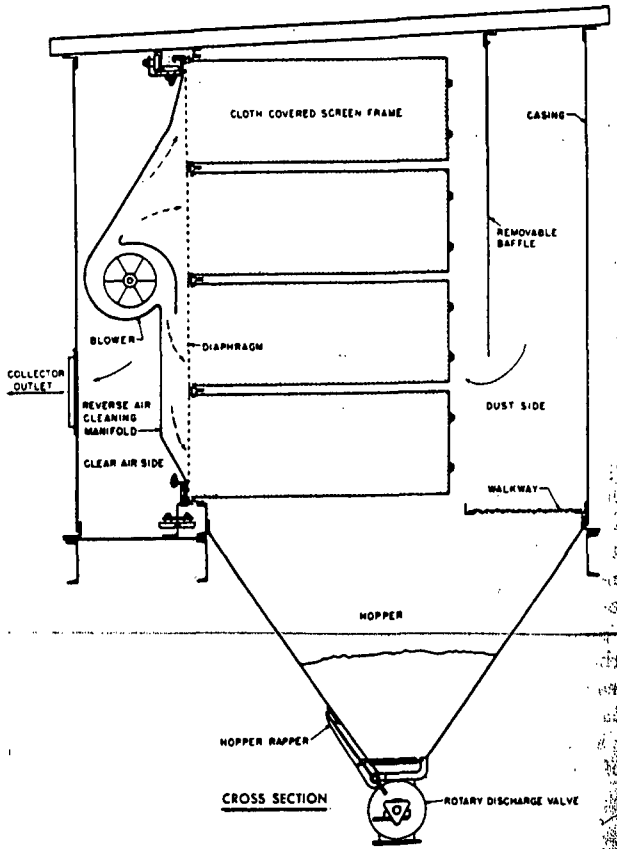

Figure 12A. Cloth-covered-screen filter assembly arranged for automatic reverse-air cleaning of filter fabric. (Courtesy Pangborn Corp., Hagerstown, Md.)

cause of the excessive space requirement, which increases approximately in proportion to the increase in effectiveness desired, specified on the degree scale (page 238).

Air velocities through electric precipitators are moderate; they are between those used for filtration with fabrics and those required for inertial separation. Accordingly, pressure drop is low, and wear due to abrasion is slight. At the same time, air distribution can be a problem with low velocities, and it may be necessary to provide distributing plates, dividers, or filters at the inlet to provide uniform approach to the charging and precipitating zones.

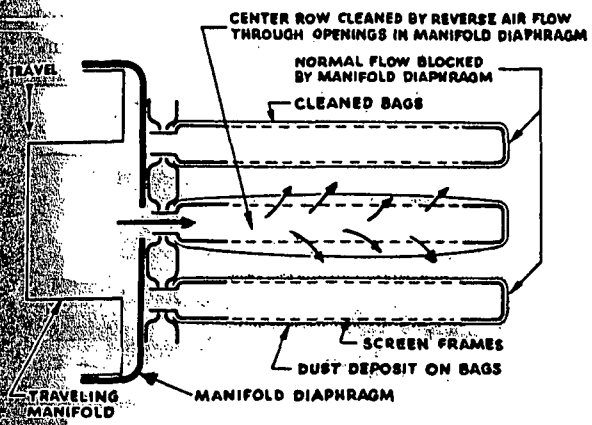

Figure 12B. Top view of reverse-air-flow mechanism for cleaning filter bags. (Courtesy Pangborn Corp., Hagerstown, Md.)

Resistivity of Dust Deposits. Two electric properties of the deposit on collecting electrodes have an important effect on the performance of electric precipitators. These are (*1*) the conductivity or resistivity and (*2*) the breakdown dielectric strength. The higher the dielectric strength of the dust layer, the less sensitive is the precipitation process to the effects of high resistivity.[9]

Humidification, using water vapor, is an effective method of reducing the resistivity of solid particles. Other vapors or gases, which in small concentrations have the ability to reduce resistivity of specific dusts, may be present in the dust-laden gas or may be added as "conditioning agents." By experience and research, manufacturers of precipitators have learned about a number of such favorable combinations.

Adhesives used in precipitators applied to air-conditioning systems not only may improve the dust-holding ability of electrodes, but also may contribute to better performance by reducing the resistivity of the dust.[10]

A. SINGLE-STAGE HIGH-VOLTAGE PRECIPITATORS

Electric precipitators for removing solids or liquids from industrial process gases generally operate at voltages from 25,000 to 100,000, direct current. The discharge electrode system of rods or wires is maintained at a negative potential, and accordingly imparts a negative charge to particles suspended in the gas. The collecting electrode arrangement leads to the description of single-stage precipi-

9. White, *Mech. Eng.*, **77**, 254 (abstract) (March, 1955).
10. Penney, *Trans. Am. Inst. Elec. Engrs.*, **70**, 1009–1013 (1951).