

A DIAPHRAGM AIR CONTROL FOR A COMMERCIAL SEED CLEANING MACHINE

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An air control device for the Clipper M-2B seed cleaning machine ¹ provides more convenient and more precise control than standard equipment.

The Clipper M-2B has sliding sheet metal gates to control the fan air supply (fig. 1). These gates close down around the fan drive shaft and are adjusted by loosening wing nuts and sheet metal screws and sliding the gates to the desired position. The adjustment of these gates is rather inconvenient, particularly on the left side of the machine where the fan drivebelt and pulley¹ are located. The adjustment of the opening when the machine is running is somewhat hazardous because working close to the pulley and belt is necessary. The irregular shape of the opening formed by the gates and the presence of the pulley, which restricts a clear view of the opening, makes it difficult to adjust the air opening exactly equal on both sides of the seed cleaner. With the installation of a belt and pulley guard, the air adjustment becomes even more difficult because space is restricted and the opening cannot be clearly seen.

¹ Manufactured by A. T. Ferrell and Co.

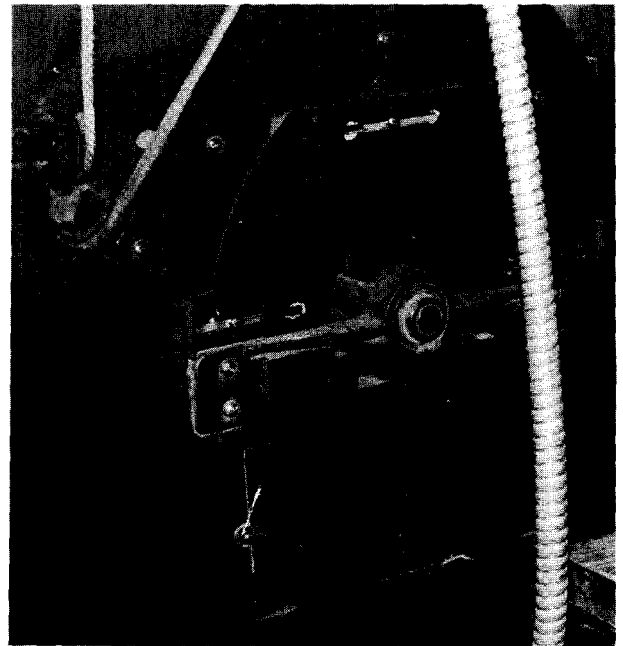


Figure 1.—Sheet metal air control gates provided as standard equipment on the Clipper M-2B seed cleaner.

To provide a better and more convenient air control, a diaphragm air control unit was constructed (fig. 2). Thus, the air control from closed to wide open may be adjusted by means of a single lever on each side of the machine. With proper calibration, actually seeing the opening is not necessary, and the machine can be easily and safely adjusted while running.

The diaphragm air control construction unit consists of a plywood base, eight kidney-shaped sheet metal leaves, a control ring, and a cover plate. The general construction and all measurements are in inches (figs. 4-6). The base is constructed of 3/4 inch plywood. A piece of 1/4-inch plywood is cut to fit around the leaves and the control ring, and is attached to the base. There are eight leaves—each with two metal pins brazed to opposite sides at opposite ends. The leaves are made of 26 gage (0.018 inch) galvanized sheet metal.

The leaves overlap (fig. 3). One of the pins on

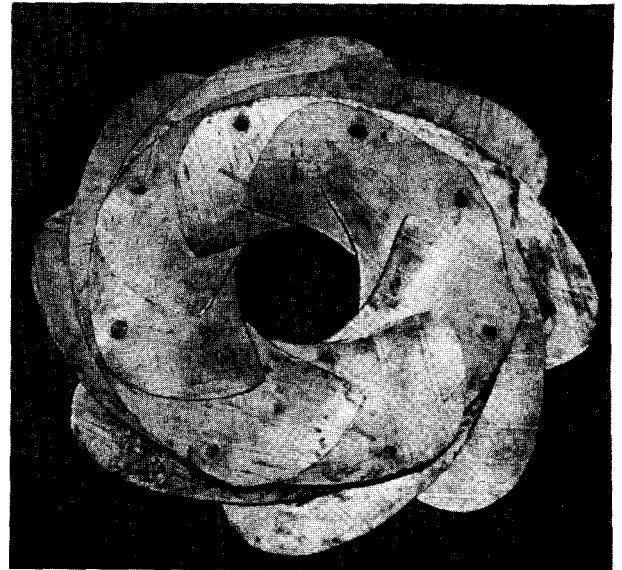


Figure 3.—The diaphragm air control with the cover and control ring removed, showing the overlapping of the leaves.

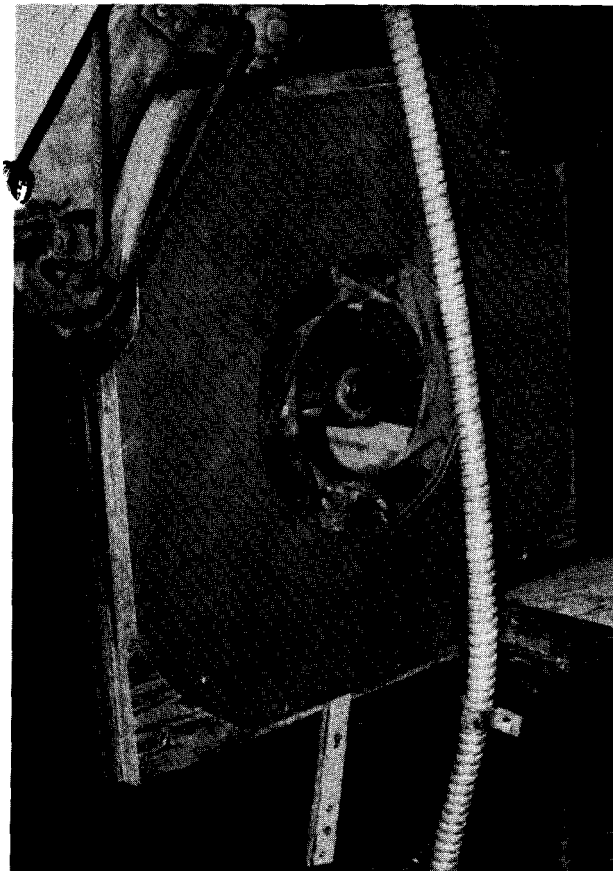


Figure 2.—Diaphragm air control device at same location as in figure 1.

0.094 STEEL PIN-0.125 LONG-
BRAZED TO LEAF-THIS PIN GOES
IN SLOT ON CONTROL RING



0.094 STEEL PIN-0.188 LONG-
BRAZED TO LEAF-THIS PIN GOES
INTO HOLE IN PLYWOOD BASE

LEAF OF DIAPHRAGM

NOT TO SCALE

Figure 4.—Side view of one leaf indicating approximate location of pins. (Measurements in inches.)

each leaf fits into a hole drilled in the plywood base and allows the leaves to pivot across the center opening. The pin in the opposite side of each leaf fits into a slot on the control ring. The control ring, when rotated, determines how far each leaf travels. One of the eight leaves is shown in the open and in the partly closed position (fig. 5). The control ring (fig. 6) is doughnut-shaped and made of 1/16-inch aluminum sheet. The handle of the control ring must be reinforced by riveting another piece of 1/16-inch aluminum to it. The cover is also made of 1/16-inch aluminum sheet and acts as a retai-

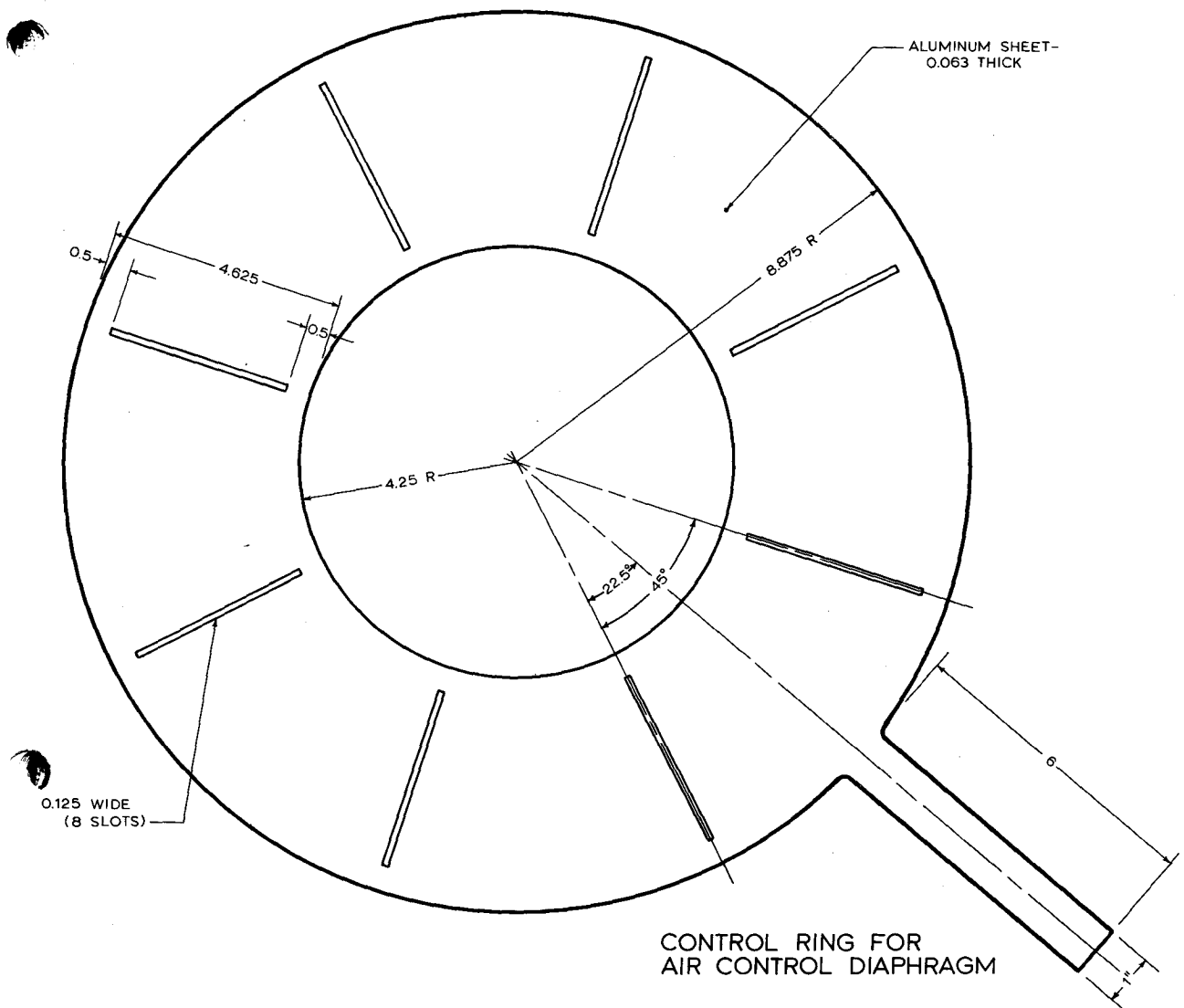


Figure 6.—Control ring. (Measurements in inches.)

ner, keeping the leaves and control ring in position. It is attached to the plywood frame with sheet metal screws.

When mounting the diaphragm unit on the Clipper M-2B, the plywood base must be $\frac{3}{4}$ -inch from the side of the machine so that the diaphragm leaves close about the shaft bearing. A piece of $\frac{3}{4}$ -inch plywood can be used for a spacer here. The position of the diaphragm is shown on the right side of the Clipper (fig. 2).

Fitting the diaphragm to the left side of the machine is a little more difficult, because part of one

spout will be obstructed. As much of the diaphragm framework as possible is cut away without hindering its function and redesigning the spout by reducing its width and placing it at an angle.

For even air separation across the cleaning machine, both diaphragms should be open the same amount. They can be calibrated before installation by placing one on top of another and closing the leaves on round cylinders of various sizes. Calibration marks can then be made along the side of the base in ink or paint.