AVIATION-MEDICINE

Device Pulls Ripcord

Barometer-like instrument does this automatically to make descents from high altitudes safer. Designed by the Army Air Forces' Aero Medical Laboratory.

➤ A BAROMETER-LIKE device that automatically pulls the ripcord on a parachute to make descents from high altitudes safer was described by a group of scientists at the opening session of the Aero Medical Association in Chicago.

The instrument was designed by the Army Air Forces' Aero Medical Laboratory at Wright Field and the Friez Instrument Division and was manufactured by the Friez Company. The scientists who worked on the problem of parachute-opening shock and an instrument to overcome it are Maj. G. A. Hallenbeck, now at the Mayo Clinic; Maj. G. L. Maison, now at Boston University School of Medicine; Capt. Kenneth E. Penrod, now at Iowa State College; Ralph E. Sturm, of the Friez Instrument Division, Bendix Aviation Corporation; and Ernest E. Martin, of the Aero Medical Laboratory.

When a man jumps with a standard parachute at altitudes of 20,000 to 25,000 feet, he is likely to be injured by the shock or impact when the chute opens, Maj. Hallenbeck explained. At altitudes above 30,000 feet this impact is almost certain to produce injuries.

Experiments in which dummies were dropped from a B-17 at altitudes up to 40,000 feet demonstrated that at the velocities at which a freely falling man would be expected to travel, the impact at parachute opening is greater the higher the altitude of parachute opening. Brief impact forces as high as 7,000 pounds were recorded when the standard 24-foot nylon parachute decelerated 200-pound dummies at an altitude of 40,000 feet.

One way to avoid the danger of injury from parachute opening shock forces at high altitudes is to have the man fall freely to altitudes below 20,000 feet before opening his parachute. Such free fall also lessens the exposure to cold and oxygen lack at high altitudes. It is not without danger, however, because unconsciousness from oxygen lack, cold, perhaps even fear, and other unknown factors can cause a man to fail to pull the ripcord.

The instrument designed to overcome these dangers and make free falls safe consists of a small powder charge which when electrically fired pushes a piston which pulls the parachute ripcord. The electrical circuit is completed by a micro switch controlled by an aneroid capsule, similar to that in many barometers, which is sensitive to changes in the air pressure which surrounds it. The position of the aneroid capsule can be set so that its contraction during descent closes the circuit and causes the powder charge to fire at any desired pressure altitude between 500 to 20,000 feet.

A safety or arming switch is, of course, necessary to prevent the device from pulling the ripcord during normal airplane descent.

Successful tests in which dummies were dropped from aircraft have shown that the design of this device is sound. With such a device a man jumping from an airplane will fall freely until he reaches the altitude at which the parachute opening device is set. At this point the parachute ripcord will be pulled automatically. The instrument does not interfere with manual pulling of the ripcord.

The studies at the Aero Medical Laboratory also showed that silk 28-foot parachutes produce approximately 50% more shock force than do nylon 28-foot parachutes at the same altitudes and air speeds. Oddly, inflation of 28-foot nylon parachutes produced slightly less shock force than did 24-foot parachutes at the same altitudes and air speeds.

Science News Letter, April 13, 1946

BOTANY

Easter Lilies Will Be Bigger and Better

See Front Cover

➤ EASTER LILIES are going to be bigger and better—bigger by a hundred per cent, better because they will be solid and last much longer in their beauty. Plants have already been raised with flowers fully seven inches across, their trumpet-like throats as much as an even foot deep. They stay in bloom much longer, too, partly because the petals are firmer and partly for reasons of internal physiology. One of the new lilies is shown on the front cover of this SCIENCE NEWS LETTER.

These miracle-lilies are not ready for the market yet; they are still growing in greenhouse benches at the great experiment station of the U. S. Department of Agriculture at Beltsville, Md., a short distance outside Washington. Magnificent though they are, Dr. Samuel L. Emsweller, the scientist who is working on them, feels that they can still be made a little finer before being released into the hands of private growers for general propagation and sale.

These lilies are one of the practical results of the half-accidental discovery, some years ago, of the ability of colchicine, an old-fashioned rheumatism remedy, to change the course of evolutionary development in plants by doubling the number of chromosomes, the heredity-bearing bits of living matter in the cell nuclei. The new lilies were produced by a doubling-up of these essential cell contents in Easter lilies of the ordinary type.

The resulting plants are taller and sturdier-looking, to match the huge blooms they bear. The tissue of the petals is solider and thicker, crisp-looking but not brittle. The flowers are strong as well as beautiful.

The reason for their longer life lies partly in this strength, partly in the fact that, like many plants with doubled chromosome numbers, they are sterile—incapable of producing seed. In ordinary lilies, when the physiological processes leading toward seed formation have been well started, the flower has no further reason for being and the petals begin to collapse. In sterile flowers this does not happen; the petals keep their perfect shape and pearly luster a great deal longer.

Other flowers are being "doubled and redoubled" in the same way. One fine series now in bloom in the Beltsville greenhouses consists of bright-blossomed snapdragons with much taller stalks and much bigger flowers than their parents. But one cannot help feeling, as he follows their originator around among the benches, that Dr. Emsweller's greatest pride and joy are his giant Easter lilies.

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When *hens* fail to get enough calcium in their feed, they draw it from their bones, up to about 25% of their calcium content.

Moxa, a nostrum for Oriental ills for generations, was a secret ingredient in the Japanese navy gas mask; the filter in the mask was made of silk, cotton and fibers of the magical weed.

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