Sept. 8, 1936. J. H. McCORMICK 2,053,403

AIR DISCHARGE NOZZLE

Filed Aug. 22, 1932

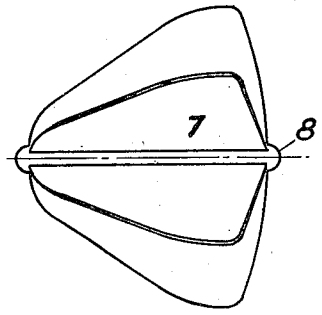

Fig. 1

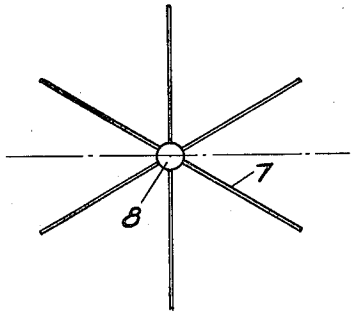

Fig. 2

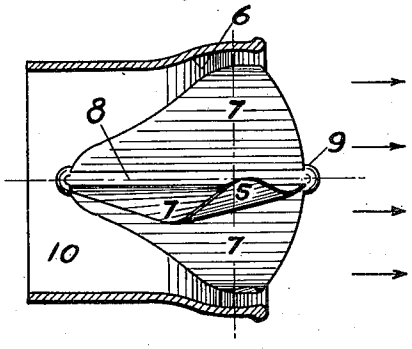

Fig. 4

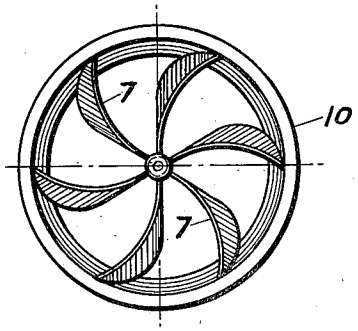

Fig. 3

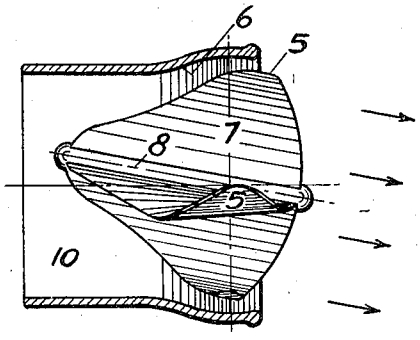

Fig. 6

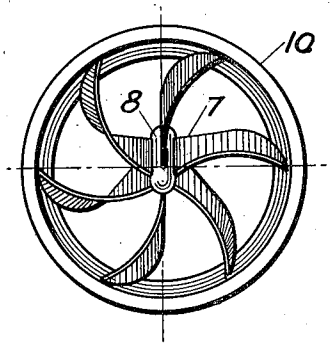

Fig. 5

JOHN H. McCORMICK

INVENTOR

BY Ralph C. Cladwell

ATTORNEY

Patented Sept. 8, 1936 2,053,403

UNITED STATES PATENT OFFICE

2,053,403

AIR DISCHARGE NOZZLE

John H. McCormick, Williamsport, Pa., assignor to J. H. McCormick & Co., Williamsport, Pa., a corporation of Pennsylvania

Application August 22, 1932, Serial No. 629,943

9 Claims. (Cl. 98—40)

My invention relates to devices for controlling the direction of air flow from substantially cylindrical nozzles and has for an object to provide means to direct the air flow and to aid the air stream discharged to take on a rotating or spiral motion whereby to set up turbulence in the space to which the discharge is directed.

As is now well known in the art to which my invention appertains, the fundamental requirement of satisfactory air conditioning is the proper distribution of air throughout the space served and the avoidance of air stratification within that space. This calls for a considerable air discharge velocity and to avoid the creation of drafts within the space, the air discharge must be broken up into non-interfering small streams of whirling air such as will carry for a considerable distance and break down only as the dynamic energy of the air stream is absorbed by the air of the space into which the stream is projected. Such streams can only be satisfactorily projected from substantially cylindrical discharge ducts or nozzles. My invention relates to means for directing the discharge from such cylindrical discharge casings or openings while at the same time permitting the stream therefrom to maintain a rotatory or spiral motion and, when necessary, aiding or causing said spiral motion.

With the foregoing and other objects in view, as will appear as the description proceeds, my invention resides in the combination and arrangement of parts and in the details of construction described herein and particularly pointed out in the appended claims, it being understood that changes in the particular embodiment of my invention may be made within the scope of what is claimed without departing from the spirit of the invention. I intend no limitations other than those of the claims when fairly interpreted in the light of the full disclosure and the present state of the art.

In the drawing:

Figs. 1 and 2 are side and end views respectively of the deflector vane assembly embodying my invention;

Figs. 3 and 4 are end and side sectional views respectively of a discharge nozzle assembly embodying my invention, including the deflector vane assembly of Fig. 1;

Figs. 5 and 6 are similar views to Figs. 3 and 4 but with the deflector vane assembly positioned to give a downwardly direction of discharge.

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

Turning first to Fig. 4, 10 represents a discharge nozzle casing or duct, substantially cylindrical so far as the air passage is concerned. Removably positioned within the casing is a deflector vane assembly 9 comprising an axial member 8 to which is joined a plurality of radially extending vanes 7, 7, (Fig. 2) preferably formed of flexible resilient material such as spring brass or steel, for example.

Adjacent one end of the nozzle casing 10, the inner face 6 preferably forms a spherical or substantially spherical surface of a diameter somewhat less than the extended diameter of the vane assembly 9, as in Fig. 2. Grasping the vane assembly 9 it may be inserted into the casing 10 by a twist to the left or right, causing the outer portions 5 of the vanes to twist or curl so as to form spiral tips which will rotatably deflect the air stream and induce a spiral motion. These being at the outer periphery of the stream have a maximum deflecting effect. These outer portions 5 contact the spherical surface, permitting arcuate adjustment of the deflector cluster 9 sideways or up and down. If, for example, it is desired to direct the air discharge downwardly, the entire deflector may be tipped down, as in Figs. 5 and 6, the curved ends 5 of the vanes 7 still contacting surface 6 of the casing. Because of the resiliency of the vanes, a friction pressure is always exerted against the casing tending to hold the deflector 9 fixed in its adjusted position. Similarly the deflector may be adjusted to direct the air stream in whatever direction is desired.

What I claim is:

1. In an air discharge nozzle, a substantially cylindrical casing and means to rotatably deflect air discharged therefrom, comprising a plurality of radially disposed resilient deflector vanes joined at an axis of said casing and flexed against the inner wall of said casing whereby to curl the tips of said vanes.

2. In an air discharge nozzle, a substantially cylindrical casing, a spherical surface located within adjacent one end of said casing and a cluster of radially disposed deflector vanes within said casing adjustably contacting said surface and adapted and arranged for arcuate movement.

3. In an air discharge nozzle, a substantially cylindrical casing and means to impart a spiral motion to an air stream passing through said casing comprising an axial member and a plurality of substantially flat radially disposed vanes extending from said member to the inner wall of said casing at the discharge end, the discharge

tips of said vanes being curled to deflect the outer periphery of the discharged air stream.

4. In an air discharge nozzle, a substantially cylindrical casing, and a plurality of deflector vanes disposed in said casing, said vanes mounted about a common axis, each vane having a relatively short length of its edge frictionally engaging the inner surface of said casing to enable said vanes to be adjusted about lines transverse to the axis of the casing to change the direction of the movement of the air discharged from the nozzle.

5. In an air discharge nozzle, a substantially cylindrical casing, and a plurality of deflector vanes disposed in said casing, said vanes mounted about a common axis, each vane being substantially triangular in shape and engaging the casing along only a small portion of one side of the triangle to enable said vanes to be adjusted about lines transverse to the axis of the casing to change the direction of the movement of the air discharged from the nozzle.

6. In an air discharge nozzle, a substantially cylindrical casing, and a cluster of resilient deflector vanes disposed in said casing, said vanes extending substantially radially from the axis of said cluster, the radial extent of each vane being greater than the radius of said casing whereby the outermost portions of each vane will arcuately flex and frictionally engage the inner surface of said casing when the cluster is inserted therein.

7. In an air discharge nozzle, a casing of substantially circular transverse section, and a cluster of vanes therein, said cluster comprising a hub and a plurality of vanes supported thereby in substantially radial disposition, each vane substantially triangular in shape and frictionally engaging the casing along only a small portion of one side of the triangle whereby the cluster may be adjusted at will about lines transverse to the axis of the casing to change the direction of the movement of the air discharged from the nozzle.

8. In an air discharge nozzle a substantially cylindrical casing, and a cluster of deflector vanes therein, said cluster comprising a hub and a plurality of vanes supported thereby, said hub adjustable to incline the axis thereof with respect to and transversely of the axis of the casing whereby to vary the direction of the air discharge from the nozzle.

9. In an air discharge nozzle, a stationary casing, and means therein to vary the rotary and axial direction of discharge from said casing, said means comprising a cluster of vanes, said cluster comprising a hub and a plurality of vanes supported thereby, said vanes arcuately deflectable and said hub tiltable.

JOHN H. McCORMICK.