A. SCHEPPER & E. COVERT.

AUTOMOBILE RADIATOR.

APPLICATION FILED APR. 26, 1910.

967,248. Patented Aug. 16, 1910.

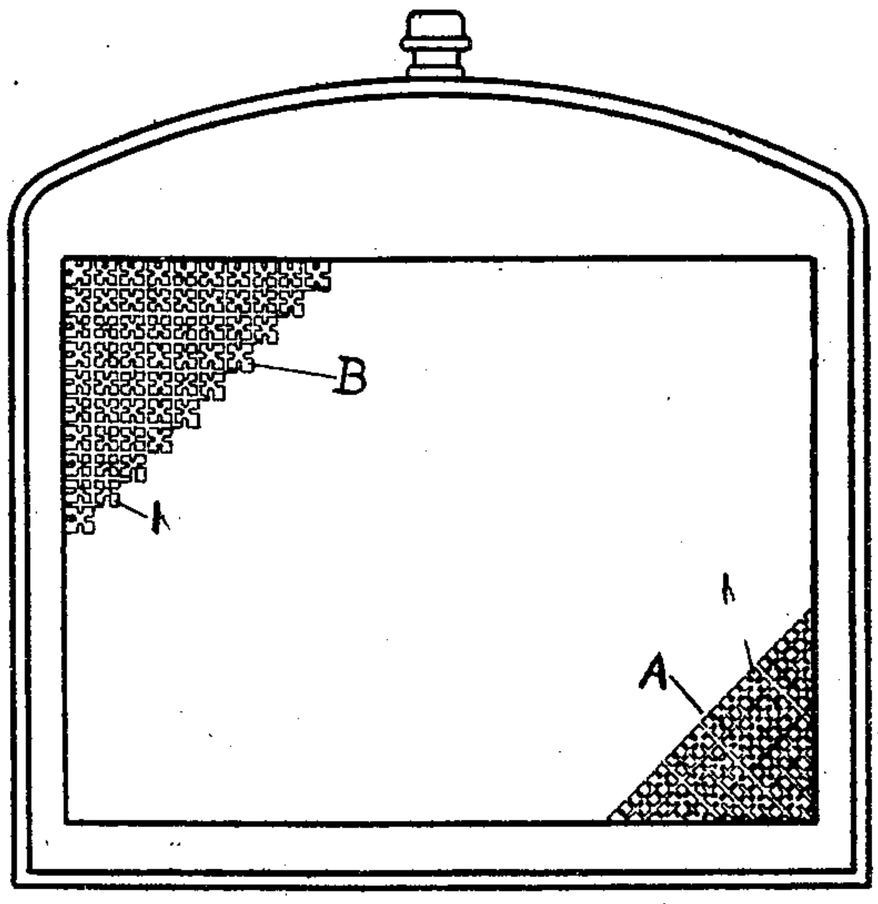

Fig. 1

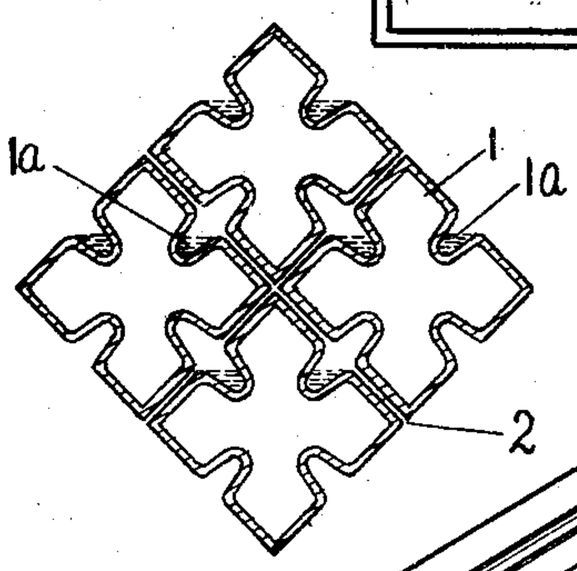

Fig. 2

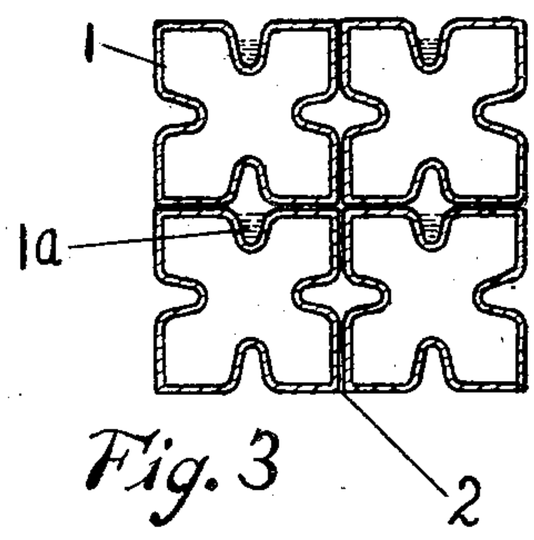

Fig. 3

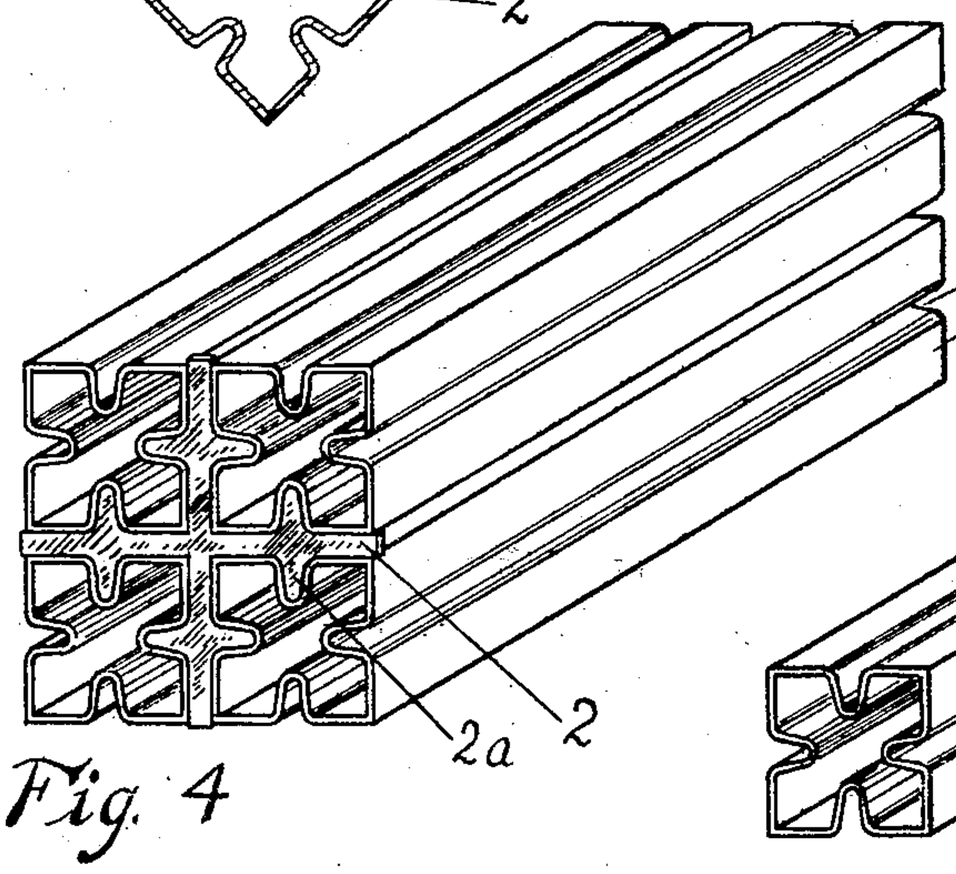

Fig. 4

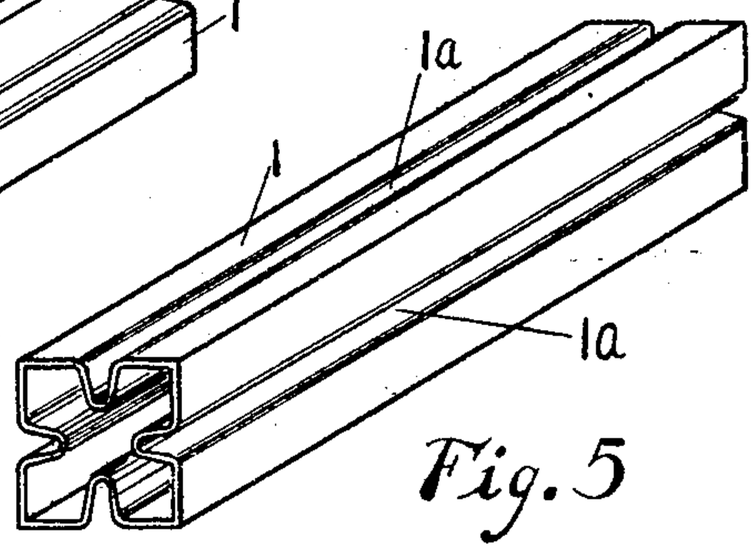

Fig. 5

WITNESSES:

J. Ray Abbey.

Christine A. Braedel.

Adam Schepper. INVENTORS

Edward Covert.

BY

Geo. B. Willson. ATTORNEY

UNITED STATES PATENT OFFICE.

ADAM SCHEPPER AND EDWARD COVERT, OF BAY CITY, MICHIGAN.

AUTOMOBILE-RADIATOR.

967,248. Specification of Letters Patent. **Patented Aug. 16, 1910.**

Application filed April 26, 1910. Serial No. 557,726.

To all whom it may concern:

Be it known that we, ADAM SCHEPPER and EDWARD COVERT, both citizens of the United States, residing at Bay City, in the county of Bay and State of Michigan, respectively, have invented certain new and useful Improvements in Automobile-Radiators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a radiator for automobiles, and the objects are to provide a radiator, the tubes of which are so constructed that if frozen, they will expand without cracking.

A further object is to so arrange the tubes that the water will be divided into thin layers as it circulates around the tubes.

With these and certain other objects in view, which will be fully set forth in the specification, our invention consists in the construction shown in the accompanying drawings, in which—

Figure 1 is a front elevation of an automobile radiator showing two arrangements of our improved tubes, Fig. 2 is an end view of the tubes arranged with their long diameters horizontal and vertical, and Fig. 3 shows the tubes arranged with their short diameters horizontal and vertical, Fig. 4 is a perspective view showing the method of attaching the tubes to the tube sheet, and Fig. 5 is a perspective detail of a single tube.

As is clearly shown in the drawings, the device consists in a tube 1, which is preferably rectangular in general cross-sectional contour, but in the middle of each side of the tube is formed a depression or groove 1^a projecting inward at right angles to the face of the tube. The grooves 1^a project inward not quite to the center of the tubes so as to leave a free air space through the centers of the tubes as well as in the four corners. The walls of the grooves 1^a form radiating surfaces, providing yielding expansion members that will expand sufficiently to prevent breaking of the tube if the water surrounding the tubes happens to freeze.

As shown in Fig. 4, the tubes are mounted in tube sheets 2, stamped out to receive the ends of the tubes 1, the tube sheets 2 forming in general, a rectangular metal frame or checker-work. In the side of each rectangle is a lateral projection 2^a conforming in shape to the cross-section of the grooves 1^a in the tubes 1.

In practice, the tubes are inserted in the sheets, as shown in Fig. 4, the tubes being fastened to the tube sheets in any suitable manner as by soldering, brazing, sweating, or dipping in molten metal.

In practice we prefer to assemble the tubes as shown in Fig. 2, the long diameters of the tubes extending horizontally and vertically. This arrangement is also illustrated at A in Fig. 1. We sometimes, if so desired, arrange the tubes as shown at B, Fig. 1, and also in Fig. 3, the short diameters of the tubes being arranged horizontally and vertically.

When arranged as shown in Fig. 2, if only a small amount of water is in the radiator, some of the water will be retained in the pockets or grooves 1^a and there will be water distributed throughout the entire height of the radiator, instead of leaving some of the upper tubes dry when the water level recedes in the radiator. Similarly in Fig. 3, the pockets 1^a will retain some of the water and the pockets thus formed, not only act as water retainers but also expose a relatively large amount of cooling surface to the action of the air passing through the radiator tubes.

What we claim as our invention and desire to secure by Letters Patent, is:—

In a radiator, the combination of a plurality of four-sided tubes, rectangular in general contour, each side of said tube being depressed inwardly to form an inwardly projecting groove, said tubes being assembled with their flat sides parallel and spaced apart, the grooves of each of said tubes lying opposite the grooves of the adjacent tubes.

In testimony whereof, we affix our signatures in presence of two witnesses.

ADAM SCHEPPER.
EDWARD COVERT.

Witnesses:
FRED NEUMANN,
ALICE STANLEY.