May 2, 1944. W. A. NORRIS 2,347,838

AIR IMPELLER

Filed Nov. 25, 1941 2 Sheets-Sheet 1

Fig. 1

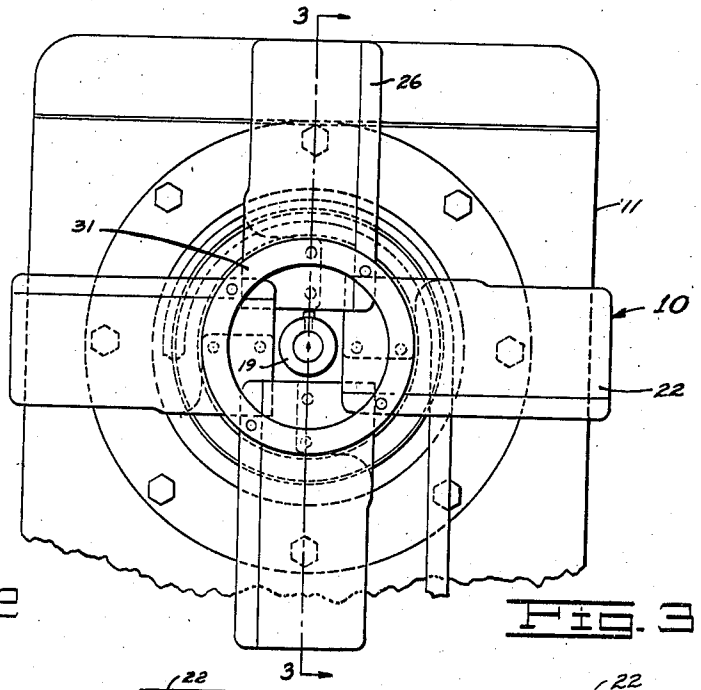


Fig. 2

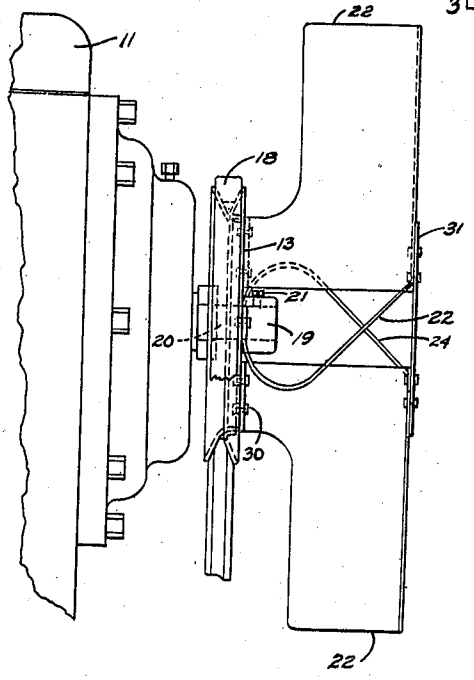
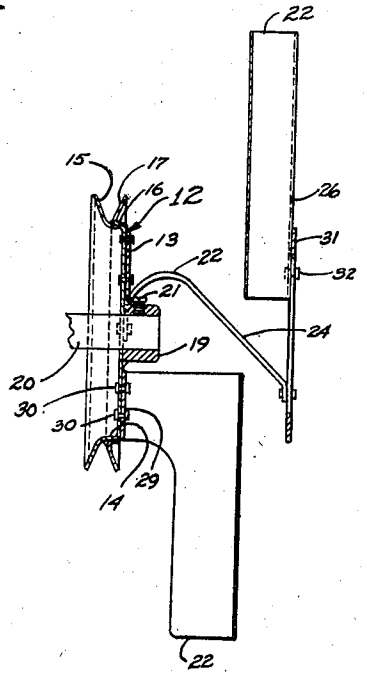


Fig. 3



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Fig. 4

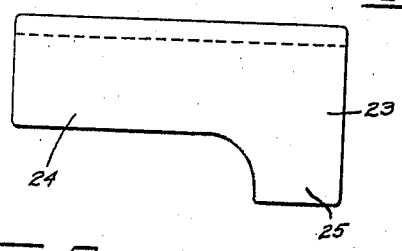


Fig. 5

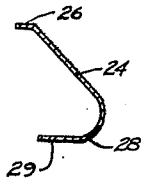


Fig. 6

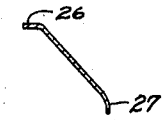


Fig. 7

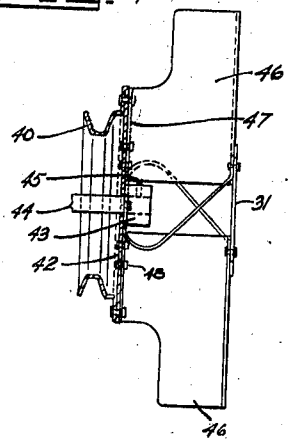


Fig. 8

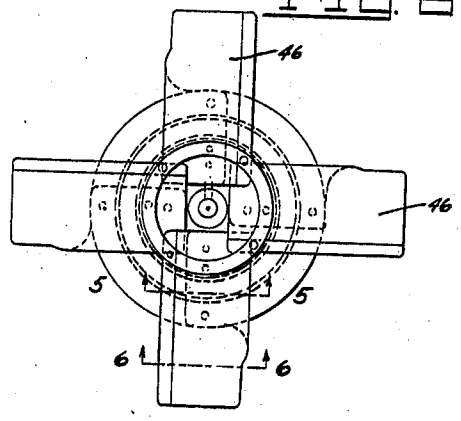


Fig. 10

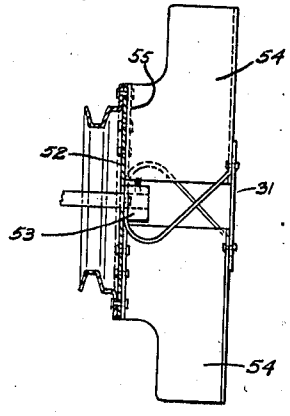


Fig. 11

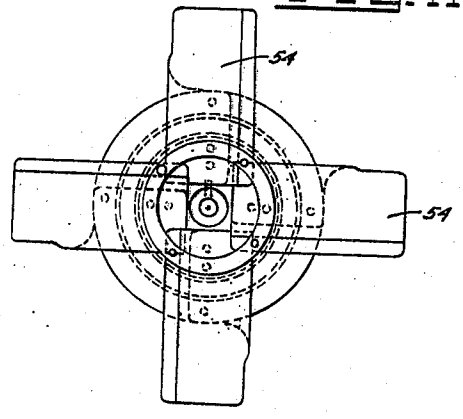


Fig. 9

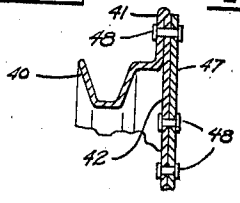
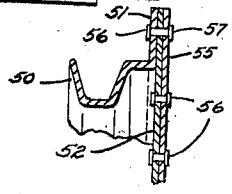


Fig. 12



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2,347,838

AIR IMPELLER

William A. Norris, Alhambra, Calif.

Application November 25, 1941 Serial No. 420,361

2 Claims. (Cl. 170—171)

This invention relates to an air impeller.

The general object of the invention is to provide an improved air impeller which is particularly adapted for use in connection with the cooling system of motor vehicles.

A more specific object of the invention is to provide an air impeller which is preferably driven by a V-belt and wherein a part of the impeller serves as a part of the belt pulley.

Another object of the invention is to provide a novel V-belt pulley for driving an air impeller.

Another object of the invention is to provide an air impeller including novel blade members.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a front view showing my improved air impeller mounted on an automobile engine;

Fig. 2 is a side elevation showing the impeller and the engine;

Fig. 3 is a section taken on line 3—3, Fig. 1;

Fig. 4 is a plan view of the impeller blade blank;

Figs. 5 and 6 are sections taken on lines 5—5 and 6—6, Fig. 1;

Fig. 7 is a side elevation partly in section showing a modified air impeller;

Fig. 8 is a front view of the modified impeller;

Fig. 9 is a fragmentary sectional view on an enlarged scale showing the modified impeller;

Figs. 10, 11 and 12 are views corresponding to Figs. 7, 8 and 9, respectively, and showing a further modification.

Referring to the drawings by reference character I have shown my invention as embodied in an air impeller which is indicated generally at 10. The impeller is shown as mounted on an automobile vehicle engine 11 although it will be understood that this is for the purpose of illustration only and that my impeller is adapted for a wide variety of uses.

In the type shown in Figs. 1 to 6, the impeller includes a base indicated generally at 12 and which includes a circular disk portion 13, preferably made as a metal stamping and including an integral cylindrical flange 14 which terminates in an outwardly flaring peripheral portion 15.

Secured on the flange 14, as by welding, I show a collar 16, which has a flaring flange 17 thereon. The portions 15 and 17 together form a pulley groove which receives a V-belt 18 (Fig. 2).

In the disclosure, my impeller is shown as including a hub portion 19 secured to the disk 13. The hub portion 19 is held on a shaft 20 of the engine 11 by a set screw 21.

In the disclosure the impeller includes four blades 22. A blank from which the blades may be formed is shown at 23 in Fig. 4. The blank includes a blade forming portion 24 and a projecting portion 25. The blank is bent to form a longitudinally extending edge portion 26 with the intermediate portion of the body 24 planar and with the edge portion 27 remote from the edge 26 bent upwardly like the portions 26. The projection 25 is bent as at 28 into arcuate form with the edge thereof as at the edge portion 29 parallel to the portion 26. The edge portion of each blade engages the disk 13 and is secured thereto as by rivets 30.

In the disclosure the blades are connected by an annular member 31 which is welded as at 32 to the portions 26 of the blades.

When my impeller is operating, air is forced rearwardly by the inclined planar portions 24 of the blades 22. Air also is drawn into the central portion of the impeller within the area defined by the member 31 and then passes radially, outwardly and then rearwardly. With this construction the full diameter of the impeller is employed in forcing air rearwardly and the loss which occurs at the hub portion in the conventional fan is reduced.

In Figs. 7 to 9, inclusive, I show a modification of my invention, wherein a V-belt pulley 40 is provided with an outwardly extending integral flange 41 and this flange in turn is integral with a disk 42 which corresponds to the disk 13 previously described. The disk 42 supports a hub 43 secured on the shaft 44 by a set screw 45.

On the disk 42 I arrange a plurality of blades 46 which are similar to the blades 22 previously described. The portions 47 of the blades 46 which correspond to the portions 29 of the blades 22 are secured to the disk 42 by rivets 48.

In Figs. 10, 11 and 12 a further modification of the invention is shown wherein a V-belt pulley 50 having a flange 51 is provided. In this further modification a disk 52 is provided and supports a hub 53. Blades 54 having edge portions 55 similar to the edge portions 29 are arranged with the edge portions 55 engaging the disk 52 and held in place by rivets 56. Thus the disk 52 and blades 54 become a sub-assembly. To complete the structure this sub-assembly is arranged upon the flange 51 and rivets 57 which pass through the flange 51, disk 52 and blades 54 serve to hold the parts united.

From the foregoing description it will be ap-

parent that I have invented a novel impeller which can be economically manufactured and which is highly efficient for its intended purpose.

Having thus described my invention, I claim:

1. An air impeller comprising a disc member having a hub thereon, said hub having an aperture adapted to receive a shaft, a plurality of impeller blades mounted on said disc member, each of said blades including a body portion which forms a vane, each of said body portions having a projection thereon, the projections being secured to the disc member, and an annular member arranged upon the body portions of the blades and secured to the edge portions thereof, the center of said annular member being open to provide a path for the column of air being moved by the vane members.

2. An air impeller comprising a disc member having a hub thereon, said disc member and hub having aligned apertures adapted to receive a shaft, a plurality of impeller blades mounted on said disc member, each of said blades including a body portion which forms a vane, each of said body portions having a projection thereon, the projections being bent and having planar edge portions, the projection edge portions being secured to the disc member, the body portions having their main portions planar and having planar edge portions extending from the planar body portions, said planar edge portions being parallel to the disc, said blades extending radially of the disc, and an annular member coaxial with the hub aperture and arranged upon and secured to the planar blade edge portions, the center of said annular member being open to provide a path for a column of air being moved by the blades.

WILLIAM A. NORRIS.