May 16, 1933. J. CARMIN 1,908,955

APPARATUS FOR DETERGING RADIATORS

Filed March 28, 1931 3 Sheets-Sheet 1

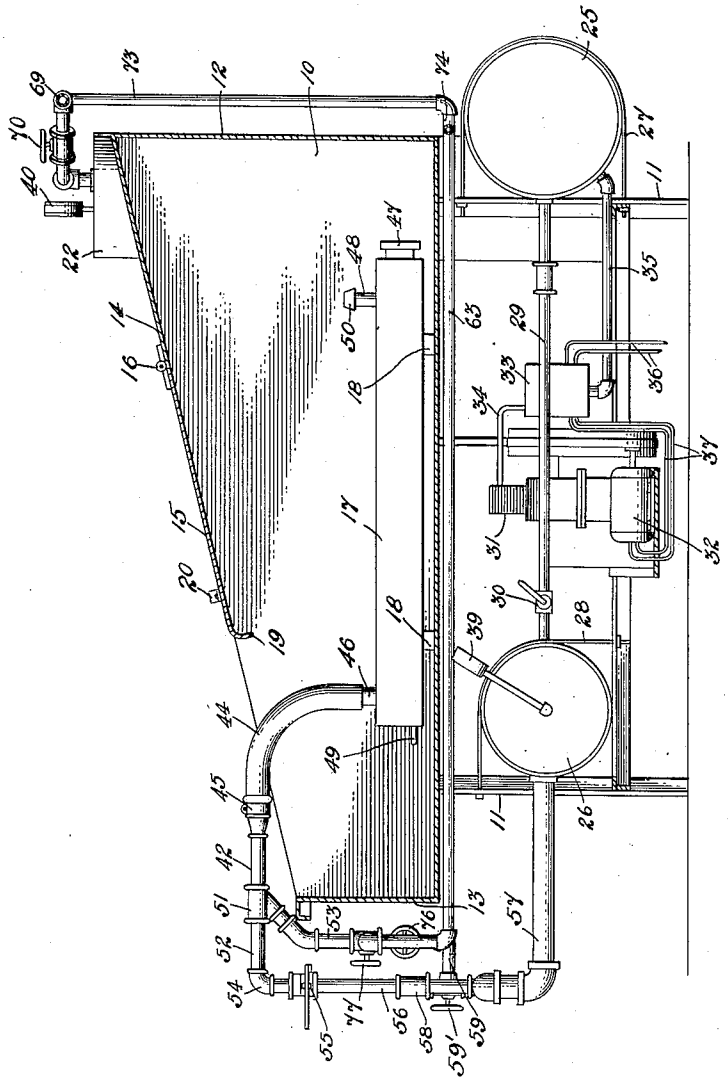


Fig. 1.

WITNESSES:

O. M. Cook

Irma O. Brown

INVENTOR

Joseph Carmin

BY

Joshua R. H. Potts

HIS ATTORNEY

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APPARATUS FOR DETERGING RADIATORS

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Fig-2.

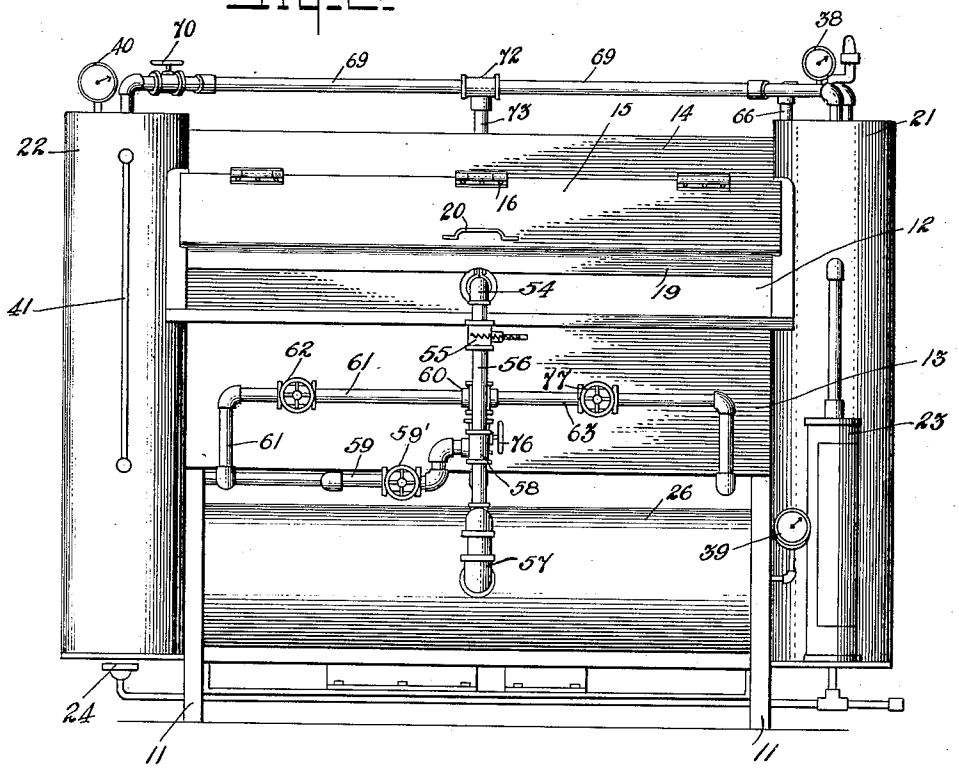
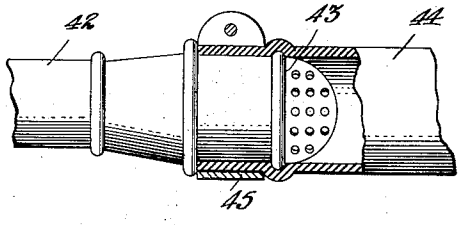


Fig-4.



WITNESSES:

O. H. Cook

Irma O. Brown

INVENTOR

Joseph Carmin

BY

Joshua R. H. Potts

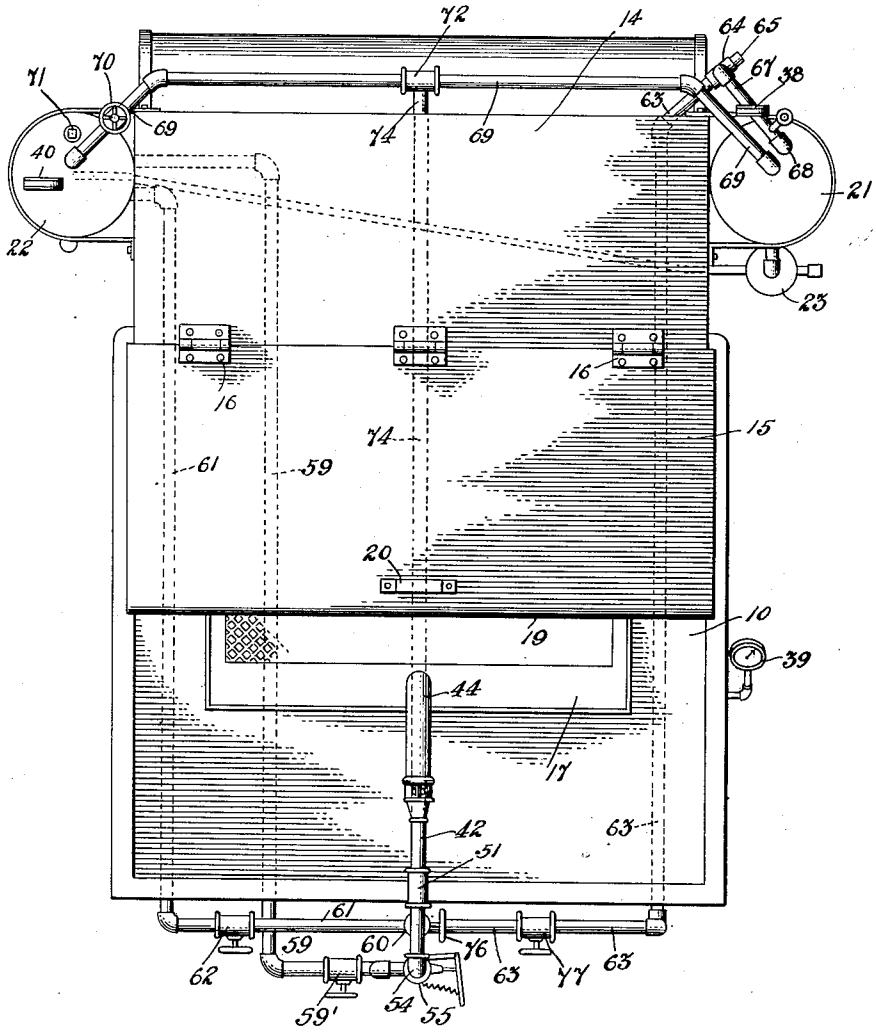
HIS ATTORNEY

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Fig. 3.



WITNESSES:

Irma D. Brown

INVENTOR

Joseph Carmin

BY

Joshua R. H. Potts

HIS ATTORNEY

Patented May 16, 1933

1,908,955

UNITED STATES PATENT OFFICE

JOSEPH CARMIN, OF PHILADELPHIA, PENNSYLVANIA

APPARATUS FOR DETERGING RADIATORS

Application filed March 28, 1931. Serial No. 525,928.

This invention relates to deterging radiators, and is a continuation in part of application, Serial No. 502,956, filed December 17, 1930.

An object of the invention is to provide an improved apparatus for carrying out and carrying forward the art as disclosed in said co-pending application.

A further object of the invention is to provide an apparatus into which a radiator may be inserted, and with approved mechanical means for effectively carrying out the art of deterging and evacuating the radiator of all encumbering material.

To provide complete understanding of the present invention, it may be pointed out that the art as disclosed in said co-pending application comprises introducing into the radiator, first a heating solution which may be merely hot water and steam, evacuating the radiator of this fluid, filling the radiator with a deterging compound, permitting the deterging compound to remain within the radiator for sufficient length of time to loosen the scale and any other extraneous matter therein, introducing substantially as an explosive within said radiator, air under high pressure which will not only evacuate the solution content of the radiator but will likewise blow out all of the loosened scale and extraneous matter, and completed by a rinsing or cleaning with water or the like.

An object of the invention is to provide in a self contained organization, all the necessary elements for carrying out the said method expeditiously and conveniently.

The invention, therefore, comprises a housing or a receptacle, into which a radiator may be inserted in recumbent position, with flexible means for connecting with one of the nipples of the radiator, through which the various fluids will be introduced, with proper receptacles for said fluids, and conduits, and manual controls for the transfer of said fluids from said receptacles to the connection.

The invention is directed to other objects and possesses other features of novelty and advantage, some of which, together with the foregoing, will be hereinafter more fully set forth.

In the drawings:—

Figure 1 is a view of the device in longitudinal vertical section,

Figure 2 is a view of the device in front elevation,

Figure 3 is a view of the device in top plan, and

Figure 4 is a fragmentary detail sectional view of the nozzle.

Like characters of reference indicate corresponding parts throughout the several views.

The present invention comprises a body 10, supported upon the proper legs or frame work 11. The body is preferably made higher at the rear, as indicated at 12, than the front, which is indicated at 13. The body is only partially covered, one section 14 adjacent the higher rear part being preferably stationary, and having a leaf 15 hinged thereto, as by the hinges 16. This part 15 is adapted to be raised to permit the introduction of the radiator, conventionally shown at 17 in Figures 1 and 3, which rests upon cleats 18 in the bottom of the housing. The cover 15 is preferably provided at its downward and its forward edge with a curved flange 19 for the purpose of preventing the splashing of the operator in the use of the device, and a handle 20 is also provided for manipulating the cover 15.

Mounted upon opposite sides of the body 10 are tanks 21 and 22 respectively, the tank 21 being a tank for containing hot water, and for the purpose of heating the water a gas water heater 23 is associated therewith. This gas heater may be of any type and is merely conventionally shown and such showing is no limitation upon the invention.

The tank 22 for holding the deterging solution is also provided with means for heating the solution represented conventionally as the gas burner 24, seen at Figure 2.

Beneath the body 10, tanks 25 and 26 are supported in any approved manner as by the straps 27 and 28. These tanks 25 and 26 are interconnected by a pipe 29 controlled by a cock 30. The tanks 25 and 26 are air tanks

and an air compressor 31 is mounted beneath the body, driven from a motor 32. It has been found from experiment that a considerable volume of compressed air is necessary so that the opening of the air valve will not unduly lower the pressure. One large air tank would, no doubt, serve the purpose, but by reason of the restricted space beneath the housing, such large tank is not feasible, consequently two tanks 25 and 26 have been employed and connected by a pipe. The two tanks operate as a single unit and are employed only on account of the space in which they are placed. A pressure switch installation 33 receives air through the pipe 34, from the compressor and discharges it through the pipe 35 into the tank 25. Lead-in lines 36 form any convenient source of power connecting with the pressure switch 33, and conductors 37 extend from such pressure switch to the motor 32. The water tank 21 is provided with a pressure gauge 38, the air tanks with the pressure gauge 39, the solution tank with the pressure gauge 40, and the latter also provided with a gauge glass 41.

At the forward side of the housing a pipe 42 extends over the top of the side 13 and is provided with a nozzle having a semi-spherical perforated part 43, as shown more particularly at Figure 4. A flexible tubing 44 is secured to the pipe 42 by a clamping member 45 of the usual and ordinary description. The flexible tubing 44 is adapted to make connection with the nipple 46 of the radiator 17.

This nipple 46 is that normally located at the bottom of the radiator. The usual radiator cap 47 and nipple 48 at the normal top of the radiator are shown at Figure 1, as well as the overflow pipe 49. Also at Figure 1, a cap 50 is shown upon the normally upper nipple 48, the utility of which will be hereinafter more fully described in the description of the operation.

The pipe 42 is provided with a fitting 51 connected with the pipe 52 and the pipe 53. The pipe 52, making a turn at the elbow 54, is provided with a gate valve 55 and continues as the pipe 56, connected with the larger pipe 57, which in turn communicates with the air tank 26. A T-fitting 58 is introduced into this pipe 56 and therefrom a pipe 59 extends to the solution tank 22, a valve 59′ being provided for manual control of air from the pipe 57 to the solution tank 22. for the purpose of producing the necessary pressure within said tank.

The pipe 53 is provided with a cross coupling 60. From one leg of the cross coupling 60, the pipe 61 extends beneath the body 10 to the solution tank 22, and a manual valve 62 controls the flow of fluid from the solution tank to the pipe 53.

From the opposite side of the cross coupling 60, the pipe 63 extends to the coupling 64 (see Fig. 3) which is connected with a source of water supply under pressure, indicated by the broken pipe 65. The pipe 66 extends upwardly from this connection and through the pipe 67 and coupling 68 into the top of the tank 21 in the usual manner of introducing cold water into heating tanks.

Also, from the top of the tank, the pipe 69 leads to the solution tank 22 with a manual valve 70 for controlling the flow of the hot water from said tank 21, across to the solution tank 22 for the purpose of making the proper solution, chemicals for which are introduced into the tank through the closure 71. Intermediate the ends, the pipe 69 is provided with a T-fitting 72 from which a pipe 73 extends downwardly connecting with the pipe 74, extending under the body 10, which in turn through the pipe 75 connects with the cross coupling 60. A manual valve 76 is introduced into this pipe 75 for controlling the flow of the hot water through the pipes 73, 74 and 75 to the pipe 53, a similar manual valve 77 being introduced into the cold water pipe 63.

The method carried out by this apparatus is the same as that described in said copending application, Serial No. 502,956, but for the purpose of a more clear understanding of the structure will be again referred to. A deterging material being introduced into the tank 22, preheated water from the tank 21 is admitted to said tank 22 by the manipulation of the valve 70 until a complete detergent solution fills said tank to the required height, indicated by the glass 41. Air under pressure is now admitted to said tank through the pipe 59, from the tank 26 which is in communication with the tank 25, the pressure being maintained therein by the compressor 31.

The radiator now being supported upon the cleats 18, as shown at Figure 1, the flexible tubing 44 is connected with the normally lower nipple 46. Hot water from the tank 21 is admitted through the pipes 73, 74 and 75 to the pipe 53, and through the pipe 42 to said flexible tubing 44. The radiator is filled with this hot water until it overflows through the overflow pipe 49, which indicates filling. During this time, the radiator cap 47 and the auxiliary cap 50 are in position, as shown at Figure 1. When the radiator has been sufficiently heated, the cap 50 is removed and the contained water blown out by the compressed air from the tank 26, through the pipes 51, 56, 52 and the flexible pipe 44 by the manipulation of the gate valve 55.

While still hot, heated solution from the tank 22 is admitted to the radiator through the pipe 61, the pipe 53 and 42 and flexible pipe 44. Again the radiator is filled, such filling being indicated by overflow as before. This solution is allowed to stand for such period of time as experience may dictate until the scale or other extraneous matter has

been loosened from the walls of the radiator. When this time has elapsed, the radiator cap 47 is removed and the gate valve 55 suddenly opened. Air under high pressure from the tank 26 thus enters the radiator almost in the form of an explosion and this impact dislodges and blows out all of the scale previously adhering to the walls of the radiator. The radiator may now be washed out by admitting cold water through the pipe 63 and associated parts.

From an examination of Figure 4, it will be seen that a particular type of nozzle is provided for the purpose outlined. The outer row of perforations is normally covered by the flexible tubing 44 as shown, so that when water or solution is introduced into the radiator, or when air is admitted merely for the purpose of blowing out the initial water, only a part of perforations are employed. When, however, the gate valve 55 is open wide to admit the full pressure of the air, this pressure expands the flexible pipe 44 at the position where it is covered so that the steam and hot water remaining therein and air admitted are intermixed and broken up by the perforations, and enter the radiator in the explosive form outline.

Of course, the apparatus for deterging radiators, herein illustrated, may be modified in various ways without departing from the invention herein set forth and hereinafter claimed.

The invention is hereby claimed as follows:—

1. An apparatus for deterging radiators, comprising a housing, an inlet conduit associated with the housing, a flexible tubing carried by the inlet conduit adapted to extend within the housing for connection to a radiator therein, a reservoir, means to heat water within the reservoir, valved means forming communication between said reservoir and the conduit, a second reservoir, means to heat a detergent solution within said reservoir, a valved passage from said last mentioned reservoir to said conduit, an air reservoir, means connecting the air reservoir with said conduit, and manual means for controlling the passage of air from the reservoir to the conduit.

2. An apparatus for deterging a radiator, comprising a housing having a cover over a part thereof, means for supporting a radiator therein, a reservoir for water, means for heating water within said reservoir, a pipe extending from said water reservoir to said housing, means for controlling the passage of water through said pipe; a flexible tubular connection extending from said pipe for connection with the radiator in said housing, a second reservoir for heating a detergent solution, a pipe from said second reservoir communicating with the first mentioned pipe, a valve for controlling said last mentioned pipe, an air reservoir, a pipe from said air reservoir communicating with said first mentioned pipe, and manual control means for controlling the passage of air through said last mentioned pipe.

3. An apparatus for deterging a radiator, comprising a housing, a support within the housing for a radiator, a flexible tubing introduced into the housing adapted to be connected with the nipple of a radiator, an air tank, means to compress air in said tank, a water tank, means to heat water in said tank, a solution tank, means to buid up a pressure in said solution tank, and valve controlled conduits from said several tanks to said flexible tubing.

4. An apparatus for deterging a radiator, comprising a housing, means within the housing to support a radiator, a pipe extending over said housing, a perforated nozzle carried by said pipe, a flexible tubular connection carried by said nozzle and normally covering some of said perforations, a water tank connected with said housing, means to heat water within said tank, a solution tank connected with said housing, means to build up pressure within said solution tank, an air tank connected with said housing, means to compress air in said air tank, conduits from said water tank and said solution tank to said nozzle, manually controlled valves for said conduits, a conduit from said air tank to said nozzle, and a manually controlled gate valve in said last mentioned conduit.

5. An organized apparatus for deterging radiators, comprising a housing, means to support the housing, an air tank, means to maintain air under pressure within said tank, a water tank carried by said supporting structure, a heater carried by said supporting structure adapted to heat water in said tank, a solution tank carried by said supporting structure, means to heat solution in said tank, a conduit from said air tank to said solution tank, means to manually control the passage of air under pressure through said conduit, a nozzle extending over said housing and provided with perforations, an elastic tubular connection carried by said nozzle and normally closing a part of said perforations, a conduit leading from said solution tank to said nozzle, manual means for controlling the passage of solution through said conduit, a conduit leading from the water tank to said nozzle, manual means for controlling the passage of water through said conduit, a conduit from the air tank to said nozzle, and a manually controlled gate valve in said air conduit.

6. An apparatus for deterging radiators comprising a housing having a substantially horizontal bottom and sides having inclined top edges, a cover for the top corresponding to said inclined edges, a part of said cover being stationary and a part manually opera-

ble, said cover covering only a part of the top of said housing, a flexible tubular connection introduced into said housing through said uncovered part for connection to a radiator therein, and means to selectively introduce hot water, cold water, detergent solution and air under pressure singly and collectively through said flexible connection.

In testimony whereof, I have signed my name to this specification.

JOSEPH CARMIN.