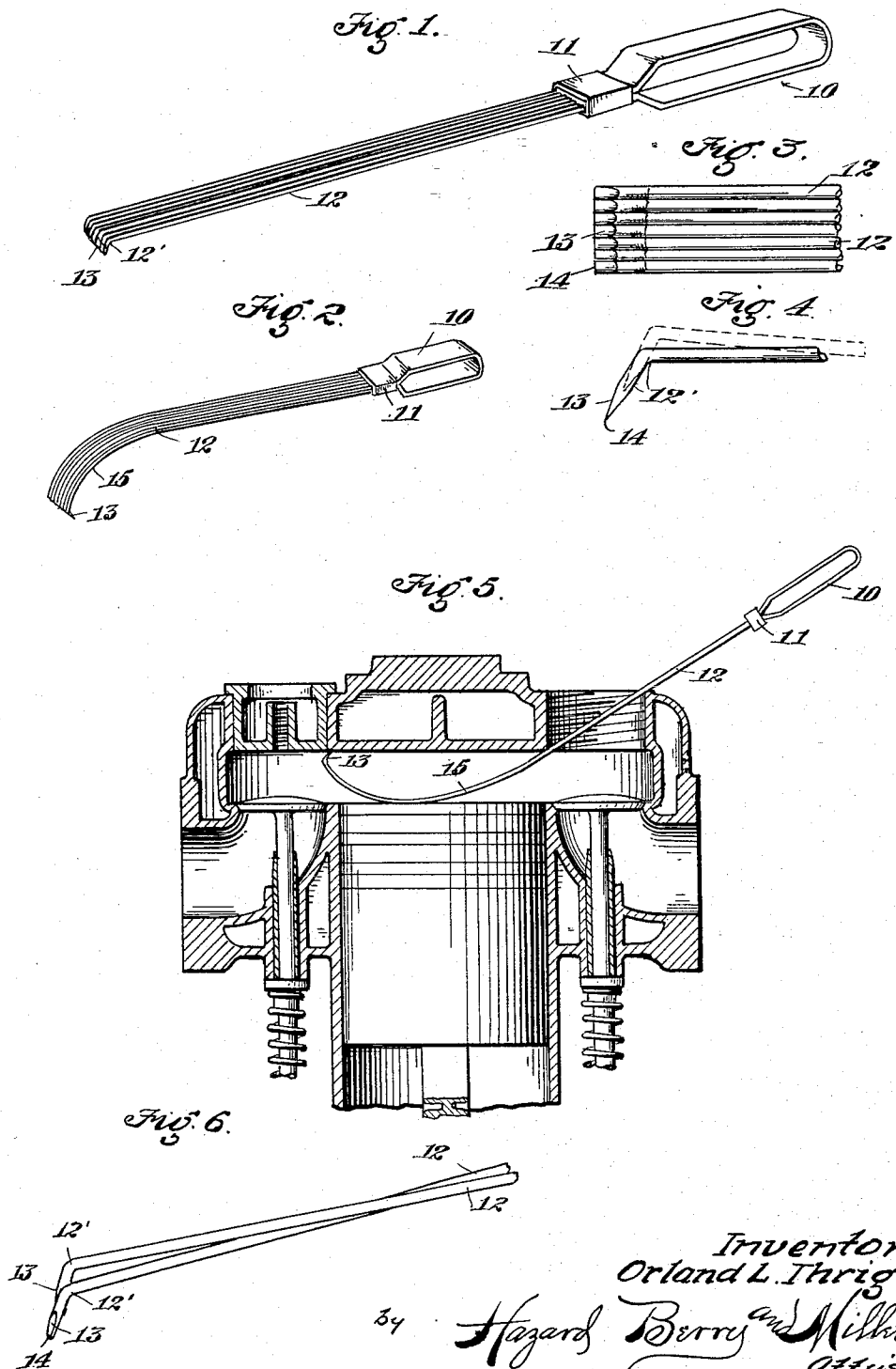


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FLEXIBLE CARBON SCRAPER.
APPLICATION FILED NOV. 13, 1915.

1,177,333.

Patented Mar. 28, 1916.



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FLEXIBLE CARBON-SCRAPER.

1,177,333.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ORLAND L. IHRIG, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Flexible Carbon-Scrapers, of which the following is a specification.

My invention relates to a scraper and in particular to a flexible carbon scraper which, while capable of general use, is especially designated for the removal of carbon deposits from internal combustion engines.

As well known, one of the most common troubles of internal combustion engines, and especially engines of motor vehicles, is due to carbon deposits in the ignition chamber. The internal combustion engine of motor vehicles has greater demands made upon it in regard to varying power and speed than stationary engines. These demands are complicated by reason of the varying conditions of temperature and humidity of the atmosphere and, as a result, carbon deposits in the combustion chamber are almost certain to occur sooner or later. No perfect carbureter has been devised as yet which will furnish a gaseous fuel mixture exactly suited to the requirements of the engine of a motor vehicle. As a consequence, a carbon deposit, due to the excessive richness of the gaseous fuel mixture, will occur. This excessive richness cannot be avoided in the ordinary operation of the motor vehicle. Furthermore lubricating oil is often decomposed within the cylinders of the engine causing carbon deposits. The carbon deposits greatly impair the efficiency of the engine, besides wearing the valves and grinding out the cylinder. It therefore becomes necessary to free the engine from these carbon deposits at frequent intervals. Various methods are at present in use for removing the carbon from the engine, such as burning out the carbon, or softening the same by means of fluid hydro-carbons. These methods are expensive and laborious. The employment of an ordinary scraper for the removal of the carbon is not feasible because of the narrow and angular passage-ways in which the carbon is located, which render access difficult.

It is also an object of this invention to devise a scraper which is flexible and composed of a plurality of scraper units and

which may be easily introduced into the ignition or valve chamber of a modern internal combustion engine, enabling the operator to reach every part thereof with ease.

It is another object of this invention to devise a flexible carbon scraper comprising a plurality of flexible scraper units which, during the operation of the scraper, may be twisted so that some of the units may ride upon the other, whereby corners and recesses otherwise difficult of access may be reached and properly cleaned.

With these and other objects in view which will appear as the description proceeds, my invention consists of the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawings which form a part of this specification, I have illustrated a convenient and practical embodiment of my invention, and in which:

Figure 1 is a perspective view of one form of my flexible carbon scraper. Fig. 2 is a similar view of another form of my scraper. Figs. 3 and 4 are detailed views, on an enlarged scale, showing a top plan view and a side elevation, respectively, of the forward end of the scraper. Fig. 5 shows a vertical cross-section of a modern T-shaped internal combustion motor, showing the application of my scraper in removing carbon deposits. Fig. 6 is a detail view hereinafter to be referred to.

My scraper consists of a handle 10 of any suitable or preferred shape, which, in the present instance, I have shown as constructed of a sheet of metal bent upon itself to form a loop whose ends constitute two flat pieces with their faces flat and parallel between which the inner ends of the scraper units are securely mounted. A metal fastening band 11 surrounds the inner ends of the handle between which said units are secured.

The scraper units consist of a plurality of rods 12 made of steel wire which extend side by side in parallel relation outwardly from the handle. I have shown the scraper as composed of seven units, but it is obvious that the number is immaterial and that the same may be increased or diminished as desired or to suit conditions of work it is designed to perform. The outer ends of the scraper units are bent downwardly, as at

12', forming an obtuse angle with the lower side of the units. The extreme outer end of each unit is flattened to form a small blade 13 having a sharp edge 14. The edges 14 of the scraper units form a straight, continuous line, as shown in Fig. 3.

The scraper shown in Fig. 1 is provided with scraper units which extend from the handle to the blade in a straight line. In the form shown in Fig. 2, the scraper units extend for some distance in a straight line and are then curved downwardly, as at 15. The units of Fig. 1 are longer than those of Fig. 2, but it will be understood that the particular length or the shape or the curvature of the scraper units may vary so as to adapt the scraper for particular conditions of work to be done.

In Fig. 5, I have shown the application of the flexible carbon scraper to a modern T-shaped internal combustion engine. As shown therein, the scraper illustrated in Fig. 2 is used for removing the carbon deposits from the upper face of the ignition chamber. If it is desired to clean the carbon from the lower face of the ignition chamber and the valves, the form shown in Fig. 1 will be more suitable, as will be understood.

The flexible scraper, by reason of its flexible, resilient units, may be easily introduced into narrow and curved channels. Furthermore, the blades will reach all points of the cavity or recess to be cleaned. If the spot or cavity to be reached is smaller than the width of the scraper, some of the units of

the scraper may be made to ride upon each other, as shown in Fig. 6.

It is therefore seen that I have devised a tool which is exceedingly simple of construction but efficient in operation and especially adapted for removing carbon deposits from internal combustion engines.

Various changes in the construction or arrangement of parts may be made by those skilled in the art without departing from the spirit of my invention, as covered by the appended claims.

I claim:—

1. A flexible carbon scraper comprising a handle, a plurality of flexible metal scraping members, extending in parallel relation from said handle, said members being independent of each other and of a length to be capable of being twisted and riding upon each other, said members being downwardly bent at their outer ends and shaped to form scraper blades, the edges of said blades forming a continuous straight line.

2. A flexible carbon scraper comprising a handle, a plurality of flexible metal scraping members extending therefrom, said members being independent of each other and of a length to be capable of being twisted and riding upon each other, the outer ends of said members being bent downwardly and shaped to form scraper blades.

In testimony whereof I have signed my name to this specification.

ORLAND L. IHRIG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."