

BRIEF PAPERS

METHOD OF STIRRING GASES WITHIN A CLOSED CHAMBER

(WITH ONE FIGURE)

In various types of investigations it is often desirable to circulate gases within a tight chamber by a simple method which allows for ready adjustment of the rate of circulation. This is especially true in measuring respiration and carbon fixation by plants or respiration by animals. A suitable apparatus has been devised for this purpose. In principle the method consists of rotating a fan inside of a chamber by means of a magnetic coupling which operates through the glass wall of the chamber in such a way as to cause the inclosed fan to turn synchronously with a revolving electromagnet on the outside of the chamber.

A convenient arrangement of such a device is shown in figure 1. A

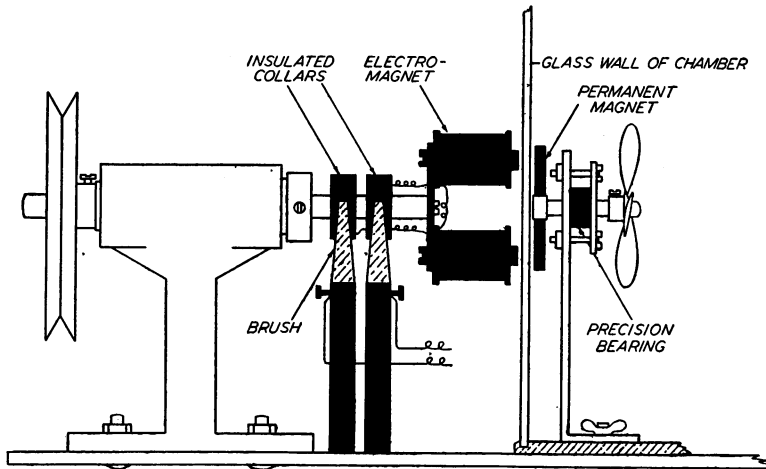


FIG. 1. Apparatus for stirring air within a closed chamber.

shaft, bearing an electromagnet and two insulated metal collars on one end, is supported by means of a suitable bearing. Copper brushes rest against the surface of the collars and carry electricity to the circuit of the electromagnet. A pulley is attached to the opposite end of the shaft and connected with a belt to a small motor by means of which the electromagnet is rotated. This part of the apparatus is mounted outside the chamber so that the ends of the core of the electromagnet are about one-sixteenth of an inch from the glass wall of the chamber and rotate in a plane parallel to it.

The removable fan unit that operates inside of the chamber consists of an L-shaped brass strip to which a precision bearing is attached by means

of a housing. The bearing supports a brass shaft, on one end of which is attached a permanent magnet, and on the other end, a fan. The unit is clamped in place by means of a bolt in the floor of the chamber so that the permanent magnet is about one-sixteenth of an inch distant from the wall of the chamber.

When the energized electromagnet rotates, the permanent magnet revolves synchronously with it, and in a plane parallel to the wall of the chamber. A suitable method of starting the apparatus is to cause the belt to slip and then gradually tighten until the maximum speed is reached as the two magnets remain synchronized only when subjected to a gradual rate of acceleration. Four units, equipped with four inch fans and electromagnets similar to those used in standard telegraph sounders, can be operated by current from an automobile generator. The amount of gas agitated by a given fan is varied by changing the speed at which the fan revolves and this is readily accomplished through the use of different sized pulleys.—JOHN W. MITCHELL and WILLIAM E. MARTIN, *University of Chicago*.