RECEPTACLE EVACUATING APPARATUS

Original Filed May 25, 1925
3 Sheets—Sheet 1

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My invention relates to apparatus for evacuating, under the control of an operator, the contents of receptacles, as for example and more particularly, the crank-cases of automobiles, preparatory to the charging thereof, with fresh oil.

The invention has to do more especially with apparatus of the character above stated comprising, as an element thereof, an extension pipe device at which the apparatus is adapted for communication with the receptacle from which the liquid is to be removed, as for example at the lower drain opening thereof in the case of a crank-case to be evacuated, the pipe device referred to containing a valve controllable by the operator and controlling the operation of that part of the apparatus which operates to effect the desired flow of the liquid from the receptacle.

My objects are to provide a construction of extension pipe device whereby the minimum resistance to the flow of liquid therethrough is presented; to provide an extension pipe device which may be easily and conveniently handled by the operator in applying it to operative position particularly when applied to an outlet at the lower portion of the crank case extending in a plane below the running-boards of the car; to locate a sight tube on the pipe device in such position that it may be readily viewable by the operator in manipulating the pipe device in the most desirable manner; and to provide improvements in the inlet portion, of a conduit-device, and especially an extension pipe device, to the end that liquid entering the conduit-device will not, upon detaching the device, drop or run out of its inlet portion.

I have devised my invention for embodiment, more particularly, in an apparatus of the type shown in my pending application for U. S. Letters Patent Serial No. 13,819, filed March 7, 1925, involving, in general, the use of an extension pipe device of the general character above referred to, the valve of which operates to control the flow of fluid-pressure, as for example compressed air, to an ejector-device positioned to exert suction in a receptacle to receive the liquid, and in turn exert suction in the pipe device to act upon the liquid in a crank-case and effect the desired flow therefrom into the receptacle referred to, and have therefore illustrated it in such an apparatus in the accompanying drawings, a description of which is as follows:

Figure 1 is a view in side elevation of such an apparatus, embodying my improvements, showing the apparatus in conjunction with the crank-case of an automobile the oil in which is to be evacuated. Figure 2 is an enlarged view in sectional elevation of the receptable and suction-producing means forming parts of the apparatus. Figure 3 is an enlarged, broken, section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow. Figure 4 is an enlarged view in sectional elevation of the outlet portion of the crank-case and that end of the extension pipe device which directly co-operates therewith, the pipe device being shown disengaged from the outlet of the crank-case, but in alignment therewith. Figure 5 is a view in elevation, partly sectional, of the handle-forming portion of the pipe device. Figure 6 is a section taken at the line 6 on Fig. 5 and viewed in the direction of the arrow; and Figure 7, a plan view of the structure in Figs. 5 and 6, with a certain part thereof sectioned.

In explanation of the illustrated apparatus as to those features forming the subject of my said pending application, it may be stated that 8 represents a receptacle for receiving the oil discharged from the crank-case to be evacuated, this receptacle being provided in its top with an ejector-device 9 supplied with fluid pressure, as for example...
compressed air, from any suitable source, through a pipe 10, the suction-inlet of the ejector being represented at 11 and opening into the upper portion of the receptacle 8. It being understood that compressed air discharging upwardly from the pipe 10 through the ejector device 9 and out through a pipe 12, creates suction, through the opening 11, in the receptacle 8. The pipe 10 is looselysurrounded by a pipe 13 which opens at its upper end into the upper part of the receptacle 8 and at its lower end connects, by a passage 14, in the bottom of the receptacle 8, with a pipe 15 which connects with a flexible hose line 16, communicating with the liquid-conduit of an extension pipe device 17 which in the arrangement shown is constructed in accordance with my present invention, and in which conduit suction is exerted by the exertion of suction in the receptacle 8 as stated.

The air pipe 10 is shown as leading outwardly from the standard 18 supporting the receptacle 8, and connected with a flexible hose line 19 which communicates, through a valve-equipped air-passage in the extension pipe device, with a flexible hose line 20 which connects with a pipe 21 extending into the standard 18 and leading to a suitable source of fluid pressure, as for example a source of compressed air, for supplying the ejector-device 9 with the desired fluid-pressure for operating the latter under the control of the operator.

Referring now to my improved extension pipe device referred to, it comprises a rigid pipe section 22 provided at one end with a head 23 and at its opposite end with a fitting 24 for engaging it with the adapter-equipped outlet of a crank-case. The head 23 contains in its main portion 25 a longitudinally-extending straight-way passage 26, forming the liquid-conduit referred to, the section of which intermediate its ends is formed of a glass tube 27 exposed to view through an opening 28 in the side of the portion 25, the pipe 22 screwing into one end of the passage 26, and a coupling 29, connected with the outer end of the pipe 16, screwing into the opposite end of the passage 26. The head 23 is provided with a pistol-grip portion 30 by which the operator may grasp and manipulate, the pipe device. The head 23 is adjacent the grip 30 contains the air-passage above referred to, shown as comprising the substantially parallel passages 31 and 32 connected by a cross-passage 33, the pipes 19 and 20 being connected with ends of the passages 31 and 32, respectively. The air-passage thus provided is controlled by a valve represented at 34 cooperating with a seat 35 in the passage 32, between the pipe 20 and the cross-passage 33, this valve being carried by a stem 36 which slides at its enlarged portion 36 in a reduced portion 37 of the passage 32 and extends at its outer end into the path of movement of the free end of a lever 38 fulcrumed at 39 on the end of the grip 30 and outwardly pressed by a coil spring 40 confined in a socket 41 in the grip 30, it being understood that the pressure of air in the pipe 20 operates to normally hold the valve 34 closed, and that this valve is opened by the operator swinging the lever 38 toward the grip 30, the valve remaining open until the operator releases his grasp on the lever 38 whereupon the pressure of air against the valve 34 closes it.

The particular extension pipe device shown is provided for cooperation with a particular form of adapter with which the drain-opening of the crank-case would be provided, the fitting 24 in the construction shown comprising a tubular member 42 into which the pipe 22 is screwed, the outer end of the member 42 being expanded as represented at 43. Sliding lengthwise on the member 43 is a sleeve 44 provided at one end with a collar 45 presenting a flange 46 overlapping a shoulder 47 on the member 48 and limiting outward movement of the sleeve 44, the opposite end of the sleeve having an inserted flange 48. Screwed into the sleeve 44, with a gasket 49 interposed between it and the flange 48, is a ring 50 presenting a valve-seat 51 for a valve 52 backed by a coil-spring 53 confined between it and a spider 54 rigid with the member 43 and holding the valve 52 to its seat. The spider 54 carries a pin 55 which extends through the spring 53 and loosely through the valve 52 to a position closely adjacent the outer end of the sleeve 44. The sleeve 44 is yieldingly held in the extended position shown in Fig. 4 by a coil spring 56 confined between the ring 50 and the spider 54.

The particular adapter shown and screwed into the usual drain-opening 57 of the crank-case shown at 58, is represented at 59, it being provided with an outwardly-seating valve 60, the spring for seating the valve being shown at 61. The outer end of the adapter, represented at 62, is of a size to be received by the opening in the outer end of the sleeve 44 and in the application of the fitting 24 to the adapter 59, the gasket 49 engages the outer end portion 69 of the adapter and upon pushing the extension pipe device toward the adapter the sleeve 62 is held stationary by the adapter and the pin 55 is forced against the valve 60 and unseats it, the member 42 sliding in the sleeve 44 in this operation.

Suction being exerted in the receptacle 8 by the action of the ejector-device 9, assuming the operator has opened the valve 34, and the extension pipe device having been applied to the adapter 59 as stated, the oil is sucked from the crank-case into the re-
ceptacle 8, the valve 52 which is backed by a light spring yielding readily and not offering substantial resistance to the flow of oil into the extension pipe device.

3. Upon removing the extension pipe device from the adapter 59 the valve 60 automatically closes to close the adapter and the valve 52 also automatically closes to prevent spilling of oil from the inlet of the pipe device.

It will be understood from the foregoing that by constructing a pipe device as described the operator may readily apply it to position for evacuating a crank-case; that, because of the straight-way passage 26, practically no resistance to the flow of oil through the pipe device is presented; and in the natural method of application to the adapter, it differs from other devices as previously designed in that the connecting hoses are in such position to avoid contact with clothes of the operator.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as various modifications and alterations may be made therein and my improvements used with apparatus of other types than that in connection with which I have illustrated and described it without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. Apparatus for evacuating the crank cases of automobiles through lower drain outlets thereof comprising an extension pipe device comprising a head having a straight-way passage therethrough for the liquid to be drained from the crank case and a rigid pipe having an inlet at one end at which it is adapted to releasably communicate with said outlets, said rigid pipe being connected at its opposite end with said head and communicating with one end of said passage, a flexible hose line in communication with the other end of said passage, and means for producing suction in said pipe, said extension pipe device being of such length that it extends from such an outlet to which it is applied, substantially to the side edge of the automobile, said head having a pistol grip for controlling the suction producing means and a portion of said passage being formed of a glass tube and said head having an opening in its side through which said tube is exposed to view.

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