Nov. 4, 1924. 1,514,463

G. ROSSI

SECTIONAL RADIATOR FOR AUTOMOBILES

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Fig. 1.

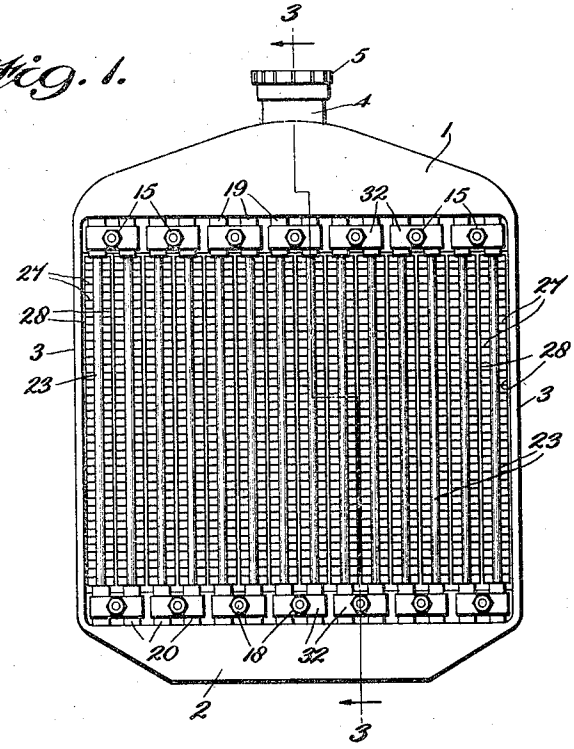
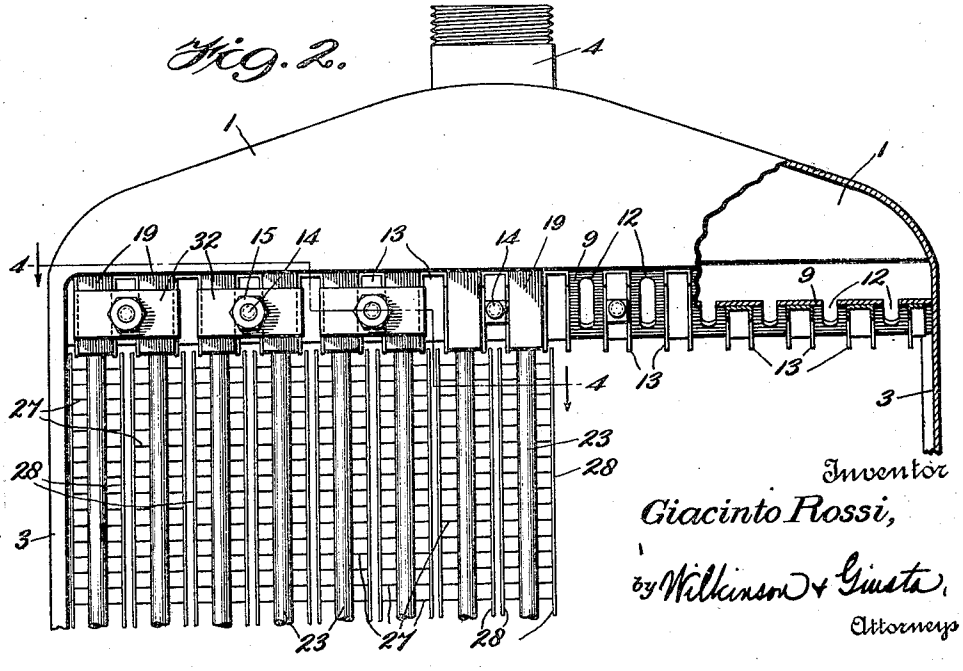


Fig. 2.



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Fig. 3.

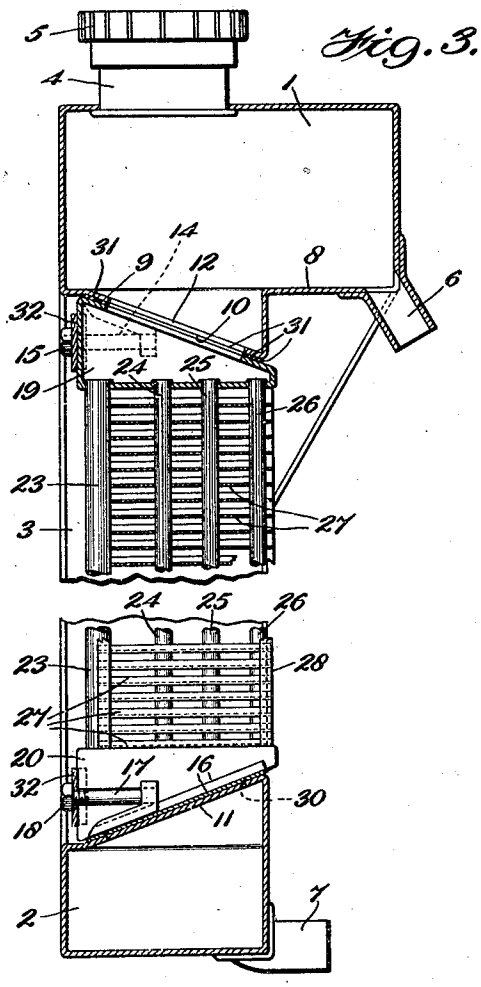


Fig. 5.

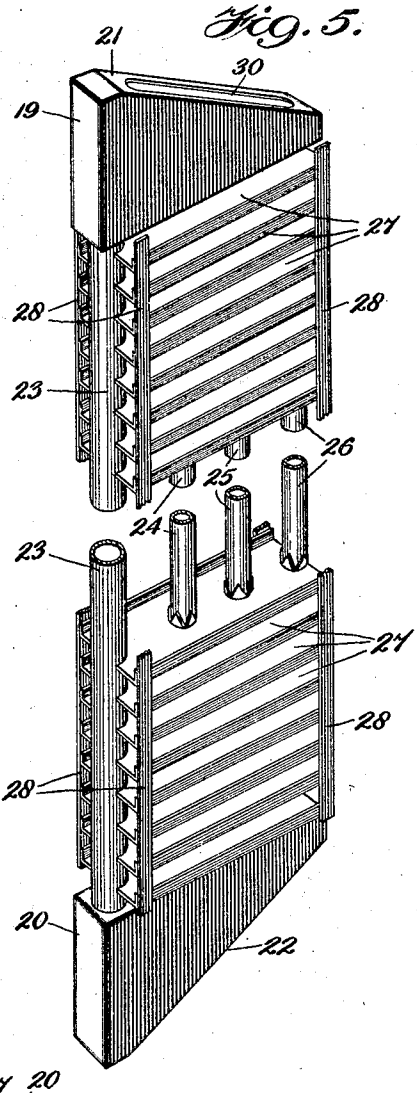
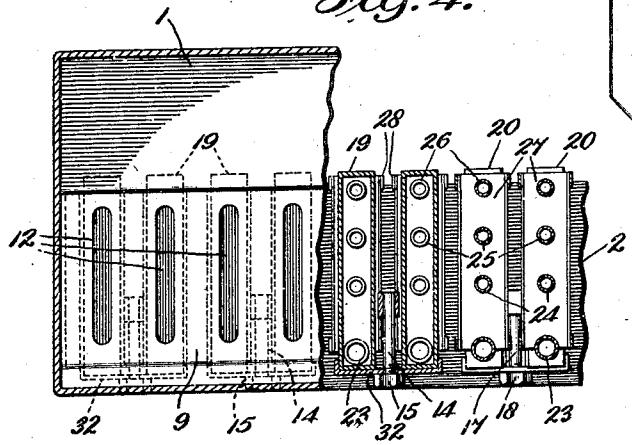


Fig. 4.



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UNITED STATES PATENT OFFICE.

GIACINTO ROSSI, OF PHILADELPHIA, PENNSYLVANIA.

SECTIONAL RADIATOR FOR AUTOMOBILES.

Application filed March 21, 1922. Serial No. 545,472.

To all whom it may concern:

Be it known that I, GIACINTO ROSSI, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sectional Radiators for Automobiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in automobile radiators and more particularly to that type of radiator in which there is provided a plurality of removable sections connecting the usual top and bottom tanks to the end that the said sections may be readily replaced in case of damage. The invention has for its objects to provide a radiator of this character which will be simple in construction, comparatively inexpensive to manufacture and more efficient in action than those which have been heretofore proposed, as well as to provide a device of this character in which the radiating sections may be accurately and readily inserted. The invention also contemplates the improvement of the construction of the individual sections to the end that their cost of manufacture may be reduced and their efficiency greatly increased over that of certain of the prior devices.

With these and other objects in view, the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the appended claims.

Referring to the accompanying drawings forming a part of this specification, in which like numerals designate like parts in all the views:—

Figure 1 is a front elevational view of a radiator constructed in accordance with the present invention;

Fig. 2 is an enlarged front elevational view, partly in section and with a portion of the removable sections omitted therefrom;

Fig. 3 is an enlarged vertical sectional view taken approximately on the line 3—3 of Fig. 1 looking in the direction of the arrows;

Fig. 4 is a fragmentary horizontal sectional view taken on the line 4—4 of Fig. 2, looking down; and

Fig. 5 is a diagrammatic perspective view, partly broken away, of one of the removable radiating sections.

Referring to the drawings, 1 indicates the usual upper tank or receptacle of an automobile radiator; and 2 the lower tank thereof, which tanks may be suitably connected together by the side frame members 3. The said upper tank may be provided with the usual filling opening 4 closed by the cap 5. The said tank is also provided with the usual water inlet 6, as will be clear from Fig. 3, while the lower tank 2 is likewise provided with the water outlet 7.

The bottom wall 8 of the upper tank 1 is depressed as at 9 to form an inclined surface 10, while the top wall 11 of the lower tank 2 is correspondingly inclined, all as will be clear from Fig. 3. The said walls 9 and 11 are provided with a plurality of elongated openings 12 which are adapted to register with corresponding openings provided in the removable sections, all as will be more fully disclosed below. The said bottom wall 9 of the upper tank 1 has rigidly secured to it, in any suitable manner, a plurality of spaced guiding members 13, which may take the form of short channel irons, see Figs. 2 and 3, and suitably secured to alternate spacing members 13 are the studs 14 threaded on their outer ends to receive the nuts 15 which are provided for the purpose of holding the removable sections in place as will likewise appear more fully below. In like manner the inclined top wall 11 of the bottom tank 2 is provided with the channel iron spacing members 16, to every other one of which is secured a stud 17 adapted to receive a nut 18 for holding the lower ends of the removable radiator sections.

Said removable sections in the present invention comprise a pair of water receiving chambers or enclosures 19 and 20 preferably constructed of thin sheet metal and provided with the enclosed surfaces 21 and 22 respectively, adapted to contact and register with the inclined walls 9 and 11 of the top and bottom tanks respectively. Connecting the said upper and lower chambers 19 and

20 are a plurality of tubes or pipes 23, 24, 25 and 26, which enter the said chambers 19 and 20 and the joints of which are made water tight in any suitable manner as by soldering, brazing, etc. Surrounding the said tubes or pipes 23, 24, 25 and 26 are a plurality of heat radiating plates or fins 27 which may likewise be secured to the said tubes in any suitable manner and which are supported, at their corners, by the vertical reinforcing and bracing members 28, to which they are soldered or brazed.

The inclined surfaces 21 and 22 of the chambers 19 and 20 are provided with elongated openings 30 adapted to register with the openings 12 which are provided in the inclined surfaces 9 and 11 of the tanks 1 and 2 whereby water from the tank 1 may be admitted into the chamber 19, whereupon it will find its way through the tubes 23, 24, 25 and 26 to the lower chamber 20 from whence it will pass through the registering openings 30 and 12 into the lower tank 2 in the usual manner. As above stated the fins or plates 27 may be secured to the tubes 23, 24, 25 and 26 by soldering, brazing or welding or they may be supported by the said tubes by merely pushing the latter through the said fins, as is illustrated in Fig. 5.

The operation of the improved radiator will be clear from the foregoing, but it may be briefly summarized as follows: The water circulating system being filled through the usual filling opening 4 in the well known manner, the tanks 1 and 2 and chambers 19 and 20 and the tubes 23, 24, 25 and 26 of the radiator, as well as the water jacket and the connecting piping of the water circulating system will be completely filled. Upon the operation of the automobile engine, the temperature of the water will of course be raised and if the thermo-siphon system is employed, or if the force pump system is employed, a circulation of the water will be set up throughout the entire cooling system. This will cause the heated water to enter the upper tank 1 through the water inlet 6 and from the said tank 1 it will find its way through the registering openings 12 and 30 into the upper chambers 19 of the removable radiating sections; whereupon it will pass down through the various tubes 23, 24, 25 and 26 of the said sections which are in direct contact with the flowing air which passes through the radiator in the well known manner. A portion of the heat in the said water will be transferred to the walls of the said tubes and also to the thin metal fins or plates 27 which are in contact therewith and from these metal surfaces it will be absorbed by the flowing air in the usual manner. The cooled water will leave the lower ends of the tubes entering the chambers 20 from whence it will pass through the registering openings 12 and 30 into the lower tank 2 and through the outlet 7 back to the water jacket to the engine.

As above stated it is an important feature of this invention that the radiating sections be made readily removable from the radiator core so that in the event one or more of them should spring a leak or should be so damaged by a collision or other cause, as to be inoperative, the said section or sections may be quickly and efficiently removed and replaced thus doing away with the necessity of taking the radiator to a repair shop to have it resoldered or replaced. This result is attained by the peculiar construction of the radiating sections whereby each set of tubes 23, 24, 25 and 26, together with their chambers 19 and 20 and their radiating fins 27, are an independent unit. These said units, as will be readily apparent, are placed within the core between the upper and lower tanks 1 and 2 with their inclined surfaces 21 and 22 engaging the correspondingly inclined surfaces 9 and 11, of the said tanks and with their openings 30 registering with the openings 12 in the said surfaces 9 and 11. Suitable rubber, leather or other washers 31 may be interposed between the metal surfaces to provide water tight joints and the said sections may be securely held in place by means of the retaining members or clips 32 which surround each of the studs 14 and 17 and which are held in place by the nuts 15 and 18, as will be readily apparent.

The provision of the inclined walls, 9 and 11, in the tanks, 1 and 2, having the openings 12 therein, and the provision of the inclined surfaces 21 and 22 of the chambers, 19 and 20, having the openings, 30 and 31, therein, adapted to register with the first mentioned openings 12, constitute an important feature of this invention, since by this construction substantially vertical water passages are provided which offer a minimum amount of resistance to the flow of cooling water therethrough. At the same time the provision of the registering openings in these inclined walls facilitates the securing of liquid tight joints between the relatively stationary and the removable members of the radiator, since, as will be readily understood, when a section is put in place with the perforated washer members 31 between the inclined metal surfaces and the nuts, 15 and 18 tightened upon their bolts, 14 and 17 respectively, a wedging action is secured, which makes possible an absolutely liquid tight joint between the tanks 1 and 2 and the removable radiator sections.

As will be readily understood by those skilled in the art, it is highly desirable and more or less difficult to prevent leaks in

motor vehicle radiators, and the present construction greatly facilitates the securing of liquid tight joints at these points.

Furthermore, the provision of the inclined surfaces above mentioned, relieves against the necessity of absolute accuracy in the radiator constructions, as regards the spacing between the top and bottom tanks, 1 and 2, since any small variations in the distance between the said tanks will be automatically taken care of by these said inclined surfaces, and since the water passages are provided through these said surfaces, the liquid tight joints above mentioned as being desirable, will still be obtained.

It will thus be seen that should one or more of the said removable sections become damaged in any way it is a comparatively simple matter to remove the nuts 15 and 18 which hold that particular section in its operative relation and then to remove the said section whereupon a new section may be substituted and the retaining members 32 and the nuts 15 and 18 replaced. It is obvious that such a construction will greatly facilitate radiator repairs, especially where the leak or other damage occurs at a distance from a radiator repair shop or garage.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangement of the parts without departing from the spirit of the invention and therefore I do not wish to be limited to the above disclosure except as may be required by the claims.

What I claim is:

1. In a radiator construction the combination with a pair of spaced receptacles each of which is provided with an inclined surface having openings therein, of a plurality of readily removable connections having inclined surfaces provided with openings adapted to register with said first mentioned openings; guiding means carried by said surfaces adapted to assist in causing the registration of said openings; and adjustable means for holding said connections in position between said receptacles with their openings in register with the openings in said receptacles.

2. In a radiator construction the combination with a pair of spaced liquid receiving tanks each provided with an inclined surface having a plurality of openings therein, of a plurality of readily removable connections between said tanks, said connections each comprising a pair of chambers having inclined surfaces adapted to engage said tank surfaces and openings adapted to register with said tank openings, and a plurality of tubular water passages provided with heat radiating fins, between said chambers; guiding channel members rigid with said tank surfaces adapted to assist in the registering of said openings; and means comprising studs rigid with said tank surfaces, and nuts for engaging said studs, adapted to removably hold said connections in place between said tanks.

GIACINTO ROSSI.