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CARBON REMOVING APPARATUS.

APPLICATION FILED JAN. 6, 1919.

1,332,606.

Patented Mar. 2, 1920.

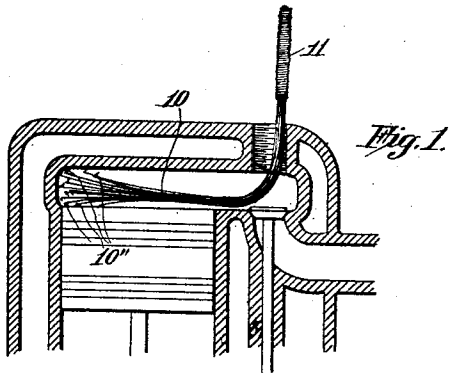


Fig. 1.

Fig. 2.



Fig. 3.

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UNITED STATES PATENT OFFICE.

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CARBON-REMOVING APPARATUS.

1,332,606. Specification of Letters Patent. Patented Mar. 2, 1920.

Application filed January 6, 1919. Serial No. 269,792.

To all whom it may concern:

Be known that I, WILLIAM B. CHUCK, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Carbon-Removing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in the art of removing carbon from the cylinders and pistons of internal combustion engines.

It is generally accepted that the mechanical removal of carbon from internal combustion engines is preferable to the burning out of such carbon because in burning the carbon there is danger of warping the valves and of otherwise injuring the parts, while at the same time there is an opportunity for failure to burn out all of the carbon. Hence, notwithstanding the ease with which the burning of carbon is accomplished and the difficulties involved in mechanically removing carbon, it is customary with the more careful operatives to remove the carbon mechanically. With the apparatus commonly in use, however, the tops of the cylinders must be removed to afford effective access to the upper surface of the piston heads and to the other parts to be cleaned.

It is the object of the present invention to secure all the advantages of the mechanically removed carbon without the disadvantages incident to the use of the heretofore-known devices for effecting such removal.

With this and further objects in view as will in part hereinafter become apparent and in part be stated, the invention comprises certain novel constructions, combinations, and arrangements of parts as subsequently specified and claimed.

In the accompanying drawing,—

Figure 1 is a fragmentary vertical section through the upper portion of an internal combustion engine with an embodiment of the present invention illustrated as in the position of operation therein.

Fig. 2 is a perspective view of the improved carbon cleaner alone.

Fig. 3 is a detail elevation of one of the strands of the cleaner detached and shown on an enlarged scale.

Referring to the drawing by numerals, 10 indicates a long, slender, flexible cable-like bundle of strands 10′. Each strand 10′ is formed of a flexible wire, preferably of steel or other metal of a hardness as great as possible without danger of injury to the parts of the engine to be engaged. To avoid injury to such parts, the several strands 10′ are of material slightly softer than the walls of the parts to be engaged, and while I prefer steel for the formation of these strands they may be of copper, brass, or other appropriate material, so long as the desired hardness is provided without that excess hardness which might result in the injurious scratching of the interior surfaces of the engine parts. The several strands 10′ which make up the cable-like bundle or tool 10 are held in their given relation to each other by being bound together appropriately near their outer end, that is, the end which remains outside of the engine during operation, the opposite ends of the strands being left free for fraying or spreading apart as hereinafter mentioned. The binding of the bundle of strands may be effected in any of various ways, as by the application of a handle, and one efficient manner of securing the strands is by coiling about them a wire 11 with its helices drawn tight so as to effectively grip and retain the several strands and at the same time provide a handle for the instrument. The handle end of the several strands 10′, therefore, is the fixed end of the strands while the opposite end is free, and at the free end each strand is formed with a substantially right angle hook 10″.

The instrument must be sufficiently small in diameter to be able to pass through one of the openings in the top portion of the engine, as, for example, through the spark plug opening, and must be long enough to enable the free end of the instrument to reach the remotest points of the parts to be cleaned, while the handle 11 remains outside of the engine.

In operation the carbon is removed by merely removing the spark plug, or other plug, or cap, for enabling access to the cylinder; the piston is raised to its uppermost position for protecting the walls of the cylinder and presenting the upper surface of the piston for cleansing, and thrusting the instrument through the opening into the cylinder and reciprocating and irregu-

larly moving and twisting the instrument. After insertion the free ends of the strands of the instrument fray out, as indicated in Fig. 1, and the pricking points formed by the hooks 10'' engage and tear loose the scales and pieces of carbon. When the carbon has been entirely loosened, a tube leading from a supply of compressed air may be applied to the opening from which the carbon removing implement will have been removed and the air may be turned on for blowing out through the exhaust the loosened carbon, or the loosened carbon may be removed in any other appropriate manner.

If, after the first introduction and removal of the implement it is found that all of the carbon has not been removed, the operation may be repeated until the parts are thoroughly cleansed.

It will be observed that the hook-like points are not all extended in the same direction but are arranged to extend outward from the center of the brush terminal so as to act in all directions during the course of the movement of the instrument.

I claim:—

A carbon removing device consisting of a number of superposed flexible metallic strands provided at one end with a binding wire forming a handle portion, the opposite ends of said strands being normally free and having hook portions projecting outwardly in various directions from the central line of the bundle formed by said strands.

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

WILLIAM B. CHUCK.

Witnesses:

ARTHUR L. DAVIS,

SAMUEL BEOMAN.