

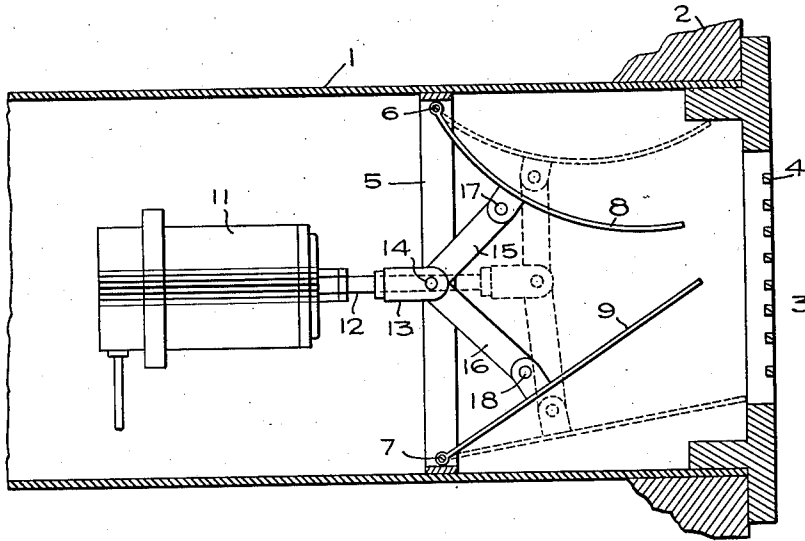
May 25, 1943.

C. A. OTTO

2,320,007

DAMPER

Filed Sept. 19, 1941



31

Inventor
Carl A. Otto
Doyle and Im.
Attorneys

UNITED STATES PATENT OFFICE

2,320,007

DAMPER

Carl A. Otto, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis., a corporation of Wisconsin

Application September 19, 1941, Serial No. 411,595

3 Claims. (Cl. 98—40)

This invention relates to dampers and particularly to volume dampers for use in controlling the supply of conditioned air to a room. The air may be heated, cooled, dehumidified or otherwise conditioned.

The principal object of the invention is to provide a nozzle-forming damper which will maintain the velocity of discharge even in the partly closed positions of the damper, and which as the damper closes will give an increasing lateral component to the motion of the discharging air.

For example, when used to control the delivery of cooled air to the upper part of a room, the damper will, when wide open (so that the discharge velocity is at its maximum) deliver the air horizontally. As the damper closes, with some unavoidable reduction of discharge velocity, the discharging air will be directed upward and outward, the upward component increasing as the damper closes. The effect is to resist too rapid settling of the cooled air into the lower portion of the room.

Such an embodiment of the invention is shown in the accompanying drawing in which the single view is a vertical section through the discharge duct, with the damper shown in its nearly closed position. The wide open position is indicated in broken lines.

In the drawing, the duct 1 leads from any suitable air distributing system or duct (not shown) through the wall 2 of a room or other space 3. A discharge grille of any suitable form is indicated at 4.

The duct 1 is of rectangular cross-section and of any desired horizontal dimension. A damper frame 5 fits into the duct 1 behind the grille 4, and carries journals 6 and 7 for two coacting damper blades 8 and 9. The journals 6 and 7 are parallel and are located close to the top and bottom walls of the duct and the blades project from these journals toward the grille. The blade 9 is plane or flat whereas the blade 8 is curved or cylindrical presenting its convex surface toward the other blade 9. The length of blade 9 is such that, in all operating positions of the two blades 8 and 9, the trailing or free edge of blade 9 is closer to grille 4 than is the free edge of blade 8. Where the air is to be diverted more and more upward as the damper closes, the curved blade is the upper as shown in the drawing.

The parts are so dimensioned that the free edges of the blades 8 and 9 are close behind the grille 4, so that the nozzle discharge action will be effective at the grille and will not be suppressed by the duct.

The blades 8 and 9 are actuated in unison by

a motor which may comprise a cylinder 11 and piston rod 12. A clevis 13 on rod 12 is pinned at 14 to links 15 and 16, which are pinned at 17 and 18 to clips on respective blades 8 and 9 respectively.

Dampers of this general type in which both blades are flat or plane have been used for many years and have the advantage of nozzle discharge. This gives sustained velocity.

The invention adds the important feature of increasing lateral deflection as the damper closes. The deflection is toward the side at which the curved blade is mounted. This may be top, bottom or either side depending on the deflection sought.

As a practical matter the position shown would be used when the discharging air is cooled. Where heated air is discharged, the curved blade would commonly be at the bottom giving downward deflection as the damper closes to counteract the tendency of heated air to rise. Other positions would be used only in rare and special cases.

What is claimed is:

1. The combination of a duct having an open discharge end; two damper blades pivotally mounted at their leading edges in the terminal portion of the duct on parallel axes which extend transversely of the duct and which respectively are adjacent opposite walls of the duct, said blades extending from their axes toward the discharge end of the duct to form a nozzle-like discharge from the duct, one of said blades being curved to present a convex cylindrical surface toward the other blade and said other blade being formed to present a plane surface toward the curved blade; and actuating means arranged to impart related motion to said blades such that they swing simultaneously in opposite angular directions and approximately at the same angular rates toward and from one another.

2. The combination defined in claim 1 wherein the damper blade having the plane face is so mounted in the duct that in all operating positions of the two blades its trailing edge is closer to the discharge end of the duct than is the trailing edge of said curved blade.

3. The combination defined in claim 1 wherein the duct is substantially straight, the axes of the blades are located substantially in a single plane normal to the longitudinal axis of the duct, and the blade having the plane surface is so dimensioned that in all operating positions of the two blades its trailing edge projects beyond the trailing edge of the curved blade and toward the end of the duct.

CARL A. OTTO.