FEATURES OF LAMBERTSEN DIVING APPARATUS (1941)

A. Harness - designed for rapid donning.

1. Designed to fit individuals of varied shape and size without time-consuming adjustments.

2. Serves as foundation for respiratory apparatus, Oxygen supply and weights.

B. Oxygen supply.

1. A small, high pressure cylinder anchored to a plate over the abdomen. Contains 70 liters Oxygen at 1800 pounds pressure and 700 F.

2. A regulator attached to the cylinder reduces the pressure and maintains a flow of 1.5 liters per minute at atmospheric pressure.

3. A hand-controlled needle valve attached to the Oxygen cylinder within easy reach of the right hand. This valve delivers a very rapid flow of Oxygen in an emergency such as too rapid descent, failure of the regulator or over-exertion.

4. A small pressure gauge in full view of the diver, calibrated in minutes duration as well as pounds pressure.

5. A warning whistle which sounds as Oxygen pressure in the cylinder approaches zero.

   a. One from regulator to breathing system. (INHALING SIDE)
   b. One from needle valve to within the breathing bag, permitting expansion of the rush of emergency Oxygen.

C. Rebreathing system - a semi-closed, circuit-breathing system consisting of: inhaler, breathing tubes with valves, soda lime canister, rebreathing bag and over-pressure valve.

1. The inhaler is a modified Army training gas mask with goggles incorporated. The goggles are defogged by the stream of inspired air.

2. The corrugated breathing tubes are equipped with an individual brass ring in each corrugation which eliminates the danger of kinking while retaining flexibility.

   A large number of corrugations to the inch increases extensibility. The arrangement of the tubes permits free movement of the head in any direction...
Each tube contains a simple, rubber disc-valve, situated in a corrugation, permitting one way respiration through the tube.

3. The soda lime canister is equipped with a spring which keeps the soda lime packed, preventing formation of irritant dust.

This canister is attached to the top of a metal bag cage in a way which permits refilling without detaching the canister.

4. The rebreathing bag of heavy rubber has a capacity of four liters. It is enclosed within a perforated metal cage which protects the bag against mechanical compression or injury.

5. The over-pressure valve permits the escape of excess gas without permitting the entrance of water into the system. It is situated behind the right shoulder where bubbles will not obscure vision.

D. Buoyancy

1. The total weight of the unit is approximately 19 pounds; when submerged it is practically weightless.

   a. The diver can descend or ascend at will, independently of aid from the surface (see J.A.M.A. March 29, 1941).

   b. Additional weights will permit walking under water.

E. Limits

1. Depth of 60 feet is limit due to toxicity of pure Oxygen at higher pressures.

2. Maximum duration of dive is approximately 45 minutes.