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R. G. GERLACH

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APPARATUS FOR REMOVING DEPOSITS OF CARBON, PAINTS,
VARNISH AND THE LIKE FROM ENGINE PARTS
Original Filed June 30, 1934

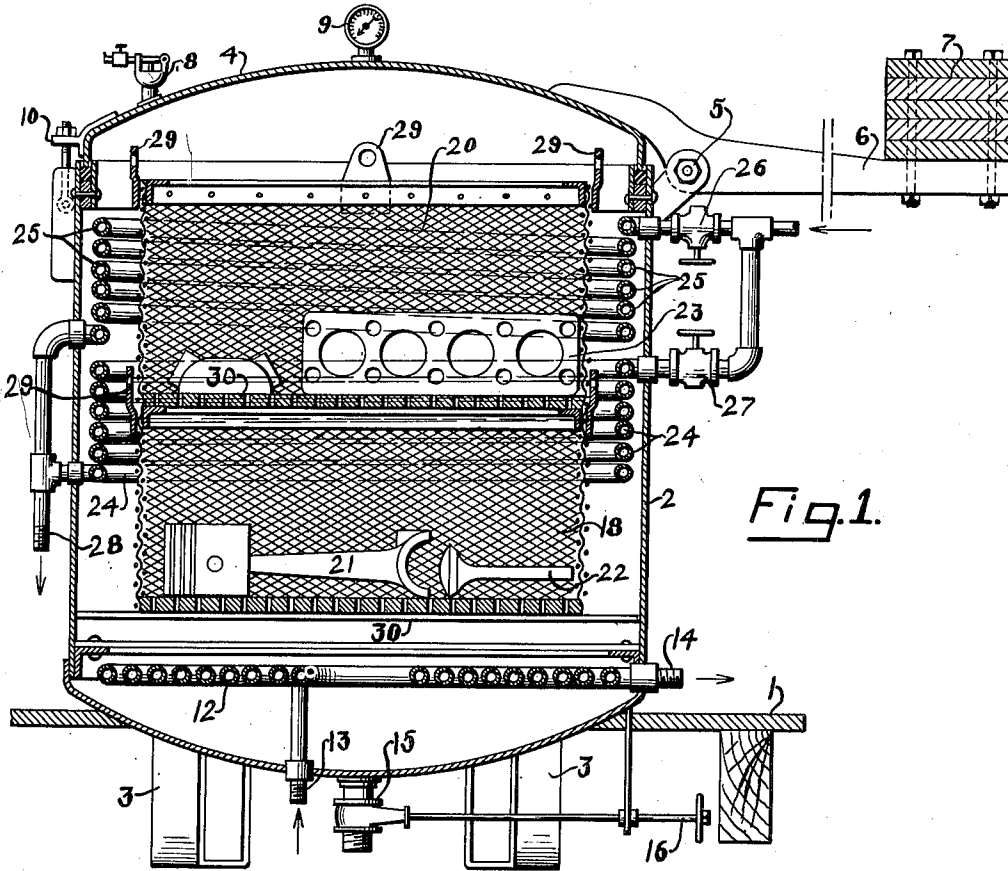


Fig. 1.

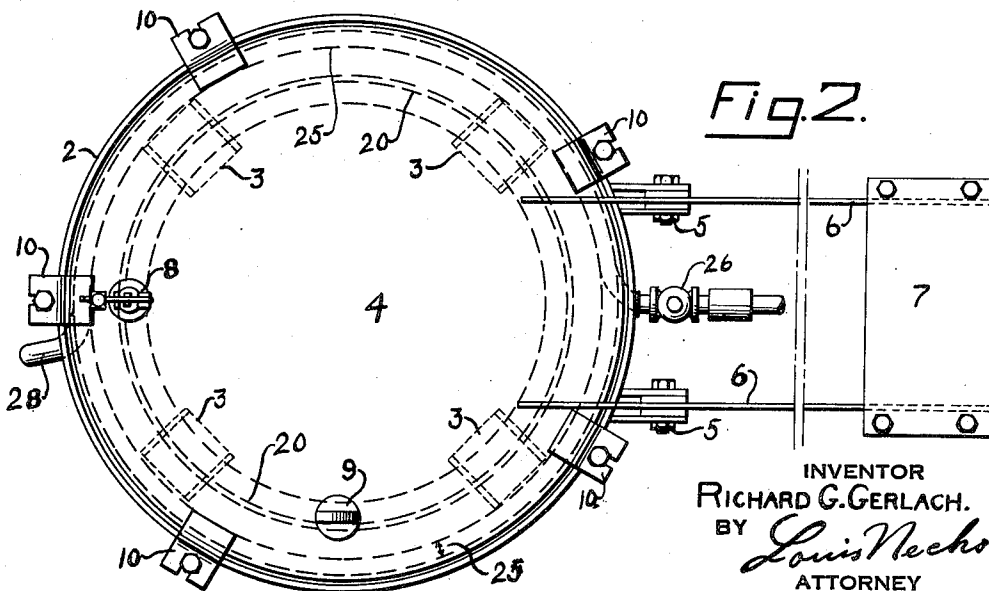


Fig. 2.

INVENTOR
RICHARD G. GERLACH.
BY *Louis Necks*
ATTORNEY

UNITED STATES PATENT OFFICE

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APPARATUS FOR REMOVING DEPOSITS OF
CARBON, PAINTS, VARNISH, AND THE
LIKE FROM ENGINE PARTS

Richard G. Gerlach, Philadelphia, Pa.

Original application June 30, 1934, Serial No.
733,155. Divided and this application October
23, 1934, Serial No. 749,520

1 Claim. (Cl. 87—6)

My invention relates to a new and useful apparatus for removing carbon deposits from parts of internal combustion engines in a very thorough manner to permit close inspection of such parts for defects and without in any way damaging or wearing out said parts, this application being a division from my copending application No. 733,155, filed June 30, 1934.

In the operation of internal combustion engines very hard carbon deposits form on the surfaces of certain parts, such as valves, cylinder heads, piston tops, etc., which seriously interfere with the safety and efficiency of the operation of such engines. In the case of automobile engines it is sufficient to remove the cylinder head and scrape off the hard carbon by means of a chisel or other hard instrument and reassemble the engine. In airplane engines this practice is not satisfactory, for the reason that it is necessary that the parts be absolutely and thoroughly cleaned in order to permit close and thorough inspection of parts for defects or cracks, and it has heretofore been the practice to scrape the carbon deposits by means of chisels and wire brushes and finally to sand-blast the parts in order to remove the last traces of the carbon deposits. Due to the extreme accuracy and nicety of fit of the parts of an airplane engine, this practice is most unsatisfactory, since the scraping by means of wire brushes and the sand-blasting result in the wearing out of the metal and alteration of the original dimensions, so that after a few cleanings of the parts according to this method some or all of the parts thus cleaned have to be renewed at a considerable expense.

It is, therefore, the object of my invention to provide an apparatus for removing the carbon deposits from such parts without the use of any scraping and without the use of wire brushes or sand-blasting, thereby thoroughly cleaning the parts and at the same time eliminating any damage to or wear of such parts.

It is a further object of my invention to provide a novel apparatus for removing carbon deposits from engine parts at a greatly reduced cost in time, labor and material.

My novel apparatus will be more clearly understood from the following specification and accompanying drawing, in which:

Fig. 1 represents a vertical sectional view of an apparatus embodying my invention.

Fig. 2 represents a plan view of Fig. 1.

Referring to the drawing in which like reference characters indicate like parts, 1 designates a table or platform or other support for support-

ing a tank 2, which is also preferably supported by means of the brackets 3. The tank 2 is provided with a water and air-tight lid or cover 4 which is hinged at 5 to the arm 6, which also carries the counter-weight 7 to facilitate the opening and closing of the cover 4. The cover 4 is provided with a safety valve 8 and a pressure gauge 9 and is secured in the closed position by any desired number of clamps 10. In the bottom of the tank 2, I provide the heating coil 12 which is supplied with live steam through the inlet 13, said coil also having an outlet 14. In connection with the heating coil 12 it is to be understood that any other desired heating element positioned within or without the tank may be used. 15 designates a drain valve which may be operated remotely by the handle 16. Within the tank 2, I position the superimposed baskets 18 and 20 which are adapted to receive the engine parts to be cleaned, such as the piston 21, valve 22, cylinder block 23, etc. Surrounding the baskets 18 and 20, I provide one or more cooling coils 24 and 25 which are supplied with cold water or other cooling medium through the inlet valves 26 and 27 and which are provided with the common outlet 28. The baskets 18 and 20 are also provided with suitable handles 29 to facilitate removal thereof from the tank 2. The baskets 18 and 20 are placed within the tank 2 on any suitable support 30.

The operation is as follows: The tank 2 is charged with water and a cleaning compound in the ratio of approximately 1 part of compound to 80 parts of water by volume. The cleaning compound I prefer to use, and which under actual test has given very highly satisfactory results, is composed of about seventy percent of ortho-dichloro-benzene, about nine percent of triethanol amine, and about twenty-one percent of oleic acid (Antarctic red oil). The compound is prepared in liquid form, and in charging the tank one part of this compound to about eighty of water is satisfactory. The parts to be cleaned are then positioned in the baskets 18—20 and the cover 4 is clamped down. Steam is then turned on in the heating coil 12 (or other heating element may be used) until a temperature of three hundred to four hundred degrees F. is reached within the tank. The temperature causes the liquid contents of the tank to evaporate, thus building up a pressure within the tank which may range from twenty to eighty pounds per square inch. The parts to be cleaned are subjected to the desired degree of temperature and pressure for a period of from one to two hours, depending upon the

nature as well as condition of the carbon deposit to be removed. After a sufficient time, has elapsed the steam is shut off and cold water is introduced through the inlets 26 and 27 into one or both of the coils 24—25, the purpose of the cold water circulating through the coils being more rapidly to cool the tank and to effect condensation of the vapors therewithin to expedite the removal of the baskets from the tank. When the tank has cooled sufficiently, the cover 4 is opened and the baskets 18 and 20 with their contents are removed by means of the handle 29. The carbon deposit now present on the parts 21, 22, 23, etc., is in the form of a soft, plastic mass, in lieu of the hard, crusty substance which it was before being thus treated. The parts are then subjected to a spray of gasoline, kerosene, or other volatile hydro-carbon, under pressure of ninety to two hundred pounds. The parts are then wiped dry and are thoroughly clean and ready for inspection and reassembling.

It will thus be seen that I have devised a novel apparatus whereby the hard, firmly adhering carbon deposits on the surfaces of parts of internal combustion engines may be thoroughly, efficient-

ly, economically and expeditiously cleaned without in any way damaging the parts or subjecting them to any wear or alteration.

It is to be understood that the apparatus herein disclosed is equally applicable to the removal of the heat-resisting varnishes with which engine parts subjected to excessive heat are usually coated.

I claim:

An apparatus for removing film deposits from engine parts comprising, a tank adapted to contain a solvent, a pair of superimposed baskets positioned within said tank in spaced relation to each other and to the bottom of said tank, a pair of cooling coils surrounding the upper portions of said baskets and disposed intermediate said baskets and the inner wall of said tank, controlled water-inlets leading to the top ends of said coils, a common drain outlet leading from the lower ends of said coils, a hinged fulcrum cover, an extension handle therefor and a counter-weight at the extreme end of said handle for facilitating the raising and lowering of said cover.

RICHARD G. GERLACH. 25