R. ZASTROW.

CARBON REMOVER.

APPLICATION FILED DEC. 6, 1909.

954,491. Patented Apr. 12, 1910.

FIG. 1.

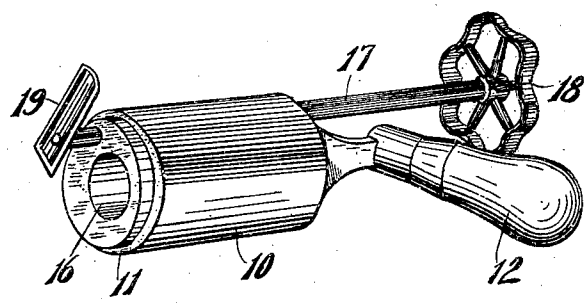


FIG. 2.

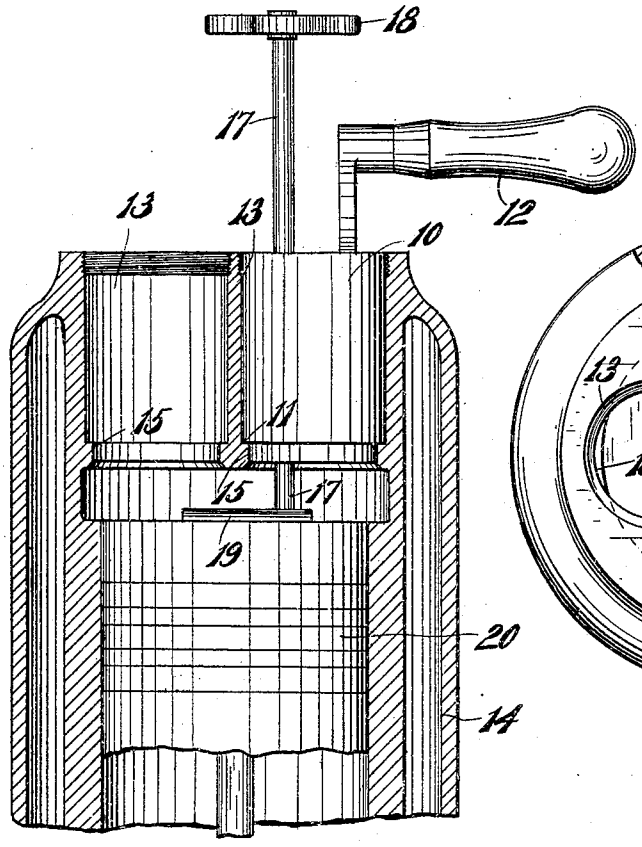
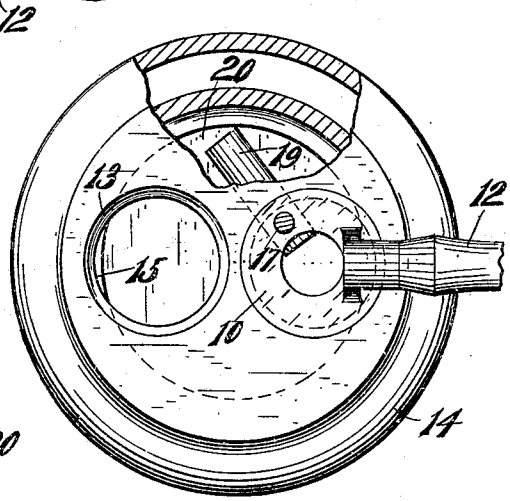


FIG. 3.



WITNESSES.

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CARBON-REMOVER.

954,491. Specification of Letters Patent. Patented Apr. 12, 1910.

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To all whom it may concern:

Be it known that I, ROBERT ZASTROW, residing in Racine, in the county of Racine and State of Wisconsin, have invented new and useful Improvements in Carbon-Removers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to means for loosening the carbon crust which forms on the piston heads of explosion engines so that it may be removed therefrom. The accumulation of such carbon deposit in the combustion chamber of an explosive engine due to incomplete combustion of the explosive gases is liable under the intense heat to which it is subjected to become incandescent and then is a source of danger in that it may ignite an explosive charge before the proper time and result in a serious injury to the mechanism. By means of this invention the removal of the carbon from the cylinder may be accomplished with the least effort and without the necessity for a material disconnection of the engine parts and without requiring a great deal of time, so that the operation may be frequently performed and the danger of premature ignition effectively prevented.

The invention consists in the carbon remover as herein claimed.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in the different views: Figure 1 is a perspective view of a carbon remover constructed in accordance with this invention; Fig. 2 is a sectional elevation of an engine cylinder having the carbon remover of this invention placed in its operative position in relation thereto; and, Fig. 3 is a plan view thereof with a part broken away to show the scraper blade in its active relation to the piston.

In these drawings 10 indicates a cylindrical guide which has one end of reduced diameter to provide an annular shoulder 11 and at the other end there is an outwardly extending handle 12 by means of which the cylindrical guide 10 may be manipulated for inserting it within an opening 13 in the end of a gas engine cylinder 14 and for turning it within said opening. The shoulder 11 on the lower end of the cylindrical guide 10 fits upon the shoulder 15 of the opening 13 which forms a seat for a valve casing of the engine in usual practice. The cylindrical guide 10 may be made hollow by forming an opening 16 therethrough, and passing longitudinally through said guide 10 near one edge thereof is a sliding and turning stem 17 with a hand wheel 18 at its upper end by means of which it may be moved in and out through the guide and turned in either direction and having on its lower end a scraper blade 19 which is preferably connected thereto nearer its one end than the other. The scraper blade is preferably provided with sharpened edges which engage the top surface of the piston head 20 of the engine when the device is in its operative position as shown in Fig. 2.

In operation the valve casing, not shown, is removed from the end of the cylinder and the cylindrical guide 10 is inserted in place thereof until its shoulder 11 fits against the flange 15, the outer diameter of the guide being sufficient to enable it to closely fit within the opening 13 and still be free to be turned therein by means of the handle 12. The turning of the cylindrical guide 10 serves to move the stem 17 to different positions over the piston 20 so that its field of scraping action on the piston may be extended over the entire surface of the piston, such scraping action being produced when the stem is forced inwardly by pressure on the hand wheel 18 and is then turned by means of said hand wheel to cause the scraper blade to sweep over the surface of the piston head and enter its sharpened edges beneath the carbon crusts to sever them from the piston. When the cylinder is provided with only one of the openings 13 it is usually centrally located above the piston and the parts of the carbon remover are then of such size that the scraping action of the blade will extend over the entire surface of the piston head, but when the cylinder is provided with two of the openings 13, as shown in the drawing, it is only necessary that the range of the scraper blade should extend over one half of the piston face when the guide is seated in one opening 13, the remainder of the piston face being reached by the scraper blade when the guide is seated within the other opening 13. When the carbon has been cut free from the end of the piston the device is removed from the opening 13 and the loose carbon may be gathered and removed on spoons or the like entered through said openings 13. It may be de-

sirable to have the hand wheel 18 removable from the stem 17 so that the guide 10 may be slipped off of the end of the stem when the stem and its scraper blade are being inserted or withdrawn from the cylinder, though the same object may be accomplished by making the stem 17 sufficiently long to enable the guide 10 to slide thereon to a position near the hand wheel 18 where it will not interfere with the entry or removal of the scraper blade.

The position of the piston during the scraping operation is at its highest point in the cylinder so that there is no danger of the scraper blade injuriously affecting the active surface of the cylinder walls by scratching thereagainst.

By means of the device described herein the carbon removing operation may be accomplished without a disconnection of the engine parts other than the removal of the valve casing from one or both of the openings 13, and as the scraping operation consists merely in the turning of the guide 10 while at the same time swinging the scraper blade back and forth by means of the hand wheel 18 the carbon crust is very quickly severed from the end of the piston and may then be removed by scoops or spoons without difficulty.

What I claim as my invention is—

1. A carbon remover for explosive engines, comprising a guide adapted to fit in an opening in the end of the engine cylinder, a stem passing through the guide eccentric thereto and adapted to turn therein, and a scraper blade carried by the end of the stem to be moved over the surface of the piston of the engine by the turning movements of the stem.

2. A carbon remover for explosive engines, comprising a guide adapted to fit and turn in an opening in the end of the engine cylinder, means for turning the guide, a stem passing through the guide eccentric thereto and adapted to slide and turn therein, and a scraper blade carried by the end of the stem to be moved over the surface of the piston of the engine by the turning movements of the stem and the guide.

3. A carbon remover for explosive engines, comprising a shouldered cylindrical guide adapted to fit within an opening in the end of the engine cylinder with its shoulder seated on the valve casing seat of said opening, a handle on the guide by which it may be turned, a stem slidably passing through the guide near one edge thereof and capable of turning therein, a scraper blade mounted on one end of the stem near one end of said scraper blade, and a hand wheel on the other end of the stem by means of which the stem may be turned in the guide.

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

ROBERT ZASTROW.

Witnesses:
F. J. MILLER,
JOS. F. MILLER.