Jan. 28, 1930. H. W. GABEL 1,744,878

VALVE RESEATER AND PILOT STEM

Filed Dec. 30, 1927

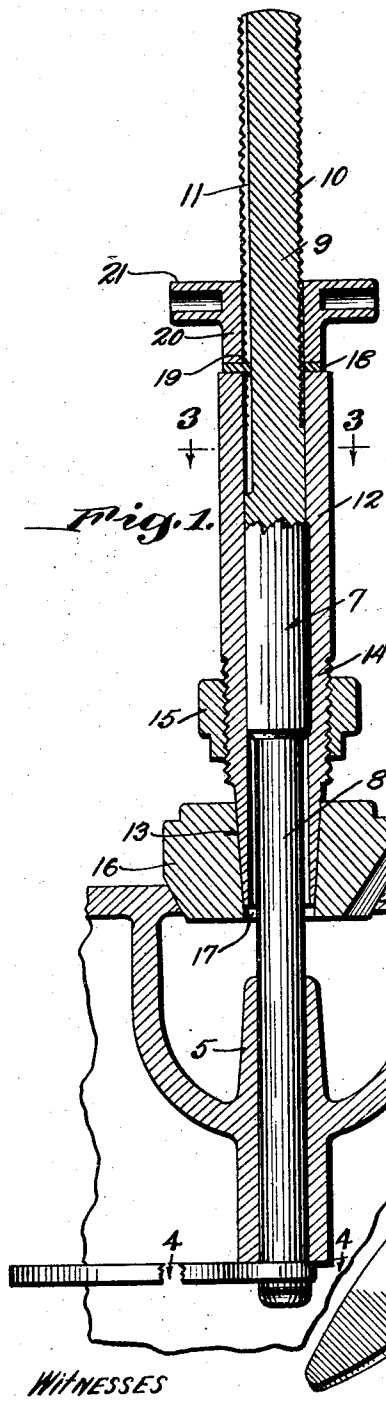


Fig. 1.

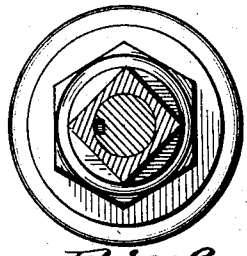


Fig. 3.



Fig. 4.

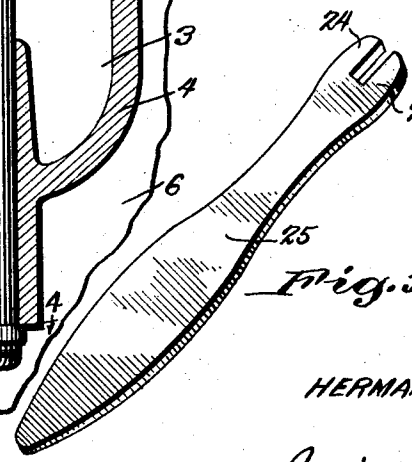
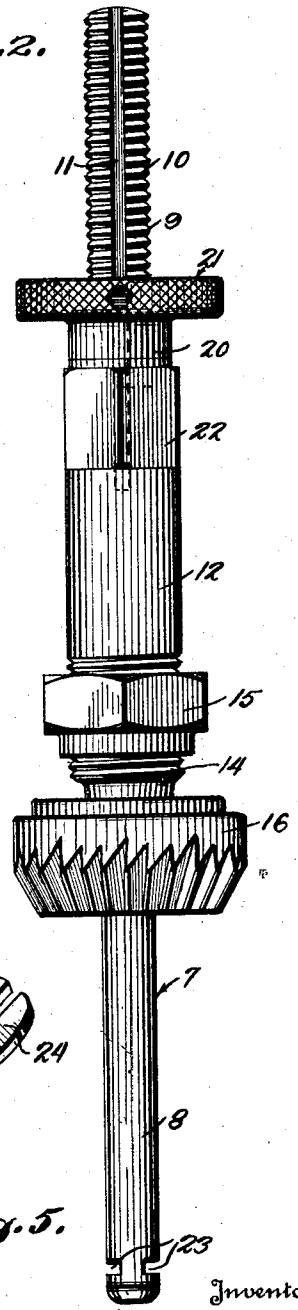


Fig. 5.

Fig. 2.



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UNITED STATES PATENT OFFICE

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VALVE RESEATER AND PILOT STEM

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This invention relates to the class of tools and pertains particularly to a valve-seat grinding tool designed particularly for use in connection with an internal combustion engine.

The primary object of the present invention is to provide, in a manner as hereinafter set forth, an improved type of pilot stem for supporting a cutter tool in position, and means for drawing the stem and cutter-actuating elements carried thereby to the proper degree of firmness against the valve to be refinished.

Another object of the invention is to provide a tool of the character above described which is designed to be easily and quickly placed in operative position and to be easily and smoothly operated for the quick performance of the reseating operation.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the present specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings, but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 shows a tool embodying the present invention partially in longitudinal section and partly in elevation, and in operative position.

Figure 2 is a side elevational view of the tool removed from engagement with the works.

Figure 3 is a sectional view taken upon the line 3—3 of Fig. 1.

Figure 4 is a section taken upon the line 4—4 of Fig. 1.

Figure 5 is a detailed perspective view of a holding wrench used in connection with the operation of the tool.

Referring now to the drawings in detail wherein like numerals of reference indicate corresponding parts, the numeral 1 indicates a portion of the lower part of an engine block in the upper surface of which the valve seat 2 is formed, the seat opening into the usual chamber 3 which leads to the valve opening, the lower portion of the wall 4 of which chamber is provided with the usual valve stem guide sleeve 5. The lower end of this sleeve extends downwardly into the valve spring chamber 6 in the usual manner.

The present invention comprises the elongated pilot stem 7 which is in the form of a steel shaft having substantially half of what is the lower end when the tool is in operative position, of reduced diameter as indicated by the numeral 8. The upper portion 9 of the stem is threaded as at 10 throughout the major portion of its length and is also provided with a longitudinally extending key groove 11.

Designed to snugly receive the upper portion 9 of the pilot stem 7 is a relatively long sleeve 12, the lower end of which has the outer wall tapered as indicated at 13 and is threaded as at 14 directly above this tapered portion. The interior diameter of the sleeve is constant throughout.

A nut 15 is threaded upon the lower end of the sleeve 12 for the purpose to be hereinafter pointed out. Frictionally engaged on the reduced tapered end 13 of the sleeve 12 is a cutter or reamer 16, the passage through the reamer being of gradually decreasing diameter from the upper end to the lower end, as indicated by the numeral 17. This tapered passage 17 snugly receives the tapered wall portion 13 of the sleeve 12 and tightly holds the sleeve in engagement with the reamer. When it is desired to remove the reamer from the sleeve, the nut 15 is threaded downwardly until it bears against the head thereof whereupon further turning of the nut will easily force the cutter from the sleeve as will be readily understood.

Engaging about the upper end of the stem portion 9 is a steel washer 18 which is provided with a key 19 designed to slidably engage the groove 11 of the stem.

Threaded upon the stem above the washer 18 is a nut 20 having the disk-like head portion 21 the peripheral surface of which is

knurled to facilitate the gripping of the nut head.

The upper end of the sleeve 12 is externally of polygonal cross-sectional design as indicated at 22 to receive a wrench or similar tool to facilitate the turning of the sleeve and the cutter member 16 carried upon the lower end thereof.

The lower end of the lower section 8 of the pilot stem is provided with a pair of diametrically oppositely positioned transversely extending grooves 23 each of which is provided to receive one of the furcations 24 formed at one end of the flat wrench member 25, when the valve reseating tool is in operative position.

In operation, the lower or reduced portion of the pilot stem 7 is extended downwardly through the valve seat opening 2 and through the valve stem sleeve 5 in the manner shown, the flat lower end of the stem portion 8 being extended beyond the sleeve 5 into the valve spring chamber 6.

The wrench 25 is then engaged with the lower end of the stem 7 in the manner shown in Figs. 1 and 4, and the nut 20 threaded downwardly upon the upper end of the stem against the upper end of the sleeve 12 until the wrench 25 is drawn against the lower end of the valve stem sleeve 15, and the nut 20 is then tightened until the required amount of pressure is exerted upon the valve seat 2 by the cutter or reamer 16. A wrench or other suitable tool is then engaged about the upper end portion 22 of the sleeve 12 and the sleeve rotated several times or until the valve seat has been properly cut.

By reference to the foregoing it will be readily seen that the present tool can be easily and quickly applied to the work and readily operated and removed therefrom.

When it is desired to remove the cutter from the sleeve 12 the nut 15 is threaded downwardly against the head and sleeve of the cutter as hereinbefore described and the cutter forced from the sleeve.

Having thus described my invention, what I claim as new is:—

A valve reseating tool comprising a pilot stem having its upper portion screw threaded and provided in said portion thereof with a longitudinally extending groove, the stem being provided at its lower end with transverse grooves, a sleeve rotatably and slidably mounted on the stem, the sleeve being provided with an externally tapered lower end portion and immediately above said portion with external screw threads, a cutter provided with a tapered bore frictionally receiving the tapered end portion of the sleeve, a nut engaging the screw threads of the sleeve and providing means by which the cutter may be forced off of the sleeve, a washer slidably mounted on the screw threaded portion of the stem and contacting with the upper end of the sleeve, said washer being provided with a key slidably engaging in said grooves to hold the washer against rotation on the stem, a nut engaged with the threaded portion of the stem and contacting with the washer, and a member extending laterally from the stem and provided with furcations removably engaged in the transverse grooves in the stem, the member and the nut cooperating to hold the cutter in engagement with a valve seat.

In testimony whereof I affix my signature.

HERMAN W. GABEL.