Aug. 30, 1932. J. A. WHITE 1,874,400

RADIATOR STRUCTURE

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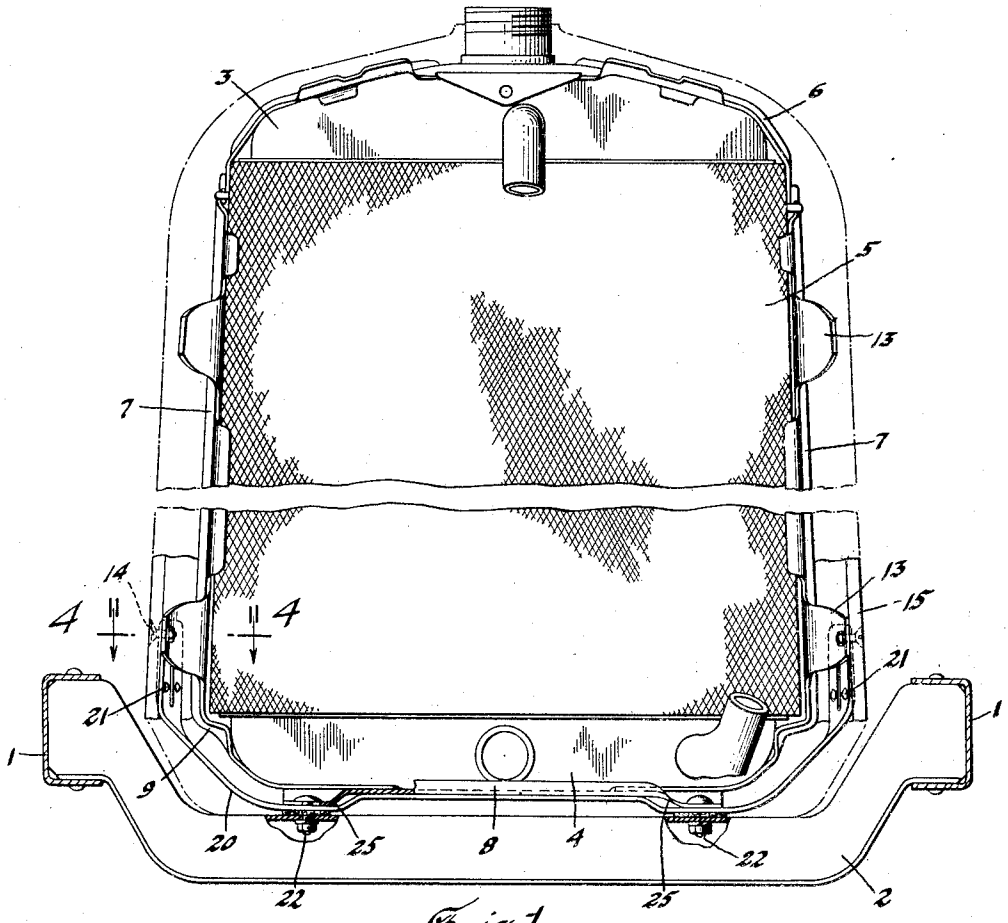


Fig. 1

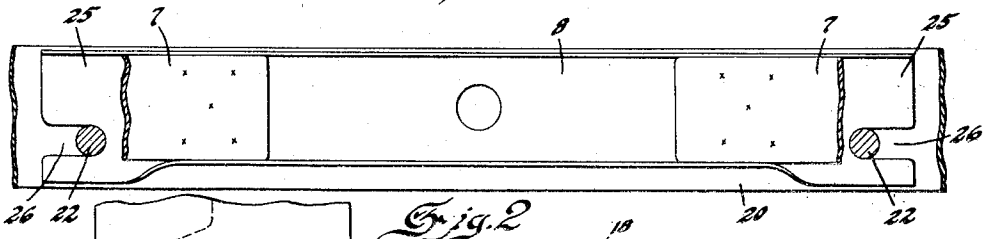


Fig. 2

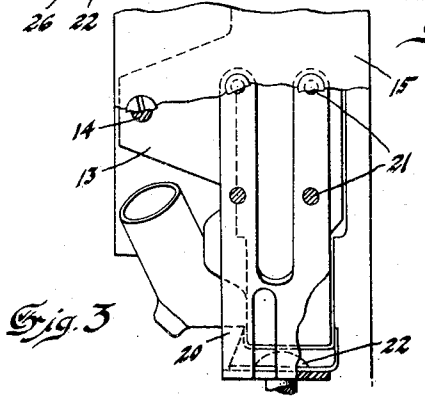


Fig. 3

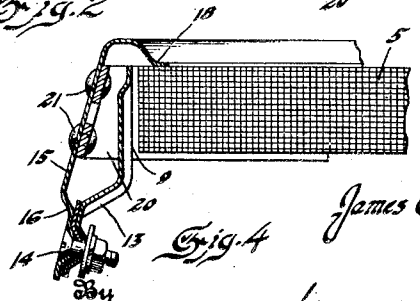


Fig. 4

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RADIATOR STRUCTURE

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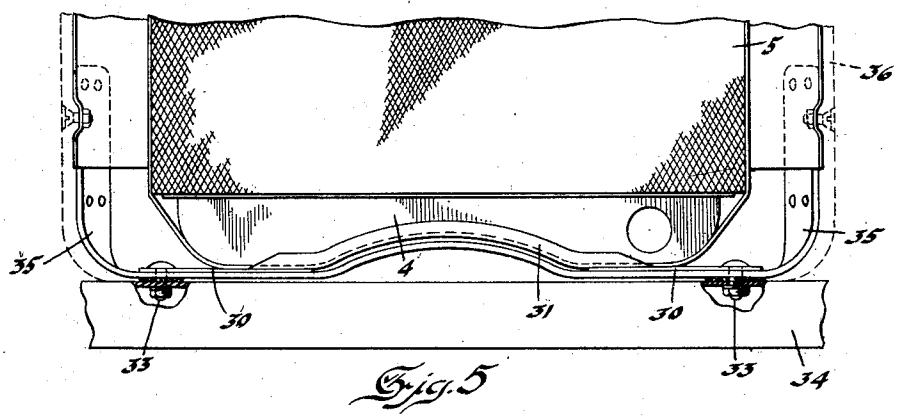


Fig. 5

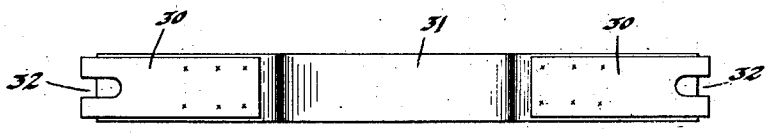


Fig. 6

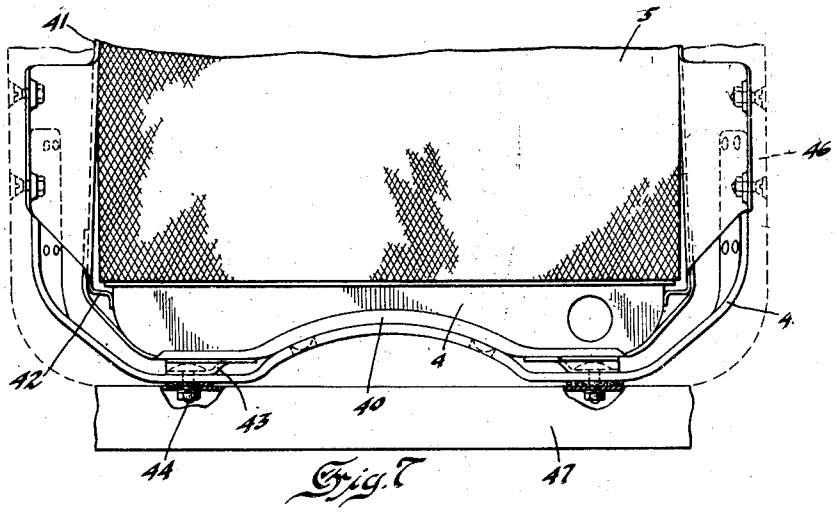


Fig. 7

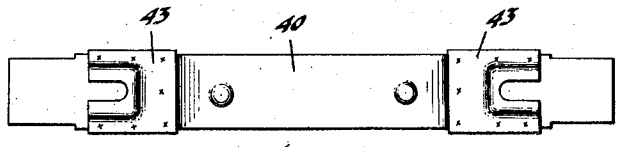


Fig. 8

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UNITED STATES PATENT OFFICE

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RADIATOR STRUCTURE

Application filed December 2, 1929. Serial No. 411,045.

This invention relates to improvements in radiator structures and particularly to the construction of the general type of radiator that forms a part of the cooling system of an internal combustion engine, such as is used on motor vehicles or the like.

The invention is especially intended for use with and has been embodied in a more or less conventional structure, wherein the heat radiating unit is encased within and suspended from an ornamental shell that is to be attached to and mounted upon a chassis frame or other suitable support. The usual suspension for the heat radiating unit involves the use of a hoop or band to encircle and hold the spaced inlet and outlet headers and intermediate core, comprising the heat radiating unit, in assembled relation, which is provided at intervals with rearwardly and outwardly projecting ears for attachment to the rear edge or hood ledge of the shell. The radiating unit is thus located forward the point of attachment and instead of being directly mounted upon and rigidly secured to the chassis frame, its weight is carried by the shell which together with the fact that the rearwardly and outwardly projecting ears are more or less flexible, serves to a great extent to free the radiating unit from racking strains and damaging side thrusts incident to frame weaving, road shocks and the like.

In practice it has been found that in some cases, relative movement of a certain nature occurs between the shell and radiating unit, and the inner marginal edge at the front of the shell, which is located adjacent to or in contact with the forward face of the core, scrapes or digs into the thin and delicate metal of the core and causes leaks or other damage. To avoid this difficulty and still retain the desirable features of the structure referred to, is one of the primary objects of the present invention and to this end it is proposed to provide a simple and economical arrangement for steadying the radiating unit in the shell and reducing the scraping or rubbing tendency of the front face of the core and adjacent edge of the shell.

Additional objects and feature of advantage will become apparent during the course of the following specification when taken in connection with the accompanying drawings.

In the drawings:

Fig. 1 is a rear elevation of a radiator illustrating an application of the present invention.

Fig. 2 is a top plan view with parts broken away, of the bottom strap of the hoop.

Fig. 3 is a side elevation of the lower portion of the radiator with parts broken away.

Fig. 4 is a transverse section taken on line 4—4 of Fig. 1.

Fig. 5 is a rear elevation of a radiator showing an alternative construction.

Fig. 6 is a bottom plan view of a part of the structure shown in Fig. 5.

Fig. 7 is a rear elevation of a radiator illustrating another modification.

Fig. 8 is a bottom plan view of a portion of the structure shown in Fig. 7.

Referring to the drawings, the reference numerals 1—1 indicate a pair of longitudinally extending chassis frame members and 2 is a transverse frame member on which the radiator is to be mounted. The radiating unit includes the inlet and outlet headers or tanks 3 and 4 respectively and an interposed core 5 preferably of the cellular type and comprising a number of preformed plates pressed from sheet copper and arranged in spaced pairs to provide a series of vertically disposed water passages connecting the top and bottom headers with intervening open spaces for the flow of air currents. Encircling the core and tank assembly is a hoop or strap for holding the parts in assembled relation and for anchoring or suspending the radiating unit in the shell. This strap may consist, as in the present case, of a top strap 6, a pair of side straps 7, and a bottom strap 8 properly secured together and provided with suitable means to contract the hoop and draw it tightly around the radiating unit. One way of contracting the hoop may consist in bending adjacent end portions of the straps 6 and 7 back upon themselves along inclined lines to form internesting cam surfaces which when moved laterally with respect to each

other will effect a wedging action. Adjacent the bottom of the core 5 each of the straps 7—7 is preferably provided with a lateral offset or interned portion 9 for contact with the side wall of the bottom tank 4 to space the portion of the strap adjacent the side of the core away from the core so that any strains or side thrust in the hoop will be delivered directly on the wall of the tank which is of stronger metal than the thin copper plates in the core. The lowermost ends of the strap 7 are turned inwardly beneath the bottom tank and are secured as by welding, soldering or the like to the bottom strap 8 whereby the straps 7 and 8 afford in effect a saddle that carries the weight of the radiating unit.

At regular intervals the straps 6 and 7 are shown provided with rearwardly and outwardly projecting feet or ears 13 for attachment adjacent their rearward edges as by means of fastening bolts 14 with the rearmost margin 16 of the ornamental casing or shell 15. This rearward portion 16 of the shell is preferably offset inwardly to provide a rest for the engine bonnet or hood while the forward edge of the casing wall is turned inwardly and rearwardly as at 18 forming a marginal head, whose inner edge is located adjacent or in contact with the front face of the core 5.

To mount the radiator, the shell 15 may be provided with a mounting strap anchor band 20 secured at its ends as by rivets 21 to the side wall of the shell and as by hold-down bolts 22 to the frame member 2. Thus the radiator shell is supported upon the chassis frame and the radiating unit in turn is suspended in the shell through the rearwardly extending ears 13 of the hoop.

In order to steady the heat radiating unit in the shell and prevent the marginal edge 18 of the shell scraping or digging into the front face of the core 5, it is proposed to tie or connect the hoop encircling the core and tanks to the shell or supporting member in a manner to restrain the tendency of the edge portion 18 and core to move toward each other.

For this purpose the opposite ends of the bottom strap 8 may be extended beyond the point of connection of the side straps 7 to form ears 25 which may be provided with open-ended slots 26 for registry with the bolt openings in the strap or bar 20 so that the ears may be secured beneath the heads of the bolts 22. This bottom strap 8 and its extensions or ears 25 are preferably of light gage sheet metal, so formed as to be slightly flexible in a direction at right angles to the plane of the strap while it will be relatively rigid or non-flexible in the direction of its plane. Thus the ears 25 will not transmit strains to the radiating unit nor hold the unit rigid relative to the chassis frame member but it will resist the tendency for to and fro movement of the face of the core and the the marginal edge 18 relative to each other.

In Figs. 5 and 6 the invention is shown applied to a radiator in which the structural details are slightly different from those heretofore described. In this case the bottom and side portions of the anchorage hoop are formed integral or in one piece and the locating ears instead of being extensions of the bottom strap consist of separate plates 30 welded or otherwise secured to the bottom portion 31 of the hoop and provided with notches 32 through which extend the fastening bolts 33 for securing to the support or frame 34 the anchor strap 35 which supports the shell 36.

Another type of hoop is shown in Fig. 7 wherein 40 is a bottom strap whose opposite end portions are turned upwardly and secured as by soldering or welding to the side straps 41, the lower portion of the side straps being turned inwardly for engagement with the side wall of the bottom tank as at 42. As in the arrangement shown in Fig. 5, slotted plates 43 are provided for attachment to the underside of the strap 40 and for detachable engagement beneath the heads of the fastening bolts 44 which secure the anchoring strap or bar 45 of the shell 46 to the frame member 47.

It will be apparent that by the use of separate ears 43, the invention may be applied to those radiators already in use, or may be embodied by the manufacturer in his present product without requiring material changes in methods of manufacture or the necessity for making up new dies or revising the existing machine set-up.

Various modifications of the invention may be readily made as will be apparent to those skilled in the art.

I claim:

1. In a radiator structure for motor vehicles, a shell, a supporting strap therefor attachable to the vehicle frame, a radiating unit, and a hoop encircling said unit including a pair of side straps having rearwardly and outwardly projecting ears for attachment to the rearward edge of the shell to suspend the unit in the shell and a bottom strap having ears extending therefrom and engaging the attachments between the strap and frame, for steadying the suspension of the unit in said shell.

2. In a radiator structure, a core unit, a shell through which the radiator structure is mounted on a support, said shell having its rear edge portion connected with the core unit to directly suspend the core unit therein and its front edge portion adjacent to but unconnected with the face of the core, and means to prevent movement of said front edge portion and the face of core to and from each other, including a plate-like element flexible in directions other than in the plane thereof, interposed between the bottom of

the core unit and the shell with its plane placed in the direction of the to and fro movement to be resisted.

3. In a radiator structure for motor vehicles, a shell through which the radiator structure is mounted on the vehicle, a core unit enclosed within and carried by the shell, and a flexible but inextensible tie connection between the bottom of the core and the shell to steady the core and hold it against movement in a direction transverse to the face of the core while permitting movement in other directions.

In testimony whereof I affix my signature.

JAMES A. WHITE.