

L. M. DIETERICH.
FAN CONSTRUCTION.
APPLICATION FILED NOV. 9, 1915.

1,244,480.

Patented Oct. 30, 1917.
2 SHEETS—SHEET 1.

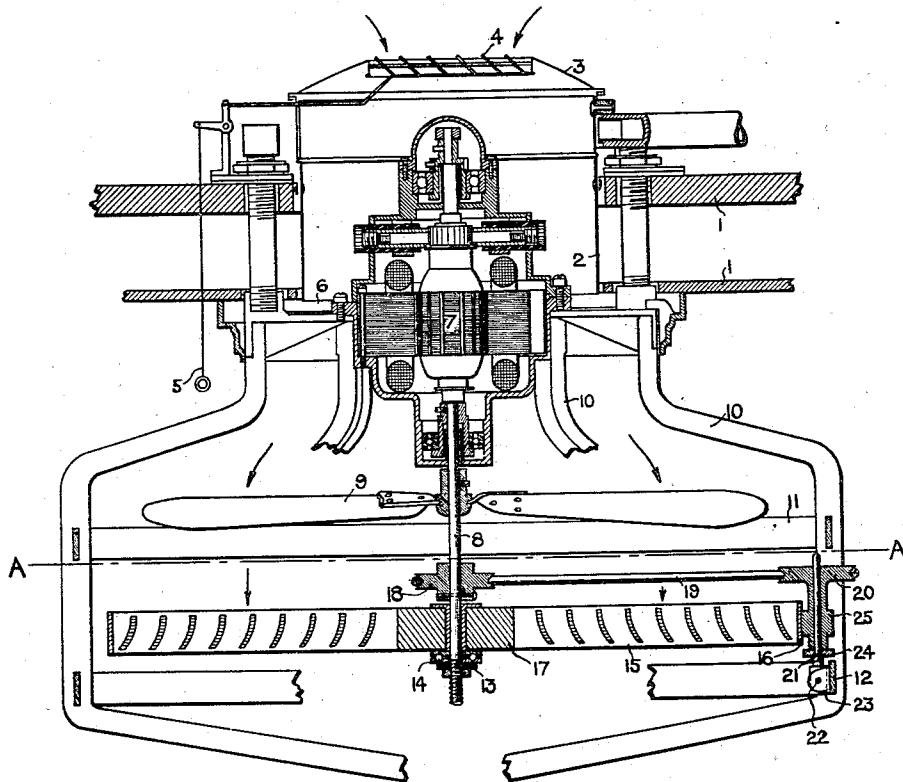


FIG. 1

WITNESSES:

H. B. Pringle
L. Levitt

INVENTOR

L. M. Dieterich

BY

Emory, Booth, James & Varnum
ATTORNEY

L. M. DIETERICH.
FAN CONSTRUCTION.
APPLICATION FILED NOV. 9, 1915.

1.244,480.

Patented Oct. 30, 1917.
2 SHEETS—SHEET 2.

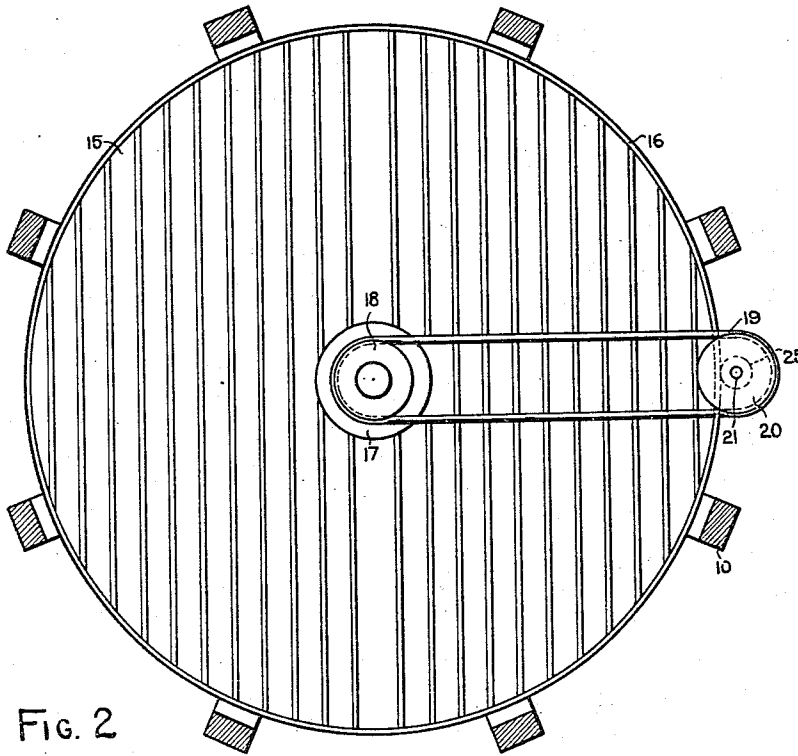


FIG. 2

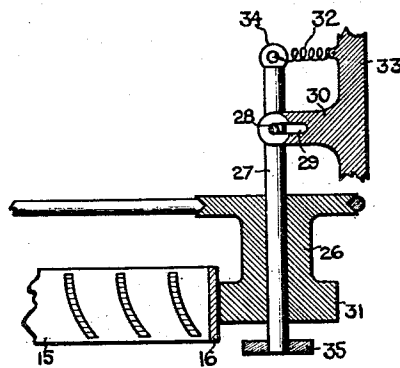


FIG. 3

WITNESSES:

H. J. Brugges
L. Leach

INVENTOR

L. M. Dieterich

BY

Emery, Dost, Jernsey & Varnum
ATTORNEYS

UNITED STATES PATENT OFFICE.

LUDWIG M. DIETERICH, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO SAFETY CAR HEATING & LIGHTING COMPANY, A CORPORATION OF NEW JERSEY.

FAN CONSTRUCTION.

1,244,480.

Specification of Letters Patent.

Patented Oct. 30, 1917.

Application filed November 9, 1915. Serial No. 60,508.

To all whom it may concern:

Be it known that I, LUDWIG M. DIETERICH, a citizen of the United States, and a resident of Mount Vernon, in the county of Westchester and State of New York, have invented an Improvement in Fan Construction, of which the following is a specification.

This invention relates to fan construction. One of the objects thereof is to provide apparatus of the above nature, of simple, inexpensive and practical construction, with the parts compactly disposed. Another object is to provide apparatus of the above type which shall be quiet, reliable and efficient in action.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the structure hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are shown one or more of various possible embodiments of the several features of this invention, Figure 1 is a sectional elevation. Fig. 2 is a sectional plan taken substantially on the line A—A of Fig. 1. Fig. 3 is a detailed sectional view.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now, to Fig. 1 of the drawings, there is indicated at 1 a portion of a car roof, it being understood that this apparatus is peculiarly adapted for use in connection with railway cars. Mounted within and extending through this roof is a sleeve 2, the cap 3 of which is provided with an adjustable shutter 4 controlled through suitable linkage by means of a rod 5 depending within the car. Mounted within sleeve 2 in any suitable manner, as by means of the fitting 6, is an electric motor 7, the details of the construction of which form in themselves no part of the present invention. The downwardly extending shaft 8 of motor 7 is provided with a rotary fan 9, the blades of which are so formed as to discharge the air downwardly when the motor is in action, this air being largely drawn through the shutter 4 and about the motor 7.

Bolted to the fitting 6 is a frame comprising a plurality of curved arms 10 rigidly held in spaced relation as by the rings 11 and 12.

Shaft 8 is carried downwardly and provided with a suitably locked nut 13 upon which rests, as by the ball-bearing 14, a deflector 15. It may here be noted that the term "deflector" is used throughout in a broad sense to denote any element adapted upon being exposed to an air blast to tend to discharge it in a desired direction.

The construction of deflector 15 is best seen from Fig. 2 of the drawings, and it will be noted that it comprises, in general, a series of plates extending downwardly, one-half of these plates being outwardly curved in one direction and the other half similarly curved in the opposite direction. These plates, which form a grid, are held in position by the rim 16 and by a central hub 17, suitably journaled upon the shaft 8.

It will thus be seen that this deflector, which is freely rotatable upon the shaft 8, is mounted in the path of discharge of the fan 9 and it may here be noted that the term "fan" is used in a broad sense to denote any device adapted to discharge an air blast, whether of the propeller-bladed type or otherwise.

Fixed to the shaft 8 above the deflector 15 is a fiber pulley 18 having a V-shaped groove in which is mounted a resilient belt 19 which connects pulley 18 with a similar pulley 20. Belt 19 may be of rubber or of coiled spring and it tends in its action to draw the pulley 20 toward the shaft 8. The latter pulley is freely mounted upon a pin 21 pivoted at 22 to a fixed bracket 23 upon the ring 12. Pulley 20, the downward movement of which is limited by a stop collar 24 upon the spindle 21, is provided with a roller surface 25 engaging the outer surface of the ring 16 and resiliently held against the same by the belt 19.

In the action of the apparatus, the pulley 18, fast upon the shaft 8, causes a rapid rotation of the pulley 20, and the latter by means of the roller surface 25 rotates the deflector about its axis, the various parts being so proportioned as to give the desired slow rate of rotation of the deflector with the fan running at its normal speed. The yielding connection between the fan shaft 8

and the deflector 15 permits the motor to be started without being exposed to the full load as slippage is permitted at the frictional engagement of the roller 25 with the rim 16 and the deflector may thus be gradually brought up to speed. The free mounting of the roller 25 with the parts connected therewith permits it to assume a position precisely in alinement with roller 18 and thus does away with any tendency of the belt to ride off the pulleys. Irregularities in the outer surface of rim 16, moreover, are prevented from exerting any objectionable effect as the spindle 21 readily swings about its pivot to as great a degree as is necessary as the deflector revolves. The entire apparatus, moreover, being free from gears, is substantially silent in action and the deflector is rotated at such proper speed as will swing the downwardly and outwardly directed air blasts at the desired rate about the axis of shaft 8.

In Fig. 3 of the drawings is shown a slightly different mounting of the pulley driving the deflector, the fiber pulley 26 being here mounted upon a spindle 27 provided with the pivot pin 28 resting in a slot 29 in the bracket 30. The roller surface 31 engages the outer surface of the rim 16, as hereinbefore described, and is resiliently urged against such surface by a tension spring 32 connected between the frame at 33 and a cap 34 on the end of the spindle 27. Downward movement of the pulley 26 is limited as by means of a stop collar 35 on the lower end of the spindle.

The action of the apparatus last described will be clear from its construction taken in connection with the description of operation of the apparatus first set forth.

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

As many changes might be made in the above construction, and as many apparently different embodiments might be made of this invention without departing from the scope thereof, it is intended that all features herein described 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 construction of the class described, in combination, a fan, a rotary deflector in the path of discharge of said fan, a source of power driving said fan, and a device driven from said source of power engaging the outer portion of said deflector and adapted to rotate the same at a slow speed relative to that of said fan.

2. In construction of the class described,

in combination, a fan, a rotary deflector in the path of discharge of said fan, a source of power driving said fan, a roller driven from said source of power and resting against the outer portion of said deflector, and means resiliently urging said roller against said deflector to rotate the same.

3. In construction of the class described, in combination, a fan, a rotary deflector in the path of discharge of said fan, a source of power, and a rotary driving member driven from said source of power and resiliently urged into frictional relation with said deflector to rotate the same.

4. In construction of the class described, in combination, a motor having a downwardly extending shaft, a fan upon said shaft, a rotary deflector mounted below said fan and coaxial with said shaft, a rotary driving member resiliently urged against said deflector to rotate the same, and means driving said member from said motor.

5. In construction of the class described, in combination, a fan, a rotary deflector in the path of discharge of said fan, a pivoted member mounted adjacent the outside of said deflector, a roller mounted on said pivoted member, and means adapted to rotate said roller and press the same against the outer portion of said deflector.

6. In construction of the class described, in combination, a fan, a rotary deflector in the path of discharge of said fan, a pivoted member mounted adjacent the outside of said deflector, a roller mounted on said pivoted member, and means adapted to rotate said roller and press the same against the outer portion of said deflector, said deflector being positioned beneath said fan and coaxial therewith.

7. In construction of the class described, in combination, a fan, a source of power driving said fan, a movable deflector in the path of discharge of said fan, and means comprising a yielding connection adapted to actuate said deflector from said source of power in a plane parallel to the plane of rotation of said fan.

8. In construction of the class described, in combination, a fan, a source of power driving said fan, a movable deflector in the path of discharge of said fan, and means comprising a yielding connection adapted to actuate said deflector from said source of power, said deflector being positioned beneath said fan and said fan being positioned beneath said source of power.

9. In construction of the class described, in combination, a motor having a downwardly extending shaft, a fan mounted upon said shaft, a rotary deflector mounted below said fan and coaxial with said shaft, said deflector being freely rotatable with respect to said fan, a pulley upon the shaft of said motor, a pulley mounted adjacent the outer por-

tion of said deflector, a flexible power transmitting device connecting said pulleys, and a roller driven from said last pulley and frictionally engaging the outer surface of said deflector to rotate the same.

10. In construction of the class described, in combination, a motor having a downwardly extending shaft, a fan mounted upon said shaft, a rotary deflector mounted below said fan and coaxial with said shaft, said deflector being freely rotatable with respect to said fan, a pulley upon the shaft of said motor, a pulley mounted adjacent the outer portion of said deflector, a roller frictionally engaging the outer surface of said deflector to rotate the same, and means adapted to drive said second pulley from said first pulley and to urge said roller yieldingly against said deflector.

11. In construction of the class described, in combination, a motor having a downwardly extending shaft, a fan mounted upon said shaft, a rotary deflector mounted below said fan and coaxial with said shaft, said deflector being freely rotatable with respect to said fan, a pulley upon the shaft of said motor, a pulley mounted adjacent the outer por-

tion of said deflector, a pivotally mounted pin on which said second pulley is journaled, a roller driven from said second pulley and frictionally engaging the outer surface of said deflector, and means driving said second pulley from said first pulley and yieldingly urging said roller against said deflector.

12. In construction of the class described, in combination, a motor having a downwardly extending shaft, a fan mounted upon said shaft, a rotary deflector mounted below said fan and coaxial with said shaft, said deflector being freely rotatable with respect to said fan, a pulley upon the shaft of said motor, a pulley mounted adjacent the outer portion of said deflector, a roller frictionally engaging the outer surface of said deflector to rotate the same, and means adapted to drive said second pulley from said first pulley and urge said roller yieldingly against said deflector, said deflector being supported by and having a bearing on an extension of the motor shaft.

In testimony whereof, I have signed my name to this specification this 1st day of November 1915.

LUDWIG M. DIETERICH.