Dec. 16, 1952 A. W. BASSETT 2,622,046

PROCESS FOR CLEANING AUTOMOBILE RADIATORS

Filed June 5, 1948 2 SHEETS—SHEET 1

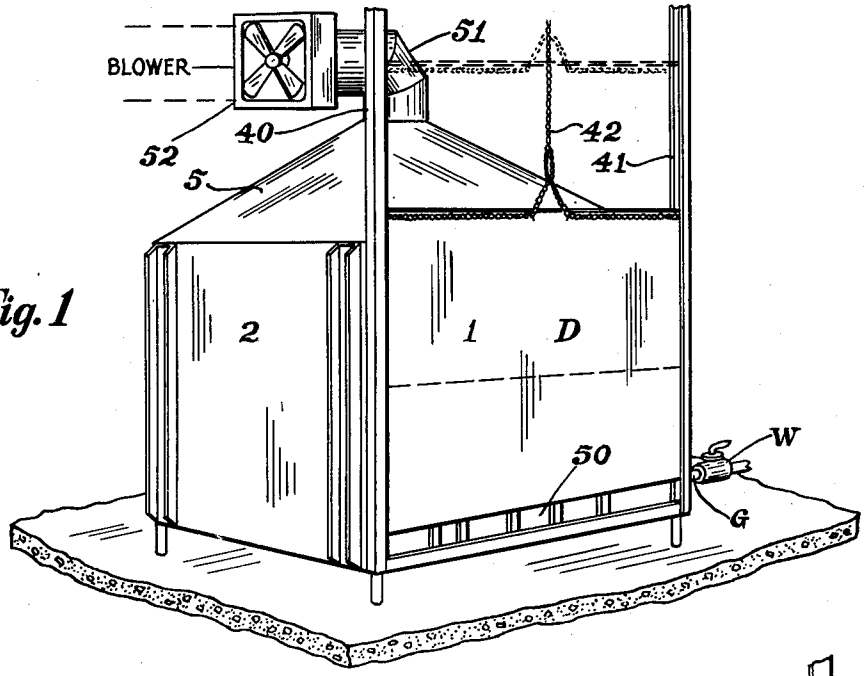


Fig. 1

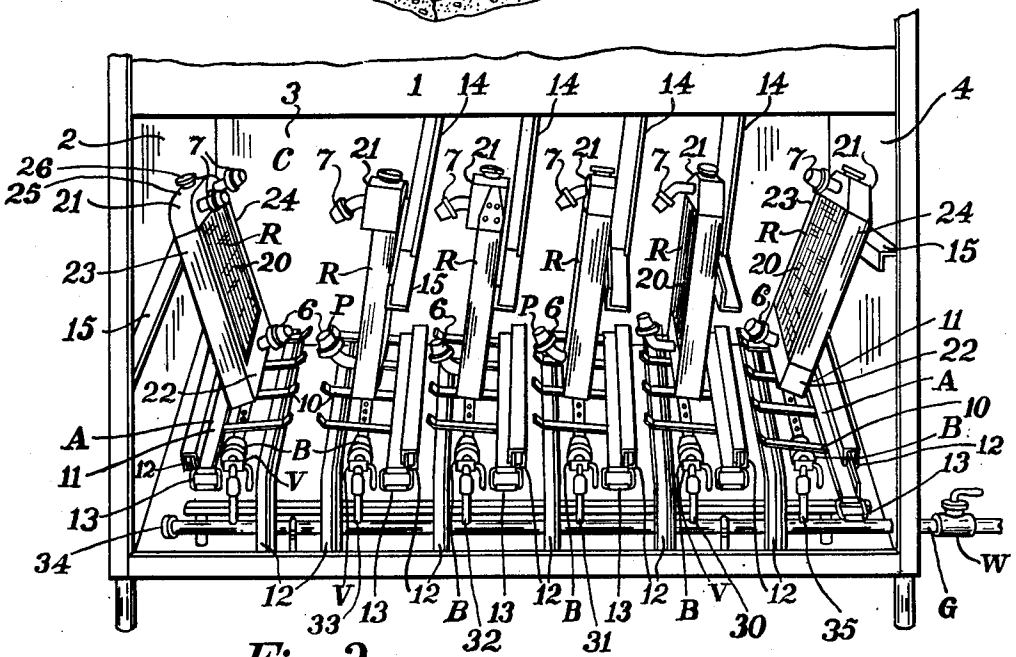


Fig. 2

INVENTOR.
Arthur W. Bassett
BY
Pearson & Pearson
attorneys.

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Fig. 3

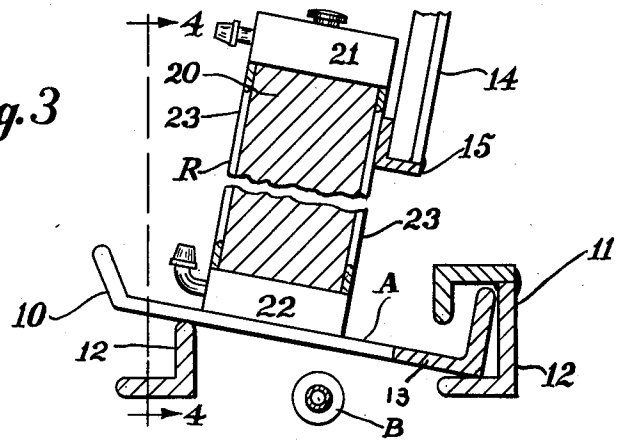


Fig. 4

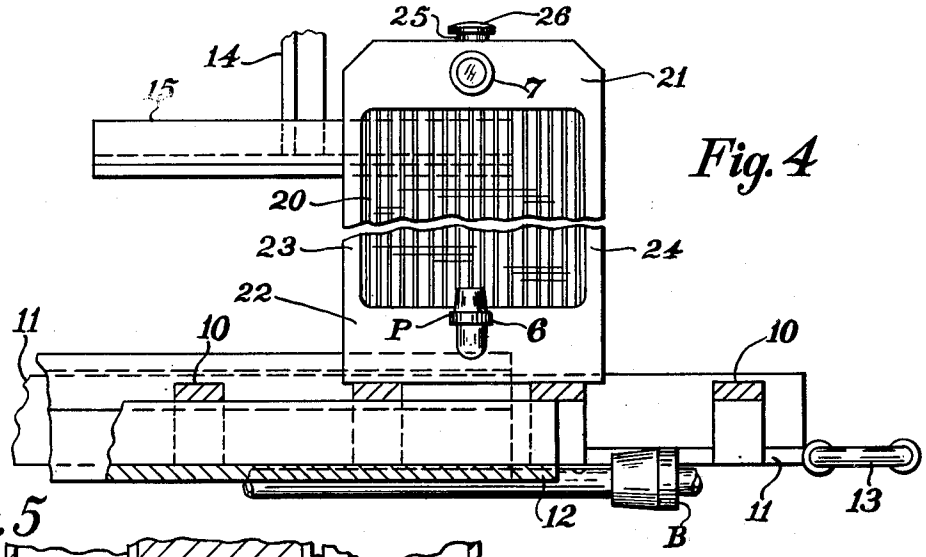
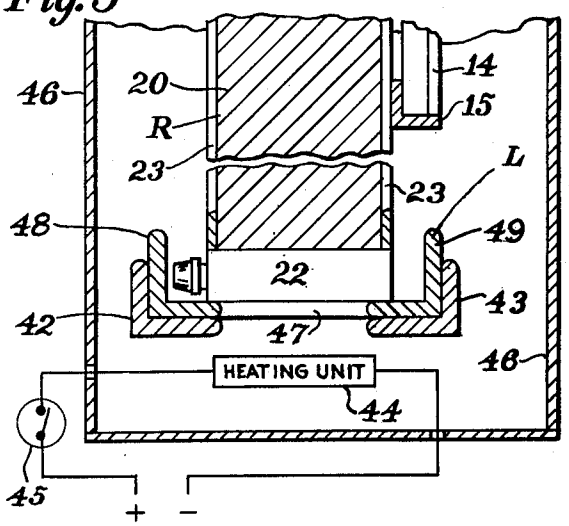


Fig. 5



INVENTOR.
Arthur W. Bassett
BY
Pearson & Pearson
attorneys

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PROCESS FOR CLEANING AUTOMOBILE RADIATORS

Arthur W. Bassett, Lawrence, Mass.

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5 Claims. (Cl. 134—3)

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This invention relates to the cleaning of automobile radiators or more correctly to removing the accumulations of sediment in the water passages through the core of a radiator.

At present automobile radiators comprise a frame made up of a top tank with a duct for a pump hose and a bottom tank with a duct for a pump hose, each duct being in a passage from a water pump which circulates water around the engine and other parts and through the core. The core which is held in the frame may be of a honey-comb or tubular type. Every such core has horizontal air passages through which air is drawn by the automobile fan and vertical passages which pass the air inlets from bottom to top between the tanks, the walls of these water passages being very close together. On account of sediment in the water, chemical actions and for other reasons, a hard sediment is formed in these water passages and when they become choked or partially plugged, the radiator heats up in a well known manner.

In order to clear these water passages of such accumulations of sediment, it is customary to force water, either cold or hot, through the radiator and its tubes in the opposite direction from its usual passage from the water pump but the trouble with this system is that obstructions in any of the passages tend to divert the water to and through the clean passages so that the ones which need cleaning most are not affected. Another system is to use a thin flat piece of metal to push down through such passages after the core is removed from its frame.

It has also been proposed to use oxalic acid or some other chemical with the idea of softening and detaching the sediment and it has been proposed to force a hot solution of oxalic acid crystals in water through the water passages alternately with air, but I have found that this is not satisfactory as merely warm oxalic acid will not loosen or dissolve the sediment.

There is ordinarily no connection between the top tank and the bottom tank except through the water passages just described and I have found that by plugging up the hose duct from the bottom tank and introducing a solution of oxalic acid into the radiator, usually through the hose duct of the top tank and then bringing the liquid to a boil and keeping it boiling for some half an hour to an hour, the boiling oxalic acid will be so agitated by the boiling process and steam pressure that it will penetrate every part of the water passages and it is much more effective in dissolving or disintegrating the accumulated deposit than merely hot acid. After boiling and continued simmering, I drain off the oxalic acid and then flush the radiator by forcing hot or cold water through it.

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For carrying out my process, it is not necessary to separate the core from the frame but the core in the frame is placed in a suitable stand and heat is applied at the bottom of the bottom tank to boil the contents of the radiator.

As a practical matter, I find it desirable to have a machine in which there are one or more stalls, each having tracks and carriers for perhaps half a dozen radiators, each so arranged that a radiator can be placed on a carrier which is slidable on tracks and has been pulled out to allow a radiator to be placed on it and then pushed back into a position where it will be held substantially upright.

There is also a top guide for the radiator parallel with the tracks. Under each set of tracks for each stand and therefore under each radiator, I preferably provide a heating element which, as shown in Figs. 1 and 2, is gas. I may however use some other source of heat such as oil or some form of electric heat.

I enclose the whole structure in a gas proof chamber to keep in the fumes but having a wide door to allow the carriers to be pulled out for loading and unloading and to allow inspection of the process as it goes on and each chamber preferably has a hood and vent to carry off the objectionable gases, if any, and the steam.

By my process, the radiator with its frame is removed, the lower duct is plugged, the radiator is filled with the liquid, and held in a vertical position while heat is applied to the lower tank.

Fig. 1 is a perspective view of my new device with the door partially raised.

Fig. 2 is a perspective front elevation, illustrating the positions of the radiators in my gas proof chamber.

Fig. 3 is an enlarged fragmentary transverse sectional view, showing my preferred form of carrier and track.

Fig. 4 is a fragmentary side elevation of the device shown in Fig. 3 and

Fig. 5 is a view similar to Fig. 3 of a modified form of carrier and track.

In the drawings each radiator is represented by R and each is formed in the usual way with a core **20** which is made in the usual way with horizontal air passages running from front to back between which are thin liquid passages which extend between them from top to bottom.

The core is held in a frame which is provided

with the usual top tank 21 and bottom tank 22 together with sides 23 and 24.

As shown, there are one or more ducts 7 in the form of a nipple extending out from the top tank 21 and another one or some times two, indicated by 6 extending out from the bottom tank 22. These ducts are for connection to the pump hose which in turn connects with the usual water pump and other parts to be cooled such as the cylinders.

P is a plug of any suitable material with which the duct 6 extending from the bottom tank is plugged up after the radiator with its frame is removed from the automobile.

The construction shown in the drawings includes the chamber C which has a front 1, back 3 and sides 2 and 4, together with a top 5 which is in the form of a hood leading to any suitable vent and operating either by gravity or by means of a fan although a fan is usually not necessary.

The front 1 is provided with a door D which preferably is of the vertically slidable type running in guides or tracks 40 and 41 and controlled by a rope 42 and suitable pulleys.

As shown in Fig. 1, a space is left at the bottom to allow air to enter to feed the gas flames of the gas burners such as B.

If gas or any other fuel which requires air is used, there should be an air inlet 50 at the bottom but in any event, to take care of the steam and other vapors, there should be a vent pipe 51 and a blower such as 52.

As shown, the chamber C is divided into what I will call six stalls extending from front to back, each to accommodate one radiator or in some cases two radiators. Each radiator R can be moved on and with a carrier A, each of which carrier moves on tracks 12, 12, each carrier being formed with a backbone 11 from which hooks, 10, 10 project, there being a handle 13 at the front end of backbone 11, the parts being so arranged that the radiator can rest upon the hooks 10, 10, and also against a horizontal top guide member such as 15 which I will call a radiator top guide. At the two ends those radiator top guides are attached to the ends 2 and 4 but for the intermediate sections, there is a downwardly projecting arm such as 14 which carries a guide 15, in all cases in such a position that the radiator will tip some to the right or left to rest against a guide such as 15.

Under and between each set of tracks 12, 12 and carrier A is a burner B shown as being of the gas type and fed from a gas piping system G including such pipes as 30, 31, 32, 33 each with a control valve V.

The drawings show a chamber with six stalls but it might be made larger or smaller to accommodate more or less stalls, even down to one, the arrangement being for the radiator to rest on the hooks 10, 10, of a carrier such as A so that it can be pulled in and out with carrier, its top resting against a top guide such as 15.

With a gas construction shown in Figs. 1, 2 and 3, it is desirable that the end pipes 34 and 35 which connect the main gas pipe G with the respective burners B, B should be rather larger than the others so that when extra large radiators are to be boiled out together with smaller ones, there can be more heat delivered to the burners of those end stalls.

There is a valve V for each of these burners and a main control valve W to shut off the gas entirely. By means of the various valves V, V, the amount of heat applied can be increased or decreased as desired.

A modified type of my device is shown in Fig. 5, where 46 indicates a chamber for a single radiator R. In this chamber is one track or set of tracks which consists of angle irons 42 and 43 supported in any suitable way, not shown. A carrier L formed of angle irons 48 and 49 connected by fingers 47 on which a radiator R can rest and be pulled in and out is slightly different from carrier A.

As shown, this chamber 46 may be provided with an electric heating device indicated by 44 energized by any suitable source of electric current and controlled by a switch 45 or some type of rheostat.

25 represents the usual radiator filling inlet with cap 26 which preferably should be removed after filling.

I claim:

1. The process of cleaning the water passages in the core of a radiator for automobiles which radiator is formed with a frame including a top tank with a duct for a pump hose, a bottom tank with a duct for a pump hose and side members between the tanks, a core between the tanks having air passages and a plurality of thin liquid passages which extend between the air passages and the top and bottom tanks; which process consists of removing the radiator and frame from the automobile; for closing the bottom duct; of holding the radiator in a vertical position; of introducing a sediment loosening liquid into the liquid passages; boiling the liquid in the bottom tank until the steam passes up through the liquid passages and loosens the sediment in them; of draining off the liquid; and rinsing the passages by flushing with water under pressure.

2. The process of cleaning the inside of an automobile radiator which is formed with a core of air cells with a plurality of thin liquid passages between them, a frame including top and bottom tanks communicating with such liquid passages each having a pump hose duct to the outside for connection with a pump; which consists of removing the radiator and frame from the autoobile; of closing the bottom duct; of holding the radiator in a vertical position; of introducing a liquid solvent into the radiator; of boiling the solvent in the bottom tank until the steam passes up through the liquid passages and loosens the sediment in them; and of then draining and rinsing the radiator.

3. The process of cleaning from deposits, the water passages in the core of an automobile radiator, which radiator is formed with a frame including a top tank with a duct for a pump hose, a bottom tank with a duct for a pump hose and side members between the tanks, a core between the tanks having air passages and a plurality of thin liquid passages which extend between the air passages and the top and bottom tanks; which process consists of closing the bottom duct; introducing a solution of oxalic acid into the liquid passages; of placing it in a device, which device consists of means to boil the oxalic acid solution in the bottom tank and means to support the radiator upright proximate to and above such boiling means; of boiling the liquid in the bottom tank until the steam passes up through the liquid passages and until the deposit is loosened or dissolved; of draining off the liquid and deposit; and rinsing the passages by flushing with water under pressure.

4. The process of cleaning the inside of an au-

tomobile radiator which is formed with a core of air cells with a plurality of thin liquid passages between them, a frame including top and bottom tanks communicating with such liquid passages each having a pump hose duct to the outside for connection with a pump; which consists of removing the radiator and frame from the automobile; of closing the bottom duct; of holding the radiator in a vertical position with the bottom tank at the bottom; of introducing a solution of oxalic acid into the liquid passages; of boiling the solution of oxalic acid in the bottom tank until the deposit is loosened or dissolved; of draining off the liquid and deposit; and of rinsing the passages by flushing with water under pressure.

5. The process of cleaning the inside of an automobile radiator which is formed with a brass core of air cells with a plurality of thin vertical liquid passages between them, a frame including top and bottom tanks communicating with such liquid passages each tank having a pump hose duct to the outside for connection with a pump; which consists of removing the radiator and frame from the automobile; of closing the bottom duct; of holding the radiator in a vertical position with the bottom tank at the bottom; of introducing a solution of oxalic acid into the liquid passages; of boiling the solution of oxalic acid in the bottom tank until the deposit is loosened or dissolved; of draining off the liquid and deposit; and of rinsing the passages by flushing with water under pressure.

ARTHUR W. BASSETT.

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