J. CONLON.

RADIATOR FOR AUTOMOBILE COOLING SYSTEMS.

APPLICATION FILED OCT. 21, 1919.

1,398,176. Patented Nov. 22, 1921.

Fig. 1.

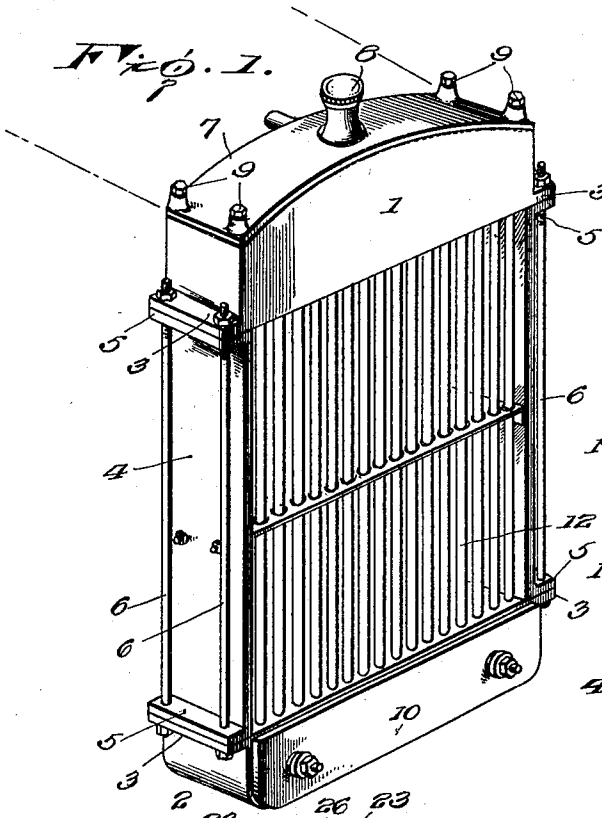


Fig. 2.

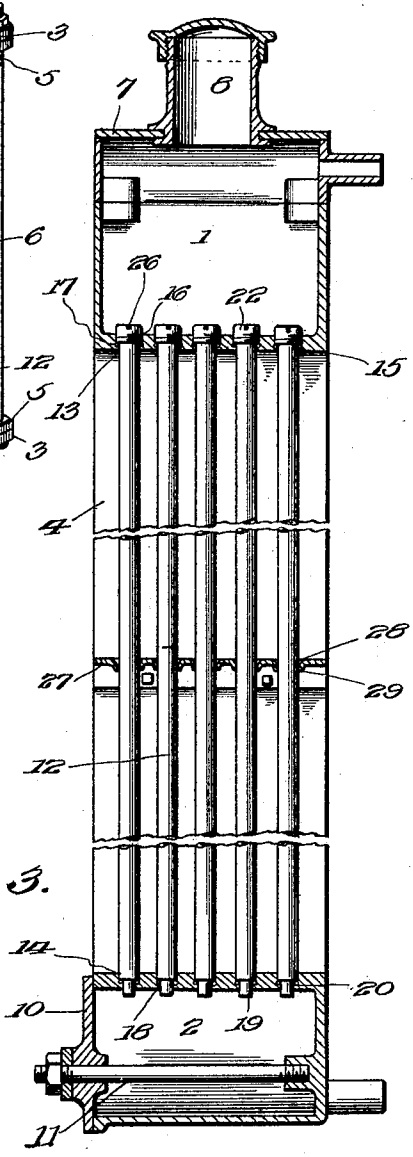
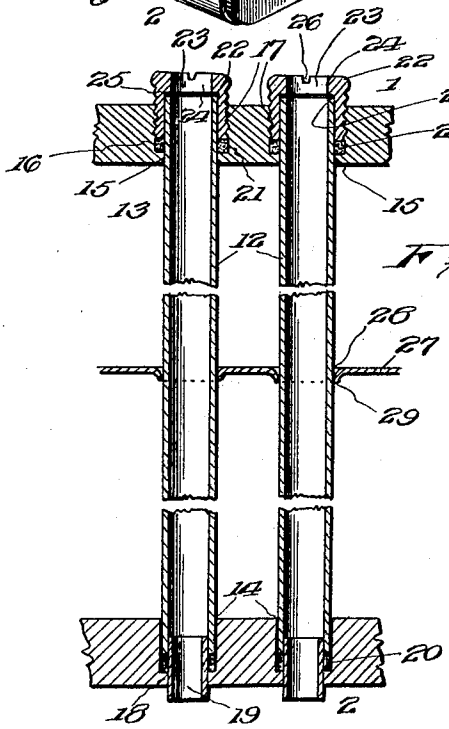


Fig. 3.



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UNITED STATES PATENT OFFICE.

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RADIATOR FOR AUTOMOBILE COOLING SYSTEMS.

1,398,176. Specification of Letters Patent. Patented Nov. 22, 1921.

Application filed October 21, 1919. Serial No. 332,335.

To all whom it may concern:

Be it known that JOHN CONLON, a citizen of the United States, residing at Plattsburg, in the county of Clinton and State of New York, has invented certain new and useful Improvements in Radiators for Automobile Cooling Systems, of which the following is a specification.

This invention relates to an improvement in radiators for automobile cooling systems, and is particularly directed to a radiator designed for simplicity in making repairs.

The improved radiator consists of the usual upper and lower reservoirs connected by tube-structure, the tubes in my construction being removably connected to or secured in the bottom plate of the upper reservoir, and also removably seated in the upper plate of the bottom reservoir. The connections of the tubes, so far as their holding means is concerned are readily accessible from the upper reservoir, and such reservoir is provided with a removable cover-plate, through which the tube connecting means may be reached. This permits the ready removal of any tube or tubes, without disturbing any other portion of the radiator, and particularly without removing the radiator as a whole from the car. Furthermore, the use of the usual header plates to support the tube structure is dispensed with, without in any way detracting from the strength or stability of the radiator, the appropriate walls of the reservoirs serving as header plates.

In the drawings:—

Figure 1 is a perspective view of the improved radiator.

Fig. 2 is a vertical section of the same.

Fig. 3 is a plan of the radiator, with the upper cover plate removed, illustrating the accessibility of the tube securing means.

The improved radiator comprises an upper reservoir 1, and a lower reservoir 2. These reservoirs which aside from the details hereinafter noted may be of any form or material, have edge flanges 3, and radiator side plates 4, arranged to space the radiator-reservoirs the proper distance apart, are positioned between the side flanges 3. The plates 4 have flanges 5 to coöperate with the flanges 3, and bolts 6 are provided to engage the appropriate flanges to secure the reservoirs and side plates into a rigid frame, capable however of ready disassembling through removal of the bolts.

The upper reservoir 1 is fully open at top, and is provided with a cover-plate 7, having the usual filling opening 8. The cover plate is removably secured to the reservoir proper in a water-tight manner, as by bolts 9. The lower reservoir 2 is open at its front and is provided with a closing plate 10 for such open portion, with such closing plate removably secured in place in a watertight manner, as by bolts 11.

The reservoirs are united by the usual tube structure, and in devices of this character it has been heretofore proposed to construct this tube structure as an independent unit, involving header plates in which the tubes are secured, and such header plates in turn secured to the reservoirs. In such constructions it is impossible to make repairs involving a tube, except through the removal of such unit from the radiator structure, and this involves the removal of the radiator as a whole from the car, and more or less expert service for the actual repairs. The present invention connects the tubes directly to the respective lower and upper walls of the upper and lower reservoirs, using the reservoir walls as tube headers, and securing the tubes in the upper reservoir wall only, though seating the tubes in a non-leaking manner in the lower reservoir. This dispenses entirely with the usual tube headers, and utilizes the reservoirs proper as such tube-plates or headers.

The tubes 12, of which of course there may be any desired number, engage openings 13 in the bottom wall of the upper reservoir, and openings 14 in the upper wall of the lower reservoir. The openings 13 in their lower portions more or less snugly receive the tube, as at 15, being thereabove enlarged at 16, with the wall of such enlarged portion threaded, as at 17. The openings 14 of the lower reservoir are formed to more or less snugly receive the tube throughout the upper portion of said opening, being then reduced somewhat in diameter, as at 18. The tube 12 is applied from above, the cover-plate 7 having been removed. The tube is provided at its lower end with a thimble 19, forced or otherwise secured therein to project below the lower end of the tube proper. This thimble fits the reduced portion 18 of the tube opening 14 of the lower reservoir, and the shoulder formed by the different diameters of such opening 14, serves to support packing 20, which is thus pressed upon by the lower edge of the tube.

The thimble 19 prevents the possibility of this packing expanding into the tube opening to interfere with the circulation.

The upper end of the tube extends through the openings 13, and packing 21 is applied about the tube and pressed onto the shoulder formed by the different diameters of the opening, by a gland nut 22, engaging the threaded wall 17 of the enlarged portion of the opening 13. The gland nut is cored at 23 to receive the tube, and has a reduced opening above the tube, as at 24. This provides a shoulder 25 to bear on the upper end of the tube, so that as the gland nut is screwed into position, the tube will be correspondingly moved on the lower packing. The gland may have means, such as a kerf 26, by which it may be readily manipulated by a suitable tool.

It will be particularly noted that the tubes are held solely in place by the gland nuts, and that these are readily accessible through the upper reservoir on removal of the cover plate. Therefore, any particular tube may be tightened in place, by suitably operating the gland nut thereof, or any tube may be removed for replacement in an equally ready manner. The tubes lead directly to the reservoirs without intervening connections, and hence the tubes are each separately secured in place, and not applied as an entire unit, as in the usual radiators.

If desired, and as preferred, a tube supporting plate 27 is arranged transversely of the radiator, being bolted to the side plates 4, and formed with tube receiving openings 28, preferably punched therein to leave a burr 29 to further support the tubes.

The closing plate 10 of the lower reservoir permits ready inspection or cleaning of the lower reservoir, and also a complete drainage of the radiator when desired, as in freezing weather.

Having thus described the invention, what is claimed as new, is:—

1. A radiator having upper and lower reservoirs, tubes slidably engaging the walls of both reservoirs, and a single means for engaging the walls of one reservoir for securing the tubes in place and compressing the packing between the tubes in both reservoirs in the same direction of movement as the movement of the single means.

2. In a radiator, an upper reservoir, a lower reservoir, tubes slidably coöperating with openings in the walls of such reservoirs, a single means coöperating with the wall of one reservoir and operating in the same direction of movement as the movement of the single means to seal the connection of the tubes with both reservoirs, the upper reservoir having an opening through which said means is accessible, and a cover plate for such opening.

3. In a radiator, upper and lower reservoirs, tubes removably seated in openings in the upper wall of the lower reservoir, packing underlying the ends of the tubes in such openings, the lower wall of the upper reservoir being formed with openings to permit the passage of the tubes therethrough, and a single means to engage the walls of the tube openings of the upper reservoir to exert an endwise pressure on the tubes.

4. A radiator having upper and lower reservoirs, the walls of the respective reservoirs being formed with tube receiving openings, means arranged in the openings in the wall of the lower reservoir to provide packing spaces between said means and said wall, packing in said spaces, tubes slidably engaging the walls of the openings of the upper reservoir wall and bearing on the packing in the openings of the lower reservoir wall, and means coöperating with the wall of the upper reservoir to exert an endwise pressure on said tube.

5. A radiator having upper and lower reservoirs with the walls thereof formed with alined tube openings, a packing arranged in each of said openings, a thimble fitting within the packing in each opening of the lower wall, and means having threaded engagement with the openings of the upper walls to bear upon the packing in said openings, and to overlie and bear upon the upper ends of the tubes in said openings, whereby the operation of said means will spread the packing in the openings in the upper walls and force the lower ends of the tubes into engagement with the packing in the openings or the lower walls.

6. A radiator having upper and lower reservoirs with the walls thereof formed with alined openings, tubes arranged in said alined openings, packing surrounding the tubes in the upper wall openings, packing underlying the ends of the tubes in the lower wall openings, and a single element coöperating with the wall of each opening of the upper reservoir to exert an endwise pressure on the tube to compress the packing at the lower end of the tube.

7. A radiator having upper and lower reservoirs with the walls thereof formed with alined openings, tubes arranged in said alined openings, packing surrounding the tubes in the upper wall openings, packing underlying the ends of the tubes in the lower wall openings, and a single element coöperating with the wall of each opening of the upper reservoir to exert an endwise pressure on the tube to compress the packing at the lower end of the tube, said element engaging the bearing upon the packing simultaneously with the movement of the tube.

In testimony whereof I affix my signature.

JOHN CONLON.