

May 27, 1941.

M. TERLESKY ET AL

2,243,446

FLUSHER FOR AUTOMOBILE RADIATORS

Filed Sept. 5, 1939

2 Sheets-Sheet 1

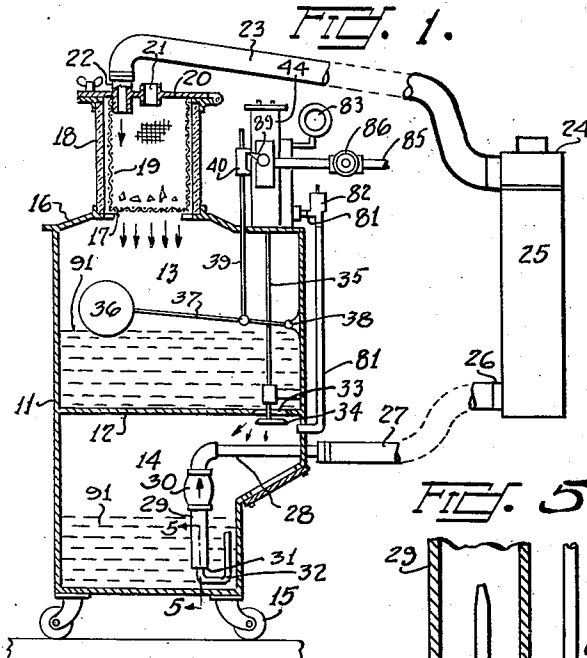
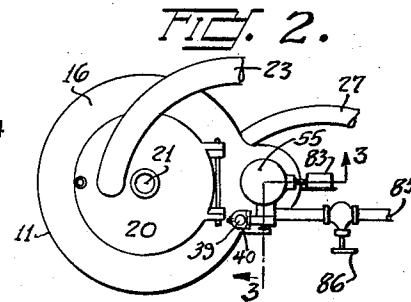
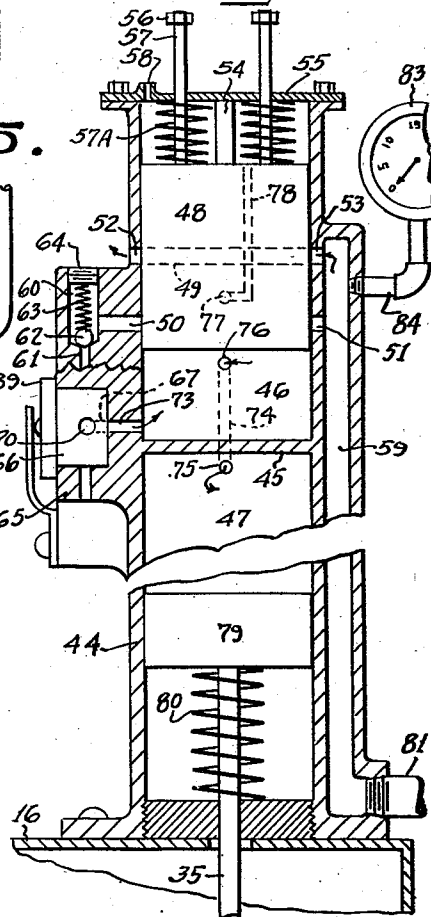
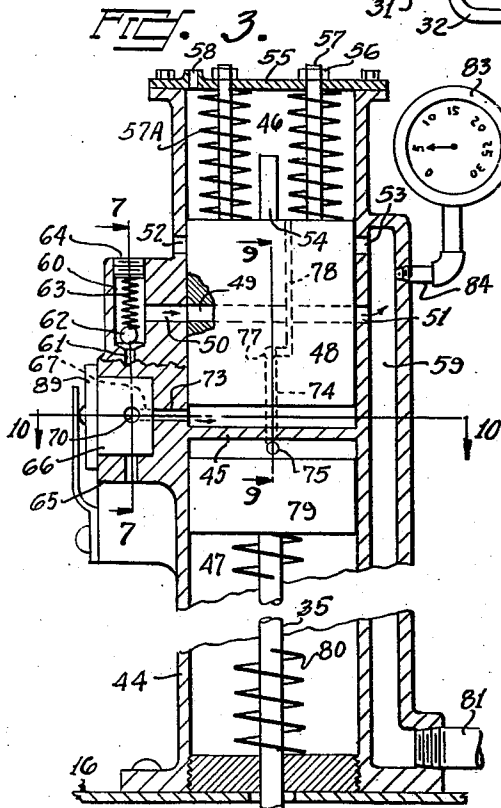


FIG. 4.



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2 Sheets-Sheet 2

FIG. 6.

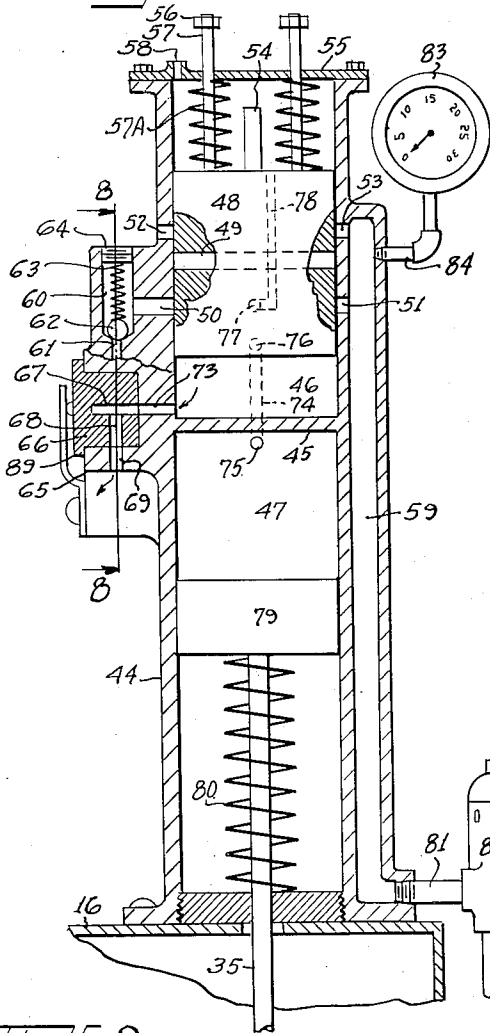


FIG. 7.

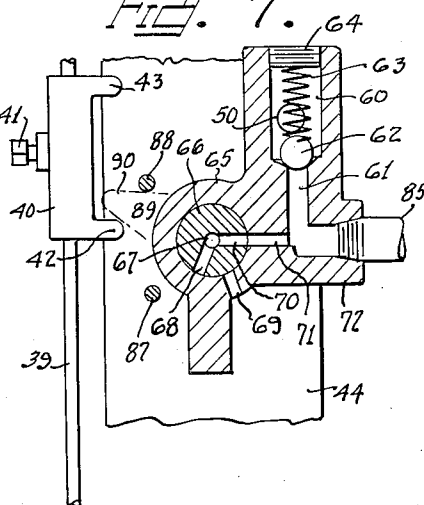


FIG. 8.

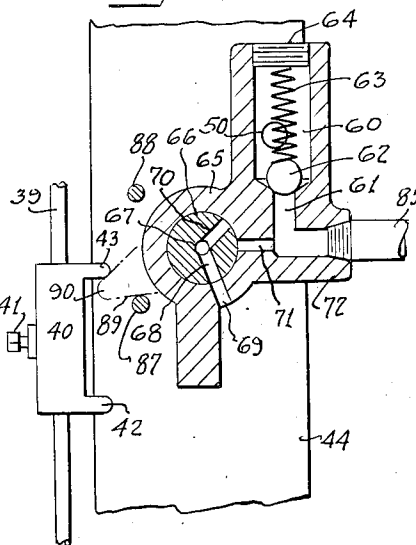


FIG. 9.

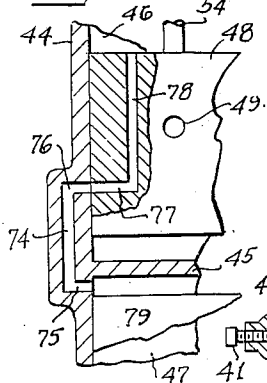
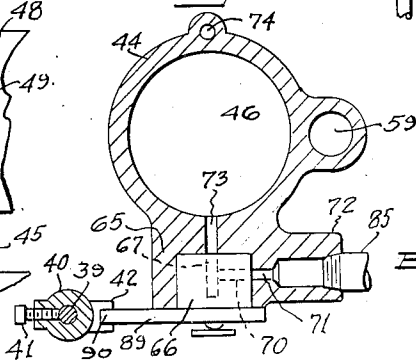


FIG. 10.



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FLUSHER FOR AUTOMOBILE RADIATORS

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Application September 5, 1939, Serial No. 293,397

2 Claims. (Cl. 141-1)

This invention relates generally to flushing and cleaning devices, and particularly to a flusher for automobile radiators.

The main object of this invention is to construct a highly efficient form of radiator flusher by means of which all of the foreign substances lodged in the radiator cores will be removed therefrom in a minimum amount of time without injury to the radiator or the necessity of removing the radiator from the automobile.

The second object is to construct a flusher of the class described which will not require expert attention and which after having been installed will require only the regulation of the air pressure during the operation of the device.

The third object is to construct a device of the class described which will be useful for flushing radiators and motor blocks with a continuous circulation of cleaning solution and compressed air by what we refer to as a "reverse flush" method.

These and other objects are accomplished in the manner set forth in the following specification as illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical section through the device showing same attached to an automobile radiator.

Fig. 2 is a plan of the device.

Fig. 3 is a vertical section through the control valve mechanism, along the line 3-3 in Fig. 2, showing the parts in position for filling the upper compartment.

Fig. 4 is a view similar to Fig. 3 showing the parts in position while the liquid is passing to the lower compartment.

Fig. 5 is a fragmentary section taken along the line 5-5 in Fig. 1.

Fig. 6 is a view similar to Fig. 3 showing the parts of the control valve in the position for exhausting the air from the upper valve cylinder.

Fig. 7 is an enlarged fragmentary section taken along the line 7-7 in Fig. 3, showing the parts in position to admit air to the lower compartment and under the upper piston.

Fig. 8 is a section taken along the line 8-8 in Fig. 6, showing the air from under the upper piston being exhausted to the atmosphere.

Fig. 9 is a fragmentary section taken along the line 9-9 in Fig. 3.

Fig. 10 is a transverse section taken along the line 10-10 in Fig. 3.

Similar numerals refer to similar parts throughout the several views.

Referring in detail to the drawings, there is

shown a casing 11 which is divided by a partition 12 into an upper compartment 13 and a lower compartment 14. The casing 11 is mounted on the castors 15 for convenience in moving same about.

In the top 16 is formed an opening 17 around which is disposed a glass cylinder 18 which contains the screen pocket 19. A hinged cover 20 is placed over the cylinder 18 and the screen 19. The cover 20 contains an air vent opening 21 and an inlet nipple 22 to which is connected a hose 23 which is connected to the top side 24 of an automobile radiator 25 whose lower side 26 is connected by a hose 27 to the pipe 28 whose downturned end 29 is provided with a check valve 30 which closes automatically against the flow of liquid therethrough in a downward direction. The lower end 31 of the downturned pipe 29 is open and has projecting thereinto a U-shaped pipe 32 as shown in Fig. 5.

In the partition 12 is formed an opening 33 which is closable by a valve 34 which is mounted on the lower end of the rod 35 which projects upwardly through the top 16.

A float 36 is mounted on the arm 37 which is hinged in the pivot 38 to the casing 11. To the float arm 37 is attached the plunger 39 on whose upper end is adjustably secured the block 40 by means of the set screw 41. The block 40 has projecting therefrom the lugs 42 and 43, the purpose of which will be explained later. The plunger 39 extends through the top 16 and guides therein.

Referring to the control valve itself, same will be seen to consist of an elongated shell 44 which is divided by the partition 45 into the upper cylinder 46 and the lower cylinder 47. In the upper cylinder 46 is disposed the piston 48 through which extends the transverse port 49 which for convenience is shown in straight lines in Figs. 3, 4 and 6 which registers with the ports 50 and 51 in the shell 44 while the piston 48 is in its lowermost position, and which registers with the ports 52 and 53 while the piston 48 is in its uppermost position, which is determined by the central stop 54 which engages the head 55 as shown in Fig. 4; whereas the downward position of the piston 48 is controlled by the nuts 56 on the rods 57 which project upwardly from the piston 48 and slidably through the head 55. The head 55 is provided with a vent opening 58. Springs 57-A urge the piston 48 downwardly.

Along one side of the shell 44 is formed a passageway 59 which communicates with the ports 51 and 53. The port 52 opens to the atmosphere.

The port 50 communicates with the chamber 60 whose lowermost end 61 is of a reduced diameter and is normally closed by the ball check 62 which is urged toward a closed position by means of a spring 63 which is held in compression by means of the screw plug 64.

Rotatably mounted in the enlarged portion 65 of the shell 44 is a valve 66 having the central opening 67 which communicates with the radial opening 68 which can register with the opening 39 which opens to the atmosphere. The radial opening 70 in the valve 66 also communicates with the opening 67 and can register with the opening 71 in the valve portion 72 which is integral with the shell 44. The opening 71 communicates with the lowermost end 61 of the chamber 60. The central opening 67 communicates at all times with the port 73 which is at the lower end of the cylinder 46.

A by-pass channel 74 has its port 75 connecting with the cylinder 47 and its port 76 connecting with the cylinder 46. The piston 48 is provided with a horizontal port 77 which communicates with the port 76 when the piston 48 is in its lowermost position. The port 77 has an up-turned portion 78 which opens through the top of the piston 48. The lowermost piston 79 is slidable within the lowermost cylinder 47.

Attached to the piston 79 is the rod 35 around which is placed the spring 80 which urges the piston 79 upwardly. Connected to the lower end of the passageway 59 is an air pipe 81 which communicates with the compartment 14. The pipe 81 includes the safety valve 82 which may be of any desired type.

A pressure gage 83 is connected to the passageway 59 by means of a pipe 84. Air from a source of supply not shown is admitted through a pipe 85 under the control of a manually operated valve 86 to the opening 71 to the radial opening 70 and thence through the central opening 67 from whence it can gain admission to the underside of the piston 48.

It is desirable to provide a pair of stops 87 and 88 to limit the movements of the valve 66 which is provided with an operating lever 89 which is secured to the valve 66 and rocks between the stops 87 and 88. The end 90 of the lever 89 is disposed between the lugs 42 and 43 of the block 40.

The operation of the device is as follows:

Assuming that it is desired to clean the radiator 25 which is installed in an automobile or removed therefrom as the case may be, it is first necessary to attach the radiator 25 by means of the hose lines 23 and 27 to the device, as shown in Fig. 1. A quantity of cleaning fluid 91 with alkaline or acid solvents, as the case may require, is now placed within the compartment 13 through the filter 19. It will be borne in mind that up to this point there is no air under pressure above that of the atmosphere within the system and that the spring 80 is urging the piston 79 upwardly causing the valve 34 to close thereby confining the liquid within the compartment 13. When the predetermined level is reached, the lug 42 through the float 36 moves the lever arm 89 upwardly permitting air from the pressure pipe 85 to flow in two directions, first through the opening 61 and the ports 50, 49 and 51 into the passageway 59 and also through the openings 71 and 67 and 73 into the cylinder 46 below the piston 48 causing the piston 48 to rise and move the port 49 out of register with the ports 50 and 51 thereby cutting

off the flow of air to the passageway 59. The piston 48 continues to travel upwardly until the stop pin 54 touches the head 55 as shown in Fig. 4.

At this point the port 76 is uncovered permitting air to flow through the by-pass channel 74 and the port 75 to the top side of the piston 79 which is within the lower cylinder 47 causing it to move downwardly and open the valve 34. The liquid 91 within the compartment 13 now flows by gravity through the opening 33 into the compartment 14 filling same.

As the liquid 91 leaves the compartment 13, the float 36 falls causing the position of the valve 66 to be reversed to the position shown in Fig. 8 thereby cutting off the supply of air from the pipe 85. Air is now permitted to exhaust from the underside of the piston 48 to the atmosphere through the opening 59 as shown in Figs. 6 and 8. The piston 48 now descends slowly first covering the port 76 which prevents the exhausting of the air from the top side of the piston 79 holding the valve 34 open and insuring the complete drainage of the liquid 91 to the lower compartment 14. When the piston 48 has descended sufficiently far to cause the port 49 to register with the ports 50 and 51 and the ports 77 and 76 to register with each other, then air escapes from the top side of the piston 79 to the port 75 and by-pass 74 and port 76 to the top side of the piston 48 from whence it escapes through the vent 58 to the atmosphere.

Since the ports 49, 50 and 51 are in register, air can now pass into the passageway 59 and through the pipe 81 into the compartment 14 forcing the material from the lower compartment 14 upwardly through the pipe 29 and hose 27 through the radiator 25, the excess liquid 91 passing upwardly through the hose 23 through the filter 19 into the compartment 13. As the level of the liquid 91 in the compartment 14 lowers below the upper end of the pipe 32, it causes air to mix with the liquid passing upwardly through the pipe 29 causing a bubbling action of the water within the radiator 25 which tends to loosen the particles which are lodged therein.

As the water continues to fall until its level is below the end 31 of the pipe 29, a larger proportion of air passes through the radiator 25 causing a more violent action dislodging more of the foreign matter and carrying it over into the filter 19 from whence it is subsequently removed. By the time a sufficient amount of liquid 91 has been returned to the compartment 13, the float 36 has again risen and carried the block 40 to the position shown in Fig. 7 restoring the parts to the commencement of the cycle of operation.

It can be seen that by this apparatus, a radiator may be automatically cleaned in a most thorough manner and all the sediment therein removed therefrom, action being intermittent and sufficiently violent to remove any form of incrustation or deposit without injury to the radiator itself.

It will be observed that the device consists of three essential parts, namely, the lowermost compartment 14 which is an aerating compartment from which the liquid is delivered to the radiator, a storage compartment 13 in which the cleaning liquid is held at intermittent periods of the cycle and the screening compartment through which all of the liquid passes when returning to the storage compartment.

While we have referred to this device as being a radiator cleaner for automobiles, it is evident that it will be just as useful for cleaning radiators for stationary motors and for coils of various kinds and also for engine blocks themselves.

We are aware that numerous forms of radiator cleaners have been constructed in the past and it is therefore not our intention to cover such devices broadly, but we do intend to cover all such forms and modifications thereof as fall fairly within the appended claims.

We claim:

1. An apparatus of the class described having in combination an elevated storage compartment for cleaning liquid, an aerating compartment below said storage compartment, a valve controlled connection between the two compartments, a float in said storage compartment adapted to actuate said valve controlled connection and pneumatic means also actuated by said float for causing liquid to flow from said lower compart-

ment through a radiator into said upper compartment,

2. An apparatus of the class described having in combination a portable aerating compartment, a storage compartment mounted over said aerating compartment, a float controlled valve for permitting liquid to flow by gravity from said storage compartment to said aerating compartment, pipes for providing communication between the bottom of the aerating compartment and one end of a radiator, and between the storage compartment and the other end of the radiator for returning the liquid from the lower aerating compartment to the upper storage compartment through the radiator, and means for automatically supplying air to the aerating compartment during intervals of time when said float controlled valve is closed for the purpose of returning the liquid from the lower aerating compartment to the upper storage compartment.

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