May 24, 1938. C. H. WILL 2,118,282

DEFLECTOR FOR AUTOMOBILE HEATERS

Filed June 8, 1936

Fig.1

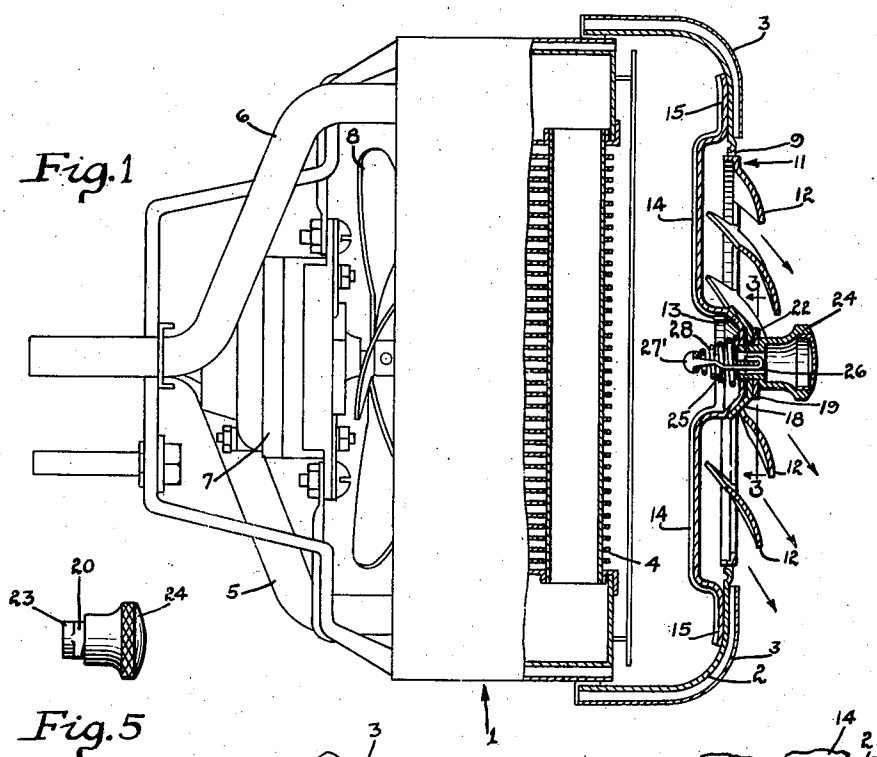

Fig.5

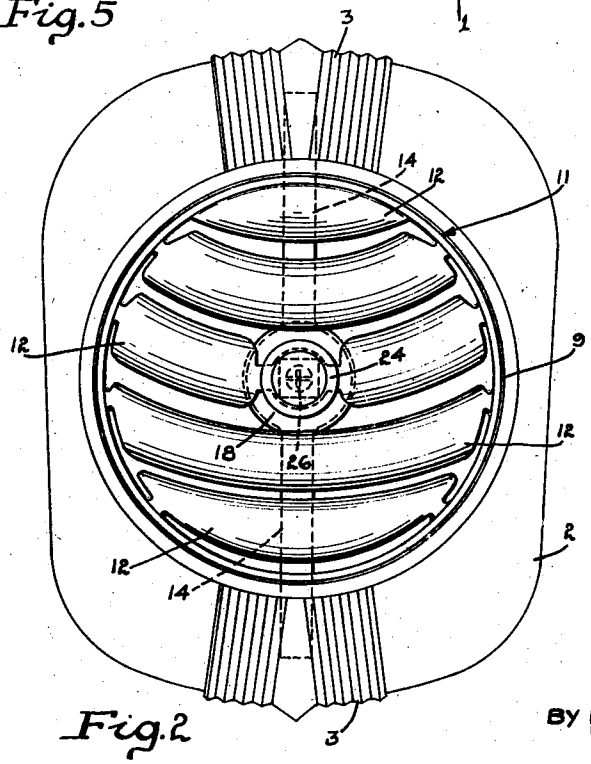

Fig.2

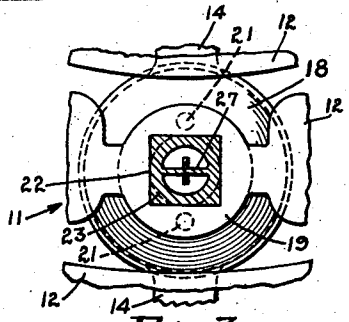

Fig.3

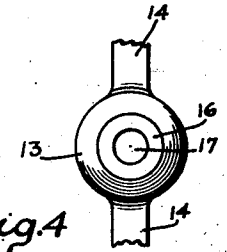

Fig.4

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DEFLECTOR FOR AUTOMOBILE HEATERS

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10 Claims. (Cl. 98—1)

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

An object of the present invention is to provide a simple and inexpensive deflector for an automobile heater which may readily and conveniently be adjusted from one position to another, and which will not relatively change its adjusted position, or vibrate and become noisy, when the car is in operation.

A further object is to provide a hot water heater comprising a casing having an opening in a wall thereof, and a suitable bearing being disposed in said opening and supporting a deflector mounted for rotary adjustment, and having spring means for frictionally retaining the deflector in adjusted position on said bearing.

Other objects of the invention reside in the simple and inexpensive construction of the deflector supporting means; in the provision of the conical bearing in the opening of the casing, and the correspondingly shaped element provided on the deflector for receiving said bearing; and, in the construction of the spring means for holding the deflector in frictional engagement with said bearing, and whereby the deflector may be conveniently rotated from one position to another to control the directional flow of heated air from the heater, and whereby the deflector is firmly retained in adjusted position without danger of relatively changing its position or becoming noisy, as a result of vibration, or shocks imparted to the body of the vehicle.

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

In the accompanying drawing, 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 be made within the scope of the claims which follow.

In the drawing:

Figure 1 is a side elevation of a conventional heater, partially in section, to more clearly illustrate the means for supporting the deflector in the opening of the casing thereof;

Figure 2 is a front view of the heater showing the preferred construction of the deflector;

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 1, showing the connection between the deflector and its supporting means;

Figure 4 is a detail view showing the friction type bearing which supports the deflector in the opening of the heater casing; and

Figure 5 is a detail view showing the finger grip or knob removed from the deflector.

In the selected embodiment of the invention here shown, there is illustrated in Figure 1, for purposes of disclosure, a heater of more or less conventional design, including a casing, generally indicated by the numeral 1, comprising a front shell 2, shown having an outer enclosing member 3 fitting thereover to enhance the appearance and attractiveness of the front of the heater. The heater is shown provided with the usual core, generally indicated by the numeral 4, which is supported in the casing 2 and is provided with the usual intake and outlet water circulating tubes 5 and 6. The usual motor 7 is also shown supported in the rear portion of the heater and has a fan 8 for circulating air through the core 4 in the usual manner.

An important feature of the present invention resides in the deflecting means provided for controlling the directional flow of the heated air from the heater, and in the means for supporting said deflecting means. As clearly illustrated in Figures 1 and 2, the casing 2 is provided in the front wall with an opening 9, through which the heated air is circulated by the action of the fan 8. A suitable deflector, generally indicated by the numeral 11, is mounted for rotary adjustment in the opening 9 and is shown provided with a plurality of louvres 12, preferably arcuately formed as shown in Figures 1 and 2. These louvres direct the air currents downwardly or to one side, depending upon the position of the deflector 11 in the opening 9.

To support the deflector 11, a conical bearing 13 is supported in the circular opening 9 of the casing 2 by suitable arms 14, preferably shaped as best shown in Figure 1, and having their terminals 15 suitably secured to the front shell 2 by such means as welding. The bearing 13 is in the form of a frustum, and has a flat surface 16 provided with a suitable aperture 17, as clearly illustrated in Figures 1 and 4.

The deflector 11 is provided at its center with a cone-shaped element 18 having an inner bearing surface corresponding in shape to the conical surface of the bearing 13, so that the member 18 of the deflector may be fitted reasonably snugly against the bearing 13. The member 18 may be suitably secured to the central portion 19 of the deflector 11 by such means as spot welding, indicated at 21 in Figure 3. The member 18 and

central portion 19 of the deflector are shown provided with alined apertures, generally indicated by the numeral 22, which preferably are square, as shown in Figure 3, and are adapted to receive the squared portion 20 of the terminal 23 of a suitable finger knob 24, shown in Figures 1 and 5. This finger knob is non-rotatably secured to the deflector. The outer end of the terminal 23 of the knob 24 is preferably cylindrical in cross-section and fits into the aperture 17 in the bearing 13, whereby it retains the deflector in axial alinement with the opening in the front shell 3 of the heater.

Another feature of the invention resides in the novel means provided for yieldably retaining the element 18 of the deflector in frictional engagement with the conical bearing surface 13, whereby the deflector may be conveniently rotated from one position to another to control the directional flow of the air from the heater, and whereby the deflector is frictionally retained in adjusted position so that it is not likely to relatively change its position as a result of vibration or shocks imparted to the vehicle body.

The means provided for thus frictionally retaining the deflector in adjusted position on the bearing 13, is best shown in Figure 1 and comprises a hook-shaped element, generally indicated by the numeral 25. This hook-shaped element has a hook 26 at one end adapted to engage a bar or pin 27 secured to the square terminal 22 of the finger grip 24. The element 25 is provided at its opposite end with a head 27' which is seated against one end of a spiral spring 28, whose opposite end is seated against the inner surface of the flat portion 16 of the bearing 13. The spring 28 constantly exerts a force against the head 27' which, by reason of the element 25, constantly urges the member 18 of the deflector into frictional engagement with the conical surface of the bearing 13, whereby the deflector is frictionally supported in adjusted position by the action of the spring 28.

The above described parts provide a very simple and economical mechanism for retaining the deflector 11 in adjusted position on the seat 13. Because of the spring 28 constantly exerting an inward force against the finger knob 24, the latter need not necessarily be permanently secured to the central portion 19 of the deflector, which simplifies the construction of the apparatus. The square terminal 22 of the finger knob 24 is merely fitted into the square apertures provided in the central portion 19 of the deflector and the member 18 thereof, and is retained therein by the action of the spring 28, as will readily be understood by reference to Figure 1.

To remove the deflector from the heater casing, the spring 28 is compressed so that the hook 26 of the element 25 may be disengaged from the cross bar or pin 27, after which the finger knob 24 and deflector 11 may readily be removed as a unit from the heater. If desired, the finger knob 24 may be non-removably secured to the central portion of the deflector, although this is not essential.

To adjust the novel deflector herein disclosed, the operator simply grasps the finger knob 24 and rotates it in either direction, depending upon the direction in which he wishes to direct the heated air from the heater. Should the frictional engagement of the member 18 with the bearing 13 be such that the deflector is difficult to rotate, the operator may pull the finger knob slightly outwardly, whereby the member 18 may move out of direct contact with the conical bearing surface of the bearing 13, thereby permitting the deflector to be readily and conveniently rotated to any desired position. The construction of the deflector and its supporting means is such that it may be rotated in any direction desired, and the degree of rotation in either direction is unlimited, as will readily be understood by reference to Figures 1 and 2. The deflector may be quickly assembled on the bearing 13 of the heater by simply fitting the member 18 of the deflector onto the seat 13 and then operatively connecting the hook 26 of the element 25 to the cross member or pin 27 of the finger knob 24, as shown in Figure 1.

I claim as my invention:

1. In combination with a heater through which air is circulated for heating, a deflector for controlling the direction of distribution of the heated air, and means mounting said deflector for rotary adjustment including, a pair of nested members providing concave and convex surfaces, cooperating to increase friction and to steady and reduce vibration of the deflector and yieldable means for maintaining an anti-rotating frictional relation between said surfaces.

2. In combination with a heater through which air is circulated for heating, a deflector for controlling the direction of distribution of the heated air, and means mounting said deflector for rotary adjustment including a pair of nested conical members one capping the other, and having their conical surfaces cooperating to increase friction and to steady and reduce vibration of the deflector, and yieldable means for maintaining an anti-rotating frictional relation between said surfaces.

3. In combination with a heater through which air is circulated for heating, a deflector for controlling the direction of distribution of the heated air, and means mounting said deflector for rotary adjustment including, a pair of members one providing a flat and a convex surface and the other providing a flat and a concave surface, said surfaces cooperating to increase friction and to steady and reduce vibration of the deflector, and yieldable means for maintaining an anti-rotating frictional relation between said surfaces.

4. In combination with a heater through which air is circulated for heating, a deflector for controlling the direction of distribution of the heated air, and means mounting said deflector for rotary adjustment including, a pair of members having surfaces cooperating to increase friction, a knob for manually rotating said deflector, and yieldable means acting on said knob and causing the same to press one member into frictional engagement with the other.

5. In combination with a heater through which air is circulated for heating, a deflector for controlling the direction of distribution of heated air, and means mounting said deflector for rotary adjustment, including a pair of members having surfaces cooperating to increase friction, a knob for manually rotating said deflector, a bar having a shoulder engaging the knob and having a second shoulder and a spring surrounding the bar and engaging the second shoulder and acting thereagainst to cause the knob to press one member into frictional engagement with the other.

6. In a heater of the class described, a casing having an opening therein, means for circulating air through said opening, a conical bearing disposed in the axis of said opening, a deflector supported on said bearing, and spring means for

retaining the deflector in adjusted position on the bearing.

7. In a heater of the class described, a casing having an opening therein, means for circulating air through said opening, a member fixed in said opening and having a conical bearing secured thereto, a deflector supported on said bearing and comprising a plurality of louvres facing in one direction, and spring means for frictionally securing the deflector in adjusted position on the bearing.

8. In a heater of the class described, a casing having an opening therein, means for circulating heated air through said opening, a conical bearing disposed in the axis of said opening, a deflector mounted for rotary adjustment on said bearing and provided with a finger grip, and a spring element operatively connected to said finger grip and engaging the bearing and serving to retain the deflector in adjusted position in said opening.

9. In a heater of the class described, a casing having an opening therein, means for circulating heated air through said opening, a friction bearing disposed in the axis of said opening, a deflector mounted for rotary adjustment on said bearing, means for holding the deflector in adjusted position on said bearing, comprising a finger grip or knob non-rotatably connected to the deflector, and a spring for retaining the knob in operative position, and whereby the deflector is held in frictional engagement with the bearing.

10. In a heater of the class described, a casing having an opening therein, means for circulating heated air through said opening, a conical bearing disposed in the axis of said opening, a deflector mounted for rotary adjustment on said bearing, a finger grip or knob having an operative connection with the deflector, a hook element having one end operatively connected to the knob, and a coiled spring having one end seated against said bearing and its other end against a head formed on the hook element, whereby an inward force is constantly exerted on the deflector to hold it in adjusted position in said opening.

CARL H. WILL.