the plane of the grinding wheel, a valve seat stone dressing tool comprising a mounting bracket having a flat face adapted to be disposed in face to face engagement with an associated grinding wheel guard end wall, mounting means on said mounting bracket for attachment to the grinding wheel guard, a dressing stone, and support means on said mounting bracket adjustably supporting said dressing stone, said support means including an elongated holder disposed parallel to said flat face and projecting beyond said mounting bracket, said mounting means including a plurality of clamp fingers, at least one of said fingers having a setscrew.

6. For use in combination with a valve refacer of the type including a grinding wheel and a guard for the grinding wheel with the guard having an end wall surface disposed parallel to the plane of the grinding wheel, a valve seat stone dressing tool comprising a mounting bracket having a flat face adapted to be disposed in face to face engagement with an associated grinding wheel guard end wall, mounting means on said mounting bracket for attachment to the grinding wheel guard, a dressing stone, and support means on said mounting bracket adjustably supporting said dressing stone, said support means including an internally threaded member secured to said mounting bracket, a screw threaded member, said dressing stone being mounted on one end of the screw threaded member, said screw threaded member being adjustably mounted in said internally threaded member, said screw threaded member having an axis disposed parallel to said flat face and said dressing stone projecting beyond said mounting bracket.

7. For use in combination with a valve refacer of the type including a grinding wheel and a guard for the grinding wheel with the guard having an end wall surface disposed parallel to the plane of the grinding wheel, a valve seat stone dressing tool comprising a mounting bracket having a flat face adapted to be disposed in face to face engagement with an associated grinding wheel guard end wall, mounting means on said mounting bracket for attachment to the grinding wheel guard, a dressing stone, and support means on said mounting bracket ad-

justably supporting said dressing stone, said support means including an internally threaded member secured to said mounting bracket, a screw threaded member, said dressing stone being mounted on one end of the screw threaded member, said screw threaded member being adjustably mounted in said internally threaded member, said screw threaded member having an axis disposed parallel to said flat face and said dressing stone projecting beyond said mounting bracket, said mounting means including a plurality of clamp fingers, at least one of said fingers having a setscrew.

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