

C. COSTELLOE AND S. G. STOLL,
 AUTOMOBILE RADIATOR.
 APPLICATION FILED FEB. 19, 1918.

1,343,352.

Patented June 15, 1920.
 2 SHEETS—SHEET 1.

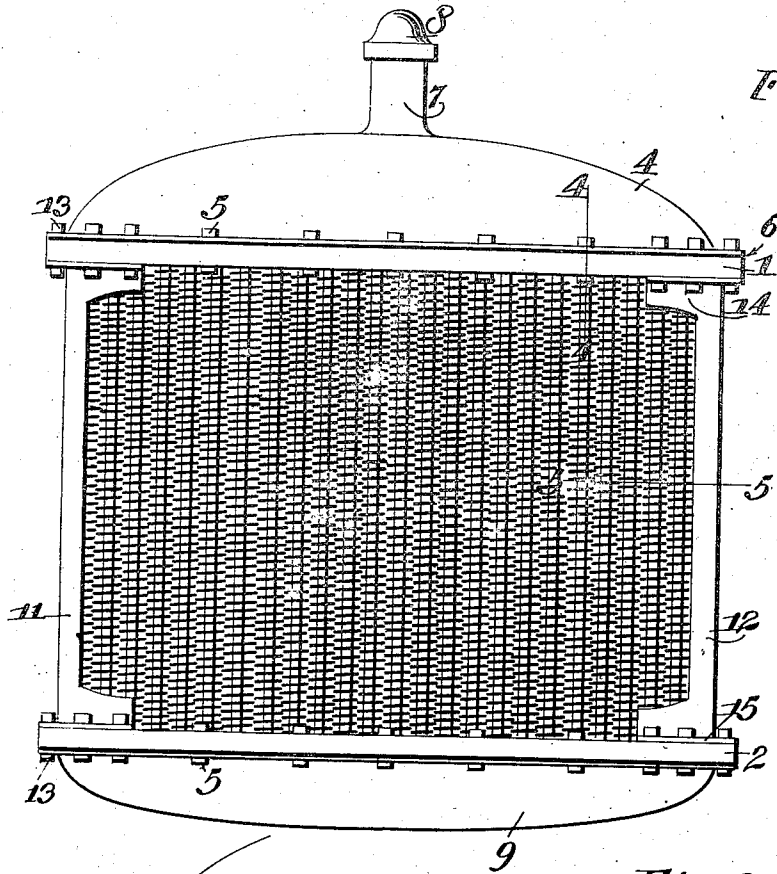


Fig. 1.

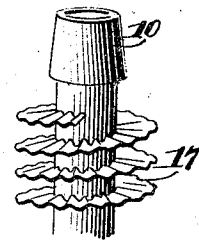


Fig. 3.

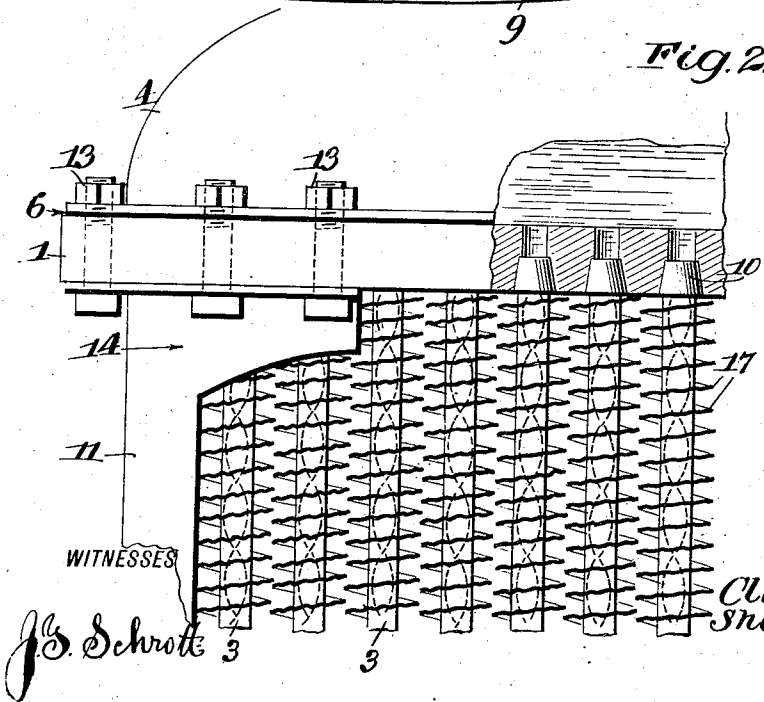


Fig. 2.

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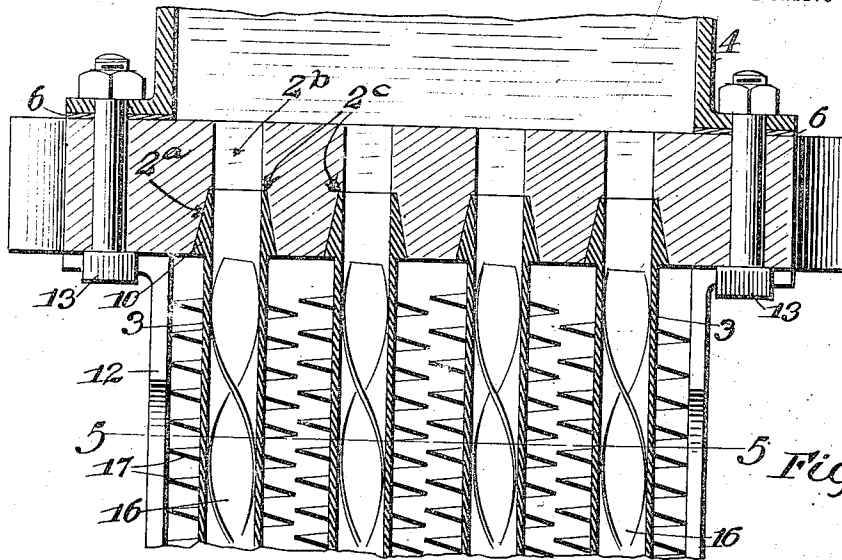


Fig. 4.

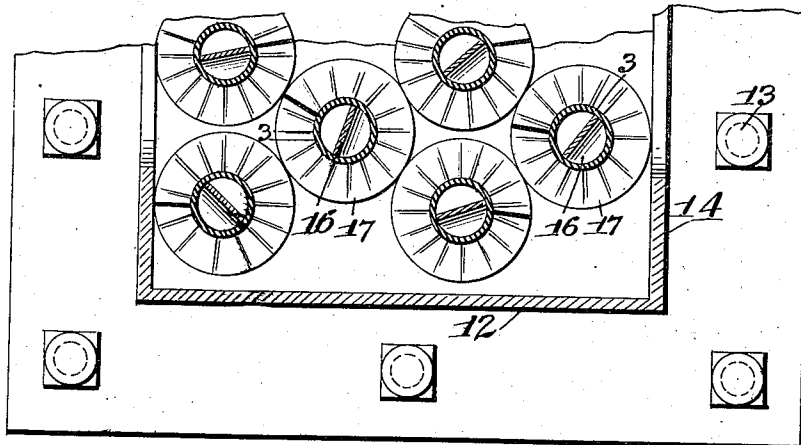


Fig. 5.

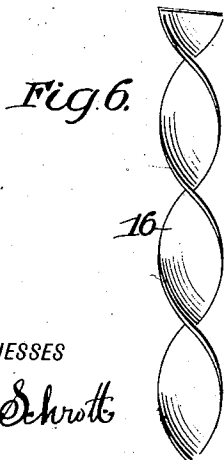


Fig. 6.

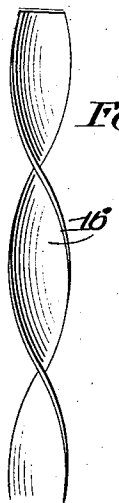


Fig. 7.

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UNITED STATES PATENT OFFICE.

CLINTON COSTELLOE AND SHERM G. STOLL, OF EL PASO, TEXAS.

AUTOMOBILE-RADIATOR.

1,343,352.

Specification of Letters Patent. Patented June 15, 1920.

Application filed February 19, 1918. Serial No. 218,162.

To all whom it may concern:

Be it known that we, CLINTON COSTELLOE and SHERM G. STOLL, citizens of the United States, and residents of El Paso, in the county of El Paso and State of Texas, have invented a new and useful Improvement in Automobile-Radiators, of which the following is a specification.

Our invention relates to improvements in automobile radiators, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of our invention is to provide an automobile radiator having as one of the important features, the ability to easily remove the top and bottom tanks, so that the tubes may be readily reached for replacement and repair.

Another object of the invention is to provide a radiator as described, including novel means for simultaneously radiating the heat and adjustably checking the flow of the water.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:

Figure 1 is a front elevation of the radiator.

Fig. 2 is an enlarged view of a portion of the radiator, parts being shown in section.

Fig. 3 is a detail perspective view of a portion of one of the tubes.

Fig. 4 is a distorted detail section taken substantially on the line 4—4 of Fig. 1.

Fig. 5 is a cross section on the line 5—5 of Fig. 4; and,

Figs. 6 and 7 are perspective views of two forms of the spiral insert.

In carrying out our invention, we provide a radiator having substantially similarly formed castings 1 and 2 at the top and bottom. These castings are rectangular solid plates with a plurality of frusto-conical recesses 2^a which merge into bores 2^b but are so arranged as to provide holders 2^c at the junctions. The recesses receive the ends of the radiator tubes 3 as presently appears below.

A tank 4 is secured on the top casting 1 by means of the bolts 5, with an interposed gasket 6 for making the joint water-tight. The tank 4 has the usual filling inlet 7 closed by a screw cap 8. A tank 9 is similarly secured to the bottom casting 2 by

means of similar bolts 5 and an interposed gasket, also to render the joint water-tight.

Formed on the extremities of the radiator tubes 3 are conical ferrules 10. These ferrules fit in the frusto-conical recesses just mentioned, and by abutting the shoulders 2^c have a solid foundation and at the same time provide an uninterrupted water passage which is continuous with the bores 2^b. The joints at the meeting places of the tubes and bores is so tight as to be almost imperceptible and so mud cannot collect at the place of connection.

Bridge members 11 and 12 at the respective sides of the radiator, hold the top and bottom castings together and in firm engagement with the conical ferrules of the radiator tubes. These bridge members are secured to the castings by somewhat larger bolts 13, as clearly indicated in the drawings. By removing these bolts the castings may be removed, so that access to the radiator tubes may be had.

The shape of each of the bridge members is shown in Fig. 5. It will be observed that they are formed like channels, which partly embrace the radiator tubes at the extremities of the radiator. Each bridge member includes inward extensions 14, upon which the flanges 15 are formed. The bolts 13 just described pass through these flanges into the castings securing the part in position, as indicated in Fig. 1.

Retarding spirals 16 are inserted in each of the radiator tubes 3, as shown in Fig. 4, to retard the flow of the water. The spirals may be made with a greater or lesser number of twists as illustrated in Figs. 6 and 7, to obtain a corresponding degree of retardation of the flow of the water. Obviously when the form of the spiral illustrated in Fig. 6 is used wherein there are a greater number of twists the water will be retarded more markedly than when the form shown in Fig. 7 is used.

This feature of the adjustability of the rate of the flow of water as it were, constitutes an important advantage where the radiator is used in widely varying climates. When the radiator is employed in hot climates, it is desirable to retard the flow of the water as much as possible so as to get the cooling effect of the air as long as possible, and in this instance the spiral in Fig. 6 is used. When the radiator is used in cooler

climates, the water may be permitted to pass through the tubes more quickly, and in this instance the spiral with the lesser number of twists in Fig. 7 is used.

- 5 Heat is radiated from the radiator tubes by means of a fluted spiral flange 17 on the outside of each of the tubes. This flange and its manner of application to one of the tubes is partly illustrated in Fig. 3. The
10 flange is soldered on or may be secured in place by any other suitable means. It is not necessary to flute the flange, since obviously it may have a smooth surface, but it is thought that by fluting the flange, the ra-
15 diating surface is materially increased. It will be observed that the retarding spiral 16 which is preferably made of metal, and occupies each of the tubes 3, forms a direct connection between the hot water in the center of the tube and the metallic surfaces of
20 the tube and external flange, thus directly conducting the heat to the place where it is radiated and disseminated into the surrounding air.
- 25 While the construction of the radiator is thought to be fully understood from the foregoing description a brief review of the operation is thought to be of advantage. First of all, one of the important features
30 consists of the adjustability of the rate of flow of water through the tubes, to suit varying climatic conditions. When the radiator is used in a particularly cold region, it is not necessary to retard the flow of
35 water to any great extent, since under such conditions, the heat radiates rapidly enough with the use of the retarding spiral with the gradual twists, illustrated in Fig. 7.
- 40 When the radiator is used in warmer climates where it is necessary to obtain as long an exposure of the water to the cooling medium, the retarding spiral with the many twists illustrated in Fig. 6 is employed. As pointed out above, the metallic retarding
45 spirals inside of the radiator tubes and in contact with the walls of the tubes, coact directly with the external spiral flanges 17 in obtaining the most rapid and effective radiation of the heat.
- 50 It is thought that the feature of ready access to the tubes for repair is fully under-

stood. The side bridge members 11 and 12 are the principal elements by which the parts are held together. Ordinarily it is necessary to simply remove the upper set of
55 bolts 13 to obtain access to the tubes. On removing the nuts, the upper tank together with the top casting 1, may be lifted off when the tubes are free to be inspected removed, replaced, or repaired. Obviously
60 the top tank and casting must be taken off to insert differently shaped retarding spirals under conditions above explained.

The tapered ground joints or ferrules 10 secure a very tight contact between the casting and the ends of the tubes so that water may not leak out. It is a matter of simple mechanical skill to shape these conical ferrules to the best advantage, since obviously
70 if the shape shown in the drawing is not entirely correct it may be altered to such an extent that the conical ferrule will adapt itself to the conical recess to the best possible advantage.

While the construction and arrangement
75 of the radiator is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claim. 80

We claim:—

An automobile radiator, comprising solid top and bottom castings, each with frusto-conical recesses merging into bores with shoulders at the junctions; radiator tubes
85 with end frusto-conical ferrules fitting the bores and abutting the shoulders for tight joints and the provision of smooth, continuous water passages between the tubes and casting bores, top and bottom water tanks
90 with flanges and packing means between the castings and the tanks, and means holding the castings, tanks and tubes together including end bridges with flanges and bolts
95 securing the solid castings to the bridges and the tanks.

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Witnesses:

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