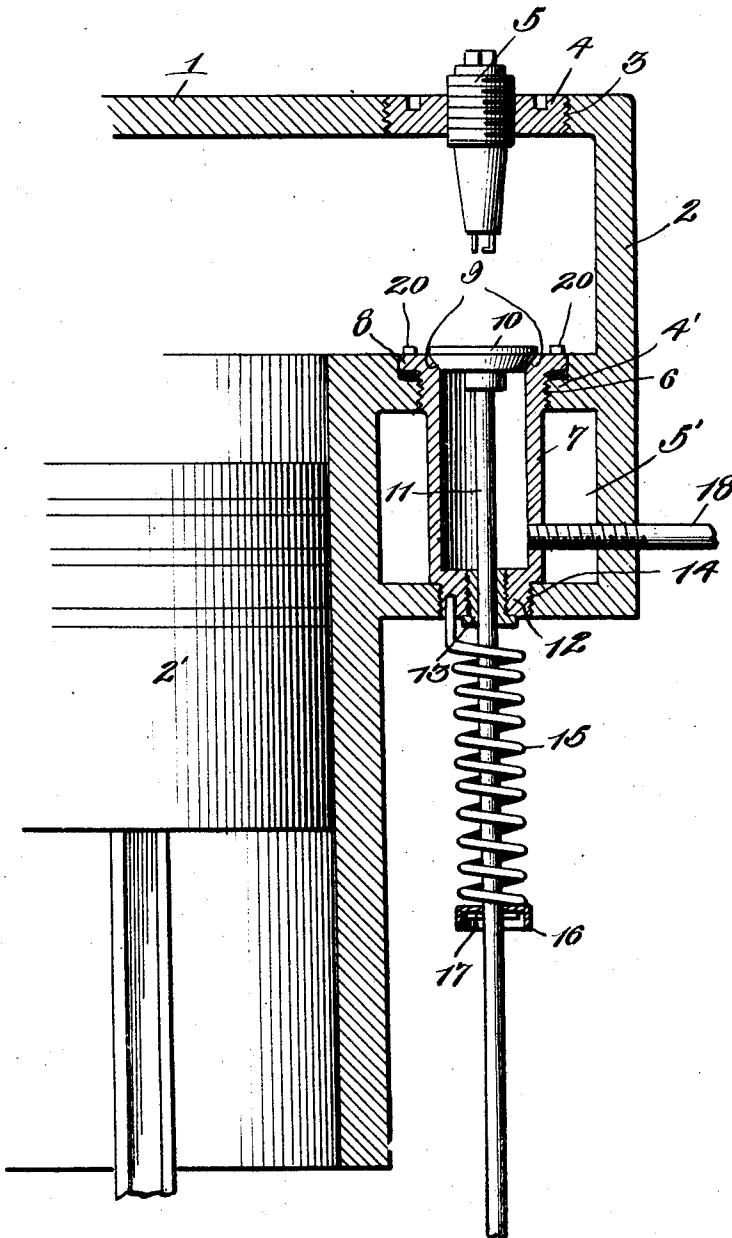


W. C. ELROD.
VALVE FOR EXPLOSIVE ENGINES.
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1,047,015.

Patented Dec. 10, 1912.



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VALVE FOR EXPLOSIVE-ENGINES.

1,047,015.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM C. ELROD, a citizen of the United States, residing at Fair Play, in the county of Polk and State of Missouri, have invented certain new and useful Improvements in Valves for Explosive-Engines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to new and useful improvements in explosive engines and more particularly to valves therefor, and my object is to provide valves which may be readily and quickly removed from the cylinder for the purpose of grinding or replacing by other valves.

A further object of the invention resides in providing a removable valve seat, and a still further object resides in providing a threaded opening in the wall of the cylinder immediately over the valve seat, whereby entrance may be had to the cylinder to readily remove said seat when desired.

Another object of the invention resides in providing a threaded plug adapted to be engaged with the threaded opening in the cylinder over the valve seat, which plug is adapted to carry the spark plug, and a further object resides in providing a valve cage or housing which is threaded into engagement with a threaded opening in the wall of the cylinder immediately below the removable plug referred to.

Still another object of the invention resides in providing a device which is extremely simple in construction, inexpensive to manufacture, and one which is very efficient and useful in operation.

With these and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawing forming a part of this application, the figure is a fragmentary vertical section through a cylinder of an explosive engine showing my improved valve applied to use thereon.

It is a well known fact among those who have had particular use for an explosive engine that the valves of an engine carbonize quite readily, which carbonization causes a

loss of power and that the grinding of the valves which is necessary to remedy this fault, causes considerable inconvenience. This is particularly true as relates to the grinding of the valves of an automobile engine wherein such grinding necessitates the temporary disuse of the machine, and while the grinding of these valves is not particularly difficult, the same, in most instances, must be accomplished in the machine which often causes considerable after trouble, in view of the fact that gritty substances and the like are liable to be left upon the valve seat or in the cylinder. It is to obviate these many difficulties that have heretofore been experienced, that I provide my improved device wherein the complete valve, including the seat therefor, may be entirely removed from the cylinder and replaced by another with little or no trouble, thereby permitting the removed valve to be ground outside of the cylinder.

In carrying out my invention, I shall refer to the drawing in which similar reference characters designate corresponding parts throughout the several views and in which 1 indicates a cylinder of an internal combustion engine of the usual or any preferred type having the usual piston 2' therein, the projecting portion 2' at the upper portion thereof having its top wall provided with a threaded opening 3, and threaded into engagement with this opening 3, is a plug 4 which removably carries thereon a spark plug 5 of the usual or any preferred type. The intermediate wall 4' of the projecting portion 2 of the cylinder which forms the top wall of the water chamber 5', is provided immediately below the opening 3 with an additional threaded opening 6, which receives in engagement therewith, the threaded portion at the upper end of a tubular valve cage or housing 7, said cage being provided at its upper end with the annular flange 8 countersunk in the upper face of said intermediate wall of the cylinder. The upper portion of the valve cage 7 is provided with a seat 9 which has mounted therein, the head of a puppet valve 10, the stem 11 of which extends through an internally and externally threaded neck portion 12 formed at the lower end of the cage or housing 7; and a packing or bushing 13

is threaded into engagement with the inner periphery of this neck portion 12, for obvious purposes.

The external threads of the neck 12 are engaged with a threaded opening 14 in the lower wall of the projection 2, that is, the lower wall of the water chamber 5', and encircling the valve stem 11 below the lower wall of the projection 2 is a coil spring 15, the upper end of which is engaged with the outer periphery of the neck portion 12 of the valve cage. The opposite or lower end of the coil spring 15 is engaged with a cap or collar 16 which is held permanently on the valve stem 11 through the medium of a pin 17, whereby it will be seen that the normal position of the valve will be closed. The valve stem, while not so shown, may be continued downwardly to be engaged with a cam shaft or the like, whereby said valve may be opened and closed automatically throughout the operation of the engine, and the valve cage or housing 7 has movably engaged with one wall thereof, a pipe or other tubular connection 18 which communicates with any desired form of explosive vapor supply means, such as a carbureter (not shown).

In practice, it will be seen that should it be found that power is being lost in the engine through the carbonization of the valves and it is desired to remove the same for grinding, the plug 4 may be removed to permit the operator to gain entrance to the cylinder. At this point, it will be understood that the pipe or tubular connection 18 from the carbureter or other supply, has been disengaged from the valve cage and the stem 11 of the valve disengaged from the cam shaft, whereupon the operator, entering his hand or an instrument within the cylinder, may engage the lugs 20 formed for the purpose on the annular flange 8 of said valve cage, to turn said valve cage in the opening 6 of the cylinder and thereby tend to remove the same. When the threads of the valve cage have been totally disengaged from the threads of the opening 6, the complete valve cage, with its adjunctive parts, will be entirely removed through the opening 3 in the upper wall of said cylinder, whereupon the same may be replaced by an additional valve cage and similar parts. In this manner, it will be seen that the temporary disuse of the engine will be but for a very short period, and the removed valve may be ground outside of the cylinder and placed in condition for reuse at such time when the valve then in place will require removal.

From the foregoing, it will be seen that I have provided a simple, inexpensive and efficient means for carrying out the objects of the invention, and while I have particu-

larly described the elements which are most well adapted to perform the functions set forth, it will be obvious that various changes in form, proportion and in the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the principles of the invention.

Having thus described my invention, what is claimed is:

1. In an explosive engine, the combination with a cylinder having explosive and water chambers formed therein, the upper walls of said chambers being provided with alining openings, the lower wall of said water chamber being also provided with a threaded opening alining with the aforesaid openings; of a valve cage externally threaded at its upper and lower ends, said threaded portions being respectively engaged with the upper and lower openings of said water chamber, a threaded plug mounted in the upper wall of said explosive chamber, and a spark plug removably carried on said last mentioned plug.

2. In an explosive engine, the combination with a cylinder provided with explosive and water chambers disposed immediately adjacent one another, the upper and lower walls of said chambers being provided with a trio of threaded openings graduated smaller in diameter toward the lower opening; of a valve cage externally threaded at its upper and lower ends to engage the threaded openings respectively in the upper and lower walls of said water chamber, the upper portion of said cage extending within said explosive chamber, a puppet valve carried by said cage and opening in the explosive chamber, means extending through said water chamber to supply fuel to the valve cage, a threaded plug engaged with the opening in the top wall of the explosive chamber, and a spark plug removably carried by the last mentioned plug.

3. In an explosive engine, the combination with a cylinder provided with explosive and water chambers disposed immediately adjacent one another, the one wall of said explosive chamber being designed to form the top wall of said water chamber and provided with a threaded opening, the top wall of said explosive chamber and the bottom wall of said water chamber being also provided with threaded openings disposed in alinement with the aforesaid opening; of a valve cage externally threaded at its upper and lower ends to engage with the threaded openings in the top and bottom walls of said water chamber, the upper portion of said cage being also provided with an annular flange adapted to be counter-sunk in the face of the wall dividing said explosive and water chambers, lugs formed on the outer face of said flange to facilitate the disposition of

said cage to its effective and ineffective positions, a puppet valve carried by said cage and opening in the explosive chamber, a tubular member threaded through the one
5 wall of said water chamber, and into engagement with the wall of said valve cage, a threaded plug engaged with the threaded opening in the top wall of said explosive

chamber, and a spark plug removably carried by the last mentioned plug.

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

WILLIAM C. ELROD.

Witnesses:

S. W. EASLEY,

J. F. UNDERWOOD.