

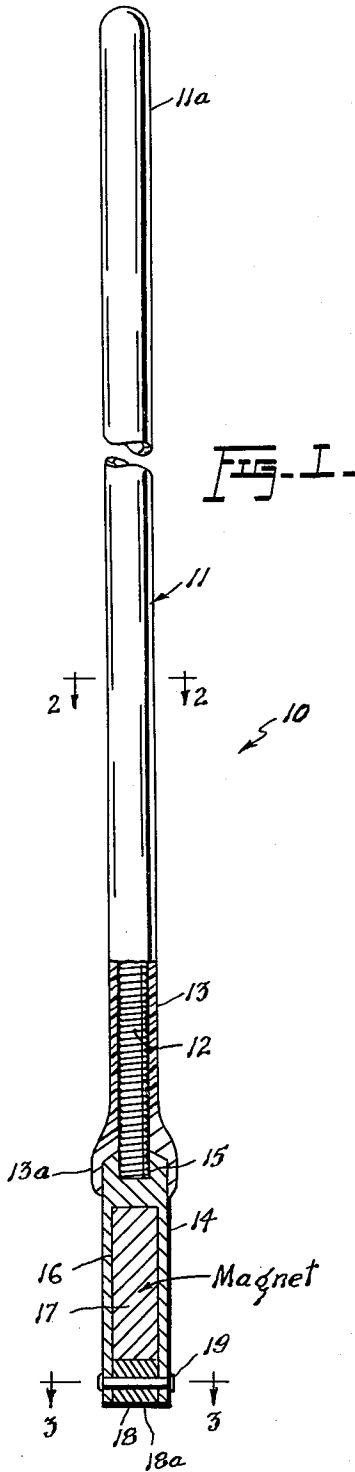
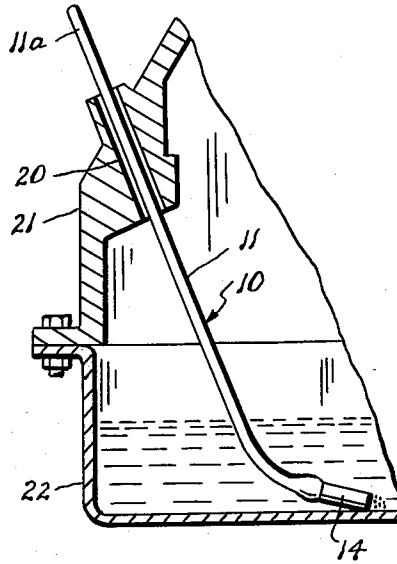
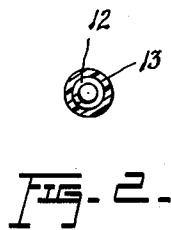
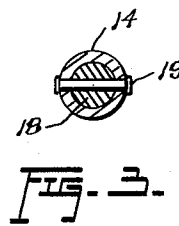
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MAGNETIC RETRIEVERS

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MAGNETIC RETRIEVERS

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This invention relates to new and useful improvements in magnetic retrievers, and the principal object of the invention is to provide a device of the character herein described which may be easily and conveniently employed for gathering and removing by magnetic force various magnetizable particles or other items from locations where, because of poor accessibility, such particles or items cannot be gathered and removed by hand or by other conventional means.

As such, the invention is primarily intended for gathering and removing abrasive metallic particles from crankcases of internal combustion engines, although the use of the invention is by no means limited to this particular environment, as will be hereinafter apparent.

While we are aware that crankcase dip sticks have been designed which embody a magnet for removing abrasive metallic particles from oil in the crankcase, the particle removing effectiveness of such dip sticks is extremely limited inasmuch as the magnet thereof is disposed in a fixed location dictated by the position of the dip stick in the crankcase and the strength of the magnetic field is not great enough to attract particles in remote locations which are not brought into the vicinity of the magnetic field by normal circulation of the oil.

The present invention eliminates this disadvantage by the provision of a magnetic retriever which consists primarily of a resiliently flexible, slender shaft having a permanent magnet mounted at one end thereof, the shaft normally being straight but adapted to be bent as required during use, whereby the same may be inserted through the usual dip stick passage into a crankcase and manipulated so that the magnet at the end thereof reaches even into portions of the crankcase removed from the dip stick passage, for the purpose of gathering and retrieving metallic particles with a marked degree of effectiveness.

As such, the retrieving device in accordance with the invention is not intended to permanently replace a conventional non-magnetic dip stick, but rather, is intended to be used only on occasions when cleaning the crankcase of metallic particles is desired, on which occasions the conventional dip stick is removed, the magnetic retriever inserted and manipulated through the dip stick passage, and the conventional dip stick replaced when the work of the magnetic retriever is completed.

It will be also apparent from the foregoing that while the device in accordance with the invention is primarily intended for retrieving metallic particles from crankcases, it may be also used for retrieving other small magnetizable items from other poorly accessible locations, such as for example, hair pins from sink drains, et cetera.

Some of the advantages of the invention reside in its simplicity of construction, efficient and versatile use, and in its adaptability to convenient and economical manufacture.

With the foregoing more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention will be understood from the following description taken in conjunction with the accompanying drawings, wherein like characters of reference are used to designate like parts, and wherein:

FIGURE 1 is an elevational view of a magnetic re-

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triever in accordance with the invention, shown partly in section to reveal its construction;

FIGURE 2 is a cross-sectional view, taken substantially in the plane of the line 2—2 in FIGURE 1;

FIGURE 3 is a cross-sectional view, taken substantially in the plane of the line 3—3 in FIGURE 1; and

FIGURE 4 is a fragmentary vertical section view of an engine block and crankcase, showing the invention in use.

Referring now to the accompanying drawings in detail, the magnetic retriever in accordance with the invention is designated generally by the reference numeral 10 and embodies in its construction a resiliently flexible, slender shaft 11 consisting of a helical spring 12 and a coating of flexible material such as synthetic plastic, or the like, which completely covers the spring and constitutes a jacket 13 therefor. The shaft 11 is normally straight, but is adapted to be bent as desired during use, it being understood, of course, that the flexibility of the jacket 13 permits it to assume whatever form the spring 12 may have upon bending or other deflection of the shaft. The convolutions of the spring 12 are preferably although not necessarily in close contact with one another, and the provision of the jacket 13 safeguards against entry of oil, dirt, moisture and other foreign matter into the spring.

One end portion of the shaft 11 provides a convenient handle 11a whereby the entire device may be manipulated, while a cylindrical casing 14 of non-magnetizable material such as brass, for example, is mounted at the other end of the shaft. This is effected by providing the casing 14 with a blind bore 15 in which the spring 12 is secured in any suitable manner, while the jacket 13 is extended and enlarged so as to overlap the casing 14, as indicated at 13a. The casing 14 is provided with a cylindrical chamber 16 containing a suitable permanent magnet 17 and a soft iron pole piece 18, the chamber 16 having an open end in which the face 18a of the pole piece is exposed, as shown. The pole piece is secured in the chamber 16 by a suitable pin or rivet 19 extending transversely through the casing 14 and through the pole piece, and the magnet 17 is in abutment with the pole piece so as to maintain the same in a magnetized state.

When the device is placed in use, as exemplified in FIGURE 4, it is inserted through a dip stick passage 20 usually provided in an engine block 21, such insertion being made after the conventional dip stick (not shown) has been removed. The casing 14 at the lower end of the shaft 11 will thus enter the crankcase 22 and abrasive metallic particles suspended in the oil in the crankcase will become attracted to the exposed face 18a of the magnetized pole piece 18, so that they may be easily removed from the crankcase by simply withdrawing the retriever from the passage 20. It is to be particularly noted that the resilient flexibility of the shaft 11 permits the device to be manipulated by bending, twisting, deflection, or otherwise, whereby to permit the casing 14 to reach portions of the crankcase remote from the dip stick passage 20 and thereby facilitate retrieving of particles from such remote regions. Obviously, the device may be used with equal expedience in transmission gear cases, differential gear housings, and the like, as well as in a domestic environment, such as for retrieving hair pins from sink drains, et cetera.

While in the foregoing there has been described and shown the preferred embodiment of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure and various modifications may be resorted to, such as may lie within the spirit and scope of the claims.

What is claimed as new is:

1. In a magnetic retriever, the combination of a cylin-

drical casing of non-magnetizable material having an open end and a closed end provided with a blind axial bore, a helical spring having one end portion thereof secured in said bore and extending outwardly therefrom to provide a resiliently flexible handle for said casing, a cylindrical permanent magnet provided in said casing with one end thereof spaced inwardly from the open end of the casing, and a disk-shaped soft iron pole piece provided in the open end portion of the casing, said pole piece having an outer surface flush with the open end of the casing and an inner surface in abutment with said one end of said magnet.

2. The device as defined in claim 1 together with a jacket of flexible plastic material completely enclosing said spring and overlapping the closed end portion of said casing whereby to assist in retaining the spring in said bore.

3. The device as defined in claim 1 together with a keeper pin extending transversely of the open end portion of said casing and through said pole piece to retain the latter in position.

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