

Apr. 17, 1923.

1,451,871

L. D. FOWLER
AUTOMOBILE RADIATOR

Filed Dec. 16, 1921

2 Sheets-Sheet 1

Fig. 1.

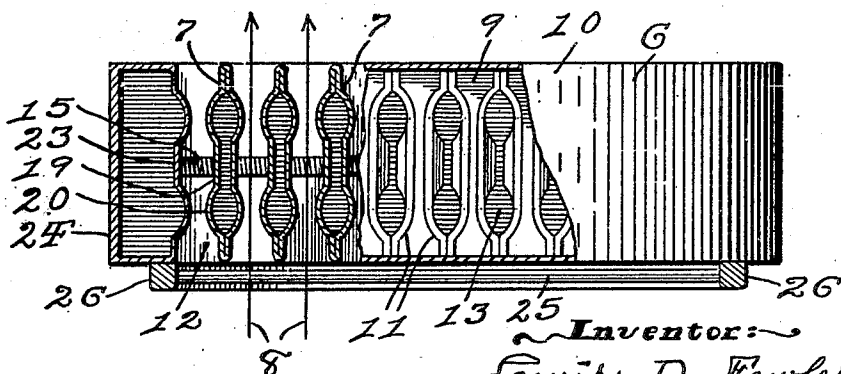
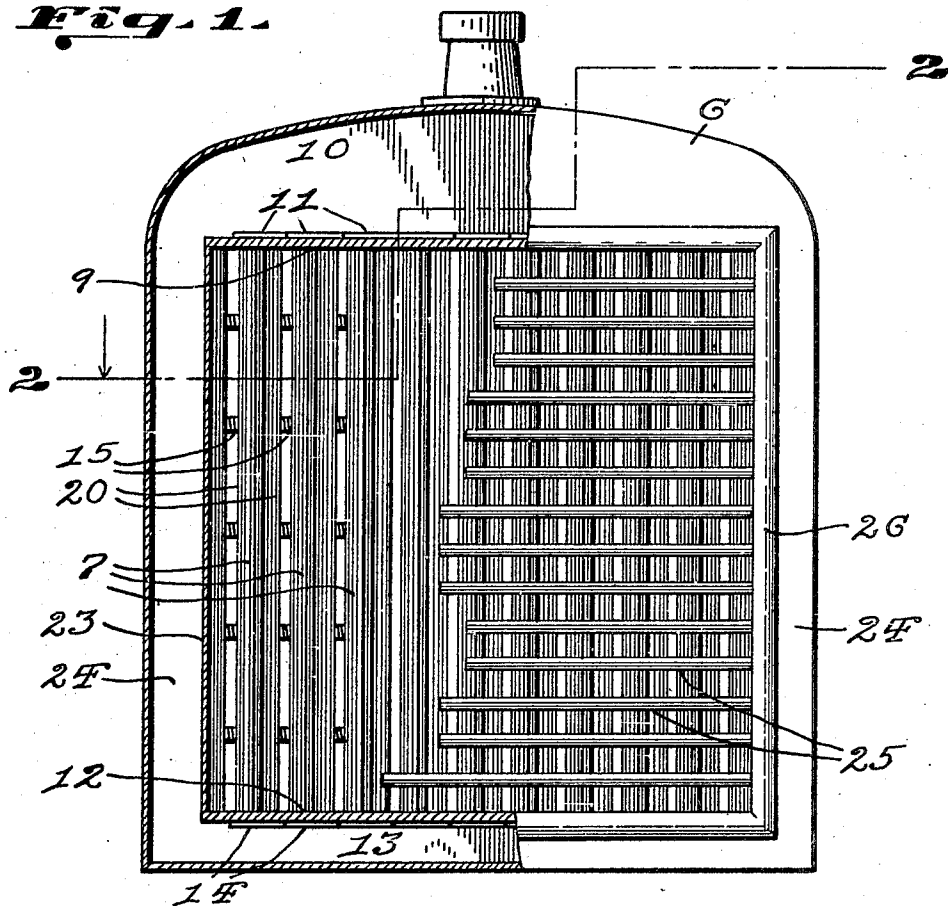


Fig. 2.

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Fig. 4.

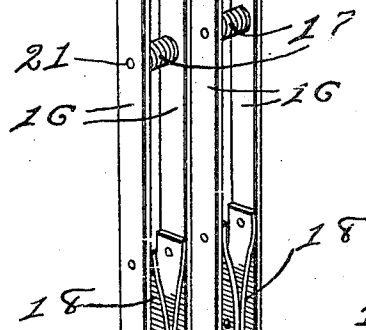
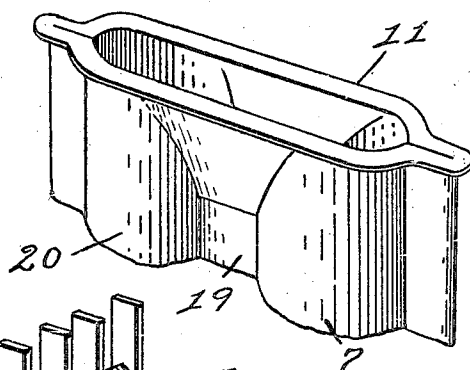


Fig. 5.

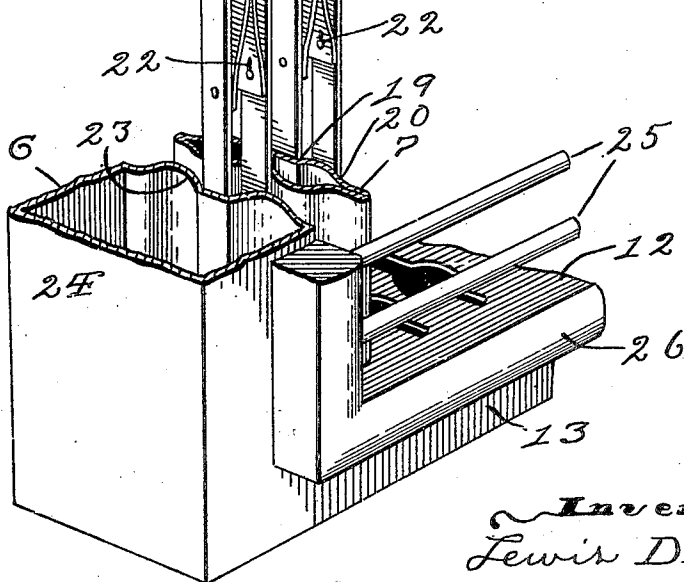
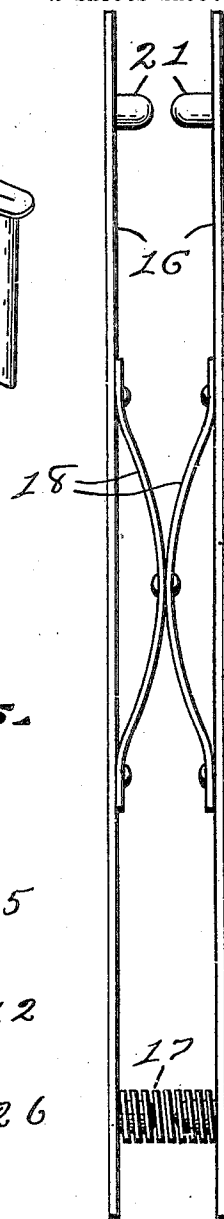


Fig. 3.



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Patented Apr. 17, 1923.

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UNITED STATES PATENT OFFICE.

LEWIS D. FOWLER, OF OKLAHOMA, OKLAHOMA.

AUTOMOBILE RADIATOR.

Application filed December 16, 1921. Serial No. 522,765.

To all whom it may concern:

Be it known that I, LEWIS D. FOWLER, a citizen of the United States, residing at Oklahoma city, in the county of Oklahoma and State of Oklahoma, have invented a certain new and useful Improvement in Automobile Radiators, of which the following is a specification, reference being had to the accompanying drawings.

The object of the invention is to provide an automobile radiator which cannot be burst or rendered leaky by freezing of the water contained therein.

Figure 1 of the drawings is a front elevation, partly in section, of the improved radiator.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a perspective of parts broken away from the lower left-hand corner of the structure shown in Figure 1, but showing a modified arrangement of certain springs.

Figure 4 is a similar view in the same direction, but at closer range, showing the upper end of an inner section.

Figure 5 is an enlarged front elevation of certain spring mechanism which appears in Figure 3.

Like characters of reference designate like parts in all the figures.

The improved radiator shown includes an outer hollow rectangular frame 6, which may not be materially different from the corresponding parts of many other automobile radiators.

A series of tubes 7 are set in the central opening of the rectangular frame 6, and spaced apart so that air may pass freely through between them as shown by the arrows 8 in Figure 2.

The open upper ends of these tubes 7 pass through the lower wall 9 of the upper portion 10 of the frame 6 and are flanged as at 11 to hold them from withdrawing from said wall; and the open lower ends of said tubes likewise pass through the upper wall 12 of the lower portion 13 of said frame and are flanged as at 14 to hold them from withdrawing from said wall 12.

The flanged upper and lower ends of the tubes 7 are soldered to the walls 9 and 12; and with said tubes and the outer frame 6 arranged as described the water can circulate freely therethrough.

In cross-section, the tubes 7 are greatly elongated in a fore-and-aft direction in order

to present a comparatively large radiating surface to the air passing through between them and that they may yield slightly to expansion and avoid bursting when the water freezes in them.

The metal used in making the tubes 7 should be elastic so as to return to normal form after each expansion from freezing; and in order to aid and insure such return of the tubes, springs are interposed between them.

These springs may be in the form of the helical springs 15 shown in Figures 1 and 2, or they may be of the possibly preferable form shown in Figures 3 and 5; the latter form consisting of two metal strips 16 which are adapted to bear against the outer surfaces of adjacent tubes 7 and which have the compression helical springs 17 and the double bow springs 18 interposed between them.

In cross-section, each tube 7 is formed with a central vertical groove or depression 19 in each of its side walls 20 to hold the bearing strips 16 in place.

The helical springs 17 are held in place between the strips 16 by short studs 21 on said strips; and the bow springs 18 are riveted to said strips, the rivet holes at one end of said springs 18 being elongated as at 22 to allow them to flex.

The inner walls 23 of the water containing side portions 24 of the rectangular frame 6 are shaped in the same manner as the walls 20 of the tubes 7, to allow said side portions proper expansion in case of freezing of the water and to hold the adjacent bearing strips 16 in place.

Any suitable form of screen may be placed in front of the tubes 7 as a partial protection from collision and flying objects.

In the present instance a number of horizontal bars 25 are placed in front of the bars 7, and the ends of said bars are supported by a frame 26 which is secured to the front of the frame 6.

Having thus described the invention, I claim:—

1. In a radiator, a plurality of tubular sections elongated transversely each with a longitudinal groove in each of its side walls, bearing strips disposed in said grooves, and springs between said strips.

2. In a radiator, a plurality of tubular sections elongated transversely each with a longitudinal groove in each of its side walls,

bearing strips disposed in said grooves, and helical springs between said strips.

3. In a radiator, a plurality of tubular sections elongated transversely each with a longitudinal groove in each of its side walls, bearing strips disposed in said grooves, and helical and double-bow springs between said strips.

4. In a radiator, a plurality of tubular sections each transversely elongated with a longitudinal groove in each side wall, an enclosing frame having its inner side walls formed with a longitudinal groove, bearing strips seated in said grooves of the sections and frame, and springs interposed between said strips.

5. In a radiator, a plurality of tubular sections each transversely elongated with a

longitudinal groove in each side wall, an enclosing frame having its inner side walls formed with a longitudinal groove, bearing strips seated in said grooves of the sections and frame, and springs interposed between said strips, said strips being unattached to said sections and frame.

6. In a radiator, a plurality of tubular sections elongated transversely each with a longitudinal groove in each of its side walls, bearing strips disposed in said grooves, and helical and double-bow springs between said strips, the bow-springs having limited loose connection at one end with the strips.

Witness my hand this 12 day of December, 1921.

LEWIS D. FOWLER.