A Stirrer Drive for Laboratory Use

MAX H. HUBACHER, Nitro, W. Va.

THE stirrer drive described in this paper is durable and can be easily constructed. The shaft holder *D* consists of a piece of steel 8.2 cm. (3.25 inches) long and 2.5 cm. (1 inch) in diameter, with a 1.3-cm. (0.5-inch) hole drilled lengthwise through it. *C* is an oil hole. Two 1.3-cm. (0.5-inch) iron rods, *H* and *G*, are welded to this shaft, 4.4 cm. (1.75 inches) apart. The upper rod *H* is 37.5 cm. (15 inches) long and the lower rod 22.5 cm. (9 inches). The shaft *F* is made of a seamless steel tubing 1.3 cm. (0.5 inch) outside diameter, 14 gage, and 27.5 cm. (11 inches) long. The shaft is slit lengthwise for 6.3 cm. (2.5 inches) and the four parts forced slightly apart, as indicated in Figure 1. A collar *E* made from brass tubing, 6.3 cm. (2.5 inches) long, is slipped over the lower part of the shaft. The pulley

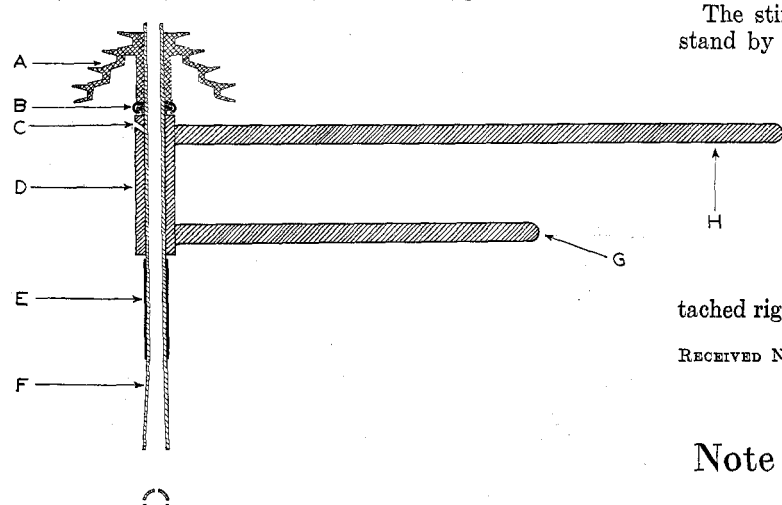

FIGURE 1. DIAGRAM OF STIRRER DRIVE

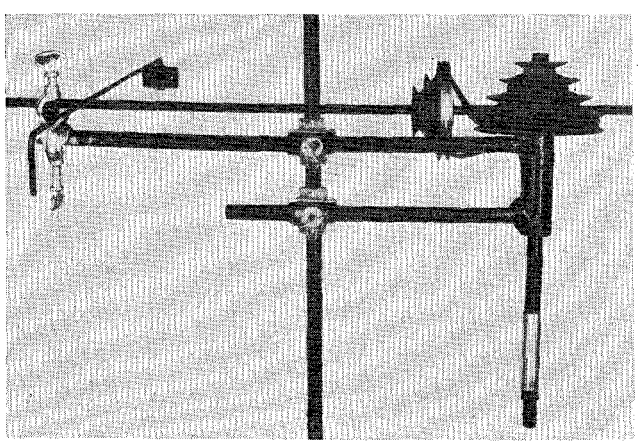

FIGURE 2. STIRRER DRIVE FASTENED TO SUPPORTING STAND

A is a three- or four-step pulley of 1.3-cm. (0.5-inch) bore and riding on a ball thrust bearing *B*.[1]

Any glass stirrer up to 8 mm. outside diameter can be attached to this shaft. A small piece of rubber tubing is slipped over the glass rod, which is then inserted into the split shaft. When the brass collar *E* is moved downwards the shaft parts are pressed against the rubber and glass rod, holding it firmly in position. In other designs of stirrer holders the glass rod is held in position by a set screw, and often breaks at the point of application of the screw.

The stirrer drive is attached to the rod of a supporting stand by two large clamp fasteners, as shown in Figure 2. The upper rod *H* is attached to the wall by a curtain or welding rod to prevent the stirrer drive from slowly shifting around its vertical axis during operation.

The advantages of this stirrer holder are: Glass stirrers can be attached quickly by merely inserting the rod in the shaft and pulling down the collar; the glass rod is held firm in a rubber cushion; and the stirrer drive can be attached rigidly to a supporting stand.

[1] Manufactured by the Walker-Turner Co., Jersey City, N. J., and retailed through S. S. Kresge & Company and Sears, Roebuck & Company stores for fifty cents. The ball thrust bearing sells for twenty-five cents.

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Note on the Micro-Dumas Method

M. L. NICHOLS, Cornell University, Ithaca, N. Y.

IT OFTEN happens in this determination, especially with azotometers which have been filled with pure mercury, that the gas bubbles adhere to the interface between the mercury and the potash solution and can be loosened only by rather vigorous shaking. Pregl (*3*) says that "this occurrence, however, ceases after the first few determinations, when sufficient finely divided copper oxide dust has collected at the boundary between the two liquids." Flaschenträger (*1*) and Weygand (*5*) have advocated the artificial contamination of the mercury by the addition of finely divided copper oxide, but Meixner and Kröcker (*2*) state that this does not overcome the difficulty. Later Trautz (*4*) advocated the addition of some of the dark sludge formed by shaking mercury with ether.

Experience in this laboratory has shown that none of the above procedures are really effective in preventing the gas bubbles from adhering to the interface between the mercury and the potash solution. This difficulty, however, can be readily overcome, even in an azotometer filled with pure distilled mercury, by the addition of a small amount of mercurous oxide. The black oxide was prepared by treating some freshly precipitated calomel with the 50 per cent potash solution and washing thoroughly.

LITERATURE CITED

(1) Flaschenträger, *Z. angew. Chem.*, **39**, 718 (1926).
(2) Meixner and Kröcker, *Mikrochemie*, **5**, 126 (1927).
(3) Pregl, "Quantitative Organic Microanalysis," p. 97, Blakiston, 1930.
(4) Trautz, *Mikrochemie*, **9**, 306 (1931).
(5) Weygand, "Quantitative analytische Mikromethoden der organischen Chemie," p. 30, Akademische Verlagsgesellschaft, 1931.

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