

is to be ventilated. Simultaneously the small hole in the second disc comes to lie opposite its counterpart allowing passage of catheters, etc. On the circumference of the connector there is a simple stop mechanism for each of the three positions. The connector has been used with the Carlen's and Bryce-Smith tubes in 32 cases, comprising lobectomies, right pneumonectomies and hiatus hernia repairs, and has been entirely satisfactory.

The virtue of this connector lies in its simplicity and ease of operation. The transition from normal to "one lung" ventilation can be made with minimal disturbance. The passage of catheters into the collapsed lung will produce no interruption in the continuity of the anesthesia. The only theoretical objection is gas turbulence between the funnel and smaller holes. This could be overcome if so desired

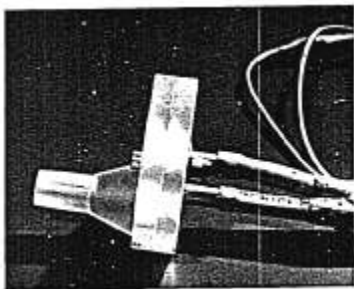


FIG. 1. Connector assembled and attached to double lumen endobronchial tube.

by further streamlining the interior of the funnel.

### A Bailing Device for the Automatic Removal of Condensate from Breathing Tubes

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Fluid accumulates in the breathing tubes of ventilators. The source of the fluid is two-fold; the cooling of humidified gases from the patient's lungs, and from humidifiers, heated and ultrasonic. If the fluid collects in sufficient amounts, air flow may be interfered with. Because of this water traps have been placed in the breathing channel. For the most part, such traps have not been completely satisfactory for the following reasons: (1) They are not placed in the lowermost

part of the breathing channel. (2) They may overflow. (3) They cannot be emptied without interfering with ventilator function. An automatic bailing device was, therefore, designed to be inserted in the lowermost part of the breathing tubes. The apparatus consists of a plastic chamber which is in com-

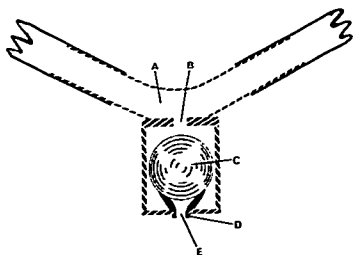


FIGURE 1.

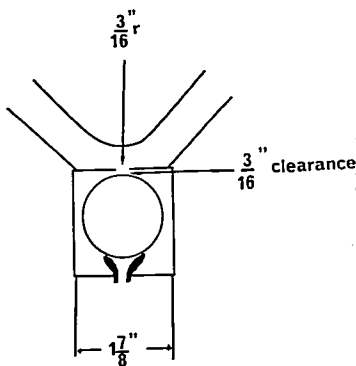


FIGURE 2.



FIGURE 3.

munication with the airway. A ping-pong ball serves to seal the valve mechanism during intermittent positive pressure (fig. 1). The arms of the apparatus, *A*, are angled so that

the unit will hang downward. Condensate drains by gravity through opening, *B*, into the collecting chamber. When sufficient moisture has collected to float the ping-pong ball, *C*, off its seat, *D*, the collected moisture will flow out the opening, *E*. A plastic bag with an overflow vent may be attached at this point to collect the condensate.

Certain critical dimensions must be conformed to if one decides to make such a unit. Figure 2 gives the dimensions found to work satisfactorily. The valve seat is fashioned from a Puritan suction replacement part, no. 612182. This was trimmed down so as to reduce the cohesive tension between the ball and seat when the valve is moist. Inasmuch as condensate may collect in both inspiratory and expiratory tubes, it is suggested that a water trap be placed in each limb of the breathing circuit (fig. 3).

## A New Mechanical Ventilator for Use During Anesthesia

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Whether controlled ventilation is better accomplished by the "educated hand" or a mechanical ventilator has been the topic of numerous discussions. The educated hand, although it has many superior features, can fatigue or be diverted for other necessary requirements. A ventilator which can be tailored to breathe for a patient in a manner similar to that achieved with the educated hand has many advantages. In addition to providing consistent, physiologic ventilation, it also frees both hands of the anesthesiologist so that he can perform ancillary duties safely during the conduct of an anesthetic. One should caution, however, that while the mechanical ventilator may physically free the hands, it does not free the eyes and ears of the anesthesiologist from constantly monitoring its operation.

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### DESCRIPTION

A new ventilator\* which is essentially a pneumatic "hand" has been designed. Basically, it consists of a bag within a bag and a control box incorporating three controls and an off and on switch. The power for the unit is derived from either compressed air or oxygen at 50 psi: only 4 to 5 liters/minute flow are required, as compared to 10 to 14 liters/minute in most pneumatic ventilators. The control box contains two pneumatic timing cartridges which control the time of inspiration and expiration-pause phases of respiration. The third control is a pressure-flow regulator which acts via a venturi pneumatically to compress a standard anesthesia bag which is enclosed within a clear plastic second bag. The venturi has two jets (gold and silver) to which the pressure-flow control

\* Ventilator to be available from Bird Corporation, Palm Springs, California.