J. LOHN.

WATER COOLING RADIATOR.

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1,401,164. Patented Dec. 27, 1921.

Fig. 1.

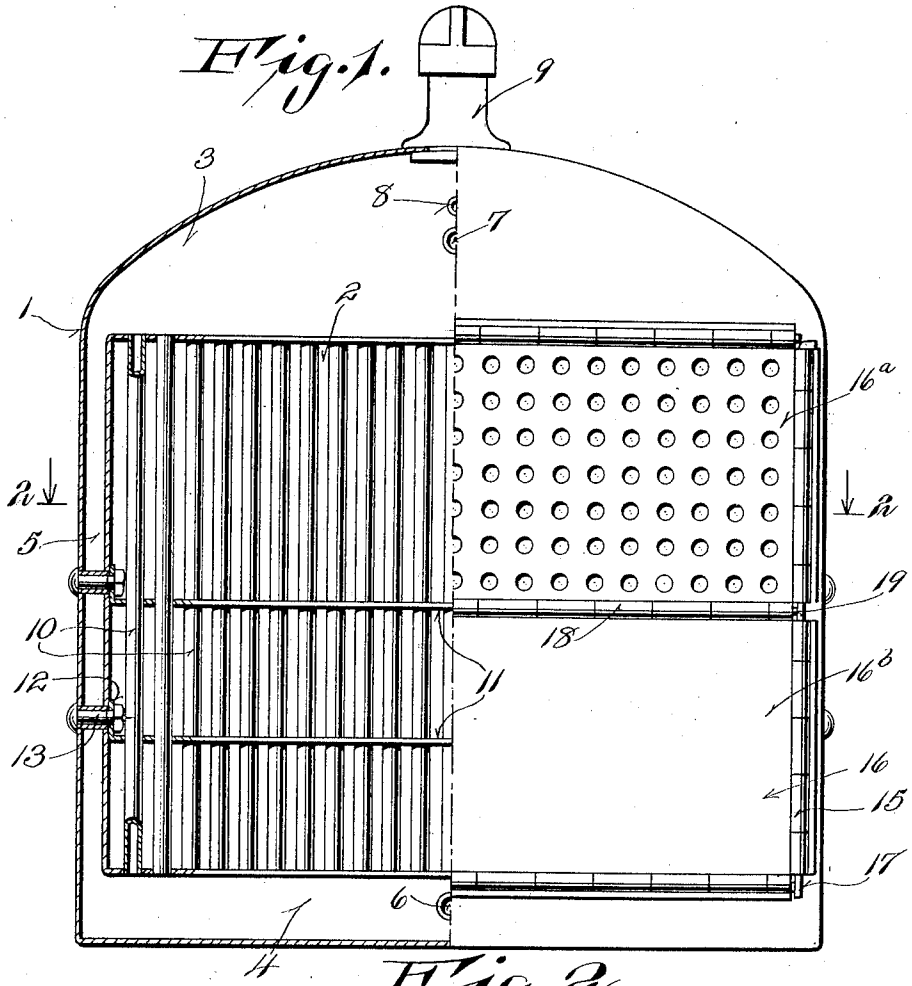
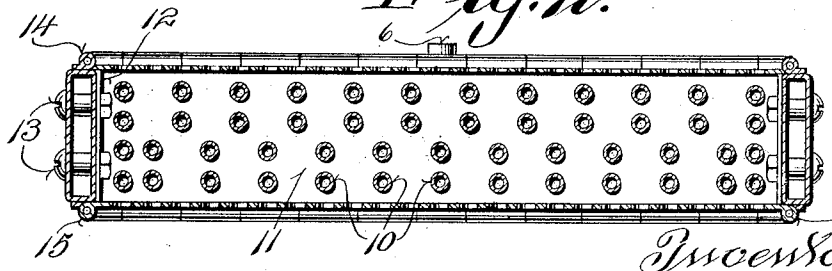


Fig. 2.



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WATER-COOLING RADIATOR.

1,401,164. Specification of Letters Patent. Patented Dec. 27, 1921.

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To all whom it may concern:

Be it known that I, JACOB LOHN, a citizen of the United States, and resident of Appleton, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Water-Cooling Radiators; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to new and useful improvements in water cooling radiators for use in connection with automobiles and other machines using internal combustion engines as a source of motive power.

It is the primary object of this invention to provide a radiator of the character described which may be inexpensively manufactured and which will have its parts so arranged and connected that repairs may be easily, quickly and cheaply made.

An additional object pertains to means for selectively controlling the cooling air passing through the radiator, whereby the interior of the radiator may be wholly or partially covered. For instance in summer the coverings may be so arranged to permit a maximum flow of cooling air through the radiator, or in winter such air may be entirely cut off.

With these and other objects and advantages in view, the invention consists in the novel arrangement of parts which will be hereinafter more particularly described and claimed and shown in the drawing wherein:

Figure 1 represents a part sectional and part elevational view of a radiator constructed in accordance with my invention, and

Fig. 2 is a horizontal section taken substantially on the plane of the line 2—2 of Fig. 1.

Referring now more particularly to the drawing, in which similar reference characters designate like parts in both of the views, the numeral 1 denotes a relatively rectangular frame having a rectangular opening 2. The frame is hollow and its upper portion constitutes a top tank 3 and its bottom portion a lower tank 4. The spaces 5 between the double walls of the sides of the frame form passageways communicating with the upper and lower tanks 3 and 4 respectively whereby water may freely pass from one to the other. An outlet 6 extends from the lower tank and an inlet 7 opens into the upper tank 3; the latter is also provided with an overflow vent 8 as is customary in conventional types of radiators. Furthermore said upper tank is provided with a filling opening 9.

The inner walls of the frame 1 forming the bottom and top of the upper and lower tanks 3 and 4 respectively are provided with a plurality of openings, the same being correspondingly arranged in the two walls and vertically alined for the reception of vertical water tubes 10. From Fig. 2 particularly it may be noted that these tubes are spaced apart so as to permit the ready passage of air therebetween thereby affording a maximum cooling for the water which flows from the upper tank to the lower tank through said tubes. The intermediate portions of the tubes are spaced and braced by one or more spacing plates 11, each of which has a number of holes corresponding to the number of tubes which are disposed therethrough. The plates 11 are positioned substantially horizontally and have their opposite ends turned laterally as at 12 to form attaching feet whereby the same may be secured to the vertical walls of the opening 2 by means of bolts or the like 13. The spacing plates are preferably readily removable, that is to say they are not fixedly connected to the tubes 10, so that when repairs are to be made on the latter they may be readily detached from the side walls of the opening 2 and slid downwardly or upwardly on the tubes as may be desired.

Surrounding the opening 2 and on both the front and back of the frame 1 is a plurality of attaching knuckles 14, the same being located adjacent the edge of the opening 2 and having their axes disposed parallel with the side of said opening on which they are located.

These knuckles 14 are spaced apart and receive therebetween correspondingly spaced knuckles 15 formed on the edges of cover plates 16. When the plates 16 are in position and the openings of the knuckles thereof alined with the openings of the other knuckles 14, pins or the like 17 are inserted therethrough to lock the several parts. In this manner both the front and back of the opening 2 may be readily covered by the plates 16. It is to be understood however, that the illustrated form of attaching means is merely one manner in which the cover plates

can be readily secured in position and that the applicant does not desire to be limited thereto.

Each of the plates 16 is preferably formed of two sections separable horizontally, the adjacent edges of the sections being provided with interengaging knuckles 18 similar to the knuckles 14 and 15 and are designed to receive a pin 19. Thus two like or unlike sections may be readily secured together to form one cover plate. In the illustration the cover plate shown on the front of the radiator consists of a perforated section 16^a and an imperforate section 16^b.

This combination may be used on the radiator in cold weather, and in warm weather two of the sections 16^a may be combined, or the plates may be entirely removed to permit an unobstructed flow of air between and around the tubes 10. On the other hand during extremely severe cold weather the passage of air may be completely cut off by connecting two of the imperforate sections 16^b together. Or if there is still danger of freezing a pipe may be led from the exhaust of the engine to the space between the front and back plates 16 and in which the water tubes 10 are located.

From the foregoing description taken in connection with the accompanying drawing, it will be evident that I have devised a very simply constructed cooling radiator in which all of the parts are readily accessible for repair, this being in contradistinction to the usual radiator, and also that the same is equipped with an arrangement whereby freezing may be prevented and the circulating water maintained at a substantially constant temperature. As hereinbefore intimated, various changes may be made in the form and proportion of the several parts and in the different combinations between the parts, without departing from or sacrificing any of the principles or advantages of the invention.

I claim:

1. In a radiator, a frame, the upper and lower portions of the same forming upper and lower water chambers respectively, a plurality of vertical tubes in the frame and connecting the water chambers to circulate water therethrough, and a substantially horizontal spacing plate disposed between the water chambers, said plate having a plurality of spaced holes corresponding to the number of tubes and receiving the same, the opposite ends of said plate being detachably secured to the side walls of said frame, said plates when detached from the side walls being movable up or down on the tubes to permit free access to the tubes.

2. In a radiator, a frame having a rectangular opening therein, the upper and lower portions of the same forming upper and lower water chambers respectively, a plurality of water tubes extending across said opening and connecting the water chambers, attaching knuckles disposed around the four side edges of the opening in said frame, said knuckles being spaced apart, a cover plate to be disposed over the frame opening and having a plurality of spaced knuckles around its edges to be alined with the first mentioned knuckles, and means for connecting the adjacent knuckles of the frame and plate together.

3. In a radiator, a frame, the upper and lower portions of the same forming upper and lower water chambers respectively, said frame having double sides which form between them a water passageway between the upper and lower chambers, a plurality of vertical tubes in the frame and connecting the water chambers to circulate water therethrough, and a substantially horizontal spacing plate disposed between the water chambers, said plate having a plurality of spaced holes corresponding to the number of tubes and receiving the same, the opposite ends of said plate being formed with laterally extending perforated feet, removable fastening means extending through said perforations and securing said plate to the sides of the frame, said plate being movable up and down on said tubes when the fastening means is removed.

In testimony that I claim the foregoing I have hereunto set my hand at Appleton, in the county of Outagamie and State of Wisconsin.

JACOB LOHN.