R. VUILLEUMIER.

FAN APPARATUS.

APPLICATION FILED AUG. 22, 1914.

1,185,267.

Patented May 30, 1916.

2 SHEETS—SHEET 1.

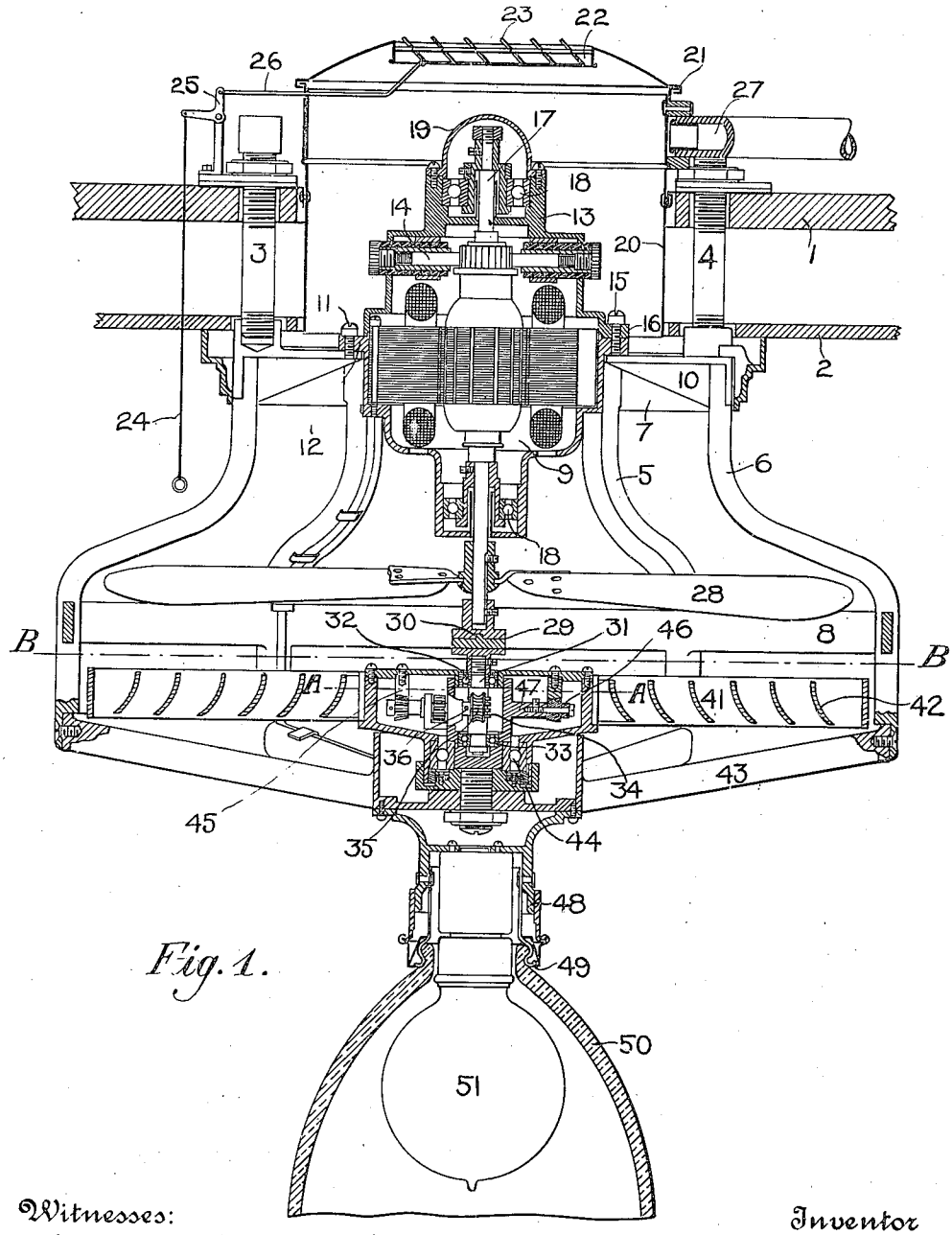


Fig. 1.

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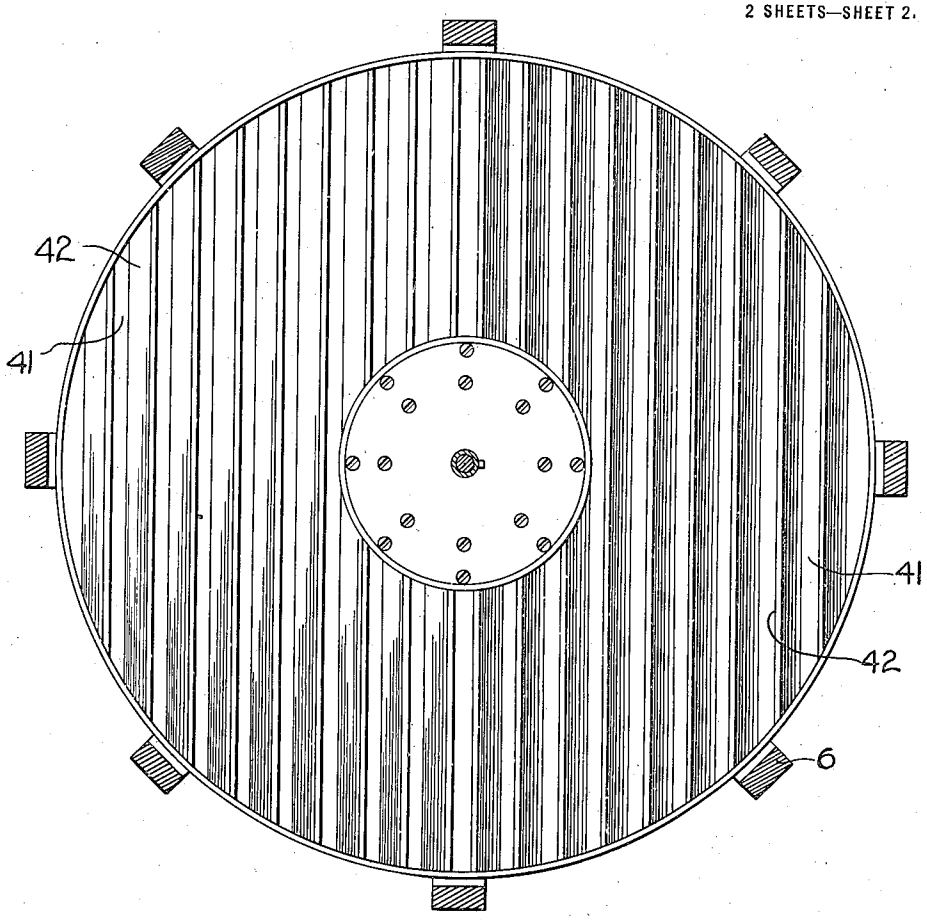


Fig. 3.

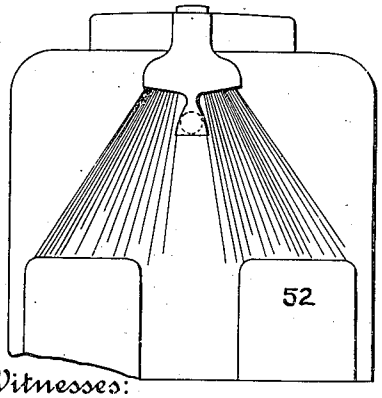


Fig. 4.

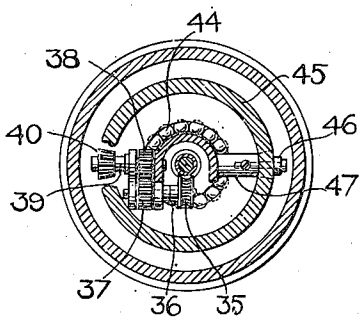


Fig. 2.

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UNITED STATES PATENT OFFICE.

RUDOLPH VUILLEUMIER, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO SAFETY CAR HEATING & LIGHTING COMPANY, A CORPORATION OF NEW JERSEY.

FAN APPARATUS.

1,185,267. Specification of Letters Patent. Patented May 30, 1916.

Application filed August 22, 1914. Serial No. 857,998.

To all whom it may concern:

Be it known that I, RUDOLPH VUILLEUMIER, a citizen of the United States, and residing at New Rochelle, in the county of Westchester and State of New York, have invented a new and Improved Fan Apparatus, of which the following specification is a full disclosure.

This invention relates to fan apparatus and related devices and with regard to certain more specific features thereof to a fan arrangement for railway cars.

One of the objects thereof is to provide apparatus of the above nature in which the discharge from the fan is efficiently directed to the desired point.

Another object is to provide apparatus of the above type in which a desired form of current of air is established without material loss in energy.

Another object is to provide apparatus of the above type in a railway car in which the discharge is so directed and of such nature as effectively to meet the practical conditions of such use.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combinations of parts, and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings, like characters of reference, denote corresponding parts throughout all the views of which:—

Figure 1 is a sectional elevation of a fan and related devices. Fig. 2 is a sectional plan taken on the line A—A of Fig. 1. Fig. 3 is a similar view taken on the line B—B of Fig. 1. Fig. 4 is a diagrammatic sectional elevation of a railway car provided with apparatus of this nature.

Referring now to Fig. 1 of the drawings, there is shown at 1 a car roof, having an inner sheathing 2. Bolted to this roof as at 3 and 4 is a supporting casting 5 comprising arms 6 connecting the rings 7 and 8. An electric motor 9 is mounted upon this casting by means of the arms 10 and screws 11, the latter passing through lugs 12 in the motor casing. The upper portion 13 of this casing, together with the brushes 14 and other parts mounted thereon, may be moved as a unit by first taking out the screws 15 securing it through lugs 16 to the lower casing. The shaft 17 of this motor is vertically disposed and journaled in bearings 18 and a removable cap 19 protects the parts from dust yet affords ready access to the bearings. This motor is mounted to extend within an outer housing 20 which projects through the car roof as at 21 and is provided with an opening 22 having an adjustable shutter comprising the slats 23 which are connected to swing as a unit and are controlled from a link 24 within the car leading to the shutter through a bell-crank lever 25 and link 26. A suitable conduit 27 is provided in the housing for the electric conductors leading to the motor.

Mounted upon shaft 17 is a rotary fan 28 having the usual inclined blades and adapted to draw air either through the opening 22 or between the arms 6 and discharge it downwardly.

The lower end of shaft 17 terminates in a coupling 29 of the Oldham type, having the inner-fitting tongue and groove 30 to allow for misalinement of the shaft with a worm shaft 31 which is driven therefrom. The latter shaft is journaled in the bearings 32 and 33 and carries worm 34 which meshes with the worm-wheel 35 positioned upon a cross-shaft 36. A pair of spur pinions 37 and 38 drive a radial shaft 39 having secured thereto a beveled pinion 40, the functions of which will be hereinafter described.

Positioned beneath fan 28 is a deflecting device 41, shown in plan of Fig. 3 of the drawings. This deflector is circular in contour and provided with the parallel curved plates 42 arranged in gridiron form and oppositely directed upon opposite sides of a diameter. The deflector is rotatably mounted upon a spider 43 secured to the lower end of the support 5, the bearing as shown at 44 being preferably of the ball type. The rotation of the deflector is accomplished by

means of a circular rack 45 having beveled teeth meshing with and driven from the pinion 40. To take up the effect of the thrust of this pinion and guard against tilting of the deflector there is provided an idle guide pinion 46 likewise meshing with the rack 45 and rigidly mounted upon the arm 47. In this manner, as the motor 9 is set in operation, the worm 34 by means of the gearing above described slowly rotates the deflector 41 about an axis substantially in alinement with the motor shaft.

Mounted upon the supporting spider 43 is a lamp socket 48 having secured thereto by a spring clip 49 a lamp shade 50 and having electrically connected therein a lamp bulb 51.

As will be seen by reference to Fig. 4 of the drawings, the above apparatus is so positioned that the lamp 51 is properly disposed with respect to the car seats 52 and by means of deflector 41 the discharge from the fan is directed toward these seats and efficiently used. This is accomplished, moreover, with a single supporting device. It will also be noted that by the use of the inlet port 22 the ventilation of the car is much facilitated and the fresh air supplied directly to the passengers.

The detailed action of the apparatus will be in large part understood from the above description but it may be noted that the air drawn through port 22 either wholly or in part supplies the fan 28 and aside from the above-noted ventilation aids in keeping the motor cool. Fan 28 throws this air to the seats without material retardation. The angle at which these deflecting vanes are placed for the desired effect is lessened by the rotating movement of the deflector as centrifugal action tends to throw the air-currents outwardly. These currents of air are thus directed intermittently upon the passenger, this form of air-current being considered advantageous in fan construction. The air inlet at 22 may be adjusted to any desired degree and all of the parts, by the devices shown, are readily assembled or removed for purposes of inspection or repair.

It will thus be seen that there is provided apparatus by which the objects of this invention are achieved.

As many changes might be made in the above construction and as many apparently different embodiments of this invention could be made without departing from the scope of its several features, it is intended that all matter described above or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus revealed this invention, I claim as new and desire to secure the following combinations of elements, or equivalents thereof, by Letters Patent of the United States:—

1. In apparatus of the character described in combination, an electric motor, a downwardly directed fan rapidly rotated by said motor, means adapted to throw air from the said fan in a current in a direction outwardly inclined from a vertical axis and means driven from said motor adapted to give a slow relative rotary movement between said fan and said first means aside from the rotation of said fan, and thereby cause said outwardly inclined current to rotate about said axis.

2. In apparatus of the character described, in combination, a fan; a deflecting device in the path of discharge from said fan shaped to throw air discharged from said fan in a current in a predetermined direction; and means adapted positively to rotate said device and thereby said current in a predetermined path.

3. In apparatus of the character described, in combination, a fan; a source of power from which said fan is driven; a deflecting device in the path of discharge from said fan shaped to throw said discharge in a path inclined to its original direction; and means driven from said source of power adapted positively to rotate said device about an axis substantially parallel with the direction of discharge of said fan and at a speed slower than that of said fan.

4. In apparatus of the class described, in combination, an electric motor mounted with its shaft substantially vertical, a fan driven from said motor and formed and mounted to rotate about a substantially vertical axis and discharge the air downwardly, a support, a deflecting device mounted upon said support to rotate about a substantially vertical axis, said deflecting device being provided with inclined members adapted to receive the air discharged from said fan and throw it outwardly, and means driven from said motor adapted positively to rotate said deflecting device at a slower speed than that of said fan.

5. In apparatus of the character described, in combination, a fan; means adapted to divide the discharge from said fan into a plurality of currents and means adapted to cause said currents to rotate about an axis from which they diverge.

6. In apparatus of the character described, in combination, means adapted to throw a current of air in a predetermined direction and means adapted to cause said current to revolve about an axis inclined with respect thereto.

7. In apparatus of the character described, in combination, a source of power; a fan driven from said source of power and positioned to drive the air downwardly; a deflecting means below said fan adapted to

receive the air therefrom and deflect outwardly; and means independent of the air discharged from said fan adapted to rotate said deflecting means.

8. In apparatus of the character described, in combination, a source of power; a fan driven from said source of power and positioned to drive the air downwardly; deflecting means below said fan adapted to receive the air therefrom and deflect it outwardly and unequally in different directions; and means adapted to rotate positively said deflecting means about an axis substantially parallel with the direction of discharge and thereby rotate about said axis the deflected current of air.

9. In apparatus of the character described, in combination, a fan; a deflecting device in the path of discharge of said fan, said device comprising a plurality of members disposed in different directions with respect to the axis of said discharge; and means adapted to rotate positively said deflecting device.

10. In apparatus of the character described, in combination, a source of power; a fan driven from said source of power and positioned to drive the air downwardly; deflecting means below said fan adapted to receive the air therefrom and deflect it outwardly, said deflecting means comprising a plurality of members inclined with respect one to the other; and means driven from said source of power adapted to rotate said deflecting means.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

RUDOLPH VUILLEUMIER.

Witnesses:

LEUDSLEE SCHAPMES,

DELOS G. HAYNES.