

S. M. TRAMMELL.
 COMBINED VALVE CUTTER AND VALVE SEAT REAMER.
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965,049.

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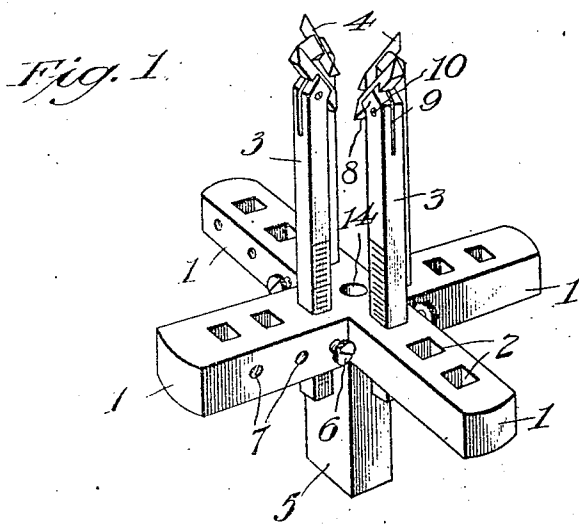
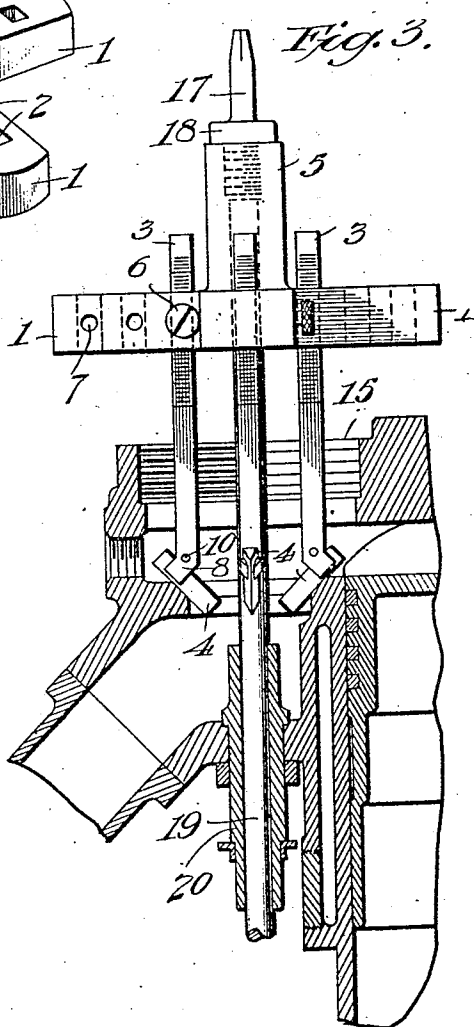
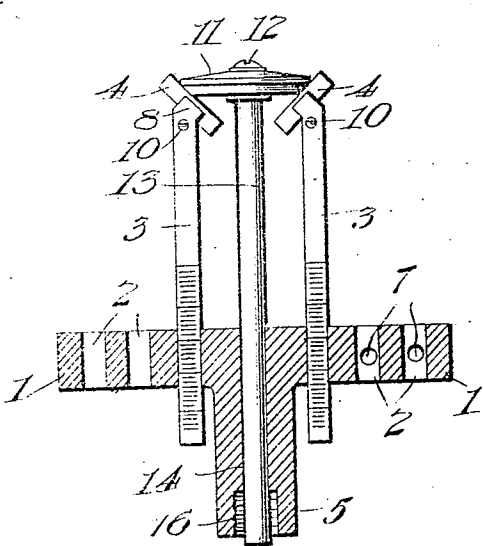


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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COMBINED VALVE-CUTTER AND VALVE-SEAT REAMER.

965,049.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SIDNEY MAURICE TRAMMELL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a certain new and useful Combined Valve-Cutter and Valve-Seat Reamer, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a combined valve cutter and valve seat reamer, the invention being especially designed with reference to use on automobiles and internal combustion engines generally wherein valves and valve seats are employed.

The object of the invention is to provide a device of the character specified which may be used both for cutting a new face on a valve and cutting a new face or valve seat in the cylinder of an internal combustion engine without removing the cylinder from the remainder of the engine, the improved device embodying in connection with a head, a plurality of cutters carried by bit holders which are adjustable to valves and valve seats of different sizes and which are also reversible so that the device as a whole may be used alternately for cutting or refacing valves and valve seats, while obtaining absolute accuracy in the pitch of the working faces of the valve and valve seat.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement herein fully described, illustrated and claimed.

In the accompanying drawings: Figure 1 is a perspective view of the device of this invention with the cutting bits and holders arranged to operate upon a valve. Fig. 2 is a diametrical section through the same showing a pair of cutting bits and holders in elevation and the relation of the valve and valve stem thereto while refacing the valve. Fig. 3 shows the manner of using the device in connection with a valve seat, a portion of the engine being shown in section and the device being shown in elevation.

The device of this invention comprises essentially a head as shown in Fig. 1 where it is seen to comprise in the preferred embodiment of the invention a series of arms 1 radiating from a common center, each arm being provided with a longitudinal

series of openings 2 for the reception of one of the holders for the cutting bits 4. The head also comprises a centrally arranged shank 5 preferably square in cross section and adapted to be clamped in a vise or the like for holding the tool as a whole stationary while cutting a new face on a valve as illustrated in Fig. 2.

The holes 2 are preferably square while the bit holders 3 which are of any suitable length are of corresponding shape in cross section so as to prevent the rotation of the holders in the holes 2 of the arms 1. This also permits the holders 3 to be removed and axially reversed and replaced in position for a purpose which will hereinafter appear. The holders 3 are held at any desired point of adjustment by means of set screws 6 which are inserted through threaded holes 7 in the arms 1 so as to bear against the holders 3 and prevent sliding movement thereof in the head, as clearly illustrated in Fig. 1.

In the preferred embodiment of this invention, each of the bit holders 3 has its outer end deflected at an angle as shown at 8 and split as shown at 9 to form a pair of jaws between which the cutting bit 4 is held, the bit being clamped in place by means of a screw 10 or its equivalent passing through one jaw and engaging the threaded opening in the other jaw. The inner faces of the jaws are also rabbeted or grooved to form dove-tailed seats for the reception of the cutting bits 4 while the cutting bit is preferably made of triangular shape in cross section to fit within the rabbeted jaws and to further provide a plurality of cutting edges as clearly illustrated in Fig. 1 any one of which edges may be disposed outwardly to act on the beveled face of the valve or valve seat as the case may be. It will be observed also that the cutting bits 4 may be slid in the direction of their length for cutting large or small valves. In case of a wide variation in the sizes of the valves the cutting bit holders 3 may be set toward or away from the center of the head by placing them in the appropriate holes 2 in the head.

For the purpose of cutting a valve, the cutting bits and their holders are arranged as shown in Figs. 1 and 2 with the edges of the bits disposed toward each other so as to operate simultaneously on the working face of the valve as shown in Fig. 2. Under this arrangement, the head of the device is held stationary by securing the shank 5 thereof

in a vise or the like while the valve indicated at 11 is turned by means of a screw driver engaged in the niche 12 of the valve, the valve being steadied in its rotation by means of the valve stem 13 which passes through a central guide opening 14 in the head and shank of the device, as clearly shown in Fig. 2.

In order to ream out the valve seat of a motor, the device is inserted through the valve opening 15 of the cylinder as shown in Fig. 3 with the cutting bits 4 reversed as compared with Figs. 1 and 2, the upper edges of the cutting bits being disposed away from each other. The cylinder being held in any suitable way, the device is rotated and this may be accomplished by any suitable device such as an ordinary hand brace. In order to enable such hand brace to be used in connection with the device above described, the shank 5 is counter-bored at its outer end as shown at 16 and internally screw threaded to receive a brace bit 17 adapted to be carried by an ordinary brace and provided with a collar 18 forming a shoulder adapted to bear against the end of the shank 5 as shown in Fig. 3.

From the foregoing description, it will be observed that the holders 3 with their bits 4 are axially reversible so that the bits 4 may be presented at either angle to cut the valve or the valve seat; also that the valve holders may be adjusted in the direction of their length to properly reach and operate upon a valve seat; furthermore that the bit holders 3 may be set nearer to or farther from the central guide opening 14 to accommodate the device to valves and valve seats of widely different sizes. It will also be seen that the cutting bits 4 may be adjusted in the direction of their length in the jaws of the holders thereby also increasing the latitude of adjustment of the device as a whole.

It will further be understood that in cutting a new face on a valve, the device is held stationary while the valve is revolved and that in operating upon a valve seat, the cylinder containing the valve seat is held stationary while the cutting device is rotated. The device is guided and braced in operating upon a valve seat by means of a guide rod 19 which is inserted through the guide opening 14 of the cutting device and which also enters the valve guide 20 in line with the center of the valve seat of the cylinder as clearly shown in Fig. 3.

What is claimed is:—

1. A combined valve cutter and valve seat reamer comprising a head formed with a central guide opening extending axially through the same, a plurality of metal facing bit holders axially reversible in openings in the head and provided with inclined bit holding sockets, and metal facing bits carried in said sockets.

2. A combined valve cutter and valve seat reamer comprising a head provided with centering means and a plurality of metal facing bit holders axially reversible on the head, and having inclined cutting edges forming valve or valve seat facing bits.

3. A combined valve cutter and valve seat reamer comprising a head formed with a central guide opening extending axially through the same, a plurality of metal facing bit holders axially reversible in openings in the head and provided with inclined bit holding sockets, and metal facing bits carried in said sockets and adjustable in the direction of their length.

In testimony whereof I affix my signature in presence of two witnesses.

SIDNEY M. TRAMMELL.

Witnesses:

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