

NEW PATENTS by ALFONS PUISHES

In this Section of NUCLEAR APPLICATIONS we briefly describe some recently issued patents which we think are particularly interesting. The patents themselves, which contain all the detailed descriptions of the inventions, may be obtained from the Commissioner of Patents, Washington, D. C. for 25¢ each. They also may be read in patent libraries in major cities.



RADICAL MULTI-PURPOSE REACTOR CONCEPT having core of gas-suspended fissionable particles surrounded by liquid moderator. Adapted for power generation, it utilizes the kinetic energy of fission particles to produce desirable chemical reactions in the gas phase, e.g., fixation of nitrogen when a mixture of nitrogen and oxygen is used as the gas. Other useful chemical products are obtained from irradiation of different liquid moderators. Fuel may be 5μ particles of enriched uranium oxide or plutonium. 3,154,473, A. F. Martin, Hercules Powder Co.

NUCLEAR SUPERHEATER with solid moderator in two-region boiling-water reactor. Superheater is con-

tained in the center of the reactor core separated by a thermal insulating wall. It utilizes more-or-less conventional fuel elements with the moderator preferably of a solid metal hydride. Advantages are said to lie in the properties of the solid moderator which permit higher temperatures and eliminate the need for moderator cooling and for insulation between moderator and steam. 3,150,052, Donald J. Stoker, Lisso Stewart Mims, Sidney Siegal, North American Aviation, Inc.

COMPACT SHIP PROPULSION REACTOR PLANT of pressurized light-water type. It comprises steam generating tubes, superheating elements, and pressurizer, located inside reactor pressure vessel, above core. It incorporates pressurized load-stabilizing drums which also provide emergency cooling for decay circulation. The arrangement of components is exceptionally compact. 3,150,051, John H. Ammon, USAEC.

TEST REACTOR having multi-foil core configuration comprising a series of lobes. Each lobe is a segment of a circle having a test loop through its center and providing a series of separate flux traps. Provision for varying the moderator in each lobe makes possible different and adjustable flux levels to accommodate different experiments in each loop simultaneously. Separate boric acid tanks around each lobe provide shim and differential control of reactivity. 3,149,044, D. R. deBoisblanc, Byron H. Leonard, Jr., USAEC.

CENTRAL STATION POWER REACTOR employing seed-and-blanket concept. Offering greater neutron economy and larger core lifetimes by eliminating the use of neutron poisons

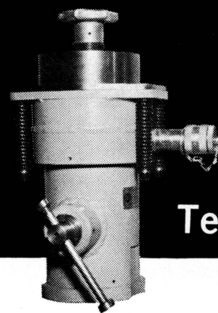
in the control system, it utilizes a multiplicity of seed-and-blanket modular assemblies. Each central seed assembly comprises a stationary and a movable concentric rod containing varying amounts of fissionable and fertile material throughout its length. Relative motion provides variation of amount of neutron leakage from fissionable material to blanket, and controls the reactor. 3,154,471, A. Radkowsky, USAEC.

REACTOR SCRAM DEVICE comprising neutron-absorbing magnetic balls which are dropped into core on de-energizing holding field. Separate magnetic fields provide against false scrams. Scramming at excess temperature is provided by inserting into the fields a material whose magnetic reluctance increases with temperature, thus making scram initiation independent of electrical or mechanical means. 3,147,188, R. H. Campbell, UKAEA.

NEUTRON JET ENGINE for marine propulsion. A reactor and heat exchanger are situated in an underwater housing positioned on a submerged structure extending from a stern framework outside the ship's hull. The engine may be of turbojet or ramjet type. Sea water passing through the heat exchanger is raised to saturation temperature. Subsequent flashing into steam which is discharged through a nozzle provides the propulsive force. 3,151,596, L.J. McMurtrey, Boeing Airplane Co.

MACHINE FOR LOADING FUEL ELEMENTS into reactor under pressure. It comprises a portable pressure vessel providing magazine storage of fuel elements, a transfer tube for delivery to a charging tube, and an externally controlled remotely

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operated mechanism for effecting transfer and loading. 3,146,900, D. E. Anderson, G. E. Co. (England).

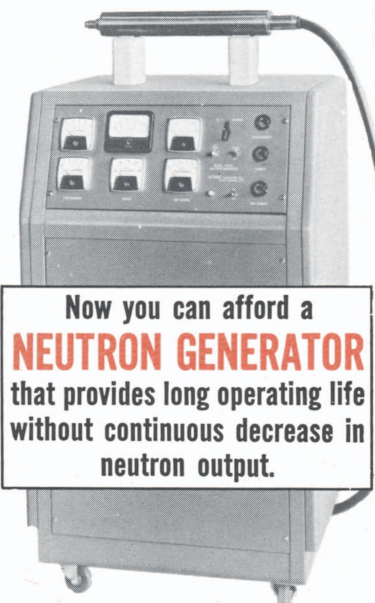
DETECTING EXPLOSIVES IN LUGGAGE using neutron beams. A Pu-Be source irradiates luggage with neutrons, and the resulting gamma radiation caused by the nitrogen in the explosive is detected by a scintillation crystal. An alarm circuit is adjusted for greatest signal-to-noise ratio. An alternative embodiment requires seeding the explosive with an additive such as boron and detecting resultant gammas and neutrons after adjusting for background. 3,146,349, Edward J. Jordan, USAEC.

DETECTION OF NUCLEAR BOMB EXPLOSIONS in the air over specific strategic targets. This makes immediately available to military high command at a distant point conclusive information that a certain target was hit by an aerial nuclear bomb and not immobilized or cut off from communication by some other force. The interval of time between two successive pulses of thermal radiation uniquely characteristic of a nuclear explosion is measured and transmitted before the blast wave destroys the device. 3,147,380, William D. Buckingham, Frank T. Turner, Robert H. Snider, The Western Union Telegraph Co.

DEVICE AND METHOD FOR GENERATING AN ELECTRIC POTENTIAL. Exposure of two dissimilar metals to radioactivity in the presence of an ionizing gas makes possible the measurement of the intensity of ionizing radiation by measuring the electric potential produced. 3,153,254, Philip E. Ohmart, The Ohmart Corp.

NEUTRON ABSORBING ASPHALTIC COMPOSITION and process for its manufacture. Commercially available asphaltites or petroleum asphalts are mixed with orthoboric acid in the presence of sulfuric acid at elevated temperatures to produce an asphaltic composition containing boron oxide. It is intended for water-proofing and caulking tanks containing radioactive materials and for augmenting existing shielding materials. 3,152,093, Robert O. Boykin, Sr., and Phillip S. Osborne, Osborne Associates.

REACTIVITY CONTROL VIA RECYCLED STEAM. A pump in the steam outlet of the core of a boiling light- or heavy-water power reactor forces a varying amount of steam back into the reactor core. This makes possible the increase or decrease in neutron flux as required by the load demands of the power plant. 3,152,048, G. H. Forsyth, Vickers-Armstrong, Ltd., England.



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