

AERONAUTICS

"Squeezing Water" Halts Jet Plane on Short Fields

► **HIGH-SPEED JET PLANES** can be stopped quickly on short runway airfields equipped with a "water squeezer."

The relatively simple device has stopped a landing Marine Corps jet fighter in less than 100 yards without damage to airplane or arresting gear.

The "water squeezer" is an energy absorber developed by All American Engineering Company, Wilmington, Del., under a U. S. Navy Bureau of Aeronautics contract. It is expected to be ready for military service in the near future.

The new method works like this: The landing aircraft engages, with a hook, one of two cables stretched across the runway. The cable is attached to a piston in a water-filled pipe. As the engaged airplane rolls forward, it pulls the piston through the water, absorbing the plane's energy.

The device is known as the expeditionary arresting gear because it can be dismantled easily, packed into helicopters or cargo aircraft, then set up at fields with runways as short as 1,000 feet, making such strips suitable for landing jet fighters.

No adjustment of the device is necessary for different landing weights and speeds.

A "water squeezer" is also used at the U. S. Air Force test base at Hurricane Mesa, Utah, where a high-speed sled is stopped short on a track to test pilot ejection seats for airplanes.

The All-American Engineering Company is now experimenting with arresting gear based on the same principle to be used as safety barriers at commercial or military airports.

Science News Letter, December 22, 1956

PHYSICS

Energy From Uranium

► **ELECTRICAL ENERGY** can be obtained directly from fissioning uranium atoms using the same ideas as for tapping the hydrogen bomb reactions for peaceful power.

A building as big as the Queen Mary, however, would be the smallest possible to hold the necessary equipment, and it might well have to be larger, Dr. S. Colgate of the University of California's laboratory at Livermore has calculated. Important work on taming the fusion reaction for power is conducted at this laboratory.

Dr. Colgate reported on the application of research in the thermonuclear program to the direct conversion of electrical energy of a fission reactor.

At the American Nuclear Society meeting in Washington, he outlined his designs for a machine to do this job. It would operate at the low efficiency of 15%, but Dr. Colgate hopes this figure can be improved.

The basic idea is to take a fissionable gas, such as uranium or plutonium, and

GENERAL SCIENCE

Top 1956 Science Events

► **THE TOP IMPORTANT ADVANCES** in science and technology during 1956 as picked by Watson Davis, director of SCIENCE SERVICE, are:

1. Discussion of the radiation danger to mankind's heredity from atomic bombs, emphasized by major scientific studies in America and England and debates during the presidential campaign.

2. Revelation of Russian research indicating possibility of harnessing the H-bomb fusion reaction for peaceful purposes, which through use of deuterium contained in the sea would obviate danger of an energy famine in the future.

3. Discovery of the anti-neutron and confirmation of the neutrino, both elusive sub-atomic particles.

4. Speculation, based on discovery last year of the anti-proton, that there is an antimatter universe, a sort of mirror image of our proton cosmos, existing remote from us.

5. Discovery that the glial cell is the site in the nervous system hit by multiple sclerosis, a step toward a new attack on this disease.

6. Demonstration trans-continently that a TV device can be added to bring sight as well as sound to the telephone.

7. Production of a hybrid virus by crossing two viruses, which may prove important in understanding such disease-causing entities.

8. Continued conquest of space, involving guided missile testing for defense and artificial satellite launching, 2,100 mile-per-hour, 126,000-foot-high experimental air-

plane flight, and supersonic jet bomber flights.

9. Indications from telescopic observations that the universe's expansion rate, confirmed by radio frequency "red-shift," is actually slowing down at the most remote points observable.

10. The wide-spread search for chemical agents useful in treating cancer, although no promising drugs were announced.

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heat it to a very high temperature, then make such a gas do work against a magnetic field.

Dr. Colgate suggests confining two masses of the fissionable uranium or plutonium, each less than the critical amount necessary for a chain reaction, at each end of a long tube. Surrounding the ends, but not the middle, would be a blanket of material that reflects the neutrons given off when the gaseous matter fissions. The cylinder's center would be wrapped with an electromagnetic coil.

A sudden jolt to the gas at one end will create a shock wave that will travel down the tube to the other end, bringing that mass to more than needed to maintain fission. This would, in turn, cause another shock wave to travel back down the tube, thus setting up an oscillating shock wave.

This motion, resulting in a varying magnetic field, would cause an electrical current in the coil.

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