

Oct. 25, 1938.

C. H. WILL ET AL

2,134,649

AUTOMOBILE HEATER

Filed June 8, 1936

2 Sheets-Sheet 1

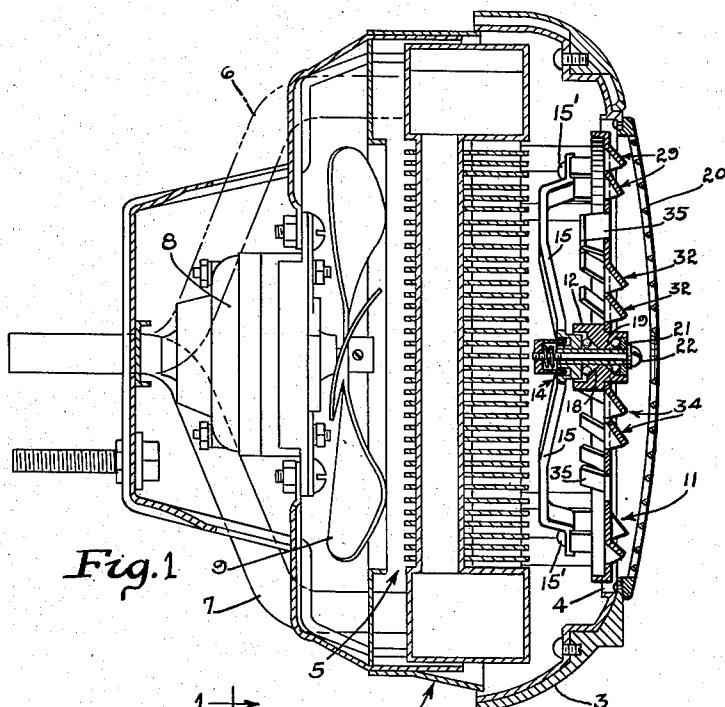


Fig. 1

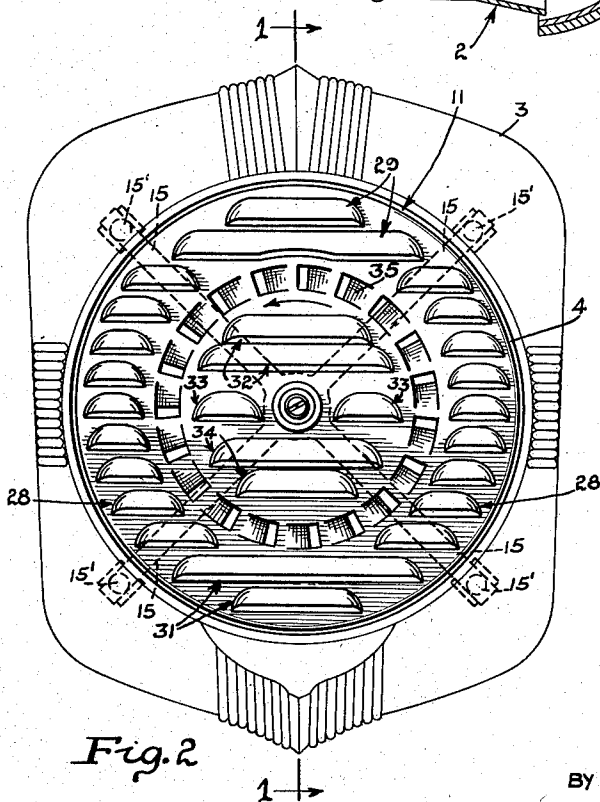


Fig. 2

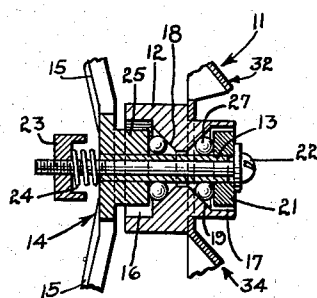


Fig. 3

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2 Sheets-Sheet 2

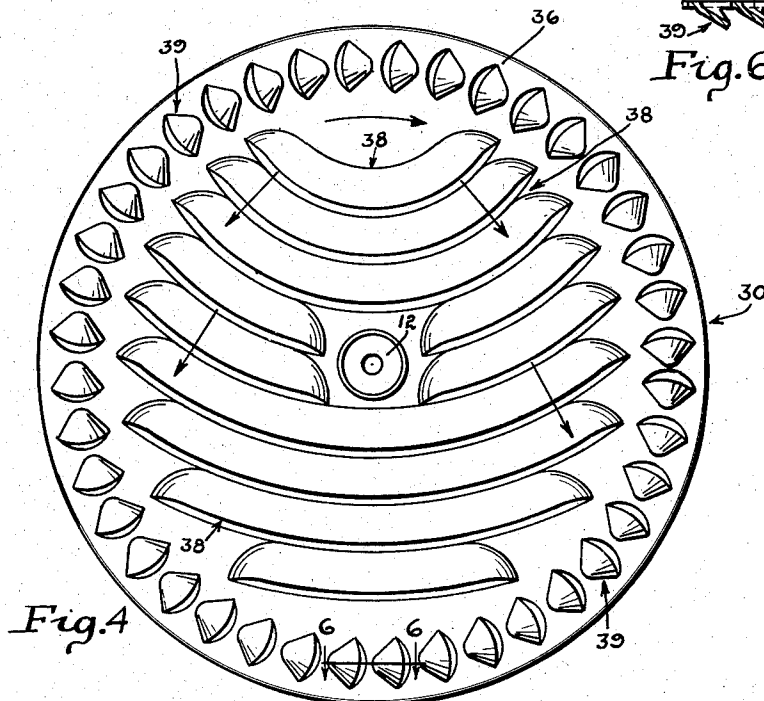


Fig. 4

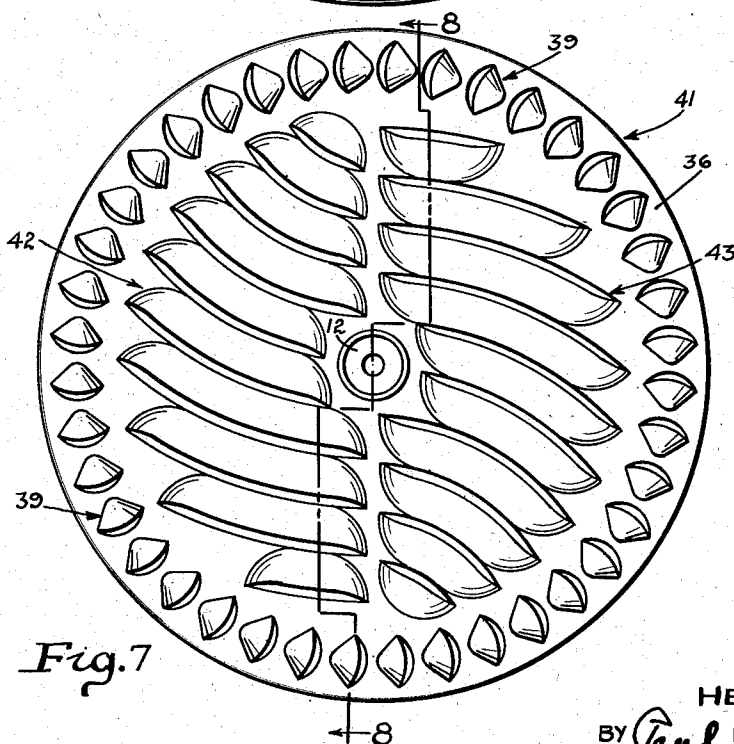


Fig. 7

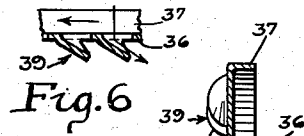


Fig. 6

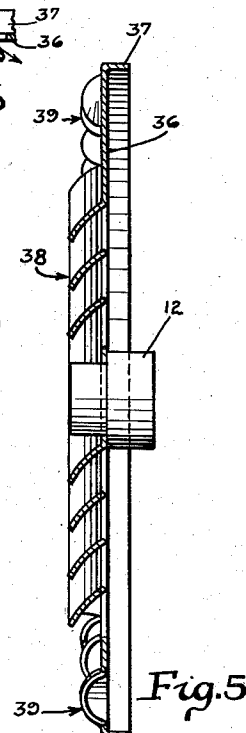


Fig. 5

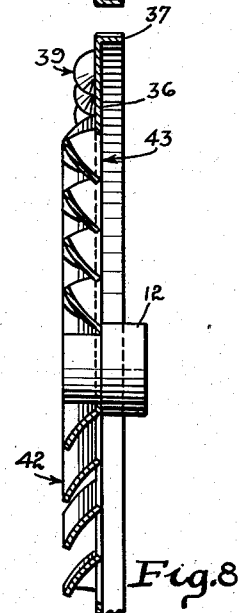


Fig. 8

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AUTOMOBILE HEATER

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Application June 8, 1936, Serial No. 84,132

9 Claims. (Cl. 98—40)

This invention relates to new and useful improvements in automobile heaters, generally, and more particularly to the air deflecting means thereof.

5 An object of the invention is to provide an automobile heater comprising a casing having an opening therein through which the heated air is circulated, and a deflector being mounted for rotary movement in said opening and adapted
10 to be driven by the circulation of air through the opening, thereby to more uniformly distribute the heated air throughout the vehicle body.

A further object is to provide a heater of the class described comprising a casing having a
15 water circulating core mounted therein and provided with means for circulating air therethrough and through an opening in a wall of the casing, and a deflector being mounted for rotary movement in said opening and having a plurality of
20 arcuately formed louvres through which the heated air is circulated from the heater, and said deflector being arranged to be driven by the circulation of air through the heater, thereby to more uniformly distribute the heated air
25 throughout the vehicle body.

Other objects of the invention reside in the specific construction of the deflector; in the novel means provided for rotatably supporting the deflector and whereby wear in the bearing parts
30 thereof is automatically taken up; and, in the particular arrangement and shape of the louvres provided in the deflector, which are so shaped that when the deflector is rotated by the circulation of air through the heater, the heated air
35 discharging from the heater will be projected at an angle from the axis of the deflector and in the form of a spiral, whereby more uniform circulation of the heated air throughout the vehicle body is obtained, and without materially adding to the
40 cost of manufacture and to the cost of operating the heater.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed
45 claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may
50 be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a cross-sectional view on the line
55 I—I of Figure 2, showing the novel deflector here-

in disclosed embodied in the construction of a conventional hot water heater;

Figure 2 is a front view of Figure 1;

Figure 3 is an enlarged detail sectional view showing the preferred construction of the de-
flector bearing;

Figure 4 is a front view of a deflector having arcuately formed louvres all directed in substantially the same direction;

Figure 5 is a cross-sectional view of Figure 4;

Figure 6 is a detail sectional view on the line
6—6 of Figure 4, showing the vanes provided adjacent the periphery of the deflector adapted
15 to be impinged by the air currents circulated through the heater, thereby to rotate the de-
flector;

Figure 7 is a front view of a deflector of modified construction wherein the louvres are arranged in two groups, and the louvres of one group being oppositely disposed with respect to
20 the louvres of the other group, whereby the heated air is projected from the deflector in opposite directions; and

Figure 8 is a cross-sectional view on the line
8—8 of Figure 7.

In the selected embodiment of the invention here shown, there is illustrated in Figures 1 and 2, a hot water heater of conventional construction comprising a casing, generally indicated by the numeral 2, having a front shell 3 provided
30 with an opening 4 through which the heated air from the heater is circulated. A suitable water circulating core 5 is mounted within the casing 2 and is provided with suitable connections 6 and 7, whereby it may be conveniently connected
35 in the water cooling system of the engine. A suitable motor 8 is shown mounted adjacent to the core 5 and has a fan 9 for circulating air through the core 5 and opening 4 into the vehicle
40 body.

An important feature of the present invention resides in the means provided for distributing the heated air within the vehicle body. As best shown in Figures 1 and 2, a suitable deflector, generally indicated by the numeral 11, is mounted
45 in the opening 4 provided in the front shell 3 of the heater. The deflector 11 has a suitable hub 12 bored to receive a tubular shaft 13, one end of which is secured to the hub 25 of a spider 14, having its arms 15 suitably secured to the
50 casing 2 of the heater by such means as screws 15'. The diameter of the deflector 11 is slightly less than the diameter of the opening 4, to permit free rotary movement of the deflector thereon.

The hub 12 of the deflector 11 is shown pro-

vided with suitable counterbores 16 and 17, the former being provided with a cone-shaped ball race 18, and the latter a similarly shaped ball race 19. A collar 21 is mounted on the other end of the tubular shaft 13, and is retained in position thereon by a suitable screw 22 having an element 23 received in threaded engagement with the opposite end thereof, as clearly shown in Figure 3. A suitable spring 24 is interposed between the element 23 and the hub 25 of the spider 14, and serves to hold the bearing parts in their operative positions, as will readily be understood by reference to Figure 3. Suitable anti-friction bearing elements 27 are interposed between the cone-shaped ball races 18 and 19, and their respective parts 25 and 21.

The bearing, above described, provides a very simple and inexpensive anti-friction bearing for the deflector 11, and is so constructed that wear in the parts is automatically taken up without attention by the action of the spring 24.

The deflector 11, illustrated in Figures 1 and 2, is shown provided with groups of deflectors, generally indicated by the numerals 28, 29, and 31, located adjacent the periphery thereof and all of which are directed in the same direction. Other louvres 32, 33, and 34 are provided in the central portion of the deflector and are disposed in the same direction as the louvres adjacent the periphery of the deflector.

A plurality of vanes 35 are struck out of the metal, and are disposed between the inner and outer groups of louvres, as best shown in Figure 2. These vanes are so disposed that when impinged by the air circulated through the heater, will cause rotation of the deflector in the direction indicated by the arrow in Figure 2.

Figures 4, 5, and 6 illustrate a deflector of modified construction, comprising a sheet metal body 36 having a peripheral flange 37, and provided with a hub 12 in a manner similar to the deflector 11.

The deflector 36 is shown having a plurality of arcuately formed louvres, generally indicated by the numeral 38, which are preferably struck from a common center, although it is to be understood that the curves or shapes thereof may be varied, if desired. A plurality of vanes 39 are provided adjacent the periphery of the deflector 36 adapted to be impinged by the air circulated through the heater whereby the deflector will rotate in the direction indicated by the arrow in Figure 4. By shaping the louvres 38 as shown, the air discharging from the heater will be spread outwardly in substantially the shape of a fan, as indicated by the arrows in Figure 4, and because of the rotation of the deflector, the heated air will be spread outwardly in the form of a spiral, whereby it is uniformly distributed throughout the interior of the vehicle body.

Figures 7 and 8 illustrate a deflector 41 comprising two groups of louvres, generally indicated by the numerals 42 and 43. These louvres are oppositely disposed, whereby greater distribution of the air is obtained when the deflector is rotated, because of the air currents being spread outwardly in opposite directions and at an angle with respect to the axis of the deflector. Vanes 39, similar to the ones shown in Figure 4 are provided for causing rotation of the deflector, when the motor 8 is operated to circulate air through the heater.

By constructing the deflector, as herein described, and by mounting it for continuous rotary

movement, when the heater is operating, the heated air discharging from the heater will be projected outwardly in a direction away from the axis of the deflector, as will readily be understood by reference to Figures 1 and 2, thereby obtaining more uniform distribution of the heat within the vehicle body without materially adding to the cost of the heater.

In the drawings, I have shown the deflector embodied in the construction of a hot water heater of well-known design, but it is to be understood that it may be used in connection with other types of forced circulation heaters where applicable, without departing from the scope of the invention. A suitable guard 20 is disposed in the opening 4 of the front shell 3 to protect the deflector 11, and also to prevent foreign objects from accidentally contacting therewith.

Elements 35 and 39, function as driving vanes. Elements 28, 29, 31, 32, 33, 34, 38, 42 and 43 function as distributor vanes. The terms "driving" and "distributor" show a difference in function and are used for the sake of clarity. It is understood of course that although the particular louvre form of driving and distributor vanes is claimed per se, the broad invention is not limited to the particular manner or shape or formation of these elements. It is true that a very cheap device can be made by punching out a disc to provide the louvre-like forms of these functionally different elements.

Features of the invention therefore include the specific manner of arranging the driving vanes relatively to the distributing vanes. For example, in Figure 2 the driving vanes circumscribe a central or middle group of the distributing vanes while these elements are in turn circumscribed by distributor vanes. In Figure 4 the driving vanes circumscribe all distributing vanes and in Figure 7 the distributing vanes are arranged in groups at opposite sides of a diameter which passes through the axis of rotation of the disc, or deflector plate.

Another feature relates to the arrangement of the elements 35 with reference to the fan to obtain a rotation of the plate in the same direction as the rotation of the fan. A feature also relates to the arrangement in Figure 4 in which the elements 39 are so related to the fan that the plate rotates in a direction opposite to the direction of rotation of the fan.

The vanes 35 are formed by inward punching of the disc, the vanes 39 are formed by outward punching. Vanes 35 are separated on three sides. Vanes 39 are separated on only one side. All louvre-like punchings provide forwardly slanting walls which cause the air to be delivered at an angle which is acute relatively to the front face of the disc or deflector element.

We claim as our invention:

1. In combination with a fan, a rotatable deflector element having driving vanes against which air delivered by the fan acts to rotate said element, said element having additional vanes which act as said element is rotated by the driving vanes to distribute the air in a predetermined manner.

2. In combination with a fan, a rotatable deflector element having marginal driving vanes against which air delivered by the outer portions of the fan blades acts to rotate said element.

3. In combination with a fan, a rotatable deflector element having marginal driving vanes against which air delivered by the fan acts to rotate said element, said element having in ad-

dition distributor vanes circumscribed by said driving vanes.

4. In combination with a fan, a rotatable deflector element having a circular row of driving vanes against which air delivered by the fan acts to rotate the element, said element having in addition sets of vanes respectively disposed within and at the outside of said row and adapted to distribute the air in a predetermined manner.

5. In combination with a fan of the axial delivery type, a deflector element rotatable on an axis co-axial with that of the axis of rotation of the fan and having driving vanes against which air delivered by the fan acts to rotate said deflector element, said element having additional vanes which act as said element is rotated by the driving vanes to distribute the air in a predetermined manner.

6. In combination with a fan of the axial delivery type, a deflector plate rotative on an axis co-axial with that of the axis of rotation of the fan, said plate having a circular row of driving vanes against which air delivered by the fan acts to rotate the plate, said plate also having distributor vanes parallel with and elongated in a direction of a diameter of the plate.

7. In combination with a fan of the axial delivery type, a deflector plate rotative on an axis co-axial with that of the axis of rotation of the

fan, said plate having a circular row of driving vanes against which air delivered by the fan acts to rotate the plate, said plate also having curved distributor vanes, the curves being generated from a common center which lies on a diameter passing through the axis of rotation of the plate.

8. In combination with a fan of the axial delivery type, a deflector plate rotative on an axis co-axial with that of the axis of rotation of the fan, said plate having a punched out circular row of driving louvers against which air delivered by the fan acts to rotate the plate, said plate also having punched out distributor louvers parallel with a diameter of the plate.

9. In combination with a fan of the axial delivery type, a deflector element rotative on an axis co-axial with that of the axis of rotation of the fan, said plate having a circular row of driving vanes and having distributing vanes arranged in sets at opposite sides of a diameter which passes through the rotative axis of the plate, one set reversely curved relatively to the other set, and the members of each set being generated from a center which lies near or on a diameter which passes between the sets.

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