June 2, 1936. E. A. HALL 2,042,782

DUST REMOVING MEANS FOR VALVE SEAT GRINDERS OR THE LIKE

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Fig. 1

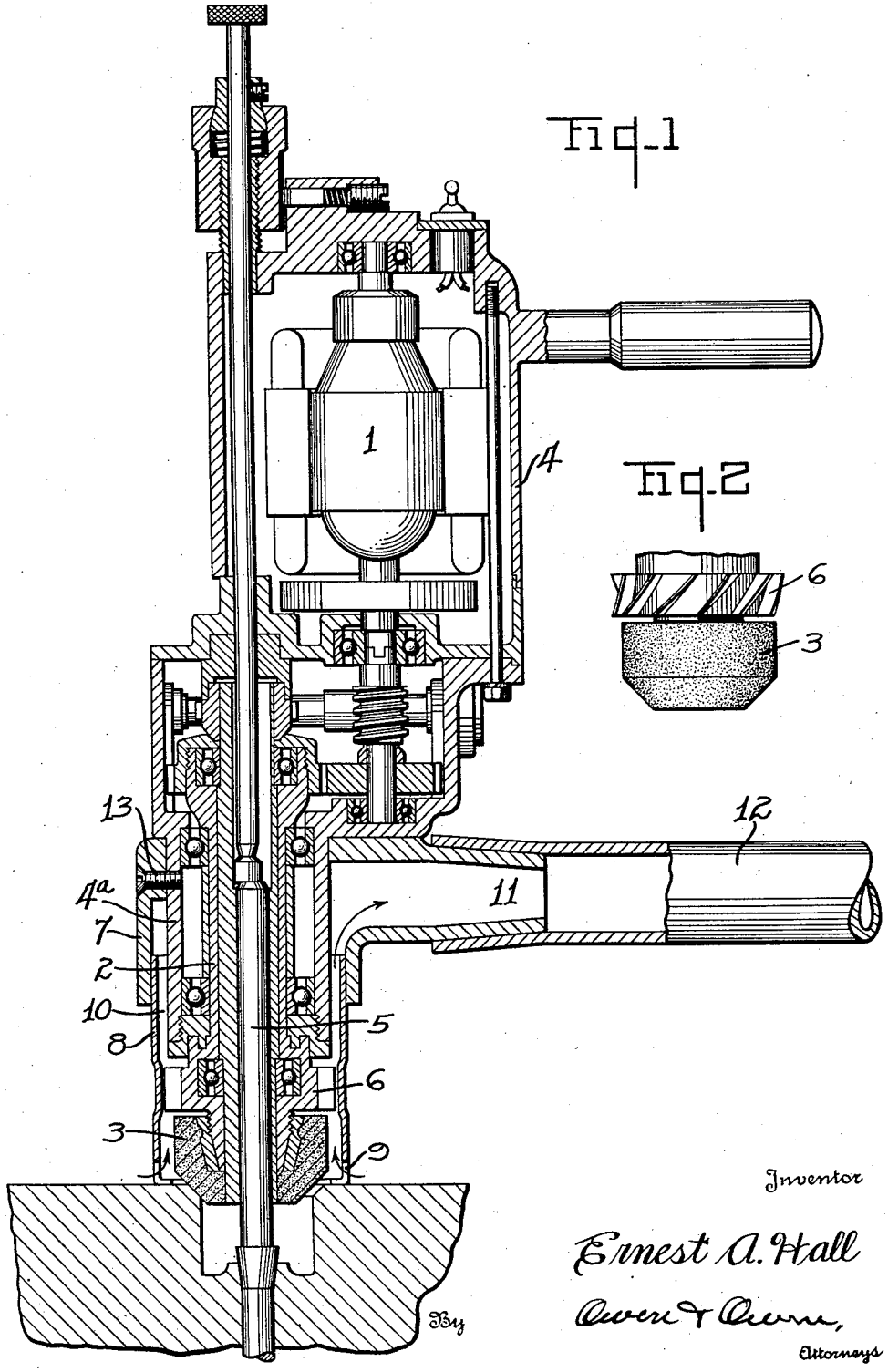


Fig. 2

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Fig-3

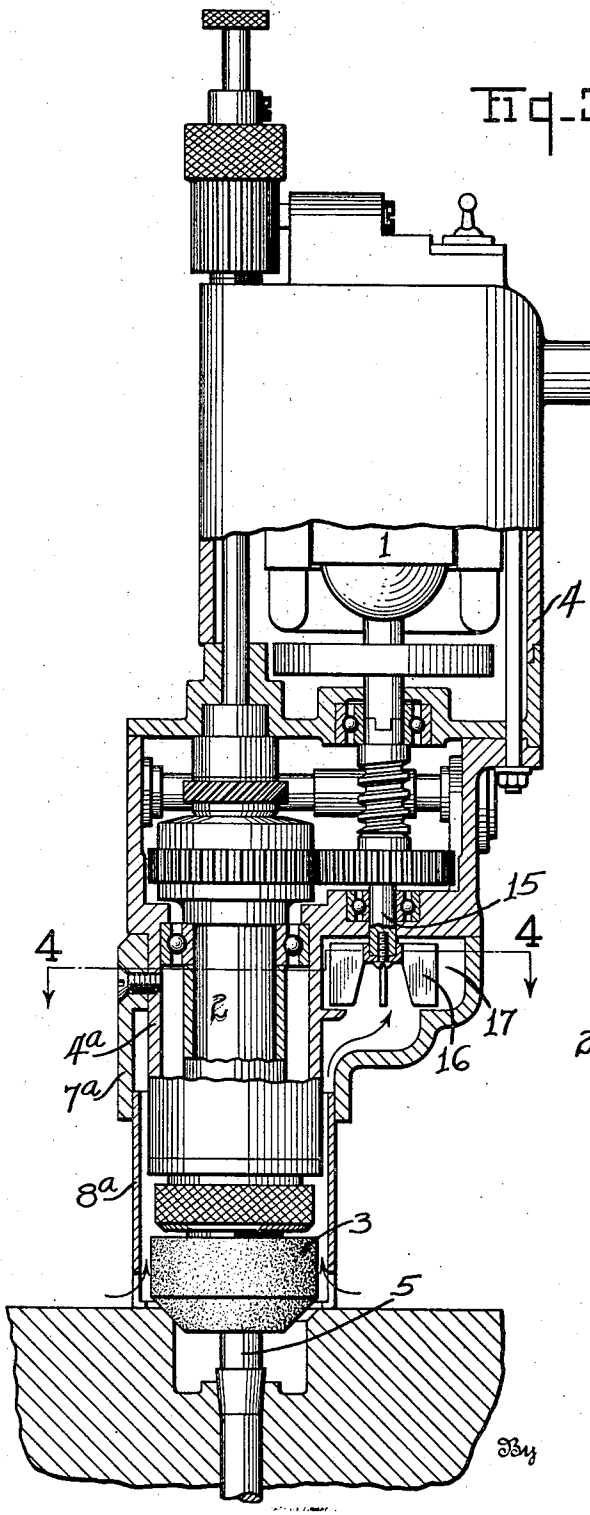
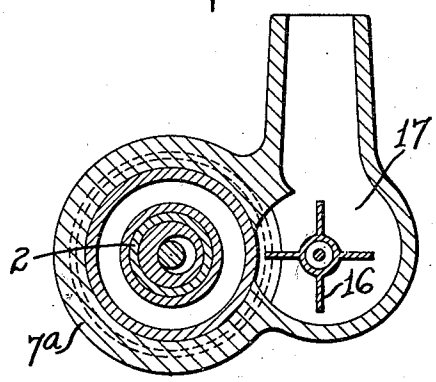


Fig-4



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DUST REMOVING MEANS FOR VALVE SEAT GRINDERS OR THE LIKE

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11 Claims. (Cl. 51—241)

This invention relates more particularly to valve-seat grinders, and especially to means in association therewith for removing the dust resulting from a grinding operation.

The primary object of the invention is the provision of a dust removing means of this character, which forms a part of or is adapted for attachment to a valve-seat grinding tool and has its suction action generated by a fan driven by a rotating part of the tool itself. Other objects and advantages of the invention will be apparent from the following detailed description of the invention, and two embodiments thereof are illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a valve-seat grinder having a suction device embodying the invention operatively associated with the lower end thereof. Fig. 2 is a fragmentary side elevation of the rotary part to which the suction fan is attached, with the fan and associated grinding member mounted thereon. Fig. 3 is a view of a grinding tool similar to Fig. 1 with parts in full and with the suction means modified to show the suction creating fan attached to a different rotating part of the tool. Fig. 4 is a cross-section on the line 4—4 in Fig. 3.

The tool, with which the present invention is preferably shown as associated, includes a motor 1, a shaft 2 geared to the motor shaft to be driven thereby, and carrying at its lower end a grinding wheel 3 for engagement with a valve-seat to be ground. In the illustrated tool, the axes of the motor shaft and grinding wheel shaft are disposed in parallel offset relation and the wheel shaft extends a distance below the lower end of the motor shaft. The motor gearing and major portion of the shaft 2 are enclosed by a casing 4, the lower end of which is formed with an extension 4^a which is concentric to the shaft 2 and has its lower end spaced a short distance from the grinding wheel 3. The tool is held in proper centered relation to the work in the usual manner by a pilot 5, which is mounted in and rises from the associated valve-stem guide of the work and extends into the tool with its axis, in the present instance, slightly offset from that of the grinding wheel. The other details of the tool have no pertinency so far as the present invention is concerned and need not, therefore, be described.

In carrying out the invention, the lower working end portion of the tool is enclosed by a housing which forms a passage or chamber in surrounding relation to the operating wheel and leads to or has communication with a suitable point of discharge for the dust and grindings resulting from the grinding operation, and a fan is conveniently located in said passage or chamber and attached to a rotating part of the driving means for the grinding wheel, whereby a draft is created through said passage away from the work.

In the form of the invention shown in Figs. 1 and 2, the fan designated 6 is attached to the wheel driving shaft 2 between the outer end of the casing part 4^a and the wheel 3, and the housing forming the suction or draft passage is mounted on said casing part 4^a. Such housing comprises a body part 7, which is disposed around said casing part, and an adjacent extension 8 adapted to surround the wheel 3 and fan 6 and to rest or substantially rest at its outer end on the work in surrounding relation to the valve-seat being ground.

The extension 8 is of sleeve-form and has its outer edge notched as at 9 to provide openings for the entrance of air to the interior thereof when the sleeve is resting on the work, and has its upper end telescoped for sliding adjustment in the housing 7. The sleeve and housing together form a passage 10 around the grinding wheel 3, fan 6 and lower portion of the tool casing 4^a, which passage communicates at its upper end with a lateral outlet passage 11 provided in the housing part 7 and adapted to have communication with any suitable point of discharge through a tube or other suitable conduit 12. It is apparent that the fan 6 rotates at a rapid speed with the grinding wheel 3 and that it operates to effect an upward draft through the passage 10, so that any dust resulting from the grinding operation will be carried from the working point to a suitable point of discharge. The housing, in the present instance, forms an attachment for the tool and is secured thereto by a screw 13 engaging into the tool casing.

The form of the invention illustrated in Figs. 3 and 4 is substantially the same as that in Figs. 1 and 2, with the exception that the lower end of the motor shaft 15 is extended through the bottom of the casing part 4 at one side of the casing part 4^a and carries the fan 16 within the outlet passage 17 of the housing, which in this form is marked 7^a. The housing 7^a has an adjustable extension part 8^a the same as the part 8 in the first form, and the outlet passage from the housing is disposed in angled relation to the housing instead of radially thereof as in said first form.

In both forms of the invention, the housing, which forms the suction chamber, is seated

closely at its inner end against the lower end of the body portion 4 of the tool casing, and, in the second form, the inner end of the housing is provided with an opening through which the fan 16 is projected.

It has been found in practice that a valve-seat grinding tool equipped with my invention will effectively remove all dust particles resulting from the grinding operation and will prevent the objectionable settling of any of said particles in the motor block passage within the valve-seat being ground. It is also apparent that the invention, when attached to the tool, comprises a part thereof; that the suction creating means thereof is attached to and operated by a grinding wheel driving part of the tool and that while, during operation, the grinding wheel and lower end portion of the tool are completely enclosed by the housing member, the adjustable sleeve member of the housing may be readily moved upward into the housing to disclose the grinding wheel and seat when desired.

I wish it understood that my invention is not limited to any specific form or arrangement 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 secured by United States Letters Patent, is:

1. The combination with a valve-seat grinding tool having a grinding wheel, pilot means for adjustably supporting the tool relative to the work, and driving means for said wheel, of a fan carried by a rotating part of said driving means, and means carried by the tool and forming a passage in which said fan is disposed and through which a draft is created by an operation of the fan to carry the dust rising from the grinding operation to a predetermined point, said last means being freely movable relative to the work.

2. The combination with a tool of the class described having a work grinding wheel, pilot means for adjustably supporting the tool relative to the work, and means for driving said wheel, of a fan carried and driven by a rotating part of said wheel driving means, and a housing carried by the tool and forming a passage in which said fan and wheel are disposed, said passage extending from a point adjacent to the point of engagement of the wheel with the work to a predetermined point of discharge, said housing being freely movable relative to the work.

3. The combination with a valve-seat grinder having a casing, a grinding wheel without the casing, pilot means for adjustably supporting the grinder relative to a valve-seat, and means within and projecting from the casing for driving said wheel, of a fan carried without the casing by a rotating part of said driving means, and a housing mounted on the casing and forming a passage in which said wheel and fan are disposed, said housing being freely movable relative to the work, whereby suction will be created therethrough by the fan away from a point adjacent to the work grinding surface of the wheel.

4. The combination with a valve-seat grinding tool having a casing, a grinding wheel without the casing, a pilot for adjustably supporting the tool relative to the work, and a wheel driving means having a rotatable part journaled in and projecting from the casing, of a fan carried by said part, and a housing carried by the casing and enclosing said fan and at least a part of said wheel and forming a passage through which an air current is created by said fan and which has its inlet adjacent to the wheel and its outlet remote therefrom, said housing being freely movable relative to the work.

5. The combination with a valve-seat grinding tool having a grinding wheel, pilot means for adjustably supporting the tool relative to the work, and a driving means for the wheel including a rotating part, of a fan carried by said part, and a housing carried by the tool and forming a passage in which said fan is disposed and which at its inlet end encircles said wheel, said housing having a part which is adjustable axially of said wheel to vary the length of the passage.

6. The combination with a valve-seat grinding tool having a grinding wheel, pilot means for adjustably supporting the tool relative to a valve seat, and a driving means for the wheel including a rotating part, of a fan carried by said part, and a housing carried by the tool and forming a passage in which said fan is disposed and which at its inlet end encircles said wheel, said housing having telescoping portions adjustable to vary the length of said passage axially of the wheel and one of said parts adapted to rest on the work in surrounding relation to the surface being ground.

7. The combination with a valve-seat grinding tool having a grinding wheel, pilot means for adjustably supporting the tool relative to the work, and means for driving the wheel including a carrying shaft therefor, of a fan mounted on said shaft adjacent to said wheel, and means carried by the tool and forming a passage in which said wheel and fan are disposed with the entrance to the passage adjacent to the wheel so that dust resulting from a grinding operation will be carried away from the grinding point through said passage, said last means being freely movable relative to the work and having a part which is adjustable axially of said wheel to vary the length of the passage.

8. A combination with a valve-seat grinding tool having a grinding wheel, pilot means for adjustably supporting the tool relative to the work, and means for driving the wheel, of a fan mounted on a rotating part of said means in spaced relation to the wheel, and a housing forming a passage in which said wheel and fan are disposed with the entrance to the passage adjacent to the wheel, the fan operating to create a current of air through the passage away from the wheel, said housing being freely movable relative to the work.

9. The combination with a valve-seat grinder having a body, pilot means for adjustably supporting said body relative to a valve seat, a grinding wheel, and means projecting from the body for driving said wheel, of a housing carried by the body and forming a passage, the entrance of which surrounds a valve-seat being ground when the wheel is in operative relation to such seat, and means operated by the wheel driving means of the grinder for creating a suction through said passage away from the wheel, said housing being freely movable relative to the work.

10. The combination with a valve-seat grinder having a body, pilot means to adjustably support said body relative to a valve seat, a grinding wheel and means projecting from the body and driving said wheel, of a housing carried by the body and forming a passage, the entrance of which surrounds a valve-seat being ground when the wheel is in operative relation to such seat, and means operated by the wheel driving means

of the grinder for creating a suction through said passage away from the wheel, said housing having a part thereof adjacent to the wheel adapted to rest on the work and movable toward and away from the work to vary the length of said passage and free to move about the valve-seat during the grinding action.

11. In an eccentric valve-seat grinder, a tool body and a grinding wheel having an eccentric movement with respect to the valve-seat, means to adjustably support said tool body relative to the valve seat, means to drive the grinding wheel, a housing carried by said tool body disposed about the sides of said grinding wheel and adapted to have free movements relative to the work during a grinding operation and movable relative to the tool body toward and away from the work, and means operated by the wheel driving means for creating a suction in said housing whereby particles removed during the grinding operation are carried away from the work.

ERNEST A. HALL.