T. F. PAYNE.

AUTOVEHICLE RADIATOR.

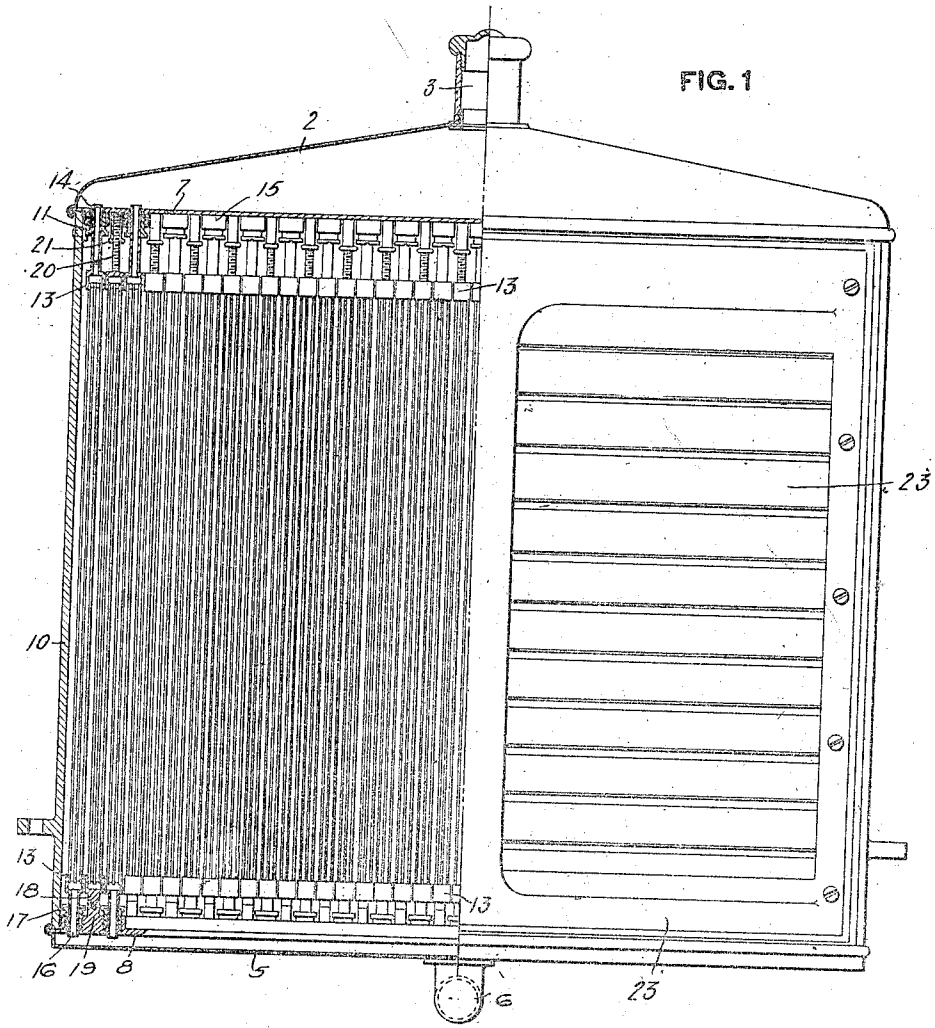
APPLICATION FILED DEC. 6, 1915.

1,228,474.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

FIG. 1



INVENTOR

Thomas F. Payne

by his Attorneys Keller & Keller

T. F. PAYNE.

AUTOVEHICLE RADIATOR.

APPLICATION FILED DEC. 6, 1915.

1,228,474.

Patented June 5, 1917.

2 SHEETS—SHEET 2.

FIG. 2

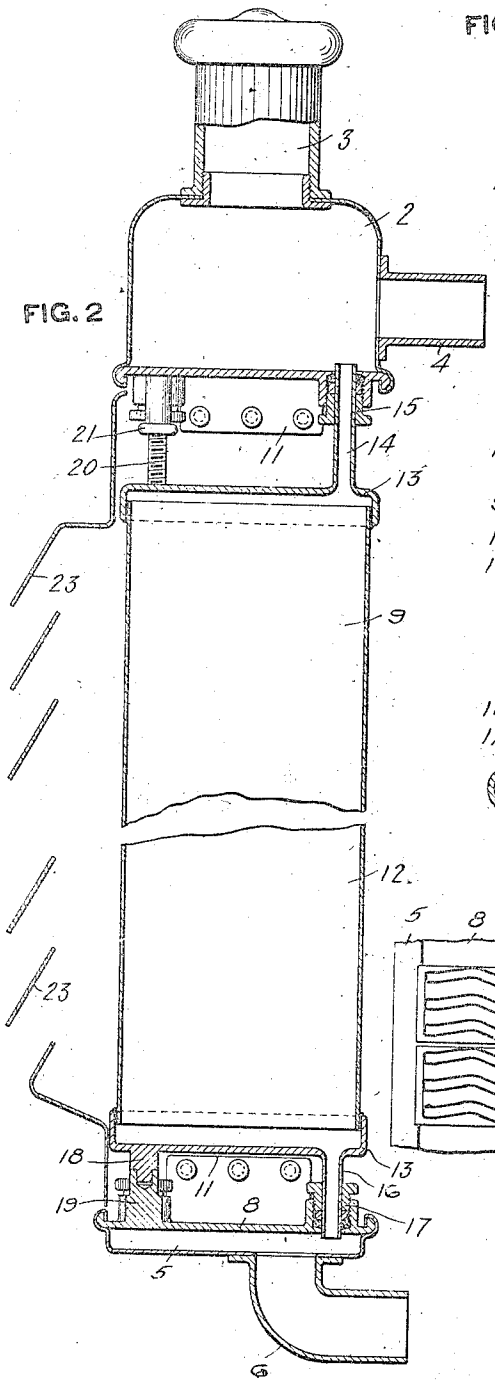
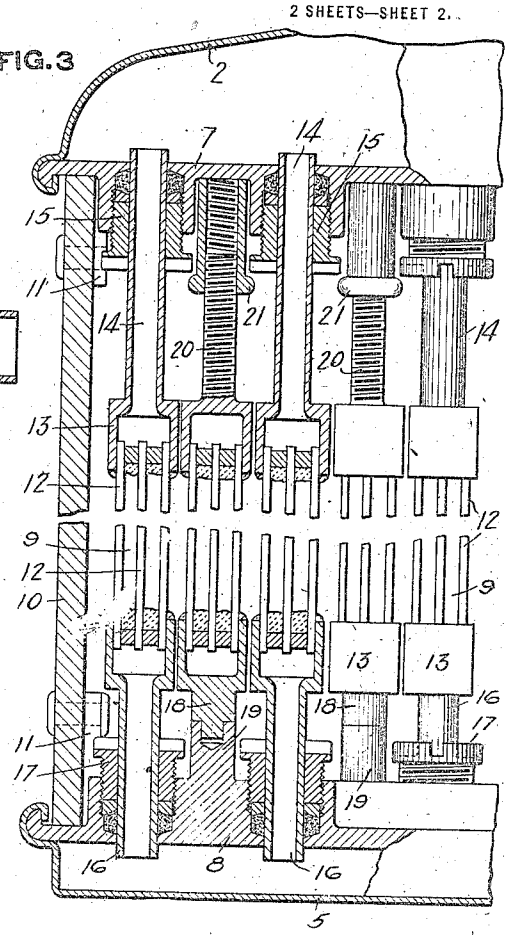


FIG. 3



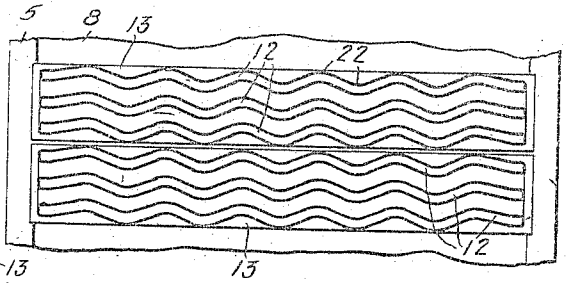


FIG. 4

INVENTOR

Thomas F. Payne

by M. Arthur Keller

his attorney

UNITED STATES PATENT OFFICE.

THOMAS F. PAYNE, OF PITTSBURGH, PENNSYLVANIA.

AUTOVEHICLE-RADIATOR.

1,228,474. Specification of Letters Patent. Patented June 5, 1917.

Application filed December 6, 1915. Serial No. 65,276.

To all whom it may concern:

Be it known that I, THOMAS F. PAYNE, a citizen of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Autovehicle-Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification.

The usual autovehicle radiator is that of the honey-comb or capillary type and consists essentially of a plurality of small, thin-walled tubes, or corrugated or crenelated sheet-metal portions, united to one another at their adjacent edges, as by soldering, in a spaced manner, so as to form between their juxtaposed walls the water passage-ways or cooling chamber of the radiator. Such radiators have many objectionable characteristics, chief of which is their liability to quick development of leaks at the soldered joints, with attending difficulty and expense of repair.

It is the primary object of my invention to provide a radiator in which there obtains the minimum liability to leakage, which affords a maximum cooling or radiating capacity, which permits of ready and cheap repair and which can be manufactured at a low cost.

As such a device my invention consists in the combination with tank sections of a plurality of connecting removable radiator elements each comprising essentially one or more conduits, all as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 is an elevational view partly in section, showing an autovehicle radiator embodying my invention; Fig. 2 is an enlarged transverse vertical sectional view, broken away at the center, of the radiator shown in Fig. 1; Fig. 3 is an enlarged detailed vertical sectional view showing manner of removably mounting the radiator elements; and Fig. 4 is a horizontal sectional view of a plurality of the removable radiator elements; showing a tortuous passage-way between and formed by the longitudinally corrugated opposing walls of the adjacent conduits.

Referring to Figs. 1, 2 and 3, the numeral 2 indicates an inlet tank or head of the radiator having the usual capped filling inlet 3 and the nipple 4 for connection with the engine (not shown), while the numeral 5 indicates the bottom or outlet tank of the radiator, having the engine connecting nipple 6. The bodies proper of these tanks are preferably formed of thin sheet metal. The upper tank 2 has a bottom or base piece 7 and the lower tank a top wall or piece 8, both of which are preferably heavier in cross section than the bodies of the tanks, for the reason that they support between them a plurality of water cooling units hereinafter more fully described. The upper and lower tanks 2 and 5 may be tied together in any suitable manner conforming with usual radiator construction. In the present instance this is shown as being effected by the provision of side plates 10 to which the tanks are connected, as by providing the bottom plate of the upper tank and the top plate of the lower tank with riveting flanges 11.

Each radiator unit 9 is shown as comprising a plurality of narrow or blade-like tubular sections or conduits 12 mounted in headers 13 that constitute chambered means for communicating connection with the tanks of the radiator. More particularly, as shown in Figs. 2 and 3, the upper header is provided with an upwardly extending nipple or hollow shank 14 received by an opening in the bottom of the tank or member 7. This joint is sealed against leakage preferably by means of the packing box arrangement 15. The lower header 13 also connects with the lower tank 5 in a like manner by means of a nipple 16 and packing box arrangement 17. However, the nipples 14 and 16 of these headers, preferably have no threaded connection with the tanks, but are smooth so as to afford a slip joint or yieldable union between the tanks and the radiator unit 9 not only for ready removal and replacement of a unit but also to provide a connection that will yield under swaying or stressing of the radiator, without impairing its water tight seal. I therefore provide means for locking the radiator units 9 against undesired vertical shifting or vibratory creepage, by forming the lower header with a boss portion or stud 18 that is received by a raised seat 19 carried by the top of the lower tank, and by forming the upper header with a stud 20 on which is threaded a sleeve nut 21 abutting the bottom of the upper tank or lower

plate 7, holds the boss 18 to the seat 19, thereby effectually locking the unit or units 9 between the tanks. It will of course be understood that the spacing of the upper header 13 from the bottom of the tank 2, as well as the length of the stud 20, is such that with the nut 21 fully retracted, and with the packing boxes 15 and 17 opened, the unit 9 may be removed by shifting it upwardly to free the boss 18 from its seat and the nipple 16 from connection with the lower tank, after which the unit may be shifted laterally and lowered to free the nipple 14 from the upper tank.

The radiator conduits 12 may be formed of thin sheet metal and are preferably very narrow in width and a great number are employed so as to provide ample radiating capacity. I therefore place the headers 13 closely together so as to provide a desirable uniformity in space between all of the conduits, and in order not to inconveniently restrict the space between the packing boxes 15 and 17, I connect the units 9 with the tanks alternately at the front and rear of the radiator; the stud 18 and its seat 19 and the threaded stud 20 and its nut 21 being disposed intermediate and preferably in alinement with the packing boxes of the joints, as clearly shown.

In Fig. 4 I have shown the conduits 12 as being symmetrically longitudinally corrugated intermediate the headers, as at 22, so that there is formed by the opposing walls of adjacent conduits a tortuous passage-way for the air currents which greatly augments the cooling action of the air.

As shown in Figs. 1 and 2, the radiator may be provided with an ornamental screen 23 that may be of any suitable construction, the arrangement shown being louvered or such as to screen the units 9 and associated parts without impeding free passage of the air to the radiator element.

The advantages of my invention will be readily appreciated. It is apparent that I provide a durably constructed radiator having great radiating or cooling capacity; that should a radiator unit 9 prove defective or it be desired to remove it for any purpose whatever, it may be readily replaced by another unit without tearing down or disassembling the whole radiator or, if another unit be unavailable, the respective packing boxes or openings in the tanks may be closed by screw threaded caps so as to render the radiator operative as to the remaining units.

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

1. In an autovehicle radiator, upper and lower tank portions, a removable radiator unit connecting the tank portions, said unit comprising a conduit and terminal headers, a positioning support for one of the headers, carried by an opposing wall of a tank portion, means for engaging said support carried by the header, and means carried by the other header and adapted to coöperate with the opposing wall of its adjacent tank portion to hold the first header in engagement with the support.

2. In an autovehicle radiator, upper and lower tank portions, a plurality of removably mounted radiator units comprising headers and connecting conduits, means constituting communication between each header and a tank portion, a positioning support for each header carried by a tank portion, and means for removably connecting the other headers to the other tank portion whereby the units are secured between said upper and lower tanks.

3. In an autovehicle radiator, upper and lower tank portions, a plurality of removably mounted units comprising conduits and headers, the units having communication with the upper and lower tank portions, positioning means carried by one tank portion and means carried by one header to cooperate therewith, and coöperating complementary clamping means carried by the other tank portion and other header of each unit to secure the unit between the upper and lower tank portions.

4. In an autovehicle radiator, upper and lower tank portions, and a plurality of removably mounted radiator units comprising conduits and headers, means constituting communication between each header and a tank, a stud carried by a header of each unit, means mounted on the tank for engagement with the stud, and coöperating means carried by the second header engaging the opposing wall of the adjacent tank portion to maintain said unit between the tanks.

In testimony whereof I have hereunto set my hand.

THOMAS F. PAYNE.