

L. BACHTEN & J. GALLAY.  
 SURFACE COOLER FOR AUTOMOBILES.  
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1,023,453.

Patented Apr. 16, 1912.

Fig. 1.

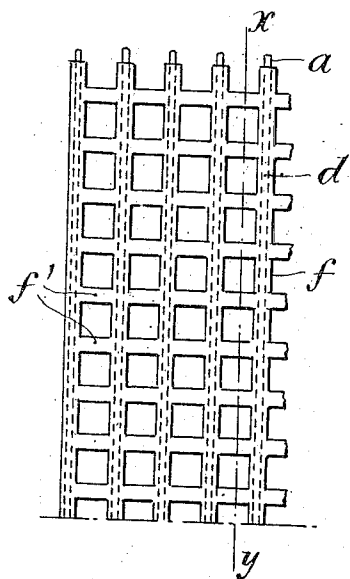


Fig. 2.

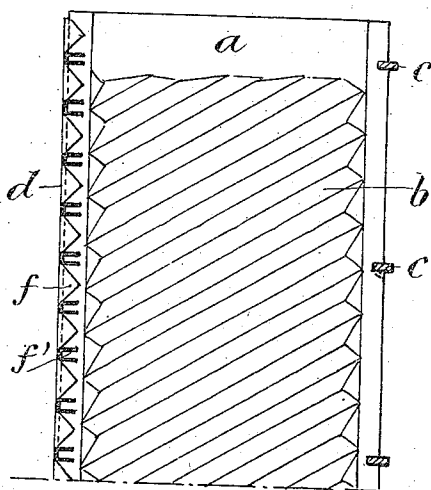


Fig. 3.

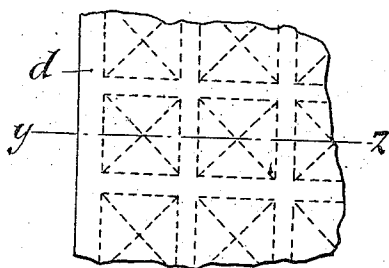


Fig. 4.

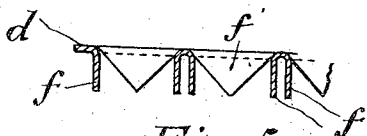
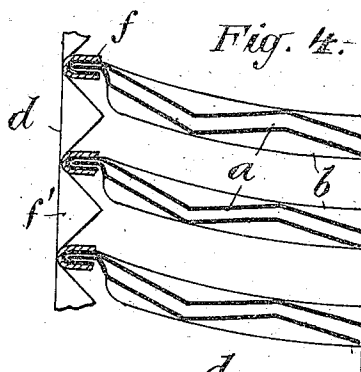


Fig. 5.

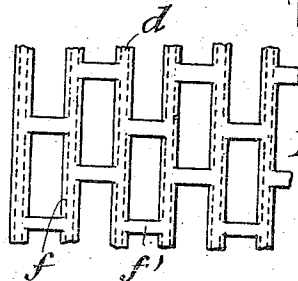


Fig. 6.

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 by Wm. H. Crawford, atty.

# UNITED STATES PATENT OFFICE.

LOUIS BACHTEN AND JEAN GALLAY, OF GENEVA, SWITZERLAND.

## SURFACE-COOLER FOR AUTOMOBILES.

1,023,453.

Specification of Letters Patent.

Patented Apr. 16, 1912.

Application filed October 28, 1909. Serial No. 525,080.

*To all whom it may concern:*

Be it known that we, LOUIS BACHTEN and JEAN GALLAY, citizens of Switzerland, residing at Geneva, Switzerland, have invented certain new and useful Improvements in Surface-Coolers for Automobiles; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of the present invention is to provide an improved radiator or surface cooler for automobiles and the like for cooling the water used in keeping down the temperature of an internal combustion engine. This radiator consists of a series of hollow corrugated or any other similar form of sections which are arranged preferably in parallel relation between two water chambers, one for warm water and the other for the cooled water, and the invention consists in the particular construction and arrangement of the sections and the manner in which they are held, whereby a strong device is economically built up, which also has the advantage of presenting a large radiating surface.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a part front elevation of a set of radiator sections and the plate holding them. Fig. 2 is a part vertical section taken on line *x, y*, in Fig. 1. Fig. 3 is an enlarged elevation of a part of a plate used for holding the sections, the plate being illustrated before it has been punched. Fig. 4 is a horizontal section through a set of sections, and Fig. 5 is a section of the front plate taken on line *y, z*, in Fig. 3 after the perforations have been punched in the plate. Fig. 6 shows a portion of a plate with different shaped perforations therein.

The radiator is formed of a large number of sections arranged preferably in parallel relation, and they are arranged so as to connect two water chambers which are not shown in the drawings. These water chambers form part of the frame work of the apparatus and are connected and communicate with each other through the sections. The sections are hollow, corrugated and usually rectangular in shape and are

made up of two very thin metallic sheets maintained at a small distance apart and united along their edges, being preferably united by having one of the thin sheets folded over on the edge of the other, although the particular means of securing the edges of the plates forming the sections is not essential. The sections are curved to prevent the pressure of the water inflating them and thus reduce the air passages between them.

The radiator sections *a* are open on the top and bottom where they are soldered to the water chambers for the passage of the water through them, and their corrugations *b* are inclined so that they tend to direct the water to the front of the cooler, where the cooling action is greatest, and in order to facilitate the passage of the cooling air between the sections, said air tending to rise as it gets warm. The distance between the sections is maintained at one edge of the sections by transverse bars *c*, these bars being notched to receive the sections and preferably soldered thereon. At one end, and preferably the front end, the sections are held by the front plate *d* which is made of a thin metallic plate perforated by forcing in the edges of the perforation whereby air passages are formed through the perforations to permit the air to pass between the sections. The perforations are preferably made by bending down the four triangular parts of the squares shown in dotted lines in Fig. 3. On opposite sides of the squares the wings *f* are formed by the inturned edges of the perforations, the wings of two adjacent perforations forming parallel holding means for clasping or holding the ends of the radiator sections as shown more particularly in Fig. 4. This serves to hold the sections and also forms a means for securing the plate to the sections and strengthening the whole structure. The intermediate wings *f'*, normally disposed at right angles to the wings *f*, project to insure the distance between the sections. This perforated plate *f* also gives the radiator a neat appearance resembling the honeycomb type of radiator. In Fig. 6 the perforations are shown of a rectangular shape in order to diminish the number of wings *f'* and increase the air passage.

Having thus described our invention, what we claim is:—

1. A radiator comprising radiator sec-

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 tions, and a front plate being provided with perforations, the edges of the perforations being turned inward so that the inturned edges of adjacent perforations will clasp the radiator sections.

5 2. A radiator comprising radiator sections, and a front plate having perforations to form air passages, the perforations having their edges turned to form wings, the wings being adapted to clasp the edges of the sections between them.

10 3. A radiator comprising radiator sections having downwardly and forwardly inclined corrugations, and a front plate having perforations with inturned edges, the inturned edges of adjacent perforations being adapted to clasp a radiator section between them.

15 4. A radiator comprising a series of radiator sections, each section being formed of corrugated plates joined at their edges, and a front plate formed with perforations, the edges of the perforations being turned in to form wings, the adjacent wings of ad-

joining perforations being adapted to embrace the joined edges of the radiator sections. 25

5. A radiator comprising radiator sections of comparatively thin form, and a front plate having a series of perforations therein, each perforation being formed by bending down four triangular abutting parts, the triangular parts forming wings for clasp- ing the edges of the radiator sections. 30 35

6. In a radiator a front plate having perforations formed therein, the edges of the perforations being bent at an angle to the plate to form means for clasp- ing radiator sections between them. 40

In testimony, that we claim the foregoing, we have hereunto set out hands this thirtieth day of July 1909.

LOUIS BACHTEN.  
 JEAN GALLAY.

Witnesses:

L. H. MUNIER,  
 FRANCIS B. KEENE.