Jan. 22, 1935. D. T. MacLEOD 1,988,693

HEATER

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Fig. 1.

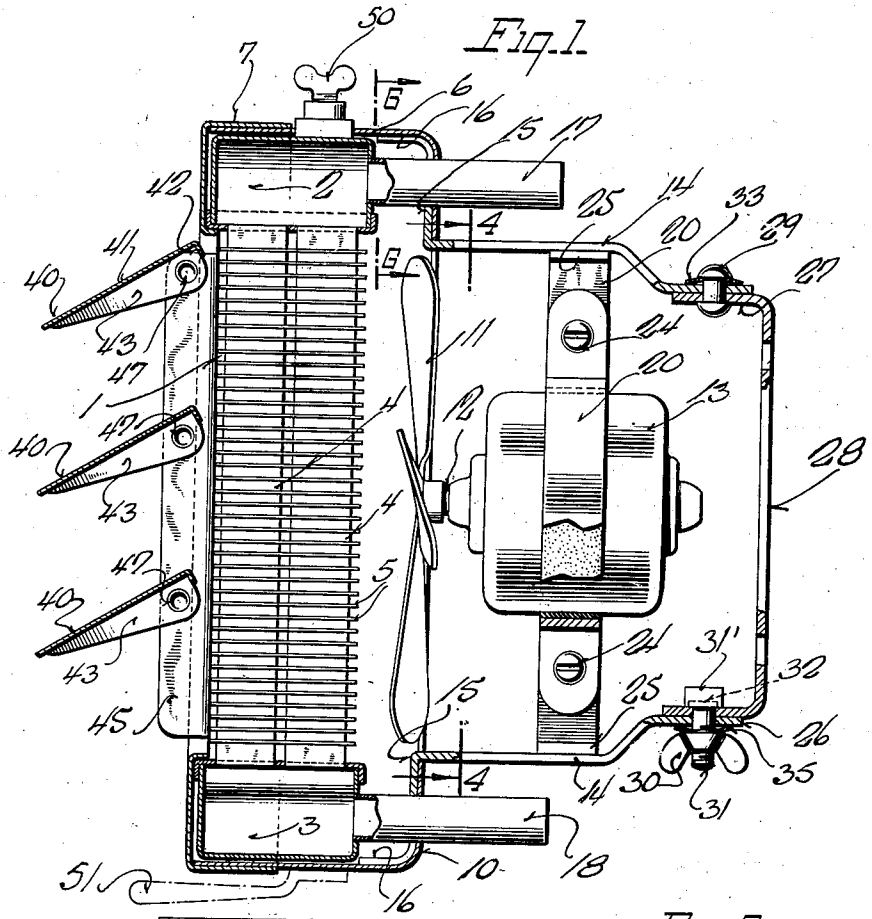


Fig. 4.

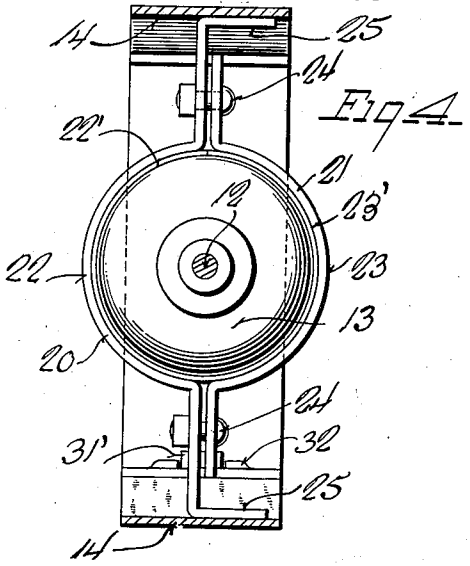
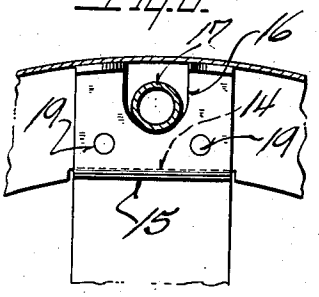


Fig. 6.



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Fig. 2.

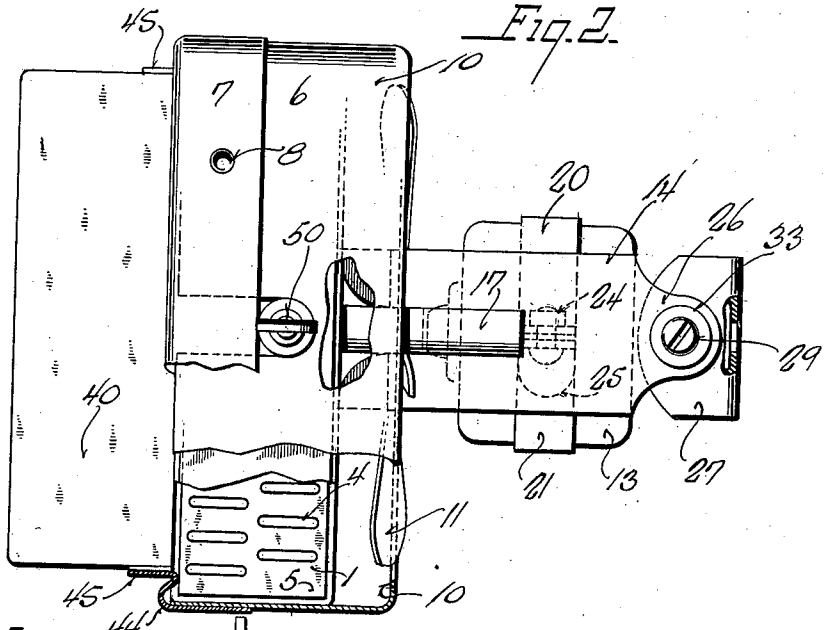


Fig. 3.

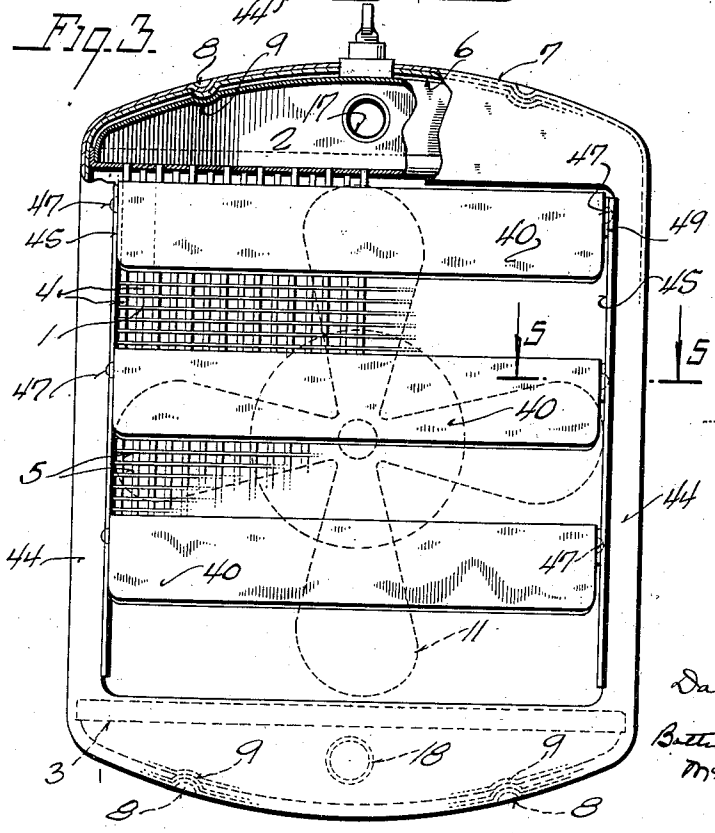
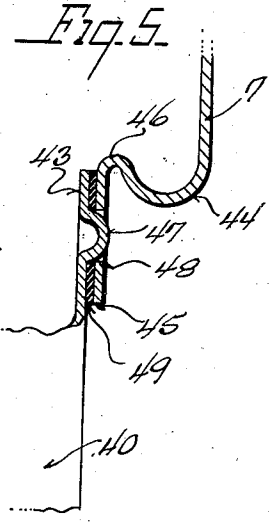


Fig. 5.



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UNITED STATES PATENT OFFICE

1,988,693

HEATER

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Application December 21, 1931, Serial No. 582,211

4 Claims. (Cl. 257—137)

This invention relates to a space or compartment heater and while particularly designed and adapted for use in heating automobiles is also well adapted for other uses and applications.

One of the principal objects of the present invention is to provide a heater of this character which is simple and durable in construction, attractive in appearance, reliable and efficient in operation, and more compact for a given size core than any prior heater of this type.

Another object of the invention resides in so organizing the component parts of the heater as to relieve not only the radiator core but also its supply and return pipes of unnecessary or excessive strain.

Other novel features of the invention reside in the particular structural organization of the louvers with the shell and in the manner of mounting the heater and of combining the motor with the mounting. The net result of these features is to give convenient and complete control over the direction of flow of the heated air with a construction extremely simple, balanced and compact.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, and in which:

Figure 1 is a view partly in side elevation and partly in longitudinal vertical section showing a heater embodying the present invention;

Figure 2 is a plan view of a heater shown in Figure 1, parts being broken away and shown in section for the sake of illustration;

Figure 3 is a view of the heater in front elevation with parts broken away and shown in section for the sake of illustration;

Figure 4 is a view in section taken on line 4—4 of Figure 1 and showing the motor support;

Figure 5 is a fragmentary detail view in section taken on line 5—5 of Figure 3 and illustrating the louver mounting; and

Figure 6 is a fragmentary detail view taken in section on line 6—6 of Figure 1 and illustrating how the supporting arms are organized with the casing or housing for the radiator core.

Referring to the drawings, wherein for the sake of illustration is shown one embodiment of the invention, the numeral 1 designates a radiator core consisting of an upper tank or header 2, a lower tank or header 3, and water tubes 4 connecting the upper and lower tanks 2 and 3 and provided with the usual heat dissipating fins 5.

An open-ended housing or casing encloses the core and consists of a rear section 6 in which the core 1 is rather snugly fitted and a front section or shell 7 which telescopes or fits over the rear section and is releasably held in assembly therewith by virtue of the coaction of inwardly pressed bosses 8 of the shell with correspondingly formed sockets 9 of the section 6. The sockets 9 present inward projections on the section 6 which engage in depressions in the tanks 2 and 3 to secure the radiator core in position in the housing.

The rear section 6 of the casing is provided with an angular extension 10 providing, around the rear opening of the casing or housing, a shroud for a fan 11. The fan 11 is secured to and rotated by the armature shaft 12 of an electric motor 13.

For supporting the motor and fan in proper relation to the shroud 10 and to the radiator core 1, upper and lower supporting arms 14 are provided. The arms 14 are of identical construction though oppositely arranged. Each of these arms has an angular extension 15 terminating in a bifurcated or slotted end 16. The upper arm 14 is engaged with the upper portion of the fan shroud and its bifurcated end straddles the water supply pipe 17 which leads through an opening in the portion 10 of the radiator housing to the top tank of the radiator core. The angular portion 15 of the lower arm 14 engages the lower portion of the fan shroud and its bifurcated end straddles the return pipe 18 leading from the lower tank 3 of the radiator core out through an opening in the portion 10 of the radiator housing. The angular portions 15 of both the upper and lower arms are suitably secured to the fan shroud portion of the section 6 of the casing in any suitable way but preferably by spot welds 19.

The motor 13 is supported on and between these arms 14 by clamping members or straps 20 and 21. As shown to advantage in Figure 4, the clamping members 20 and 21 have semi-circular portions 22 and 23 provided with cushioning friction linings 22′ and 23′ to enhance the frictional engagement and clamping action of these semi-circular portions on the motor when they are urged into clamping engagement by the clamping screws and nuts 24. These lin-

ings 22' and 23' also have the important function of reducing or cushioning vibration and minimizing noise, that is, they tend to deaden any sounds that might result from the operation of the motor and fan. The clamping member 21 is shorter than the clamping member 20 and the clamping member 20 has angular extensions or attaching portions 25 abutting the upper and lower arms 14 and suitably secured thereto as by spot welding.

The rearward ends of the upper and lower arms 14 are bent toward each other and terminate in apertured and flat attaching portions 26 which are engaged with similarly formed and apertured portions 27 of a supporting bracket 28. These arms 14 are pivotally interconnected with the supporting bracket 28 by means of a rivet 29 and a wing nut 30 and bolt 31. The bolt 31 and rivet 29 are vertically alined so that the heater may be swung to any desired angular position with respect to the bracket. A spring washer 33 is interposed between one head of the rivet and the arm 14 to allow of turning movement of the upper arm 14 relative to the bracket 28 while yieldingly resisting this movement whereby the rivet 29 and spring washer 33 tend to maintain any selected angular adjustment of the heater assembly relative to the bracket 28. Retention of any particular angular adjustment may be further insured by tightening up on the wing nut 31. The head 31' of the bolt 31 is seated between lugs 32 on the bracket 28 so that the bolt 31 is held against turning. This facilitates tightening up and also loosening of the wing nut 30. A spring washer or lock washer 35 may be used to hold the wing nut and bolt in any adjustment.

The direction of flow of the current of heater air delivered from the heater is controlled not only by selecting the angular position of the heater about a vertical axis with respect to its bracket but is also determined by the action of louvers designated at 40 and operatively associated with the front opening of the radiator housing or casing. Any suitable number of these louvers may be provided. In the construction illustrated, three are shown. Each louver is constructed of sheet metal and consists of a flat body portion 41 reinforced along its upper edge by a flange 42 and having at its ends reinforcing and attaching flanges 43 which may taper toward their lower ends.

The portions 44 of the shell or front section 7 of the radiator housing which lie along the sides of the front opening thereof are provided with mounting strips 45. These strips 45 are integrally and resiliently connected to the portions 44 by inset and curved connecting portion 46, as illustrated to advantage in Figures 1, 2 and 5. The flanges 43 of each louver are provided with transversely alined and outwardly pressed or directed mounting bosses 47 engageable in transversely alined pivot openings 48 provided therefor in the mounting strips 45. Encircling at least one of the bosses 47 of each louver and interposed between the portion of flange 43 surrounding the boss and the adjacent portion of the mounting strip 45 is a friction washer 49.

The parts are so proportioned that when the louvers are assembled with the mounting strips 45 these strips are slightly flexed or tensioned and due to their stiffly resilient character and mounting, frictionally engage the mounting bosses 47 and the friction washer 49 to such extent that the louvers, while adjustable, are retained in any selected pivotal adjustment. The strips 45 are, however, sufficiently resilient to provide for convenient assembly and disassembly of the louvers.

The front section or shell 7 and the louvers 40 may be chromium plated to enhance the appearance of the heater.

A conventional vent 50 may be provided for the top tank 2 of the radiator core and the section 6 appropriately slotted to accommodate the same.

While the casing or housing of the heater may be readily grasped to adjust it angularly, it may be desirable to provide a handle 51 to facilitate this angular adjustment as illustrated in dot and dash lines in Figure 1.

By having the supporting arms 14 act through the casing or housing to support the radiator core and also by utilizing these arms to support the motor and fan, the radiator core and its supply and return pipes are relieved of excessive strain and are effectively protected.

It is to be understood that when the heater is installed in an automobile, the bracket 28 is suitably secured to stationary structure in the interior of the automobile and that the supply and return pipes 17 and 18 are connected up to the water cooling system of the engine of the automobile or motor vehicle.

While one embodiment has been selected for the purposes of illustration, it is to be understood that various changes in the size, shape and arrangement of the parts may be made without departing from the spirit of the invention or the scope of the subjoined claims.

The invention claimed is:

1. A heater of the character described comprising a radiator core, an open-ended casing therefor, means coacting with said casing to support the same and acting through the casing to support the radiator core, a motor driven fan acting to cause a flow of air through said casing and said radiator core, said casing having resilient mounting strips along the vertical edges of its front opening, louvers for the front opening, and means for adjustably supporting the louvers on said mounting strips including cooperating bosses and pivot openings.

2. A heater of the character described comprising a radiator core, an open-ended casing therefor, means coacting with said casing to support the same and acting through the casing to support the radiator core, a motor driven fan acting to cause a flow of air through said casing and said radiator core, said casing having resilient mounting strips along the vertical edges of its front opening, louvers for the front opening, and means for adjustably supporting the louvers on said mounting strips including cooperating bosses and pivot openings with friction washers interposed between at least certain of the louvers and mounting strips.

3. A heater of the character described comprising a radiator core, a housing therefor including a rear section in which the core is snugly fitted, a front section telescoped over the rear section and releasably secured thereto, said front and rear sections having openings, said rear section having an angular extension providing a fan shroud, supporting arms interfitted with and secured to the angular extension of the rear section of the housing, and a motor driven fan supported on said arms in cooperative relation to the fan shroud.

4. A heater of the character described comprising a heating element, an opening ended housing therefor, a motor driven fan cooperatively disposed with respect to the rear opening of the housing for advancing air therethrough, said housing having opposed mounting strips disposed on the opposite margins of the front opening of the housing, and a plurality of louvers for controlling the direction of flow of the heated air currents issuing from the front opening of the housing, said louvers having end flanges formed with bosses, said mounting strips having openings into which said bosses are snapped and with which they are frictionally engaged, whereby said louvers are adjustably supported and releasably retained in adjusted position.

DANIEL T. MacLEOD.