

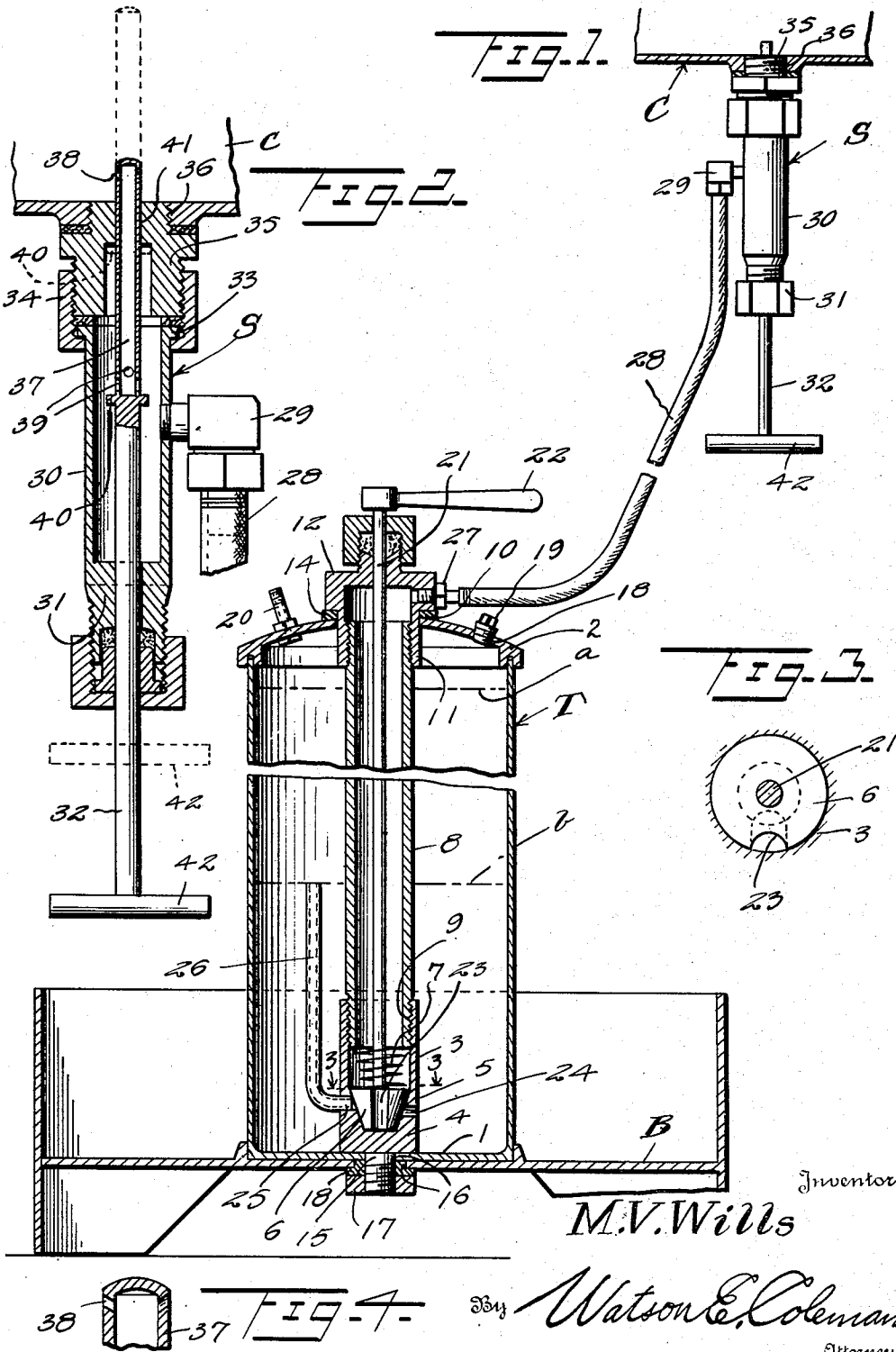
Sept. 3, 1940.

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2,213,480

APPARATUS FOR FLUSHING CRANKCASES OF AUTOMOBILES

Filed May 9, 1939



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2,213,480

## APPARATUS FOR FLUSHING CRANKCASES OF AUTOMOBILES

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Application May 9, 1939, Serial No. 272,580

3 Claims. (Cl. 184—1.5)

This invention relates to an apparatus for flushing an automobile crankcase, and it is an object of the invention to provide an apparatus of this kind which can be effectively employed for the purpose desired by connecting the apparatus at the usual drain plug of the crankcase.

It is also an object of the invention to provide an apparatus of this kind so constructed and operated to assure effective agitation of the flushing liquid within the crankcase after a predetermined amount of fluid has been discharged within such case.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved apparatus for flushing an automobile crankcase whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawing, wherein:

Figure 1 is a view partly in section and partly in elevation illustrating a flushing apparatus constructed in accordance with an embodiment of my invention;

Figure 2 is an enlarged view partly in section and partly in elevation illustrating the valve structure as herein employed;

Figure 3 is a detailed sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a fragmentary longitudinal sectional view taken through the inner or discharge end of the rod comprised in the valve structure.

As disclosed in the accompanying drawing, my improved apparatus comprises a base member B which may be as desired but which is preferably in the form of a receptacle for holding tools or the like. Mounted upon the base B at the central part thereof is an upstanding elongated tank T of desired capacity and which has its lower end closed by a bottom wall 1 and its upper end closed by a cap or head 2.

Positioned within the tank T and resting upon the bottom wall 1 thereof at the axial center of the tank is an elongated valve casing 3 tubular in form with its lower end 4 closed. This lower closed portion is formed to provide a tapered ground valve seat 5 with which coacts a tapered ground valve member 6 adapted to rotate within its seat 5. This valve member 6 is constantly urged toward its seat by a coil spring 7 of desired tension interposed between the upper portion of the valve member 6 and the lower or

inserted end of a riser or pipe 8 threading, as at 9, within the upper portion of the tubular valve casing 3. This riser or pipe 8 is readily insertible within the tank through a central opening 10 in the cap and through which opening 10 also passes from above a coupling sleeve 11 depending from an outlet box 12. Interposed between the cap 2 and the under peripheral portion of the applied box 12 is a gasket 14 whereby escape of fluid within the tank T out through the opening 10 and around the sleeve 11 is prevented. The sleeve 11 threads upon the upper portion of the applied riser or pipe 8 thus assuring said riser or pipe 8 being effectively maintained in desired position within the tank T.

The casing 3 is positively maintained in position within the tank T through the medium of a stud 15 depending from the closed lower end 4 of the casing 3 and which stud extends out through the registering openings 16 in the bottom wall 1 of the tank 2 and the base B. The extended portion of the shank or stud 15 has threaded thereon a conventional holding bolt 17. It is to be noted that the opening 16 in the base B is of such a size as to allow a suitable gasket 18 to be interposed between the applied nut 17 and the bottom wall 1 of the tank T whereby loss by leakage through the opening 16 is eliminated.

The cap 2 is provided with a filling opening normally closed by a plug 19 and said cap also carries an adapter or coupling 20 whereby the interior of the tank T may be placed in communication with a suitable source of air under pressure.

The valve member 6 is carried by the lower or inserted end portion of a control rod 21 which extends out through the top of the box 12 and the outer or extended end portion of this rod carries an operating handle 22 whereby the port 23 in the periphery of the valve member 6 may be placed in neutral position as illustrated in Figure 1 or brought into communication as desired with either of the ports 24 and 25 disposed through the wall of the casing 3 at diametrically opposed points and which ports are normally closed by the valve member 6.

In communication with and leading from the port 25 is an inlet tube 26 which extends upwardly a predetermined distance above the bottom wall 1 of the tank T for a purpose to be hereinafter more particularly referred to.

Coupled to and in communication with the box 12, as at 27, is an end portion of a flexible conduit or hose 28 of desired length and which hose or conduit has its opposite or outer end portion coupled, as at 29, for communication with the elongated tubular casing 30 of the valve structure S. One end portion of this casing 30 is closed by the head 31 through which is slidably disposed the elongated rod 32.

Swivelled, as at 33, to the opposite or normally open end portion of the casing 30 is a coupling sleeve 34 for coaction with an adapter 35. This adapter 35, as is clearly illustrated in Figures 1 and 2, threads within the usual drain opening 36 of a crankcase C. The inserted or inner end portion of the rod 32 for a desired distance therealong is tubular, as at 37, with the opposite ends of said tubular portion 37 closed.

The side wall of the tubular portion 37 of the rod 32 closely adjacent to the outer closed end thereof is provided therearound with the discharge openings 38 while said wall adjacent the inner closed end of the tubular portion 37 is provided with the inlet opening 39. As particularly illustrated in Figure 4 the discharge openings 38 are disposed on an angle with respect to the longitudinal axis of the rod 32 to assure the liquid from the tank T to be discharged within the crankcase C in a most effective manner.

The rod 32 preferably adjacent to the tubular portion 37 thereof is surrounded by an outstanding stop flange 40 for contact with the head 31 to prevent the rod 32 being accidentally pulled out entirely from within the casing or barrel 30 of the valve structure S.

In practice the tank T is initially substantially entirely filled with oil, said level being indicated at *a* in Figure 1. The valve 6 is initially in neutral position, as also illustrated in Figure 1, and the adapter 35 is engaged within the drain opening 36 of the crankcase C. The adapter 20 has coupled thereto a hose leading from an air compressor. The valve 6 is then turned to bring the port 33 in register with the port 25. The pressure of air upon the top of the oil will force said oil down through the tube 26 up through the riser or pipe 8 and out through the hose or conduit 28 and the casing or barrel 30 into the crankcase C after the rod 32 has been retracted to bring the stop 40 into contact with the head 31 of the casing or barrel 30. When this stop flange 40 is in contact with the head 31, the inserted or inner end of the rod 32 is substantially entirely within the casing or barrel 30 so that the fluid flows within the crankcase C through the bore 41 of the adapter 35. When the rod 32 is extended through the bore 41 said bore is closed. After the level of the fluid within the tank T has been lowered to a point substantially flush with the upper end of the tube 26 the rod 32 is forced inwardly so that the tubular portion 37 thereof will pass through the bore 41 to plug or seal said bore but permitting air under pressure to pass into the portion 37 through the opening 39 and out through the openings 38. Of course, any fluid remaining in the casing or barrel 30 will be expelled through the portion 37 and openings 38 with the air.

It is to be noted that in Figure 2 of the drawing the inner portion of the bore 41 is transversely enlarged. This is to assure desired flow of the fluid out through the bore 41 when the rod 32 is retracted.

It is also to be particularly pointed out that the rod 32 may be readily rotated or can be easily moved lengthwise to readily allow the air as discharging out thru the openings 38 to be at different planes and also to direct the air jets in different directions to assure a thorough agitation of the flushing oil through all parts of the crankcase.

When desired, however, the rod 32 may be fully retracted to allow the air to pass into the case C thru the bore 41 of the adapter 35 which allows

for a vertical movement of the air through the oil within the crankcase. It is believed to be obvious that with the rod 32 extended within the crankcase the air may be discharged in an angular direction through the openings 38 and at all planes within the case C upon raising or lowering the rod 32.

The cross handle 42 carried by the outer end portion of the rod 32 provides means whereby it can be readily determined in what direction the air jets are being discharged out through the openings 38.

After the flushing operation has been completed, the crankcase is drained of the flushing oil and then, if desired, the valve 6 can be adjusted to bring the port 23 thereof in register with the port 24 whereupon the air pressure upon the level *b* of the oil within the tank T will force the remaining oil into the crankcase C for rinsing purposes.

From the foregoing description it is thought to be obvious that an apparatus for flushing an automobile crankcase constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. An apparatus for flushing a crankcase of an automobile or the like having a drain opening comprising, in combination, a barrel, means carried by the barrel for engaging within the drain opening of the crankcase, a rod having endwise movement through the barrel, the inner end portion of the rod being tubular and having discharge openings adjacent to the outer end of said tubular portion and inlet openings adjacent to the inner end of said tubular portion, and means for delivering fluid under pressure within the barrel.

2. An apparatus for flushing a crankcase of an automobile or the like having a drain opening comprising, in combination, a barrel, means carried by the barrel for engaging within the drain opening of the crankcase, a rod having endwise movement through the barrel, the inner end portion of the rod being tubular and having discharge openings adjacent to the outer end of said tubular portion and inlet openings adjacent to the inner end of said tubular portion, and means for first delivering a liquid under pressure within the barrel and later air under pressure.

3. An apparatus for flushing a crankcase of an automobile or the like having a drain opening comprising, in combination, a barrel, means carried by the barrel for engaging within the drain opening of the crankcase, a rod having endwise movement through the barrel, said rod also being free to rotate about its longitudinal axis, the inner end portion of the rod being tubular and having discharge openings adjacent to the outer end of said tubular portion and inlet openings adjacent to the inner end of said tubular portion, and means for delivering fluid under pressure within the barrel.