

## INVENTION

# Patents of the Week

A spacecraft that can change its shape by unfolding its wings on reentry and a generator that produces ions from gases earned patents.

► A SPACECRAFT that can change its shape by folding or unfolding its wings and needs no parachute in reentry received a patent from the U.S. Patent Office.

Invented by William H. Phillips of Hampton, Va., the craft, granted patent 3,104,079, may be used as a space ferry to and from orbiting satellite stations by the National Aeronautics and Space Administration. It completely eliminates the need for a parachute-retarded, water landing.

Lifted into outer space by a booster rocket, the spacecraft would rendezvous with an orbiting station, keeping its auxiliary, movable wings folded over the basic delta wings spreading out from the body.

Upon returning to earth's atmosphere, the ship would approach it at a sharp angle, exposing only the completely flat, bottom

surface of the vehicle to the heat, pressure and other forces present in reentry.

After it has reentered the atmosphere, its auxiliary wings are unfolded to help the craft glide into a ground landing. In addition to the flat lower surface of the delta wing, the device includes a compartment for human occupancy on the top surface of the delta wing where it will be sheltered upon reentry.

The folded wings rest at right angles to the delta wing, and when unfolded, the first half stands at a 90-degree angle to the delta wing and the second half at a right angle to the first half.

## Ionized Plasma Generator

A device that assists researchers in harnessing the power of the hydrogen bomb for peaceful uses was awarded patent 3,104,345, assigned to the Atomic Energy Commission by the U.S. Patent Office.

Created by John M. Wilcox of Berkeley, Calif., and William R. Baker of Orinda, Calif., the instrument creates ions, or electrically charged particles, from hydrogen or deuterium gases fed into a cylindrical chamber that contains a magnetic field. The electrodes necessary to ionize the gases are contained in a coil wrapped around the chamber so there are few impurities in the gases.

A thermonuclear reaction, such as that taking place in the hydrogen bomb, joins lightweight ions by fusion to produce helium and release energy.

Eventually scientists hope to use a controlled thermonuclear reaction as a source of power during peacetime. A thermonuclear reaction is so hot that only a magnetic field can hold it. In nuclear reactors, heavier atoms of elements such as uranium and plutonium are split by fission, and the whole process is cooled by a slurry of water or other coolant.

This particular plasma generator uses one of several known ways to produce a highly ionized electrical plasma from gases. It has been experimentally built and tested.

## Other Significant Patents

Other patents included:

A solar still that uses the sun's radiation to distill fresh water from sea water, for which Wadsworth W. Mount of Summit, N. J., received patent 3,104,210. A thin layer of water is exposed to the sun's rays, causing it to evaporate and leaving salt behind. Water vapor condenses on a cooler surface and the fresh water is drained off.

An apparatus for reading gas, electric and other utility meters from a distance, instead of having company personnel come to read them. Donald P. Morgan of Warren, Pa., and Donald D. Dalrymple of North Warren, Pa., earned patent 3,104,382 for the device, which can be installed on existing meters inexpensively. It sends coded pulses back to a central office as the dials of the meter turn.

An automobile coat-hanger support that can be installed in shelf above the rear seat of an automobile, allowing clothing to hang freely without obstructing the driver's vision. Edward A. Craig of Detroit, John E. McRae of Dearborn and Paul D. Davison of Royal Oak, all in Michigan, were awarded patent 3,104,041.

A chalkless writing board for which Wilfred J. McDonald of Mattawa, Ontario, Canada, earned patent 3,103,751. As a person writes with a magnetic pen on a rigid sheet of opaque material, metallic pins mounted on the inside of the backing board attach themselves to the front sheet, making an impression.

A combination air filter, space heater and light earned patent 3,104,307 for Donald G. Garofalow of Teaneck, N. J., and Edward P. Schlosser of Ridgefield Park, N. J. Using an infrared bulb as the source of heat and light, the heater has a glass fiber mesh air filter and heat exchanger that allows the light to pass.

• Science News Letter, 84:222 Oct. 5, 1963

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## Nature Note

► AS COLD WEATHER approaches, the various families in the insect world disappear from sight until spring. Yet sharp-sighted hikers in the woods on a wintry day may be surprised to find a frozen butterfly hanging from the underside of a tree limb.

The butterfly is certainly frozen, but it is not dead. A few of these "flying flowers" regularly live through the cold season in a state of suspended animation, like that of a hibernating ground squirrel or frog.

The common mourning-cloak butterfly, a beautiful dark-winged insect that haunts the shadow of the woodlands, is among these. She takes refuge under a projecting tree limb and goes to sleep. There is no question that she is frozen, and that her circulation has almost completely stopped. Somehow the butterfly is able to survive the winter without eating or noticeably breathing.

When thaws come, she thaws out also and flits about in search of food. Oozing sap or soggy frozen-and-thawed apples on the ground will supply a hasty pick-up meal.

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