Sept. 28, 1948. B. W. CURRY 2,450,186

TURBINE BLOWER

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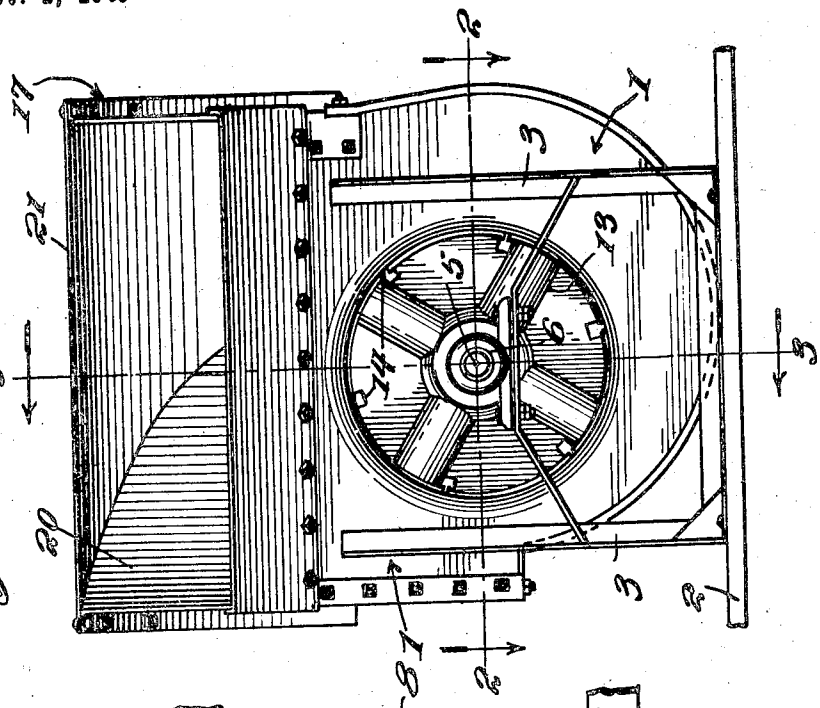


Fig. 1.

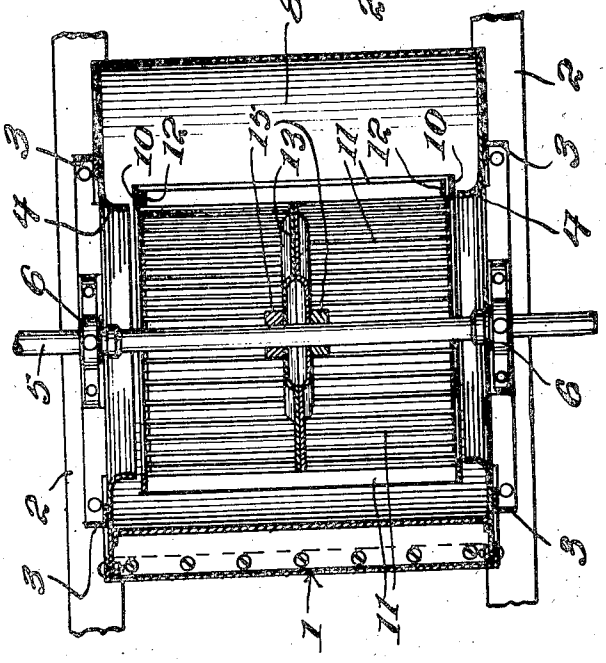


Fig. 2.

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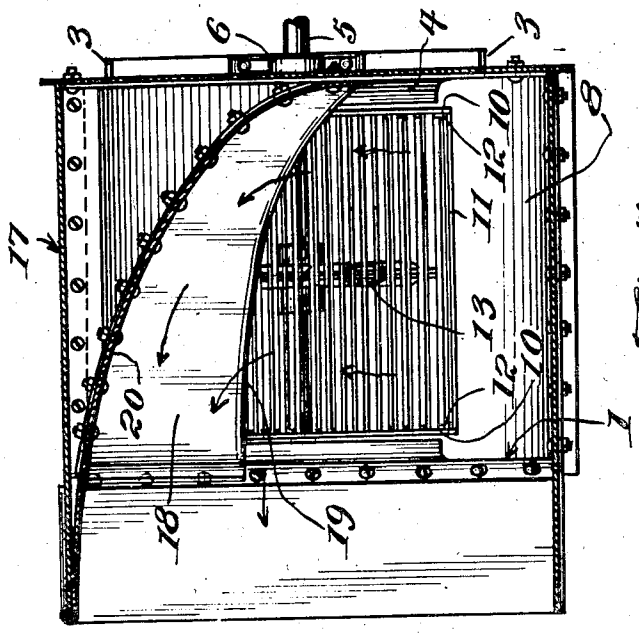


Fig. 3.

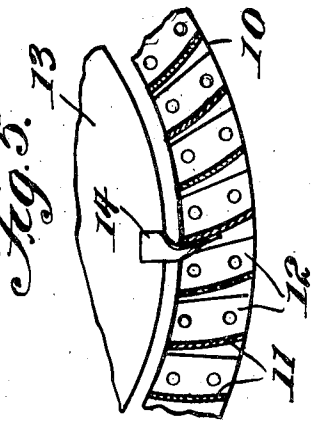


Fig. 5.

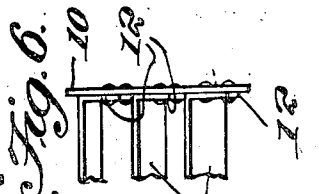


Fig. 6.

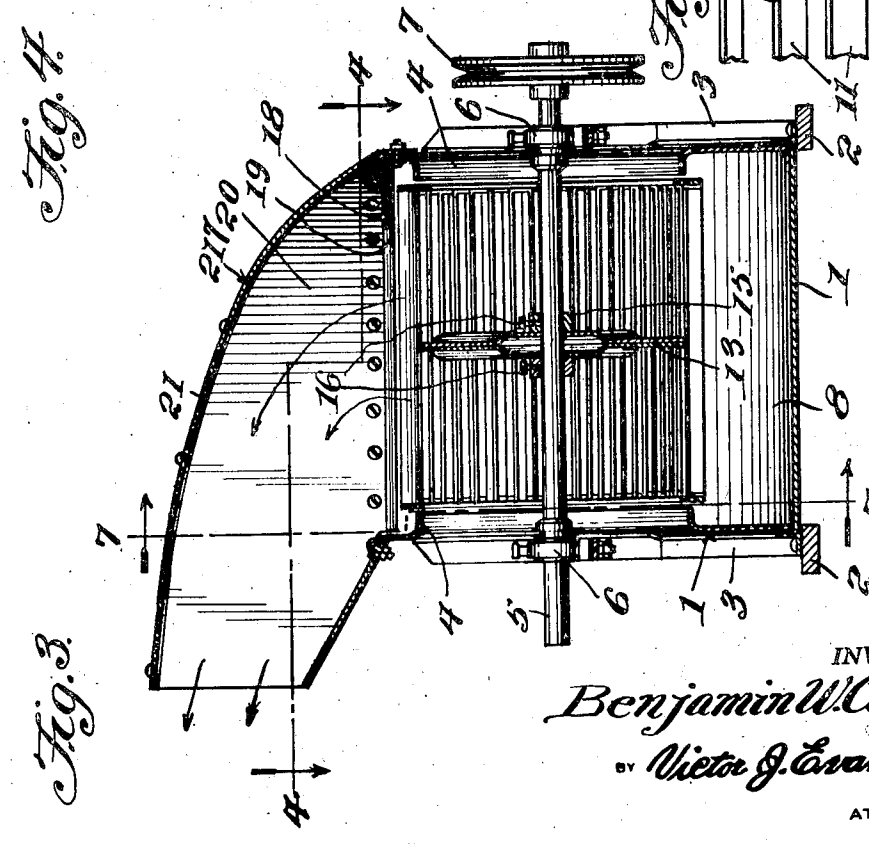


Fig. 4.

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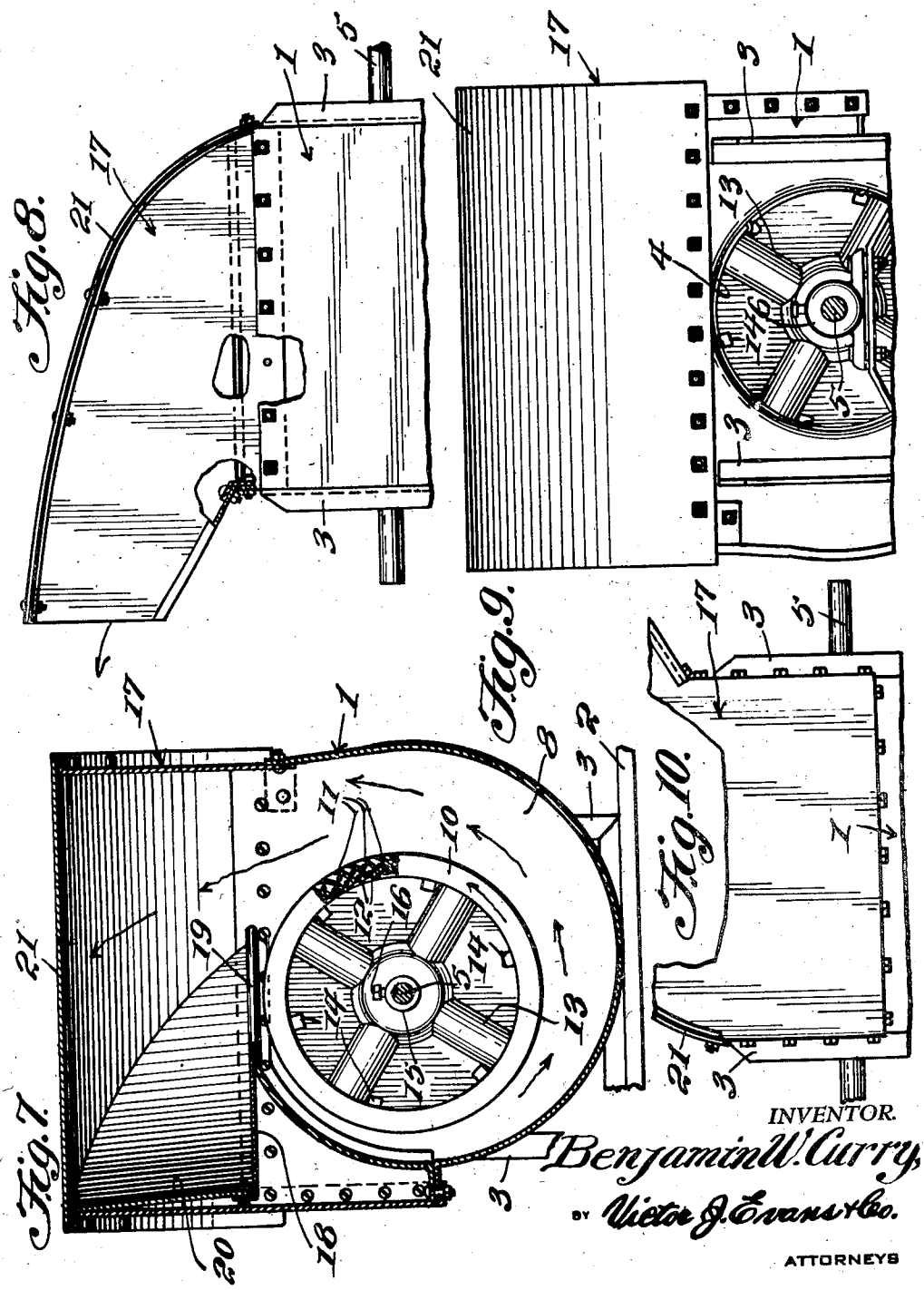
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,450,186

TURBINE BLOWER

Benjamin W. Curry, Jacksonville, Fla.

Application October 1, 1946, Serial No. 700,429

3 Claims. (Cl. 230—128)

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My present invention relates generally to improvements in rotary air blowers, and more specifically to an improved turbine blower of the expansible chamber type having a center intake, a squirrel-cage impeller or blower wheel, and a horizontal discharge alined with the plane of the impeller axis.

While the blower of my invention is well adapted for various uses and purposes it is particularly applicable for use in automotive vehicles of the semi-trailer type in connection with refrigerating apparatus of the vehicle, when transporting produce and other perishable commodities. In such an installation of the blower of my invention the blower within the vehicle is connected with the ice bunker and the shaft of the blower is extended through the front wall of the trailer and operated by means of an auxiliary motor exterior of the trailer. By this arrangement the air currents are discharged from the blower shaft wise, or in a plane parallel with the horizontal axis of the blower, through the ice bunker, and circulated through the interior of the trailer.

The primary object of my invention is the provision of a blower for this purpose which is fashioned from a minimum number of compactly arranged parts that may be manufactured with facility and assembled with convenience to provide an appliance that is durable and efficient in the performance of its functions.

The invention consists essentially in certain novel combinations and arrangements of parts for conveying the air currents or air blast through the blower as will be more specifically described and set forth in my appended claims.

In the accompanying drawings I have disclosed one complete example of the physical embodiment of my invention wherein the parts are combined and arranged in accord with one mode I have thus far devised for the practical application of the principles of my invention. It will be understood that various changes and alterations are contemplated and may be made in these exemplifying drawings and mechanical structures within the scope of my claims without departing from the principles of my invention.

Figure 1 is a view in end elevation of a blower constructed in accord with the principles of my invention.

Figure 2 is a central horizontal longitudinal sectional view through the blower as at line 2—2 of Fig. 1.

Figure 3 is a vertical axial sectional view through the blower as at line 3—3 of Fig. 1.

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Figure 4 is a horizontal sectional view on line 4—4 of Fig. 3 showing the discharge hood, the baffle plates or deflectors for air currents, and the enclosed impeller.

Figure 5 is an enlarged detail view showing the turbine blades of the impeller or blower wheel in section, with means for attaching the impeller to its central interior partition.

Figure 6 is a detail view showing the attachment of the turbine blades to the impeller head or ring.

Figure 7 is a transverse sectional view through the blower at line 7—7 of Fig. 3.

Figure 8 is a detail side elevation showing the discharge hood of the blower.

Figure 9 is an end elevation at the right hand side of Fig. 8; and

Figure 10 is an exterior end view, broken away, as seen from the opposite side of Fig. 8.

In the preferred form of my invention I utilize a helical shaped housing 1, which is made up of welded parts and supported upon horizontal base bars 2 by means of vertical end frames 3, 3, and the housing is provided with circular flanged end openings 4, 4, for intake of air to the interior of the blower. In one installation of the blower, it is supported by the base bars 2, within the interior of a vehicle, and attached to the ceiling, with its elongated shaft 5 journaled in bearings 6, 6, mounted in the frames 3, 3, and a driven pulley is indicated at 7 for a belt-drive to the shaft located exterior of the vehicle body, and a suitable auxiliary motor is provided to operate the belt drive.

As best seen in Fig. 7 the shaft is journaled eccentrically of the helical or spiral shaped housing, and the cylindrical impeller or blower wheel that is mounted upon the shaft forms an expansible air chamber 8 that increases in area toward the outlet port 9 of the chamber.

The cage type of impeller or multi-blade blower wheel as a whole includes an open cylinder having spaced open heads or rings 10 axially alined with the adjoining center intakes of the housing, and the spaced rings are rigidly united with a peripheral series of circumferentially spaced tangentially arranged forwardly curved turbine blades 11, having attaching flanges 12 that are riveted or otherwise secured to the rings to form a rigid structure.

The turbo-impeller is rigidly mounted on to turn with the shaft by means of a central interior transversely arranged circular partition 13 that is radially braced, and its outer periphery is attached to the turbine blades, as by means of a

number of lugs 14 that may be welded or otherwise secured to the complementary parts.

The impeller or blower wheel is adjusted and rigidly mounted on its shaft by means of a central hub 15 of the partition, and the hub is affixed to the shaft by set bolts or screws 16.

The outlet port 9 from the chamber 8 is covered by a hood 17 providing an air flow direction change unit for the discharge of the air blast into the ice bunker, and the discharge hood, which may be secured to the housing by rivets, bolts, or in other suitable manner, receives the air currents from the interior of the expansible chamber and discharges the air blast in a horizontal plane parallel with the axis of the shaft and the impeller.

At the port 9, and between the discharge hood and the expansible chamber of the housing a horizontal partition or port plate 18 is interposed and rigidly mounted, which plate as best seen in Fig. 4 extends over the impeller to close the rear smaller end of the expansible chamber, and its curved edge 19 terminates in position or location to restrict the outlet port 9 to an area covering approximately one longitudinal half of the impeller.

This horizontal port plate is provided with a perpendicular or vertical baffle plate or deflector wall 20 against the interior surface of which the air currents tangentially impinge as they flow through the outlet port 9, and this curved deflector eliminates the use of angles that would otherwise form pockets or dead air spaces to impede the free flow of air currents from the impeller or blower wheel.

As best seen in Figs. 3 and 4, the air currents flow from the impeller, through the outer port 9, and as they impinge obliquely against the tangentially arranged deflector 20 and the rounded dome 21 of the hood, the direction of the air-stream is changed, without any material impediment to its progress, from a vertical flow to a horizontal flow in a plane parallel with the axis of the impeller, or shaft-wise of the blower.

From the discharge hood a compact and effective horizontally flowing air stream is directed to the ice bunker within the interior of the trailer or other vehicle, and the chilled air from the bunker is distributed and circulated in usual manner.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a blower of the center intake type, the combination, which comprises, a substantially rectangular shaped housing, an impeller having turbine-like vanes in the periphery positioned in the housing, a shaft journaled in the housing on which the impeller is fixedly mounted, a jacket having a gradually increasing radius surrounding the said impeller with the said radius increasing toward the discharge end thereof, a superimposed housing providing a discharge connection mounted on said rectangular shaped housing with the interior thereof communicating with the discharge end of the jacket through a horizontally disposed opening having an arcuate inner edge, said superimposed housing having an arcuate upper surface and a vertically disposed arcuate inner wall, said arcuate upper surface deflecting air discharged by the impeller from a vertical to a horizontal direction and said vertically disposed arcuate wall deflecting the said air in a direction perpendicular to the path of the air discharged from the impeller.

2. In combination with a blower having an impeller with vanes on a shaft and provided with a chamber having a gradually increasing radius with a discharge port at the discharge end of the chamber; an air flow direction change unit communicating with said port comprising an arcuate upper horizontally disposed surface extending from a point corresponding with one end of the impeller upward and over the opposite end of the impeller for deflecting air from the port to a duct in a plane parallel to and spaced above the axis of the shaft thereby bending the air flow from a vertical to a horizontal direction, and said direction change unit also including an arcuate vertically disposed surface extending from the end of the impeller from which the said horizontally disposed arcuate surface extends and also following the inner edge of the port to a vertical side of the duct deflecting the air flow laterally in a direction perpendicular to the transverse centerline of the impeller, said port having an arcuate inner edge substantially corresponding with the axis of the impeller.

3. In a blower of the type having an impeller with a plurality of blades carried by spaced rings mounted on a shaft, the combination which comprises a housing with the wall thereof on a plurality of gradually enlarging radii and leading to a rectangular-shaped discharge port, and an elbow positioned on said housing including an arcuate wall extended from one end of the discharge port across the said port, over the impeller, and directing air from the impeller in a path parallel with the axis of the shaft and spaced therefrom, said elbow having a flat side and an arcuate side extending from a point extending slightly over the axis of the shaft to the opposite side of the housing and adapted to direct air from the impeller into a path aligned with the axis of the shaft.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,679,226	Mitro	July 31, 1928
1,767,279	Bulkeley	June 24, 1930
2,188,464	Moorman	Jan. 30, 1940