GADGETS

Portable Intermittent Positive Pressure Breathing Apparatus

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A completely portable oxygen intermittent positive pressure breathing (IPPB) apparatus (fig. 1) has been designed at the USAF Hospital, Travis AFB, and built with the aid and cooperation of the Bird Corporation and the First Aeromedical Evacuation Group.†

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The device † includes a sturdy steel mounting for two small D-type oxygen cylinders, designed to fit on a litter (fig. 2). The cylinders are attached to the Y-shaped yoke and reducing valve with regulator and connected by flexible tubing to the respirator. A CGA 540 male connector permits direct connection to a high pressure oxygen source (for example, a large H-type oxygen cylinder) and a separate connection is available for attachment to a low pressure oxygen (or air) source (fig. 3). The

† Available as Air Evac Litter Pack from the Bird Corporation, Palm Springs, California.

FIG. 1. Complete unit with accessories, mounted on litter.

FIG. 2. Component parts, including steel mounting, yoke and reducing valve, and accessory high-pressure oxygen hose.
respirator itself is bracketed and held in place by a spring mounting. The entire apparatus weighs approximately 35 pounds, is 20 inches in width and 22 inches in length.

This arrangement allows each small oxygen tank to be used separately. Since the tanks can be replaced when empty, a continuous oxygen and pressure source is assured for uninterrupted patient use. The other connections allow for use of alternate high or low pressure oxygen (or air) sources.

The portable cradle-type respirator unit was designed primarily for use in the transport of patients by aircraft or surface vehicles. It has been successfully used on several occasions in the air evacuation of apneic patients and has eliminated the necessity for more bulky and less efficient portable artificial respiration devices.

**Warning System for Piston-Type Respirator**

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A need arose for a positive, fail-proof warning system on the Mueller-Mörch piston-type respirator which is used at the Veterans Administration Hospital in Omaha. Since there is nothing commercially available which satisfactorily fills the need, an instrument which provides a warning alarm when abnormally low or high pressure appears in the tubing which leads to the trachea of the patient was constructed by the Electronics Research Unit. This apparatus has been in continuous use on a 24-hour basis on one patient for the past two months. The check-out procedure each 8 hours has revealed no failures during this period of service. With the exception of the warning bell, the instrument is encased in a 5 by 6 by 9 inch utility cabinet. The fact that it is coupled to the tracheal tube of the respirator with gum rubber tubing allows it to be placed in any convenient location. The warning bell may be placed at any desired distance from the unit. It does not introduce any hazard in being coupled to the gum rubber tracheal tube since the aperture therein closes if the tube from the respirator alarm is inadvertently withdrawn. If there is any hesitancy about operating the alarm from the power line (the respirator itself is so powered), the battery charger which is described subsequently can be dispensed with and the alarm will then be entirely battery-operated.

**Design and Construction**

The tube leading from the respirator to the trachea is punctured by a sharp needle-shaped stainless steel tube of approximately 3 mm. in-