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DISPENSING GUN FOR DECARBONIZING LIQUIDS

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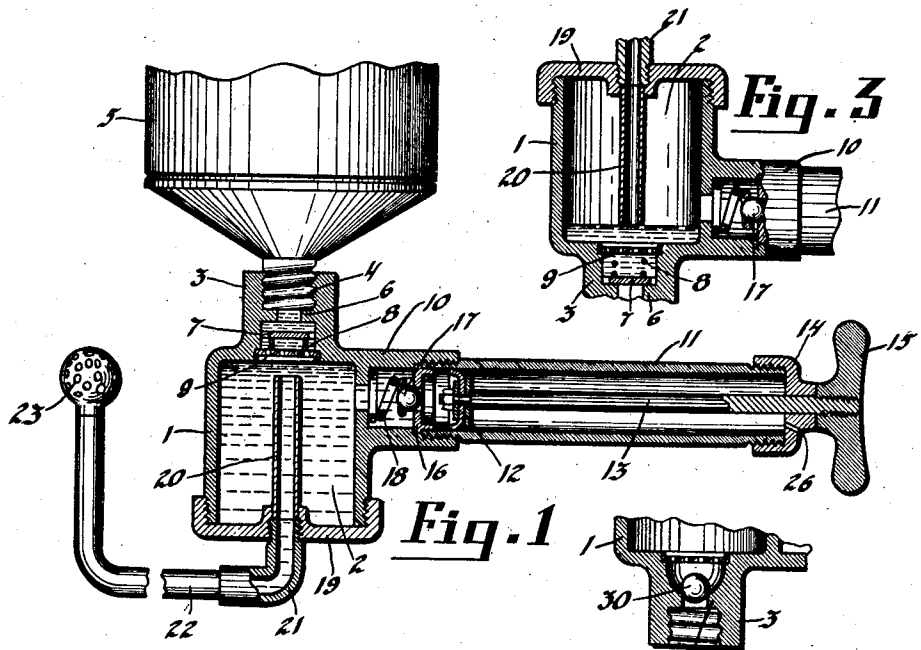


Fig. 1

Fig. 3

Fig. 4

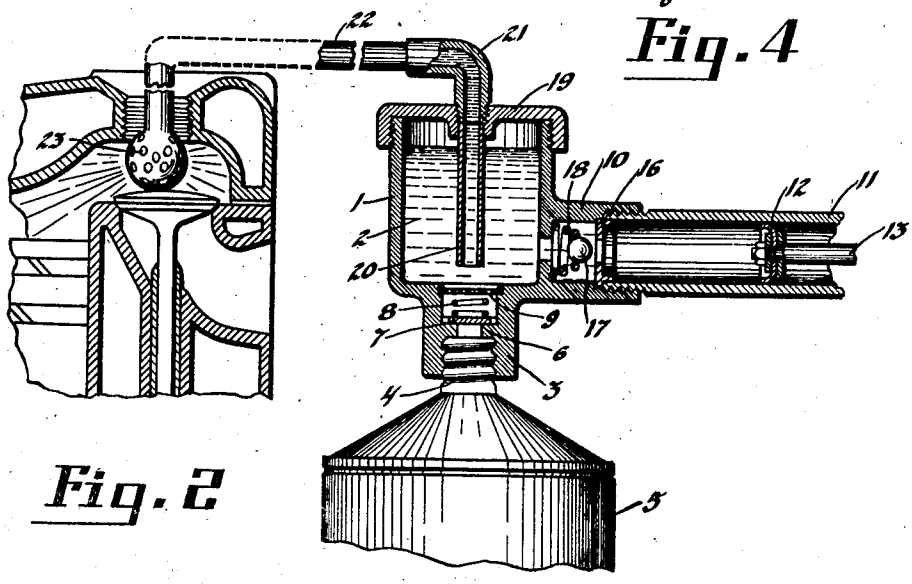


Fig. 2

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DISPENSING GUN FOR DECARBONIZING LIQUIDS

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This invention relates to dispensing apparatus and more particularly to a device for injecting a charge of decarbonizing liquid into a cylinder of an internal combustion engine.

After a period of use the walls of the combustion chambers of an explosive engine become coated with a carbon deposit which serves to lessen engine efficiency. One method some times employed to remove the carbon deposit and restore engine efficiency consists in pouring a liquid decarbonizing solution into the cylinders when the engine is hot. The engine is then allowed to remain idle for a certain interval, in which the liquid acts upon and loosens the carbon coating. When the engine is again started the loosened carbon is blown or carried out the exhaust line. This decarbonizing liquid is usually sold in small cans or containers and it is sometimes difficult to pour the liquid from the can into the combustion chamber and in the proper quantity.

It is an object of the present invention to provide a dispenser for the liquid which may be readily attached to and used with a regular container in which the liquid is purchased on the market and which will allow a predetermined amount of liquid to be easily and conveniently injected into the engine combustion chamber.

Another object of the invention is to provide a device with which is associated a pressure pump for forcing the liquid charge into the engine combustion chamber and which embodies a check-valve to prevent the liquid entering the pump cylinder.

A further object of the invention is to provide a device that will dispense only a predetermined charge regardless of the number of pump strokes employed or the degree of pressure acting on the liquid.

A further object of the invention is to provide a device which will distribute the liquid to every surface of the combustion chamber.

Other objects and advantages will be apparent from the following specification taken in connection with the accompanying drawing wherein:

Figure 1 is a vertical sectional view of the device embodying the present subject matter secured to the commercial liquid container and positioned to permit the contents of the container to enter the measuring chamber forming a part thereof.

Figure 2 is a similar view of the parts inverted and in position to permit the discharge of the liquid from the measuring chamber.

Figure 3 is a detailed sectional view showing the level of the liquid after the full charge has been dispensed.

Figure 4 is a detailed sectional view of a modified form of check valve.

Referring to drawing the reference character 1 indicates a hollow cylindrical body portion providing a measuring chamber 2, and from which projects a boss or reduced portion 3 for detachable engagement with the screw-threaded neck or spout 4 of the can or container 5. An integral flange 6 in the opening through the boss forms a seat for the plate or disk valve 7, controlling communication between the container 5 and measuring chamber 2, the tension of the coil spring 8 interposed between the valve 7 and a fixed perforated plate 9 tending to urge the valve toward its seat. The cylindrical body portion is also provided with a lateral projection or boss 10 into which is threaded the end of a pump cylinder 11, having therein a reciprocatory piston 12, preferably consisting of a leather cup mounted on one end of a stem 13 that extends through the cap or cover 14 of the pump cylinder and has a handle 15 at its opposite end. The end of the pump cylinder 11 is closed by a plate 16 positioned between the end of the cylinder and a shoulder in the hollow boss 10, and having a skirt portion extending within the cylinder and a central opening that is closed by a ball valve 17 held over the opening by spring 18. Screw-threaded on the cylindrical body 1 is a closure cap or cup 19 carrying a stand-pipe 20 of a predetermined length that extends into the chamber 2 and forms an outlet passageway leading through the elbow fitting 21, a pipe or conduit 22 to a globular diffuser tip or spray nozzle 23, having a number of small perforations or holes therein.

In use the boss 3 is threaded on the spout

4 of the liquid container in place of the customary closure cap. By turning the container upside down to the position shown in Figure 1 the liquid by its own weight opens the valve 7 and passes into and fills the chamber 2 and the outlet passageway leading to the nozzle 23. The smallness of the openings or perforations in the nozzle and the surface tension of the liquid prevents the liquid from passing through the perforations without the application of pump pressure. At this stage the parts are inverted or turned so that the container is top side up, when the valve 7 will return to its seat. The nozzle may then be inserted through the customary spark plug openings and into the combustion chamber of the engine whereupon operation of the pump will force the liquid in the measuring chamber through the nozzle. On the pressure stroke of the pump the air that had passed the piston on the suction stroke is replaced by air entering the port 26 in the cap 14, and is forced past the check valve 17 to act on and cause the discharge of liquid through the standpipe 20. The check valve 17 at all other times remains closed, thereby preventing the entrance of liquid into the pump cylinder where it might tend to cause deterioration of the piston material and destroy its action. It will be apparent that when the level of the liquid falls below the open end of the standpipe the air under pressure will escape through the outlet and no longer cause liquid to be discharged. Thus the length of the standpipe determines the amount of the liquid to be injected, and by substituting various lengths of volume determining tubes or conduits, different predetermined quantities of liquid may be dispensed according to the size of the engine as well as the extent of the carbon deposit.

Figure 4 shows a modified type of check valve comprising a ball 30 that may be substituted for the spring pressed plate valve heretofore described. Instead of employing a hand operated pressure pump for forcing out the liquid the pump may be replaced by suitable nipple with which may be connected a compressed air line.

While the invention has been described more or less specifically it is to be understood that the structure of the device may be modified as to details without departing from the scope of appended claims.

I claim:

1. In a hand device for injecting a measured charge of decarbonizing fluid into an engine cylinder, a fluid container a metering chamber associated therewith, a valve controlling communication between the chamber and container, pressure means for forcing the contents out of the chamber when said valve is closed, a check valve between the chamber and pressure means and a discharge conduit leading from the chamber, having at its end a diffuser for spreading the discharged fluid in different directions.

2. A hand tool of the character described including in combination with a fluid container of a metering chamber detachably associated therewith, a valve controlling communication between the container and chamber, a pressure pump adapted to act on the contents of said chamber and a valve between the pump and chamber adapted to open under the pressure of said pump.

3. A hand tool for injecting a measured charge of decarbonizing fluid into an engine cylinder, including a metering chamber for attachment with a fluid container, a pressure pump adapted to act on the contents of the chamber to discharge the same, and a normally closed check valve between the pump and chamber to prevent fluid flow into the pump and which is opened under influence of the pump pressure.

4. A device for dispensing a measured charge of fluid including a metering chamber for attachment with a fluid container, a pressure pump adapted to act on the contents of the chamber to discharge the same and an outlet leading from the chamber and located in predetermined spaced relation with the ends of the chamber to control the volume of fluid discharged.

5. A device for dispensing a measured charge of fluid including a metering chamber for attachment with a fluid container and a pressure pump adapted to act on the contents of the chamber to discharge the same, an outlet passageway leading from a predetermined point in said chamber to control the volume of fluid discharged, and a diffuser nozzle associated with the end of said passageway.

6. A device for dispensing a measured charge of fluid, including a metering chamber for attachment with a fluid container, a pressure pump associated therewith, and check valves interposed respectively between the chamber and container and between the chamber and pump.

7. A device for dispensing a measured charge of fluid, including a metering chamber for attachment with a fluid container, a pressure pump associated therewith, and check valves interposed respectively between the chamber and container and between the chamber and pump, a discharge passageway leading from the chamber and provided at its end with a perforate diffuser nozzle.

8. A device for dispensing a measured charge of fluid, including a metering chamber for attachment with a fluid container, a pressure pump associated therewith, and check valves interposed respectively between the chamber and container and between the chamber and pump, an outlet passageway leading from the chamber and a stand pipe forming a part of said passageway and ex-

tending into said chamber to a predetermined point for controlling the volume of fluid to be discharged.

9. A hand device for dispensing a measured charge of fluid, including a metering chamber adapted for attachment with a fluid container, a valve interposed between said chamber and the container movable to open position when the device is turned upside down to allow fluid to pass from the container to the chamber and movable to closed position when the device is restored to upright position to cut off communication between the container and chamber, and pressure means to force the fluid from the chamber when said valve is closed.

10. A hand device for dispensing a measured charge of fluid, including a metering chamber adapted for attachment with a fluid container, a valve interposed between said chamber and the container movable to open position when the device is turned upside down to allow fluid to pass from the container to the chamber and movable to closed position when the device is turned right side up to cut off communication between the container and chamber, a pressure pump associated with said chamber, and a spring pressed valve normally closing communication between the chamber and pump but movable off its seat under the action of said pump to permit pump pressure to eject the fluid from said chamber.

11. Means for dispensing a measured charge of liquid from a container including a chamber adapted for detachable engagement with the container, a check valve to control communication between the container and said chamber, a pressure pump associated with said chamber adapted upon operation to place the liquid in the chamber under pressure, a check valve interposed between the pump and chamber to prevent the liquid entering said pump, and a replaceable discharge pipe extending for a predetermined distance within said chamber through which the liquid is discharged under the influence of pump pressure until the liquid level falls below the open end of said pipe, whereby the amount of liquid to be discharged is definitely controlled.

12. A hand device for injecting measured charge of decarbonizing fluid into an engine cylinder or the like comprising a chambered housing adapted for detachable engagement with a vessel containing decarbonizing fluid, a normally closed valve controlling communication between the vessel and chambered housing, and movable off its seat under the weight of the fluid when the vessel and housing are inverted, to allow fluid to pass into the chambered housing, and means to permit a predetermined amount of fluid to be discharged from the chambered housing after the housing and vessel are restored to upright position.

13. A hand device for injecting a measured charge of decarbonizing fluid into an engine cylinder or the like including a vessel containing a supply of decarbonizing fluid, a metering chamber of a given volume connected with said vessel, a valve governing communication between the vessel and chamber, said valve being opened under the weight of the fluid when the vessel is in inverted position and being closed when the vessel is in upright position, means to apply pressure on the fluid in the chamber to eject the same, and means to limit the amount of fluid discharged under pressure from said chamber.

14. A hand device for injecting decarbonizing fluid into an engine cylinder or the like, including a vessel for a supply of decarbonizing fluid, a chambered housing connected with said vessel and into which the fluid gravitates when the vessel is turned upside down, a valve to prevent return of the fluid to said vessel when the vessel is top side up and means for discharging fluid from the housing.

15. The structure of claim 14, wherein a discharge conduit leads from the chambered housing and is provided at its end with a diffuser tip that is adapted for insertion in an engine cylinder and to spread the discharged fluid in different directions.

16. The structure of claim 14 wherein the discharging means includes a pressure pump.

17. The structure of claim 14 wherein the discharging means includes a pressure pump and a valved connection between the pump and housing to prevent the fluid entering said pump from the housing.

18. The structure of claim 14, wherein a discharge conduit leads from the chambered housing and is provided at its end with a diffuser tip that is adapted for insertion in an engine cylinder and to spread the discharged fluid in different directions, and a pressure pump is connected with the housing.

19. The structure of claim 14, wherein a discharge conduit leads from the housing and has a portion thereof extending into the housing with an opening at a predetermined position below the top of the housing to definitely govern the amount of fluid to be discharged.

20. In a device as described in claim 19, wherein the portion extending into the housing is interchangeable with other like portions of different length so that the amount of fluid to be discharged can be varied by the substitution of one portion for another.

21. A hand device for injecting a measured charge of decarbonizing fluid into an engine cylinder including a chambered housing of fixed capacity having means for connection with the container in which the fluid is put up for the trade, a check valve in said connection which permits the fluid to flow from

the trade container into said chambered housing when the device is upside down, and which prevents return of the fluid when the device is top side up, a pressure pump carried by and extending laterally from the housing, a check valve between the pump and chambered housing, and a discharge conduit leading from the chambered housing and having an interchangeable portion extending to a predetermined level into the housing, whereby pump pressure discharges a measured quantity of the fluid from the chamber.

In testimony whereof I affix my signature.

MARK L. BLAIR.