

INVENTION

Patents of the Week

The characteristic flash of a nuclear bomb explosion at a "target area" in the United States would trigger the alarm signal of a newly patented device—By Ann Ewing

► A DEVICE to detect the explosion of a nuclear bomb, now being used as an alarm at more than 100 target areas around the country, was patented by the U.S. Patent Office.

Three or four of the U.S. Air Force bomb alarms are installed near each target area. They are constructed to signal only when a nuclear detonation has occurred, and do not respond to lightning or intense sunlight.

The sensors are blast detectors that react only to the characteristic flash of a nuclear explosion. Although the heat or blast wave of such a detonation might destroy the sensor, it would have transmitted information about the blast's location before destruction. More than one sensor is used at each installation to make sure that at least one sends a signal.

The signal that a bomb blast has occurred appears as a red light on a map of the United States at the Pentagon and at various command headquarters around the country.

The "nuclear bomb explosion detecting device" was granted patent 3,147,380. Rights were assigned to The Western Union Telegraph Company, which completed installation of the devices at missile-launching and other sites under conditions of great secrecy during 1962.

William D. Buckingham and Robert H. Snider of Southampton, N.Y., with Frank T. Turner of Hampton Bays, N.Y., developed the device, which is reliable in operation. Western Union estimates that leasing the devices yields an income of more than \$5 million a year.

Hypersonic Airplane

A plane designed to travel seven times the speed of sound for trips of more than 3,000 miles earned patent 3,146,971 for James H. Walker and Gene J. Pietrangeli of the Applied Physics Laboratory, Silver Spring, Md.

There are no plans at present to produce any Mach 7 airplanes, Mr. Pietrangeli said. Such a plane would fly more than twice as fast as the SST, or supersonic transport, the controversial aircraft whose design is still under study.

A Mach 7 airplane would be built, in all likelihood, under a program financed mainly by the Government, as is the SST.

According to the patented design, the plane would have two propulsion systems. One would consist of turbojets for taking off and climbing to cruising altitude, since these engines operate most efficiently at such relatively lower speeds.

The other system, for cruising at ex-

remely high altitudes, would be ramjets, which are most efficient at speeds of about Mach. 7.

The airplane designed by Mr. Walker and Mr. Pietrangeli would be delta-winged in shape. They assigned patent rights to the Government through the Secretary of the Navy.

Free Piston Hydraulic Pump

Dr. Vannevar Bush of Belmont, Mass., retired president of Carnegie Institution of Washington, has been granted patent 3,145,660 for a "free piston hydraulic pump" that could be used to power automobiles.

The free piston engine is still rather experimental, although used in some European cars. It is not mechanically connected to convert the power it generates into useful work, as in the transmission of most automobiles. The power of the free piston is used directly.

In Dr. Bush's invention, the free piston engine is linked directly to a hydraulic pump in a single interacting unit. A free piston is not only more efficient than conventional engines but can operate on less expensive, or diesel, fuel, Dr. Bush said.

Rotating Satellites

Two Navy satellites, carrying instruments that are doing secret experiments, have been able to do their job because of a method of satellite rotation developed by Dr. Richard B. Kershner of Johns Hopkins Applied Physics Laboratory, Silver Spring, Md.

The satellites, Omicron one and Alpha eta one, were launched in 1961 and are still sending useful information earthward. If a satellite did not rotate as it whirled around the earth, the side continuously in the sun would become quite hot while the other side would be quite cold. This large temperature difference could damage the delicate instruments aboard.

However, if the satellite is rotating, even slowly, large temperature differences do not occur. Dr. Kershner found that rotation could be ensured by equipping the satellite with four paddles, painted black on one side and white on the other, having solar cells that respond to radiation pressure from the sun.

Dr. Kershner assigned rights to patent 3,145,948 to the Government through the Secretary of the Navy.

Other Interesting Patents

A slide rule upon which such birth control data as the conception period and the

first day of the next monthly menstrual cycle can be quickly and easily calculated. Isamu Tsuji and Toshio Ikeuchi of Kofu, Japan, earned patent 3,146,943 for their birth control indicator.

A wave guide for focusing electromagnetic radiation that has the shape of a scimitar. Wilfred N. Caron of Arlington Heights, Ill., assigned rights to patent 3,146,454 to the Government through the Air Force.

A mechanism for cleaning coke-oven door frames and shells, for which seven Russian inventors were awarded patent 3,146,475. They assigned rights to Konstruktorskoje Bureau Koksohim mash Giprokoks.

A steam-generating unit on which five patents were granted. Earle C. Miller of Worcester, Mass., assigned rights to patent 3,146,759 to Riley Stoker Corporation, also of Worcester. That corporation was also assigned rights to patents 3,146,760 through 3,146,763 by Norman S. Blodgett of Westboro, Mass.

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ENGINEERING

Infrared Camera Can Spot Invisible Flames

► A TV CAMERA that can see invisible flames is being used to spot liquid hydrogen fires at the National Aeronautics and Space Administration's launch center on Merritt Island, Fla.

Liquid hydrogen, a high-energy rocket fuel, gives off no visible light when it burns. The new warning system, however, "sees" by infrared light, and the infrared pictures are "dubbed in" on a TV screen carrying a normal-light picture.

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