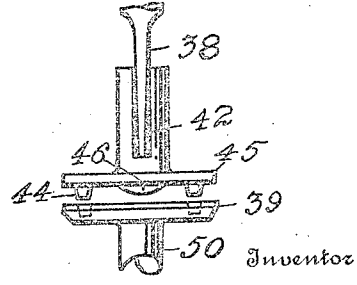
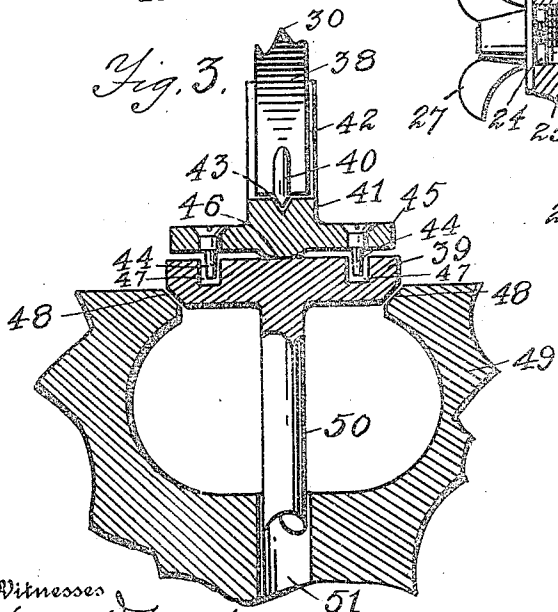
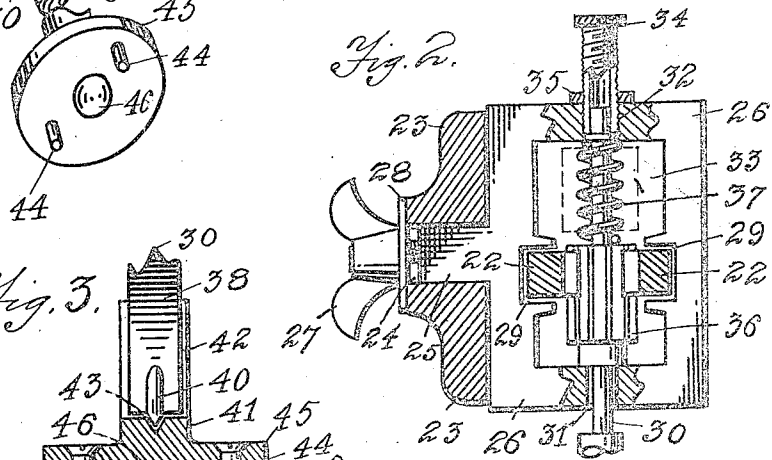
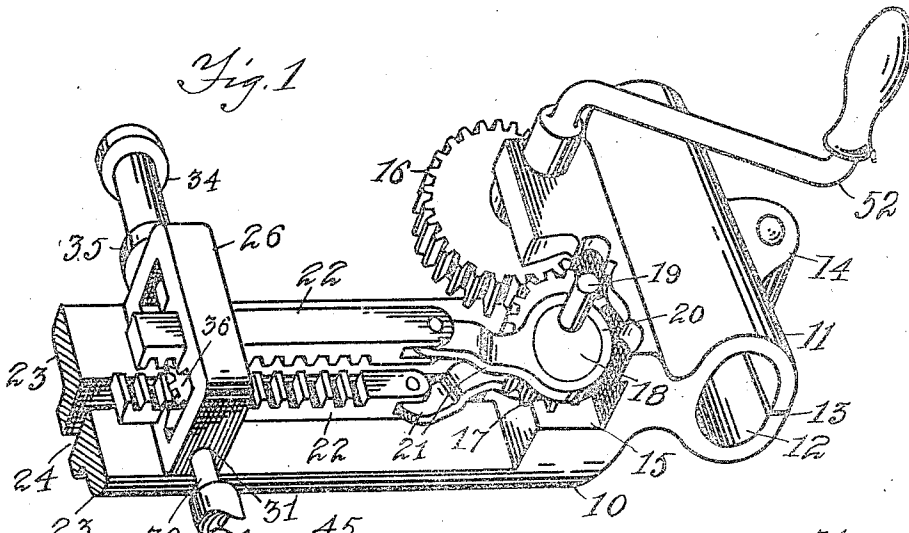


A. ASHWORTH.  
 BIT FOR VALVE GRINDERS.  
 APPLICATION FILED JULY 12, 1915.

1,154,159.

Patented Sept. 21, 1915.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ASA ASHWORTH, OF SALAMANCA, NEW YORK.

BIT FOR VALVE-GRINDERS.

1,154,159.

Specification of Letters Patent. Patented Sept. 21, 1915.

Application filed July 12, 1915. Serial No. 32,232.

To all whom it may concern:

Be it known that I, ASA ASHWORTH, a citizen of the United States, residing at Salamanca, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Bits for Valve-Grinders, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to valve grinders and is an improvement upon my multiple valve grinder as shown in my application for Letters Patent filed May 27th, 1915, Serial No. 30,730, and the improvement consists in providing the spindle with an engaging bit for the valve which, while adaptive to the different positions of the valve when reciprocally rotated, yet preserves a constant uniform central pressure upon said valve as it presses upon the valve seat during the grinding of the valve; and the invention consists in the novel features and combinations hereinafter set forth and claimed.

In the drawings, Figure 1 is a perspective view of the driving mechanism for the reciprocal rotation of the valve in grinding the same, a portion of the racks, frame and spindles being broken away, and showing the underside of the improved form of holding bit with the central projection thereon and the engaging pins at each side. Fig. 2 is a sectional view of the frame and racks showing an elevation of one of the spindles and rotating bits above the valve ready to insert the same. Fig. 3 is a sectional view of the improved bit and the valve showing the construction of the same and the position of the bit when reciprocally rotating said valve upon the valve seat, a portion of the engine cylinder being shown in section to show the valve seat, and the lower end of the spindle being also shown in position in the bit.

The numerals of reference refer to corresponding parts in the several views.

The numeral 10 designates the metal frame which supports the grinding mechanism and which consists of the head portion 11 with the hole 12 therethrough, the head being slotted at 13 to receive a standard through the hole 13 to adjustably support the frame 10, the frame being clamped at any desired height by means of a suitable bolt through the lugs 14. The opposite side of the head has the groove 15 within which the pinions

16 and 17 are revolubly mounted. The pinion 17 has the cam 18 on each side thereof with the pins 19 to form a crank shaft. The cams 18 are surrounded by the rings 20 which have the arms 21 extending out therefrom for pivotal attachment to the ends of the oppositely placed toothed racks 22 at each side, the teeth of the racks facing one another a spaced distance apart.

The frame 10 has the portion 23 extending out from the head 11 and has the slot 24 extending lengthwise of the central portion of said part 23 to receive therethrough the supporting extension 25 on the brackets 26 which fit within said slot 24. A thumb-screw 27 with washer 28 is attached to the end of the extension 25 in a threaded hole to draw the bracket 26 rigidly against the side of the part 23 on each side of the slot 24. The thumb-screw 27 permits the quick adjustment of the bracket 26 at any desired point along the slot 24. The bracket 26 has the central opening 33 therein and the cross-wise grooves 29 in the opposite walls of said opening 33, suitable lugs extending out each side of the grooves 29 to hold the racks 22 loosely and slidably in line in the grooves 29 during their reciprocative movement.

In order to reciprocally turn the valve 39 a spindle 30 is provided in the bracket 26, being loosely mounted through a hole 31 in the lower portion of the bracket. A threaded opening 32 is provided through the upper portion of the bracket and a threaded nut 34 fits within the threaded opening 32 and has the lock nut 35 thereon for holding it firmly in the adjusted position. The nut 34 has a central lengthwise hole to permit the spindle 30 to slide vertically therein.

A pinion 36 is attached to the spindle 30 within the opening 33 in the bracket 26 and meshes loosely in the racks 22 at each side. A tension coil spring 37 is provided between the upper end of the pinion 36 and the lower end of the nut 34 to give the desired pressure on the valve 39. The nut 34 is of sufficient length to be turned into the threaded opening 32 and thereby give any desired tension to the spring 37 yet permits the spindle 30 to be manually thrust upward so that the pinion 36 escapes above the toothed racks 22 thereby permitting the free side-wise movement of the bracket 26 and spindle 30 along said racks and the portion 23 of the frame without the removal of the spindle 30 and the pinion 36 attached thereto. The

loose support of the pinion 36 in racks 22 and the spindle 30 in the bracket 26 permits said spindle to adjust itself to any movement or inequality of the valve 39 in grinding the same. This is a flexible movement which is essential to the quick and perfect grinding of the surface of said valve.

The spindle 30 is preferably provided with a flat end 38 having a centering point 40. A spanner bit 41 is preferably provided for the flattened spindle end 38, having a slot 42 in the stem to receive said flattened end 38, said slot having preferably an opening 43 at the center of its lower wall for the centering point 40, which arrangement prevents the sidewise movement of the flattened end 38 out of the slot 42. The spanner bit 41 is provided on its lower surface with two projecting tapered points 44 a spaced distance from the center thereof and on opposite sides of the flat disk-shaped head 45. The points 44 are preferably made by screws inserted through threaded openings in the head 45. Said head 45 has also the rounded projection 46 central thereof to bear on the center of the valve 39. The valve 39 is provided with spaced holes 47 which are deeper than the length of the spaced pins 44 so that they cannot bottom in said holes 47 when the central projection 46 bears on the top of the valve 39. The valve 39 rests on the seat 48 on the engine cylinder 49; valve stem 50 extending down through the hole 51 in said cylinder.

In order to grind the valve 39 and valve seat 48, the surfaces therebetween are coated with an abrading compound. The gear 16 may be power driven but is preferably manually rotated by means of the crank 52. When said pinion 17 is so rotated with the machine in position upon the valve 39, it is apparent that a reciprocating movement will be given to the racks 22 by the crank shaft formed by the cams 18 and pins 19 with the rings 20 around said cams, thereby giving a reciprocal rotation to the pinion 36 and the spindle 30 attached therethrough and the spanner bit 41 and valve 39. The loose mounting of the spindle 30 permits the spanner 41 to adapt itself to the movement of the valve 39 as it turns backward and forward, the pins 44 turning the valve 39 yet not bottoming in the holes 47 thereby keep-

ing a constant central pressure on the curved central downward projection 46 on the center of the valve 39. This arrangement permits the quick removal of the spanner bit 41 and the driving mechanism therefor, yet is thoroughly adaptive to any irregular movement of the valve 39, and can be adjusted to any degree of tension so as to obtain a perfectly smooth ground surface on the valve 39 and valve seat 48.

I claim as new:

1. A valve grinder comprising a frame, a spindle rotatively mounted in said frame, mechanism to rotatively reciprocate said spindle in said frame, a disk shaped spanner bit having a central opening removably engaged by said spindle, and a central projection on the end of said spindle to bear against the center of said spanner bit in said opening when reciprocally rotating the same.

2. A valve grinder comprising a frame, a spindle rotatively mounted on said frame, mechanism to rotatively reciprocate said spindle, a disk-shaped bit end on said spindle for engaging the valve, projections on said disk-shaped bit for engaging in spaced openings in the valve to turn said valve, and a curved projection central of said disk to bear on the center of said valve during the process of grinding.

3. A valve grinder comprising a frame, a spindle rotatively mounted on said frame, mechanism to rotatively reciprocate said spindle, a flattened end to said spindle having a central projection, a spanner bit having spaced projections thereon to engage in similarly spaced openings in the valve, said spanner bit having a slotted stem with a central opening therein to receive said flat spindle end and the central projection of said spindle in said slot and central opening, and a central rounded projection on the lower side of said tip to bear continuously on the center of the valve top during the grinding of said valve.

In testimony whereof I have affixed my signature in the presence of two witnesses.

ASA ASHWORTH.

Witnesses:

H. A. SANDBERG,  
HAROLD FORSBERG.