Dec. 5, 1933. E. A. HALL 1,938,330

SUCTION NOZZLE FOR VALVE SEAT GRINDERS

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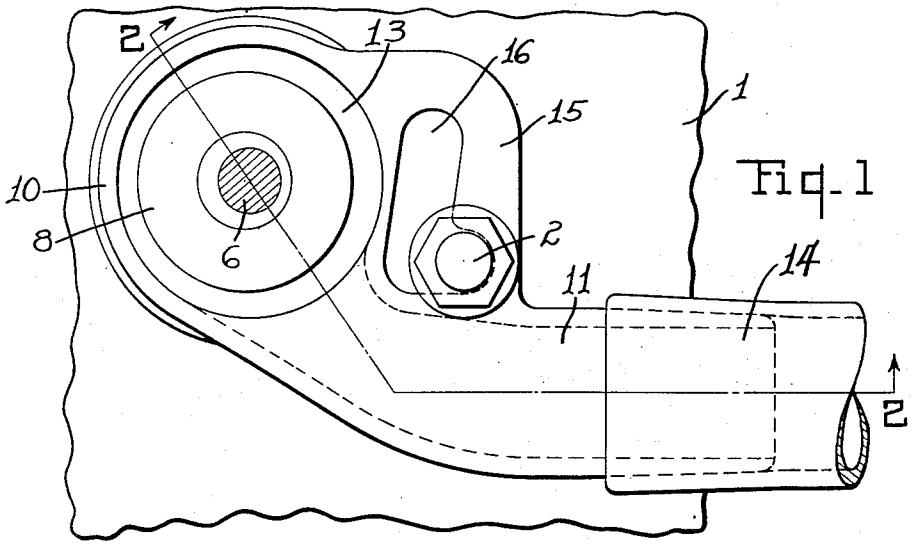


Fig. 1

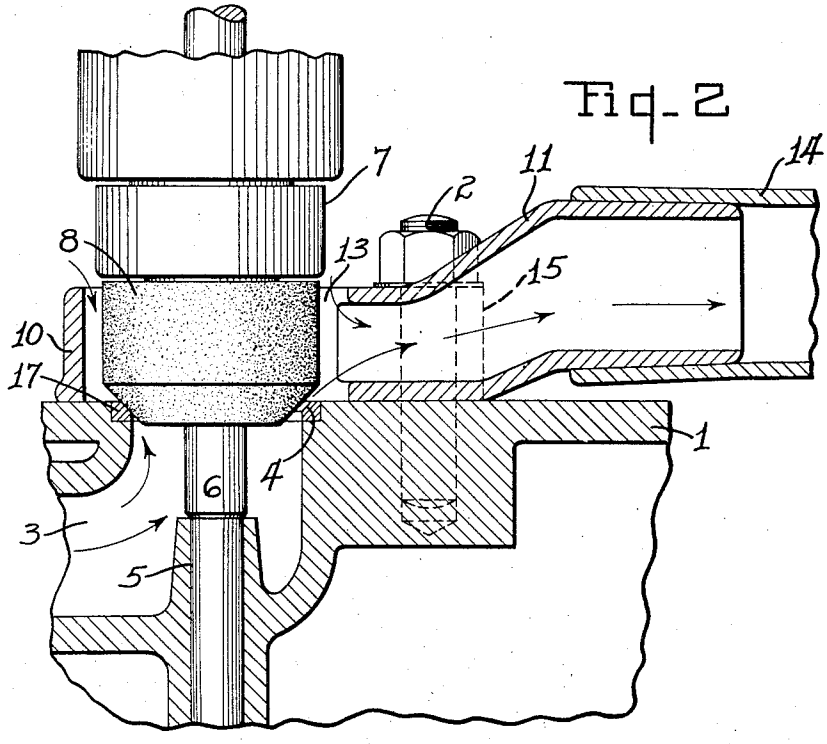


Fig. 2

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SUCTION NOZZLE FOR VALVE-SEAT GRINDERS

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9 Claims. (Cl. 51—273)

This invention relates to means particularly intended for use in connection with means for grinding or otherwise acting on the valve seats of internal combustion engines to remove the grindings or cuttings from the tool and work, and has for its object the provision of a simple and efficient means of this character, which is capable of being clamped to a cylinder block by some one of the head securing stud bolts, and of encompassing the valve-seat and seat grinding tool to remove, by suction action, all dust, chips, grindings or cuttings, resulting from the use of the tool.

The invention is fully described in the following specification, and the preferred embodiment thereof illustrated in the accompanying drawing, in which—

Figure 1 is a plan view of a device embodying the invention secured to an engine block and having a valve-seat grinding means operatively associated therewith and in horizontal section, and Fig. 2 is a vertical section thereof on the line 2—2 in Fig. 1, with parts in full.

Referring to the drawing, 1 designates the upper end of an engine block with the head removed, 2 one of the customary stud bolts for securing the head to the block, 3 a passage in the block having a valve-seat 4 at its outer end, and 5 a valve stem guide provided in the passage 3 in concentric relation to the valve-seat. A pilot stem 6 is mounted in the guide 5 and projects upwardly therefrom through and above the valve-seat 4 in concentric relation thereto and adapted to enter a valve-seat grinding tool 7 and hold its rotary grinding element 8 in proper relation to the valve-seat, as well understood in the art. The tool 7, in the present instance, is of the eccentric grinder type in which the element 8 has engagement with the valve-seat at one side only of its axis and such point of contact progresses around the seat as the grinding progresses. A tool of this character is disclosed in United States Letters Patent No. 1,760,493, dated May 27, 1930.

The device embodying the invention comprises a suction head 10 with a neck 11 projecting laterally therefrom and forming a throat passage 12 opening communication between the head cavity 13 and a tube or conduit 14 leading to a suitable suction creating source.

The head 10 has a flat bottom adapted to seat closely on the top of the engine block in spaced surrounding relation to the valve-seat 4 being operated on, and the cavity 13, in the present instance, comprises a straight bore entirely through the head and of a diameter to receive the grinding element 8 and provide a space therearound. The head is preferably of a height to reach substantially to the top of the grinding element, as shown. The head 10 thus forms a housing, which is adapted to encompass, in spaced relation thereto, the element 8 acting on the valve-seat and to have its bottom open only to the passage 3 and its top open around the element 8 to the atmosphere.

The passage of the neck 11 leads substantially radially from the head cavity 13 at one side thereof and then angles slightly to extend in a direction which disposes its axis substantially tangential to the outer side of the head, the outer end of the neck being disposed slightly above the bottom plane of the head to permit a fitting of the top end therearound.

The side of the head 10 in the angle formed by it and the neck 11 is broadened laterally of the head axis to form a web 15, which is flush at its under side with the head bottom to adapt it to seat on the engine block, and is provided vertically therethrough with an angled or L-shaped slot 16 for receiving a suitable stud bolt 2 by which the device is clamped to the engine block.

The provision of the angle slot 16 and the disposition of the neck 11, with respect to the head 10, enables the suction device to be clamped to an engine block in proper encircling relation to a valve-seat irrespective of the number and arrangement of the stud bolts, which is an important feature, as the number and arrangement of such bolts vary for different makes of engines.

It is apparent that the head 10 comprises a suction nozzle adapted to be easily and quickly clamped to an engine block with the wall of its cavity 13 in outwardly spaced concentric relation to the valve-seat 4 and pilot 6 and also in surrounding spaced relation to the valve-seat treating tool, whether such tool be an abrading wheel for acting on the valve-seat itself or a counterbore member for counterboring the marginal edge portion of the passage 3 to receive the valve-seat ring 17. It will be understood that the term "grinder", as used herein, is not necessarily limited to a valve grinding tool, but contemplates any tool, such, for instance, as a counterboring tool, for acting on a valve-seat to reseat or true the same, and also to a cutting tool for acting on the valve-seat itself or on the metal of the engine block to form a recess or counterbore for receiving a valve-seat ring.

I wish it understood that my invention is not limited to any specific arrangement or form of

the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is:

1. A device of the class described, comprising a suction head having a cavity therein open at top and bottom and having a neck projecting laterally therefrom with its throat passage opening from said cavity and adapted to have connection with a suction creating source, the head adapted to seat at its bottom on an engine block in surrounding relation to a valve-seat therein and to receive a valve-seat grinding tool in its cavity through its top, and means for clamping the head to an engine block.

2. A device of the class described, comprising a suction head having a cavity therein open at top and bottom and adapted to seat down on an engine block in spaced surrounding relation to a valve-seat therein and to receive through its top a grinding tool, said head having a part at one side thereof angularly slotted to receive an engine block stud bolt in various positions therein for clamping the device of the engine block, said head also having a suction neck angularly projecting from a side thereof with its throat passage in communication with said cavity.

3. A device of the class described, comprising a suction head having a cavity therein open at top and bottom and adapted to seat down on an engine block in spaced surrounding relation to a valve-seat therein and to receive through its top a grinding tool, said head having a part at one side thereof angularly slotted to receive an engine block stud bolt in various positions therein for clamping the device of the engine block, said head also having a suction neck projecting from a side thereof around said slotted portion with its throat passage in communication with said cavity.

4. A device of the class described, comprising a suction head having a cavity therein open at top and bottom and adapted to seat down on an engine block in spaced surrounding relation to a valve-seat therein and to receive through its top a grinding tool, said head having a part at one side thereof angularly slotted to receive an engine block stud bolt in various positions therein for clamping the device of the engine block, said head also having a suction neck angularly projecting from a side thereof around said slotted portion with the axis of its outer end portion disposed in a line substantially tangential to the head and with its throat passage in communication with said cavity.

5. The combination with an engine block having a passage therein terminating in a valve-seat at the top of the block, a pilot stem projecting upward from the passage concentrically through the valve-seat, and a valve-seat grinding tool mounted on the stem and having an eccentric valve-seat abrading element, of a suction head seating flat on the engine block and having a circular vertical cavity therethrough open at top and bottom receiving said abrading element, the wall of said cavity surrounding and laterally spaced from said valve-seat and element, said head having a neck projecting laterally therefrom with a suction throat therein.

6. A device of the class described, comprising a block-like suction nozzle of flat form for seating on an engine block over a valve-seat, said nozzle having a head portion and a neck portion projecting laterally therefrom, the head portion having a vertical bore therethrough of greater diameter than the valve-seat adapted to receive a valve-seat grinder through its top and forming a space around the valve-seat and grinder, said neck portion having a suction passage in communication with a side of said bore, and means for clamping said nozzle to the cylinder block with the bore and valve-seat substantially in axial register.

7. In a device of the class described, a housing for seating on an engine block in surrounding relation to a valve-seat being acted on and open at its top for receiving a tool for acting on the seat, said housing having a passageway in communication with a suction source for carrying away the cuttings or grindings, and means for clamping the housing to the engine block.

8. In a device of the class described, a housing for seating on an engine block in surrounding relation to a valve-seat being acted on and open at its top for receiving a tool for acting on the seat, said housing having a passageway in communication with a suction source for carrying away the cuttings or grindings, and means for clamping the housing to the engine block, said means comprising the provision of an angular slot in the housing and a stud bolt on the engine block entering the slot.

9. The combination with an engine block having a valve-seat in its top with a passage leading therefrom, a pilot mounted in said guide and extending upward from said passage through and above the valve-seat concentric thereto, and a grinder rotatably mounted on the pilot for acting on the valve seat, of a housing suction nozzle seating on the engine block in spaced surrounding relation to the valve-seat and having a suction cavity in spaced surrounding relation to the valve-seat and grinder and open at its bottom to the passage and at its top to the atmosphere, said nozzle having a suction neck extending laterally therefrom and adapted to have communication with a suction source, and means for clamping the nozzle to the engine block.

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