J. B. D. L. CHARDARD.

MOTOR VEHICLE RADIATOR.

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1,416,945.

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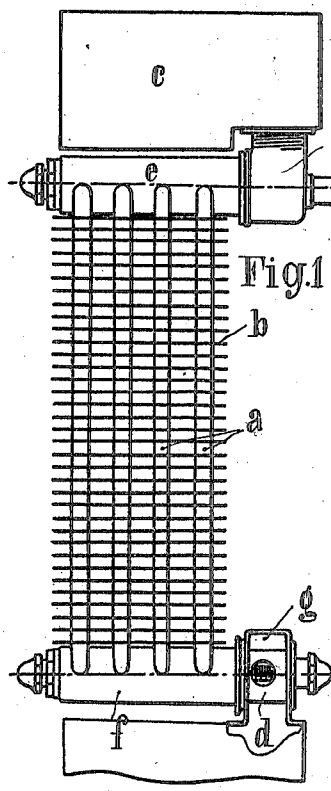


Fig.1

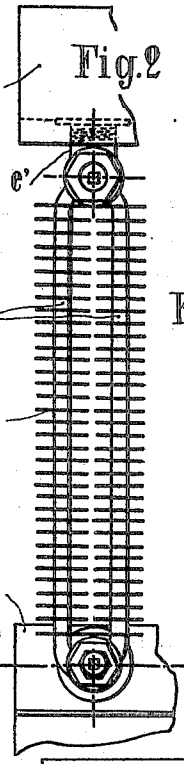


Fig.2

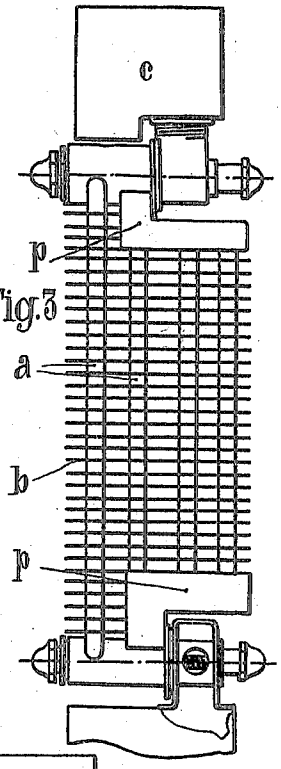


Fig.3

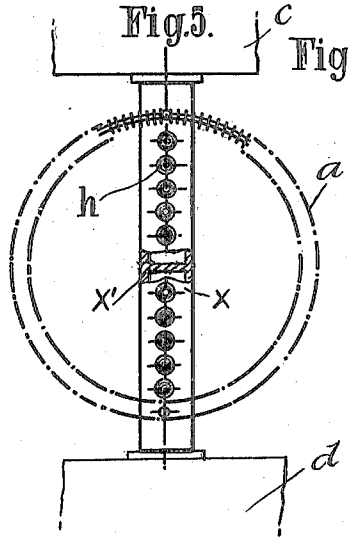


Fig.5.

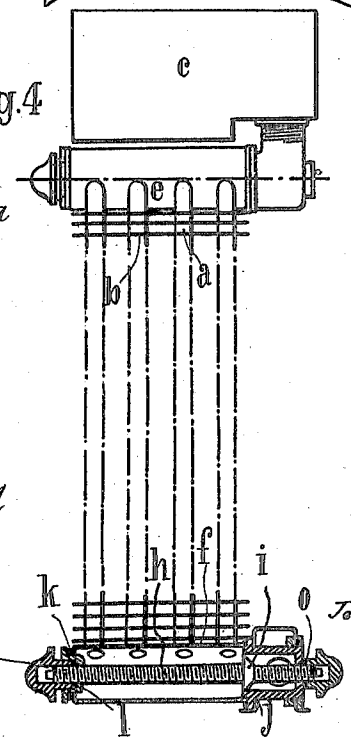


Fig.4

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MOTOR-VEHICLE RADIATOR.

1,416,945. Specification of Letters Patent. Patented May 23, 1922.

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To all whom it may concern:

Be it known that I, JEAN BAPTISTE DOMINIQUE LÉON CHARDARD, citizen of the Republic of France, and resident of Paris, France, (post-office address 41 Rue Ribera,) have invented new and useful Improvements in Motor-Vehicle Radiators, which improvements are fully set forth in the following specification.

This invention relates to radiators for motor vehicles of the kind comprising elements independent of each other and capable of being replaced in case of damage.

The radiator or cooler according to the present invention is chiefly constituted by elements of variable form and position—curved, straight, vertical, horizontal, etc., mounted on collectors in a manner enabling them to be readily dismantled; and the characteristic features of the radiator are the mode of assemblage and the provision of a regulator by means of which it is possible to vary the quantity of water passing through each element and, in case of necessity, to stop the circulation of water therein, (for instance in case of a leak), without interfering with the circulation in the other elements.

The accompanying drawing illustrates, by way of example, a radiator with the features forming the subject of the present invention.

Figure 1 is a side elevation of a radiator element, of which—

Figure 2 is a front elevation.

Figures 3–5 show modified construction.

As shown in Figures 1–3, each element is constituted by a convenient number of tubes *a* provided with cooling ribs *b:* said tubes *a* establishing communication between an upper collector *c* and a lower collector *d*.

The tubes *a* may be substantially straight and arranged vertically in pairs, as represented in Figures 1, 2, 3 and 4, or they may be circular, as indicated diagrammatically in Figure 5; and in the latter case, they will be arranged one within another in concentric relation.

The assembling is done in the following manner:

In the upper tank *c* of the radiator is secured by any suitable means, for instance by screwing, a vertical union *e'* (Figure 1) which, in the example illustrated in the drawing, receives the upper junction pipe *e* of the element.

The tubes *a* terminate at the bottom end in a second junction pipe *f* which is connected to the bottom collector *d* either by means of a union similar to the union *e'* attached to the tank *c*, or by means of a feeder *g* as shown in Figure 1. The connection to the upper and bottom tanks may be varied as desired and it is possible to use either the union or the feeder for any one of, or for both, the tanks *c*, *d*.

Whatever the connection utilized—whether by feeder or union—a threaded rod *h* (see Figure 4) is provided which is disposed longitudinally in the junction pipe *f* and projects beyond the same at opposite ends, one end extending into the feeder and through an opening in the end wall thereof and carrying a valve *i*. This valve is located within the feeder, the free edge of which latter constitutes a seat therefor, so that when said valve is disposed against its seat it will shut off communication between the feeder or union and the pipe *f*. At the top there is, similarly, a screwthreaded rod arranged in like manner and carrying a valve intercepting, when it is pressed against its seat, any communication between the union *e'* and the junction pipe or branch *e*.

The two junction pipes *e f* and the tubes *a* are secured together to form one piece which constitutes one element. These tubes *a* could be replaced by blades or other equivalent parts such as are used in radiators.

When the element is separated from the tanks *c* and *d*, it will be noticed that the ends of the two rods *h* project from the same. In connecting the element to the tanks the two junction pipes *f*, *e* are passed over the rods *h* until their adjacent edges abut against the bearings *j* on the feeders or unions, at which point there are placed washers forming a joint that can withstand a temperature of 300–400°.

At the front end of each of the junction pipes *e*, *f* is also arranged a washer *k* secured by means of a nut *l* mounted on the front end of the corresponding rod *h*, a part of each nut *l* projecting into the interior of the junction pipe in order to center the lat-

ter on the screwthreaded rod *h*. By tightening up the nuts an absolutely tight joint of the whole is ensured. On the front end of the screwthreaded rod *h* and projecting into a smooth recess in the nut is also screwed a lock nut *m* closed at one end and engaging the terminal of said rod which is made square for manipulating the rod. The rear ends of the rods are threaded through the previously mentioned openings in the end walls of the feeders or unions and are likewise fitted with lock nuts which are similar to those just described.

The valves *i* having been suitably moved away from their respective seats, and the apparatus assembled as described, it will be understood that water will circulate through the element and become cooled by heat dispersion from the ribs.

In case of a leak occurring, and it is desired whilst traveling to cut out the damaged element, it is necessary only to unscrew the lock nuts *m* and to turn by means of a suitable spanner the screwthreaded rods *h* so as to shut the valves *i* down on their seats. The turning of the rods *h* is rendered possible as they are supported adjacent their ends in the openings in the nuts *l* and the feeders or unions. As soon as the valves *i* are in contact with their seats, the element is cut out, and the leak stopped.

On arriving at the destination, or when the chauffeur has time to spare, he can detach the nuts *l* and remove the damaged element and substitute another. He then puts back the nuts *l* and turns the screw threaded rods *h* so as to effect the opening of the valves *i* to give the desired flow of the water, and finally secures the whole by means of the lock-nuts *m*.

In certain cases, when the radiator is of a limited width, the element could be arranged as shown in Figure 3, so as to give it nevertheless the desired depth, using bends *p* as junction pipes for some of the tubes.

In the case of circular tubes of the type represented in Figure 5 the assembling would still be done by means of screwthreaded rods *h*. In these conditions, the hot and cold water tanks would be connected to a central feeder *x* divided into two parts by a central partition *x'*. Whilst still adhering to the described method of assembling the component parts of the element or unit, it is possible to eliminate the valves, which of course removes the possibility of regulating the flow.

The advantages of the use of the radiator elements according to the present invention are very great, and the chief ones may be summed up as follows:

In case of a leak occurring in the cooling "block" of a radiator, it is sufficient to close the regulator valve of the damaged element and then continue the journey, or after the said operation, to replace the said element by a spare one, and to re-open the regulator, this operation taking but a few minutes. This practically eliminates leakage troubles.

In winter, or in cold countries, the regulators of each element can be slightly closed in order to obtain less cooling and thus avoid freezing; this makes it possible to obtain a variable circulation.

In winter one or more elements could be cut out completely by closing their regulators.

In very hot weather, all the regulators can be opened, or the elements replaced by elements with a larger radiating surface. This makes it possible to obtain a variable radiating surface.

Examination and cleaning are facilitated.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An automobile radiator unit comprising, in combination with the hot and cold water headers, a union rigidly attached to each header; a junction pipe connected to each union; a plurality of water-circulating elements connected at opposite ends to said junction pipes; a connecting rod extending through each junction pipe and the corresponding union for fastening the two together, each rod being rotatable from the exterior of the radiator unit, and means carried by each rod and operable by the rotation thereof for controlling communication between the junction pipes and the unions.

2. An automobile radiator unit comprising, in combination with the hot and cold water headers, a union rigidly attached to each header; a pair of parallel junction pipes secured to said unions; a plurality of water-circulating elements connected at opposite ends to said junction pipes; a threaded rod disposed within each junction pipe and projecting at one end into the adjacent union; and a valve on each rod to control communication between the respective junction pipe and its connected union, said rods being operable from the exterior of the radiator unit to effect the displacement of said valves.

3. An automobile radiator unit comprising, in combination with the hot and cold water headers, a union rigidly attached to each header; a pair of parallel junction pipes secured to said unions; a plurality of water-circulating elements connected at opposite ends to said junction pipes; a threaded rod disposed within each junction pipe and projecting at opposite ends beyond the same, one end of the rod extending into and through the adjacent union; a centering nut threaded on each rod and serving to close the end of the respective pipe opposite to that to which the union is connected, each

rod having squared terminals to permit its being turned from the exterior of the radiator unit; a valve on each rod to control communication between the respective junction pipe and its connected union and displaceable consequent upon the turning of the rod; and lock nuts threaded on the projecting ends of the rods and fitting over their squared terminals.

4. An automobile radiator unit comprising, in combination with the hot and cold water headers, a pair of junction pipes, one associated with each header; water-conducting means between the headers and the junction pipes; a plurality of water-circulating elements connected at opposite ends with said junction pipes; a rod movably mounted in each junction pipe and fastening it to the water-conducting means, said rod being operable from the outside of the junction pipe; and valves carried by said rods for controlling communication between the water-conducting means and the junction pipes and shiftable consequent upon the movement of the rods.

5. An automobile radiator unit comprising, in combination with the hot and cold water headers, a pair of junction pipes, one associated with each header; water-conducting means between the headers and the junction pipes; a plurality of water-circulating elements connected at opposite ends with said junction pipes; and a rod fastening each junction pipe to the water-conducting means and operable from the exterior of the radiator unit, said rods having means for controlling the passage of the water through the water-conducting means to or from the circulating elements.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JEAN BAPTISTE DOMINIQUE LÉON CHARDARD.

Witnesses:

ALPHONSE NICOLAS,

GEO. CARRIERE.