S. BOWMAN.

RADIATOR.

APPLICATION FILED AUG. 6, 1917.

1,329,697.

Patented Feb. 3, 1920.

Fig. 2.

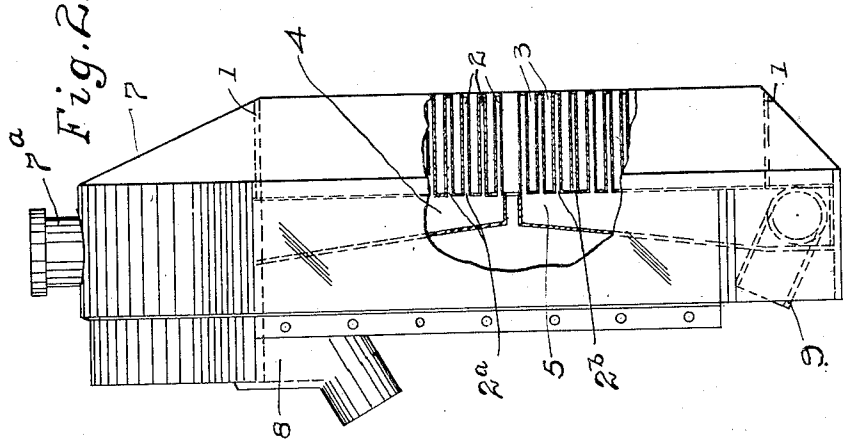


Fig. 3.

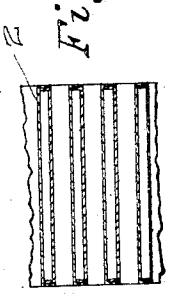
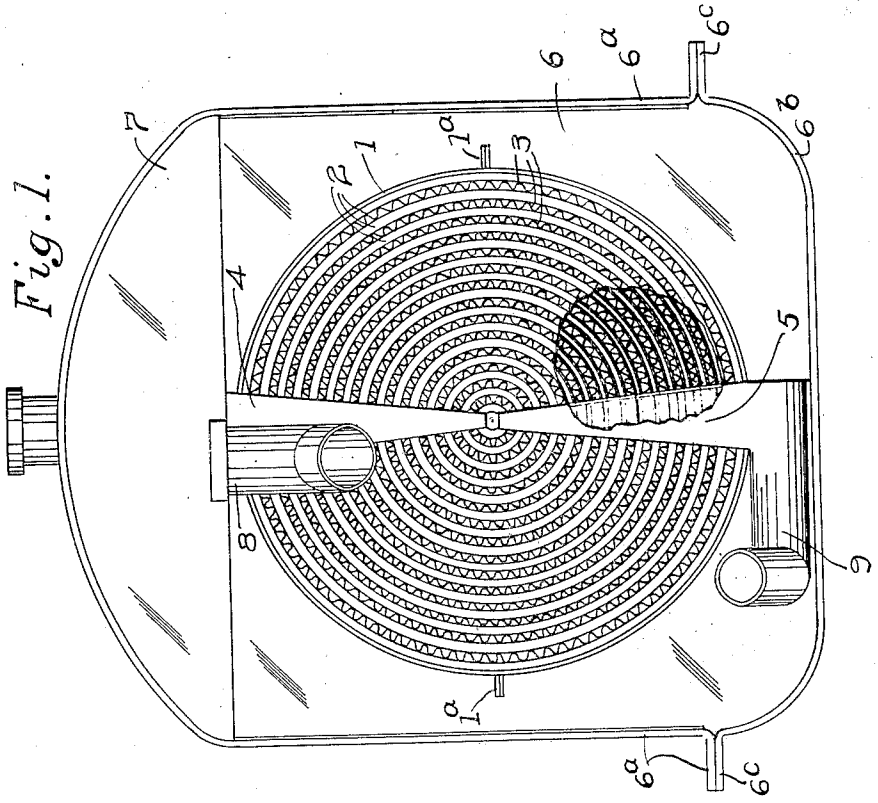


Fig. 1.



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UNITED STATES PATENT OFFICE.

SAMUEL BOWMAN, OF REDONDO BEACH, CALIFORNIA.

RADIATOR.

1,329,697. Specification of Letters Patent. Patented Feb. 3, 1920.

Application filed August 6, 1917. Serial No. 184,562.

To all whom it may concern:

Be it known that I, SAMUEL BOWMAN, a citizen of the United States, residing at Redondo Beach, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

My invention relates to radiators such as are used on automobiles for cooling the water to the engine and the objects of my invention are, first, to provide a radiator which is simple and economical of construction, second, to provide a radiator of this class which is easy to repair, third, to provide a radiator of this class which is very strong and durable and will not be materially affected by the wrenching effect of running over rough ground, fourth, to provide a radiator of this class which is applicable for and may be readily placed in position in the different shaped hoods or radiator supports for the various makes of automobiles, and fifth, to provide a radiator of this class which is very efficient in its action and will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this specification in which:

Figure 1 is a rear elevational view of my radiator shown mounted in position in the front end of the hood and showing the water receptacle in connection therewith and showing a portion broken away and in section to facilitate the illustration; Fig. 2 is a side elevational view thereof and showing a portion broken away and in section to facilitate the illustration; and Fig. 3 is a sectional view on an enlarged scale showing a portion of the radiating section in detail.

Similar characters of reference refer to similar parts throughout the several views of the drawings.

The supporting band 1, annular tubes 2, corrugated spacers 3, water conductor 4, water conductor 5, frame 6, receptacle 7, tube connection 8 and tube connection 9 constitute the principal parts of my radiator.

The supporting band 1 is a circular metallic band of suitable size for the outer tube 2 to rest therein and the remainder of the tubes 2 are placed concentric with each other and spaced apart from each other by means of the corrugated spacers 3 which permit the air to pass through between said tubes and the water in said tubes is cooled by radiation from the metal of said tubes and these corrugated spacers.

It will be here noted that these tubes 2 are flat and made from two pieces which pieces overlap each other at the front and back edges where they are soldered together as shown best in Fig. 3 of the drawings thus providing double strength at the edges where great strength is required.

The inlet and outlet conductors 4 and 5 to and from said tubes 2 taper toward the center so as to provide the proper proportion of water to the outer tubes as to the inner ones in proportion to their area. These tubes 2 have inlets 2^a from the conductors 4 and outlets 2^b connecting with the conductor 5 so that the water circulates through approximately one-half of each tube in opposite directions so that each tube is in effect a double conductor of semi-circular form. This supporting band 1 is lock seamed in and the ends 1^a left apart and serve as clamps for securing said band 1 to the outer tube 2. Mounted on the top of said supporting frame 6 is the water receptacle 7 which is preferably the same shape as the ordinary or conventional receptacle for water for a radiator and it is provided with an inlet port 7^a for pouring the water into the radiator. The supporting frame 6 is provided with reinforcements 6^a and 6^b which extend outwardly and serve as lugs 6^c which rest on the side frames of the vehicle. Connecting with the water receptacle 7 is the return hose connection 8 and connecting with the connection 5 is the exit hose connection 9 so that the water circulates from the lower end of the connection 5 through the engine to the hose connection 8 and into the water receptacle 7 therein into the connection 4 and into the tubes 2.

Though I have shown and described a particular construction, combination and arrangement of parts, I do not wish to be limited to this particular construction, combination and arrangement but desire to include in the purview of my invention the construction, combination and arrangement

substantially as set forth in the appended claims.

It is obvious that with this construction, there is provided a radiator in which the water circulates in certain semi-circular confined channels from the top to the bottom of the radiator therein through the engine to the top again; that the inlets to the separate tubes are of a size proportional to the surface area thus permitting only a certain quantity of water to pass into said tubes so that all are cooled equally; that the tubes being circular in form provide great strength and durability; that the structure as a whole is very simple and economical of construction, durable and will not readily deteriorate or get out of order.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a radiator, a plurality of circular tubes concentrically spaced apart from each other, said tubes having inlets and outlets proportional to the surface area of said tubes, means for conducting water to and from said inlets and outlets and means for holding said tubes in certain spaced relation to each other consisting of corrugated metallic members.

2. In a radiator, a plurality of circular tubes concentrically spaced apart from each other, said tubes having inlets and outlets proportional to the surface area of said tubes, means for conducting water to and from said inlets and outlets and a water receptacle communicating with the means for conducting water to said inlets.

3. In a radiator, a plurality of circular tubes concentrically spaced apart from each other, said tubes having inlets and outlets proportional to the surface area of said tubes, means for conducting water to and from said inlets and outlets, a water receptacle communicating with said means for conducting water to said inlets, and means for holding said tubes in certain spaced relation to each other.

4. In a radiator, a plurality of circular tubes concentrically spaced apart from each other, said tubes having inlets and outlets proportional to the surface area of said tubes, means for conducting water to and from said inlets and outlets, a water receptacle communicating with said means for conducting water to said inlets, means for holding said tubes in certain spaced relation to each other and means for supporting said tubes and spacing means on the frame of the vehicle.

In testimony whereof, I have hereunto set my hand at Redondo Beach, California, this 27th day of July, 1917.

SAMUEL BOWMAN.