

some relationship between two of the four apparent variables of the system, since only three of them can be independent.

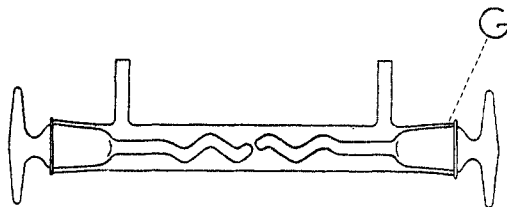
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**A Drying Tube for Phosphorus Pentoxide.**—When phosphorus pentoxide is used for drying a gas, it is usually suspended on glass wool in an upright tube, or is spread over the lower half of a horizontal tube. In the first case phosphoric acid resulting from the union of pentoxide with moisture tends to clog the apparatus, and with a horizontal tube the surface of the phosphorus pentoxide soon becomes glazed and inactive.

If in this latter case the reagent could frequently be stirred or turned over, fresh oxide would be brought into contact with the gas, and the period of the efficiency of the drying agent would be greatly prolonged. To accomplish this, the tube shown in the figure was devised. It is used in the horizontal position, and is filled to about two-thirds its diameter with phosphorus pentoxide.



The two hollow, glass stoppers in the end are very carefully ground and terminate in heavy glass rods which are bent as shown. The stoppers are lubricated with a rubber-vaseline-paraffin lubricant<sup>1</sup> at G to a distance of not over 5 mm. along the barrel of the stopper. The gas is passed in and out through the side arms. The phosphorus pentoxide in the tube can be stirred and fresh surface exposed simply by turning the two stoppers. The tubes that we have used have a length over all of 25 cm.

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<sup>1</sup> Dennis, "Gas Analysis," The Macmillan Company, 1913, p. 115.