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TOOL FOR REMOVING OIL FILTERS AND THE LIKE

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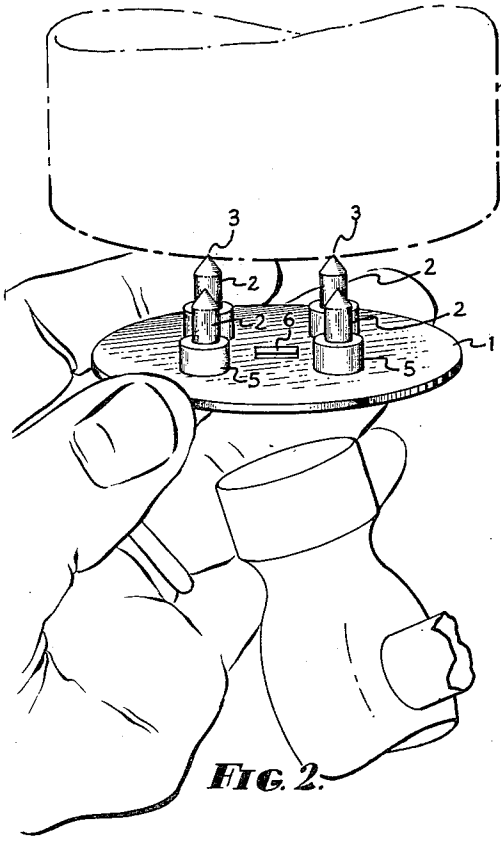


FIG. 2.

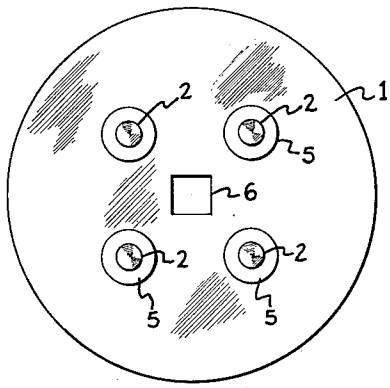


FIG. 1.

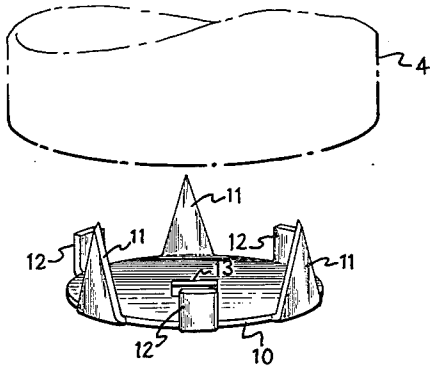


FIG. 5.

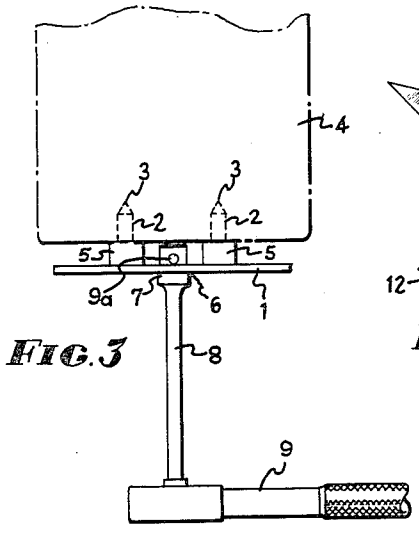


FIG. 3.

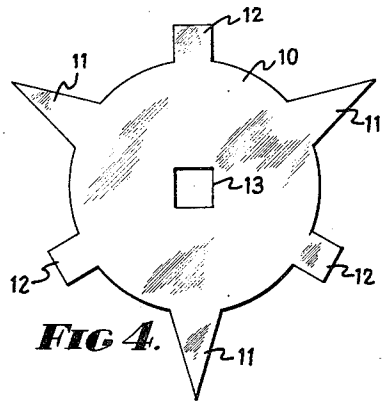


FIG 4.

INVENTOR.
ALBERT H. LEDERER,
BY Allen & Allen
ATTORNEYS

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TOOL FOR REMOVING OIL FILTERS AND THE LIKE

Albert H. Lederer, 7647 Forest Road, Cincinnati 30, Ohio

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This invention relates to a device for removing oil filters, and more particularly to a tool by means of which a spin-on type of filter unit may be readily engaged and removed.

The oil filters on present automobile engines are intended to be replaced at regular intervals, and there has been a growing trend toward the use of disposable filters in which the entire unit is replaced. The so-called spin-on filter now in widespread use comprises a generally cylindrical metallic container having an integral bottom and provided at its opposite end with a threaded fitting by means of which the unit may be easily and quickly attached to a mounting head or cap forming a permanent part of the engine lubricating system. Due to space considerations and the placement of the various engine components, the oil filter is often relatively inaccessible, usually being fitted into a narrow space between the engine crank case and the adjacent frame structure or wheel suspension of the automobile chassis. In most instances, the oil filter can be changed only from beneath the automobile, and the mechanic or service station attendant is left with very little room in which to work. While it is relatively simple to install the filter, the user simply having to turn it on the threaded fitting, considerable difficulty is encountered in endeavoring to remove the old filter which after prolonged use may have become stuck or "frozen" in place. The usual tool for removing stuck filters comprises a relatively large wrench of a size to span the perimeter of the cylindrical filter housing; but in many instances there simply is not sufficient space in which to apply such a wrench, with the result that the removal of the filter becomes a difficult and time consumming job.

Accordingly, a principal object of the instant invention is the provision of a tool by means of which filters of the character described may be readily engaged and easily removed.

A further object of the instant invention is the provision of a filter removing tool adapted to engage the bottom or exposed end of the filter housing, the tool comprising a plate having a plurality of prongs arranged to puncture the end wall of the filter housing, whereupon the plate may be engaged by the drive shank of a ratchet wrench and force exerted to loosen the filter.

Still a further object of the instant invention is the provision of a tool of the character described which is of simple and inexpensive construction and capable of being readily fabricated.

The foregoing, together with other objects of the instant invention which will appear hereinafter or which will be apparent to the skilled worker in the art upon reading these specifications, I accomplish by those constructions and arrangements of parts of which I shall now describe certain exemplary embodiments.

Reference is now made to the accompanying drawings wherein:

FIGURE 1 is a plan view of a tool in accordance with the instant invention.

FIGURE 2 is a fragmentary perspective view illustrating the manner in which the tool is associated with a filter housing.

FIGURE 3 is a fragmentary side elevational view illustrating the manner in which the tool is engaged by the drive shank of a socket wrench.

FIGURE 4 is a plan view illustrating the blank for a modified form of the invention.

FIGURE 5 is a perspective view of the device of FIGURE 4 in the assembled condition.

Referring to FIGURES 1 and 2 of the drawings, the filter removing device illustrated therein comprises a metal disc or base plate **1** having a plurality of prongs or pins **2** projecting upwardly from one surface thereof, the prongs terminating at their free ends in points **3** by means of which the prongs can be caused to puncture the closed end of the oil filter housing **4** shown in FIGURE 2.

In the embodiment illustrated, each of the prongs **2** is surrounded by a collar or spacer **5** seated against the disc **1**; and at its center the disc is provided with a polygonal opening **6** of a size to receive the head of the drive shank of a ratchet wrench of the type found in most garages and service stations.

The device just described may be easily fabricated, the disc **1** being stamped from sheet metal of suitable gauge, the disc being additionally punched to provide openings of a size to receive the pins or prongs **2** in addition to the polygonal opening **6**. The collars **5** may be press fitted on the prongs **2** either before or after the prongs have been riveted or otherwise secured to the disc **6**.

In use, the device will be juxtaposed to the bottom of the filter housing **4** in the manner illustrated in FIGURE 2, whereupon the prongs will be caused to puncture the housing, as by striking the outer surface of the disc **1** with a hammer or similar tool. The disc is thus caused to engage the housing, whereupon the head **7** of a drive shank **8** is engaged in the polygonal opening **6** and the shank turned by means of a ratchet wrench **9**. As will be evident from FIGURE 3, the spacers **5** act to space the disc **1** from the under surface of the housing **4** by a distance such that the ball detent **9***a* of the conventional drive shank may engage the inner surface of the disc adjacent the opening **6**, thereby securing the shaft to the disc in a manner which will be readily understood by the worker in the art. The spacers assure sufficient distance for the head of the drive shank to properly engage the disc, whereupon the wrench may be turned to unscrew the filter unit. It will be evident that the arrangement just described permits the user to apply turning forces at a point remote from the disc **1**; and consequently by the choice of a drive shank of suitable length, the filter can be easily removed even though it is set in a relatively narrow recess between the engine crank case and the spring suspension or the like of the automobile. Since, as already indicated, the spin-on type of oil filter is not intended for reuse, the puncturing of the filter housing during removal is of no consequence.

In FIGURES 4 and 5 of the drawings, I have illustrated an alternative embodiment of the invention where the tool is stamped in its entirety from a metal plate, the disc having a generally circular body **10** having a plurality of integral prong members **11** projecting outwardly therefrom. Intermediate the prong members **11**, I provide a set of integrally formed spacers **12** which, in the finished device, serve the function of the collar **5** of the preceding embodiment. As before, the disc will be provided with a centrally disposed polygonal opening **13** for engagement by the head of the drive shank.

As will be evident from FIGURE 5, the prong members **11** and the spacers **12** are bent to substantially right angles with respect to the disc **10**, thereby placing them in position to engage the filter housing. Preferably the prong members **11** will be of triangular configuration and may be sharpened if so desired, although such sharpening is not generally required. It will be understood, of course, that the number of prongs or spacers employed does not constitute a limitation on the invention, although three or four such prongs are preferred. Simi-

larly, the wrench employed to manipulate the tool does not constitute a limitation on the invention; and it will be readily apparent that diverse forms of wrenches or wrench-like members engageable with the opening in the disc could be employed to apply turning forces to the disc. While the instant invention is ideally suited for use in removing oil filters, it will be evident that its utility is not limited to oil filters and the device may be employed in other applications wherein a puncturable housing or the like is removed by a turning movement.

Having, however, disclosed my invention in certain exemplary embodiment and with the understanding that modifications may be made therein without departing from its spirit and purpose, what I desire to secure and protect by Letters Patent is:

1. A device for removing oil filters and the like comprising a base plate, a plurality of pointed piercing prongs projecting outwardly from one face of said base plate, spacing means on said plate and extending therefrom a distance less than that of the prongs to space said base plate from a surface punctured by said prongs, and means on said base plate for engaging the shank of a wrench, whereby said wrench may be utilized to apply turning forces to said base plate, said prongs acting to impart such turning forces to the surface punctured thereby.

2. The device claimed in claim 1 wherein said prongs comprise pins fixedly secured to said base plate, said pins terminating outwardly in tapered points.

3. The device claimed in claim 2 wherein said spacing means comprise collars surrounding said pins.

4. The device claimed in claim 1 wherein said prongs are integrally formed with said base plate and are turned at substantially right angles thereto.

5. The device claimed in claim 4 wherein said spacing means comprise lugs integrally formed with said base plate and turned at substantially right angles thereto.

6. In a tool for removing oil filters and the like, an essentially planar disc, a centrally disposed opening in said disc configured to receive the head of a drive shank by means of which said disc may be rotated, a plurality of prongs projecting outwardly from one face of said disc, said prongs terminating at their free ends in points, whereby said prongs may be driven through the end of an oil filter by striking the opposite face of said disc with a hammer, said prongs being radially disposed with respect to the opening in said disc, and spacing means carried by said disc, said spacing means extending in the direction of said prongs and being of a length less than that of said prongs and arranged to contact the end of the oil filter, such spacing means being dimensioned to space said disc from the end of the oil filter by a distance sufficient to permit the head of the drive shank to be securely engaged in the polygonal opening in said disc.

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