Jan. 2, 1951 H. M. DUNN ET AL 2,536,492

OIL-CHANGER

Filed Nov. 17, 1949

Fig. 2.

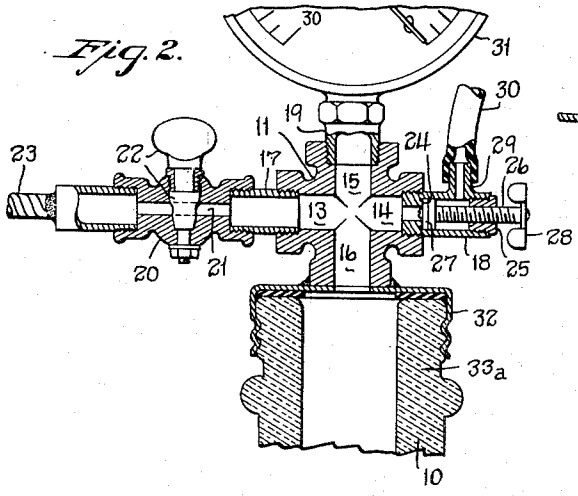


Fig. 1.

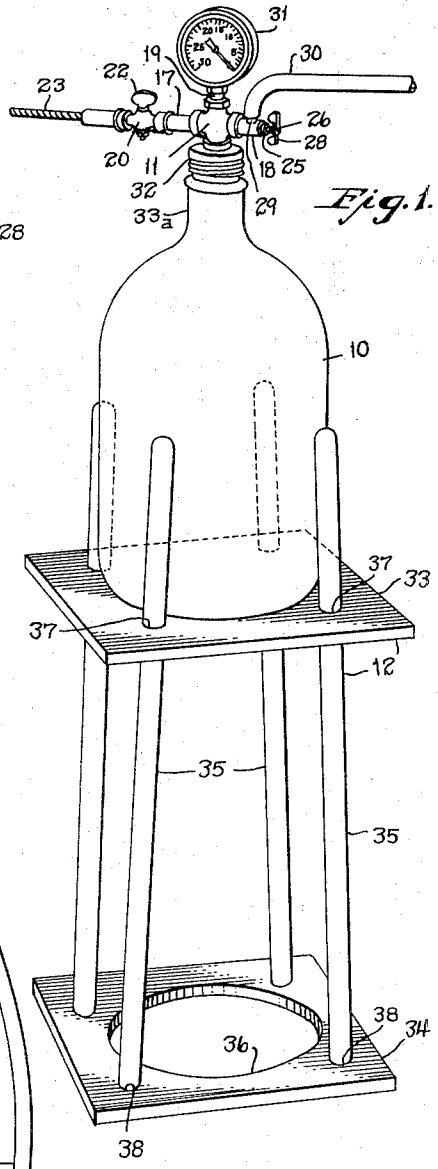
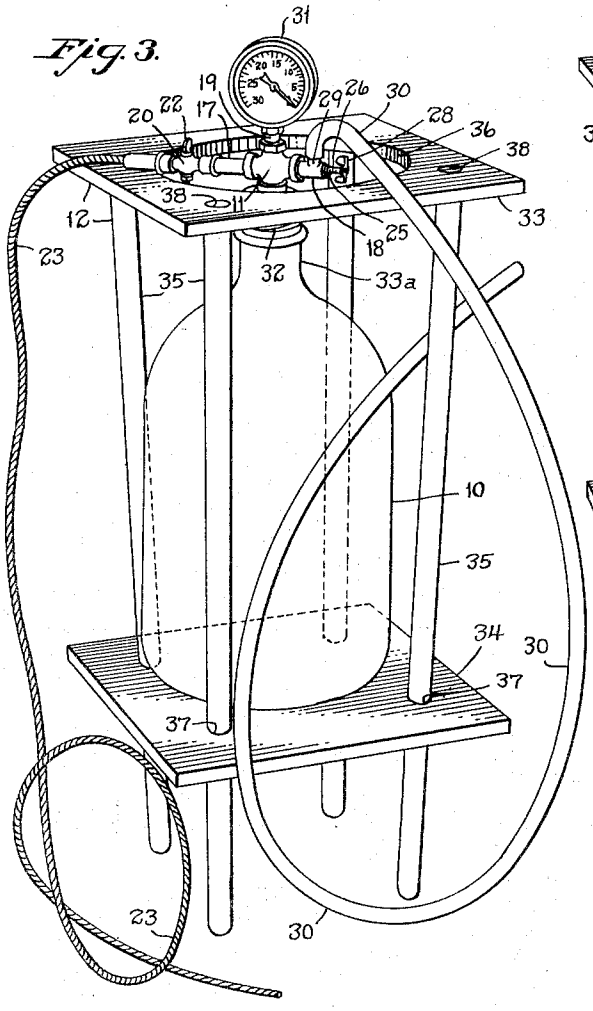


Fig. 3.



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Patented Jan. 2, 1951

2,536,492

UNITED STATES PATENT OFFICE

2,536,492

OIL CHANGER

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Application November 17, 1949, Serial No. 127,976

3 Claims. (Cl. 226—116)

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The present invention relates in general to fluid-removing apparatus and more especially to vacuum-operated apparatus for removing oil from the crankcase of motor vehicles.

An object of the invention is to provide superior oil-removing apparatus for use by individual motor-vehicle owners.

A further object of the invention is to provide vacuum-operated oil-removing apparatus which is of simple and inexpensive construction, which is easy and convenient to operate, and which embodies a minimum of parts.

A still further object of the invention is to provide a vacuum-operated oil-receiving unit with an improved stand whereby the oil-receiving unit may be supported in a convenient position for use and safely stored when not in use.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a perspective view of the improved vacuum-operated oil-removing apparatus of this invention including the stand, for supporting the oil-receiving unit while in use;

Fig. 2 is an enlarged broken sectional elevation of the control-fitting of the oil-receiving unit assembled on the neck of the oil-receiver; and

Fig. 3 is a perspective view of the vacuum-operated oil-removing apparatus, with the oil-receiving unit of the apparatus assembled within the stand for storage.

The oil-removing apparatus of this invention is especially adapted for use by individual motor-vehicle owners who buy oil for their cars in bulk and who change the oil themselves. Consequently, the apparatus of this invention is characterized by its economy of construction as well as by its simplicity and convenience of operation. Referring especially to Figs. 1 and 3, the vacuum-operated oil-removing apparatus comprises, in the main, an oil-receiving unit which, in keeping with the simplicity and economy of the apparatus, consists of an oil-receiver 10 such as, for example, a five-gallon glass bottle of any well-known make, and a connector-fitting indicated generally at 11, for connecting the bottle with a vacuum source and with the crankcase of a motor vehicle for withdrawing oil therefrom into the bottle; and a stand 12 which serves both as a means for supporting the oil-receiving unit

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while in use as indicated in Fig. 1, and as a storage-crate for protecting the oil-receiving unit when not in use, as indicated in Fig. 3.

Referring more especially to Figs. 1 and 2, the connector-fitting 11 of the oil-receiving unit comprises a cross-shaped pipe-fitting, or a member of equivalent construction, having four arms provided with passages 13, 14, 15 and 16 respectively intersecting at substantially right angles to each other, the arms identified by the passages 13, 14 and 15 being provided at their outer ends with internal threads for threaded engagement with a nipple 17, a valve-member 18 and a meter-stem 19 respectively. The nipple 17 of the passage 13 is threadedly secured at its outer end to the adjacent end of a fluid valve-member 20 having a valve-passage 21 therethrough which is adapted to be opened and closed by means of a valve-plug 22. The opposite end of the valve-passage 21 of the fluid valve-member has one end of a flexible tube 23 secured therein, the free end of which is adapted to be inserted in the opening in the crankcase of a motor vehicle for withdrawing oil herefrom, as hereinafter described.

The valve-member 18, secured in the outer end of the connector-fitting arm identified by the passage 14, constitutes the body-portion of a vacuum-valve, and to this end is provided at its inner end with a valve-seat 24 and at its outer end with a flanged bushing 25, the flanged bushing 25 being adapted to threadedly support a valve-spindle 26 for movement longitudinally within the vacuum valve-body 18. Secured to the inner end of the spindle 26 is a valve-washer 27 which is adapted to be moved into and from engagement with the seat 24 of the valve-body by longitudinal movement of the spindle 26 therein, the longitudinal movement of the spindle 26 being effected by means of a valve-operating handle 28. Intersecting one wall of the vacuum valve-body 18 at substantially right angles thereto and intermediate its ends, is an inlet-pipe 29 to which is attached one end of a flexible tube or hose 30, the opposite end of which is adapted to be secured in any convenient manner to a source of vacuum such as, for example, the intake-manifold of a motor vehicle, or to the windshield-wiper, for creating a vacuum in the bottle 10.

The meter-stem 19 of the connector-fitting constitutes the externally-threaded stem of a vacuum meter-gauge 31, by which the latter is threadedly secured in the passage 15 of the con-

nector-fitting for measuring the amount of vacuum created in the bottle or receiver 10.

The connector-fitting is adapted to be detachably secured on the upper end of the neck of the bottle, and to this end a cap 32 is soldered or otherwise secured to that arm of the fitting which is identified by the passage 16, the cap 32 being adapted to be screwed onto the upper open end of the neck 33a of the bottle 10, and having a central aperture therein communicating with the open end of the bottleneck and the passage 16 of the connector-fitting. Thus, by rotating the cap 32 manually, the entire fitting, including the flexible tube 23, the hose 30 and the vacuum meter-gauge 31, may be assembled on or removed from the neck of the bottle with facility and dispatch.

The aforesaid stand 12 of the apparatus is adapted both to support the bottle 10 of the oil-receiving unit when the latter is in use and to protect the bottle when the unit is in storage and for transportation. As shown especially well in Figs. 1 and 3, the stand 11 comprises a pair of end-members 33 and 34 respectively, each of which is a substantially-square wooden board or member of equivalent material; and supporting-means therefor which, in a preferred embodiment, comprises four rigid wooden rods 35. The end-member 34 of the stand is provided with a substantially-central aperture 36 of sufficient diameter to permit the bottle 10 to pass therethrough, and is held in substantially vertically-spaced relationship with respect to the end-member 33 by the aforesaid four rigid wooden rods 35 which are engaged in apertures 37 in the end-member 33 and apertures 38 in the end-member 34, the four apertures of each respective end-member being adjacent the corresponding four corners thereof respectively. More particularly, the substantially-rectangular locus of the apertures 38 of the apertured end-member 34 is of greater linear dimension than the substantially-rectangular locus of the apertures 37 of the solid end-member 33, as a consequence of which the supporting-rods 35 converge slightly from the apertured end-member 34 to the solid end-member 33. As shown especially well in Figs. 2 and 3, the four rods are firmly seated in the apertures 38 of the apertured end-member 34 and extend therefrom from one face only, whereas the opposite ends of the four rods 35 extend through the apertures 37 of the solid end-member 33 so as to project beyond the opposite face thereof, the length of the projecting ends of the rods corresponding substantially to half the height of the glass bottle 10, so as to firmly support the latter on the solid end-member 33 when using the apparatus for withdrawing oil from the crankcase of a motor vehicle. The extremity of the upwardly-projecting end of each rod 35 is rounded off to provide a finished and pleasing appearance and for facilitating handling and use of the stand 12.

In using the vacuum-operated oil-removing apparatus of this invention, the stand is arranged, as shown in Fig. 1, with its apertured end-member 34 placed on the ground or the floor of a garage, and with the solid end-member 33 uppermost. The glass bottle 10 is then placed on the solid end-member 33 within the enclosure formed by the upwardly-projecting ends of the rods 35, whereby the glass bottle 10 is firmly and securely supported in a relatively-elevated position. With the bottle in this position, the flexible tube 23 of its fitting is inserted in the dip-stick opening of the crankcase of the motor vehicle from which the oil is to be removed, while the hose 30 is connected to the intake-manifold of the engine or to an equivalent vacuum source. Assuming the vacuum source is the intake-manifold of the motor, then the valve-plug 22 of the fluid-valve 20 is turned to close the passage 21, and the handle 28 of the vacuum-valve 18 is turned in a counterclockwise direction to unseat the valve-washer 27 from the valve-seat 24 thereof. The interior of the glass bottle 10 is thus connected directly to the source of vacuum through the tube 30 and with the vacuum meter-gauge 31. Thereupon, the motor is started to create a vacuum in the bottle, the amount of vacuum being indicated by the position of the needle of the vacuum meter-gauge. After a sufficiently high vacuum has been created within the glass bottle, the vacuum valve-handle 28 is turned clockwise to seat the valve-washer 27 on the valve-seat 24, thereby shutting off the bottle from the vacuum source. The motor is then shut off and thereafter the valve-plug 22 is rotated to open the valve-passage 21 of the fluid-valve 20, whereupon the vacuum within the glass bottle 10 will cause the oil in the crankcase of the motor to flow up through the flexible tube 23 into the glass bottle 10. Should the vacuum within the bottle be reduced during this oil-withdrawing cycle to a point where no additional oil flows out of the crankcase, then the operator has only to turn the valve-plug 22 to close the valve 20 and start the motor of the vehicle. Then, by turning the valve-handle 28 to unseat the valve-washer 27 of the vacuum-valve 18, a vacuum may again be created in the glass bottle, after which the vacuum-valve 18 may be closed, the motor stopped, and the fluid-valve 20 opened, whereupon the re-created vacuum within the bottle will cause the remaining oil in the crankcase to flow into the bottle.

After the oil has been removed from the crankcase of the motor vehicle in the manner hereinabove described, the bottle 10 may be lifted up out of the stand and carried to a suitable place for disposing of the oil within the bottle, the disposal of the oil being accomplished readily by unscrewing the cap 32 of the connector-fitting from the neck of the bottle. To put an empty bottle or a bottle containing oil in storage, the stand 12 is inverted to the position shown in Fig. 3 such that the projections of the rods 35 constitute legs for supporting the stand substantially upright. The glass bottle, including the connector-fitting 11 and its attached flexible tubing and hose, is then lowered down through the aperture 36 of the end-member 34 which is now uppermost, until the glass bottle rests on the solid end-member 33 which now functions as the bottom of the stand. The glass bottle will thus be enclosed within the four rods 35 of the stand and hence protected against breakage, both in storage and in transportation.

Although the vacuum-operated fluid-removing apparatus of this invention is described with regard to its use in removing oil from motor vehicles, it will be understood that the apparatus may have other applications not related to motor vehicles, such as sucking up bilge water in a boat, siphoning off gasoline from a tank, and similar uses.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all

respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

We claim:

1. A portable fluid-removing unit for use in conjunction with a vacuum source for removing fluid from a container, said portable fluid-removing unit comprising: a fluid-receiver; a connector-fitting secured to said fluid-receiver, said connector-fitting having four passages intersecting at a common junction point within said fitting, one of said passages having connecting-means for making a connection with said fluid-container, a second passage having connecting-means for making a connection with said vacuum source, and a third passage in communication with said fluid-receiver; and valve-means carried by said fitting, said valve-means being arranged to be operated manually to close the connecting-means to said fluid-container and to open the connecting-means to said vacuum source for creating a vacuum in said fluid-receiver and thereafter to close the connecting-means to said vacuum source and open the connecting-means to said fluid-container to cause the fluid therein to flow into said fluid-receiver.

2. A portable fluid-removing unit for use in conjunction with a vacuum source for removing fluid from a container, said portable fluid-removing unit comprising: a fluid-receiver; a connector-fitting secured to said fluid-receiver, said connector-fitting having four passages intersecting at a common junction point within said fitting, one of said passages having connecting-means for making a connection with said fluid-container, a second passage having connecting-means for making a connection with said vacuum source, and a third passage in communication with said fluid-receiver; valve-means in the connecting-means to said vacuum source and in connecting-means to said fluid-container, said valve-means being arranged to be operated manually to close the connecting-means to said fluid-container and to open the connecting-means to said vacuum source for creating a vacuum in said fluid-receiver and thereafter to close the connecting-means to said vacuum source and open the connecting-means to said fluid-container to cause the fluid therein to flow into said fluid-receiver; and a meter connected to the

fourth passage of said fitting to measure the vacuum in said fluid-receiver.

3. In a portable apparatus for use in conjunction with a vacuum source for removing fluid from a container, the combination including: a fluid-receiver having a connector-fitting arranged to be connected to said vacuum source and said fluid-container; and a reversible stand constructed and arranged to be used both for storing said fluid-receiver and for supporting said fluid-receiver when withdrawing fluid from said fluid-container, said reversible stand comprising a pair of end-members, one of said end-members being imperforate and the opposite end-member being provided with a substantially-central aperture of sufficient transverse dimension to permit said fluid-receiver to pass therethrough; a plurality of rigid rods arranged to hold the said end-members securely in spaced substantially-parallel relationship with the distance between said end-members corresponding substantially to the height of said fluid-receiver, said rigid rods being constructed and arranged to converge from said apertured end-member toward said imperforate end-member to form a closed cage between said end-members for supporting said fluid-receiver on the imperforate end-member for storage, and integral extensions on said converging rods arranged to pass through said imperforate end-member and project beyond the outer face thereof, said extensions serving as legs to support said reversible stand during storage and upon reversal of said stand, serving as an open-ended cage for supporting said fluid-receiver on the outer face of said imperforate end-member during withdrawal of fluid from said fluid-container.

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