Intermittent vacuum regulator (left) is used in conjunction with piped vacuum system in recovery room.

capacity, compensates for initial excessive gas and fluid removal and reduces the hazard involved. Constant availability of the service is assured by use of a duplex vacuum pump located outside the patient area, in a mechanical room.

Another advantage of the intermittent vacuum regulator lies in its constant availability for service because it usually remains on a wall bracket close to the outlet. On the other hand, suction pumps are usually returned to the central supply or to the maintenance department for cleaning after use on a patient. In addition, the convenience of the intermittent vacuum regulator allows maximum utilization of the recovery-room nurse's skills, since the time wasted in pulling over a portable suction pump, making connection to an electrical outlet, and preparing the equipment for drainage is eliminated. Instead, catheter application and turning a dial are the only activities required. The unit is light and maneuverable (less than 6 inches high) and can be easily transferred between piped outlets.

The intermittent vacuum regulator functions from a vacuum wall outlet and not from an electrical connection thus reducing the potential hazard in the recovery room, where oxygen is used extensively and where flammable anesthetics may be re-administered.

Respiratory Monitor for Infants

Drs. H. J. Birkhahn and M. Heifetz of the Government Hospital "Rambam" in Haifa, Israel, report a solution to the problem of monitoring respiratory changes in the pediatric patient. Due to the infant's diminutive size there is constant overlapping between surgical and anesthetic fields especially in head and neck surgery, and frequently the anesthetist finds himself maintaining remote control over his patient. In view of this they have devised a simple gadget which gives sufficient information to administer a safe, balanced anesthetic and to have constant control over the respiratory pattern.

The idea of monitoring breath sounds has been popularised by the 'breathophone' of Shane. However, the amplification of breath sounds, particularly if partial obstruction, *e.g.* secretions, is present, can be alarming to non-anesthetic listeners. A more discreet and inexpensive gadget is the use of a modified Ayre's T-piece with a stethoscope attached. Between one end of the tube and the endotracheal connection an adapter with a nipple for connecting the rubber tubing of the stethoscope is inserted. They have constructed T-tubes with a built-in nipple in order to reduce the dead space. To prevent gas escaping through the ear pieces a small piece of cellophane is inserted between the ear piece and the metal arm of the stethoscope. No pressure changes have been noted on manometric control through the stethoscope connection because the resistance is much

Respiratory monitor for infants.

greater than through the open arm of the T-tube.

With this simple monitor constant control is maintained and secretions or other causes interfering with the airway potency can be detected early.

Modified Endotracheal Tube Cuff

Dr. Ernest A. Stern of Flushing, New York, believes there is need for greater protection against accidental collapse of the endotracheal cuff in many types of surgical procedures. This is true particularly in neurosurgery, surgery of the spine or back, or other surgical procedures requiring the patient to be in the prone position. It applies, also, to surgery of the kidney, lungs, heart, or spleen, with the patient on his side.

Collapse of the cuff in heart, or chest surgery may so endanger the oxygen supply as to threaten the patient's life. Delivery of oxygen or any anesthetic gas under pressure in the form of controlled, or assisted respiration may be impossible. Rupture of the cuff can lighten the anesthesia to a point where the patient could aspirate gastric or oral contents, or wake up during the operation. When explosive gases are used, it could precipitate an explosion.

He has designed an endotracheal safety cuff, with a dual inflation feature which (figs. 1, 2, 3 and 4) provides a simple, practical and very economical solution to this problem. It comprises an endotracheal catheter with both an outer and an inner cuff (fig. 3). The latter normally remains in reserve in a deflated condition, while the outer cuff functions (fig. 6). It is thus protected and ready to take over instantly if the outer cuff should collapse from herniation or accidental puncturing by the surgeon's knife, needle, or any other sharp edge (figs. 5, 7 and 9).

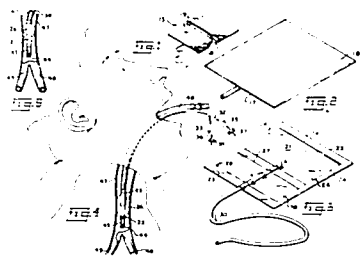

FIG. 1. The flat shaped stem endotracheal safety cuff prior to the removal of protective cover sheet, with adhesive surface for mounting to endotracheal catheter partly visible. FIG. 2. Adhesive surface fully visible. FIG. 3. Both cuff chambers and openings for inflation are revealed in this drawing. FIG. 4. Cuff in position with large chamber inflated—as in normal use. Note pilot balloons on two-channeled inflation catheter. FIG. 5. Cuff in position with large chamber collapsed and small emergency chamber inflated—as in emergency use.

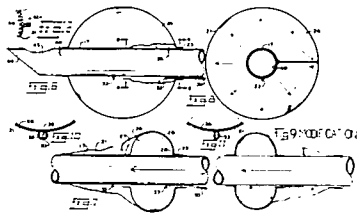

FIG. 6. Enlarged drawing of cuff detail from Figure 4. FIG. 7. Enlarged drawing of cuff detail from Figure 5. FIG. 8. Cross section of Figure 6 along line 8-8. Note overlap of cuff seams. FIG. 9. Modification: more distal position of emergency cuff. FIG. 10. Detail showing two-channeled inflation catheter with part of endotracheal catheter visible. FIG. 11. Detail showing only one half of the two channeled inflation catheter for inflation of the inside emergency cuff only.

A glance at the drawings will reveal the advantages of the flat design of the endotracheal safety cuff over the conventional tubular design (figs. 1, 2 and 3). Notice how the two cuff compartments are separately inflatable by means of a dual inflation catheter and can be applied to the endotracheal catheter without requiring a cuff spreader. Each cuff has its own pilot ballon (fig. 4). The two paper leaves that protect the adhesive surface of the cuff (fig. 1) are removed from the latter which is then rotated around the catheter, thereby adhering to it. The drawings and their captions clearly explain the principle of the safety cuff.