INVENTION

Patents of the Week

A nuclear reactor especially valuable in producing short-lived isotopes and already in use all over the world has been awarded a patent.

➤ A NUCLEAR REACTOR now in use all over the world received U.S. patent 3,094,470.

The reactor manufactures radioactive isotopes needed for industry, research and medicine.

The reactor's distinctive feature is an inside ring that holds the isotopes like a lazy Susan, rotates around the core, and exposes the chemicals simultaneously to radiation from uranium. The reactor is especially valuable because it produces short-lived isotopes, those with half lives of 12 hours or less.

Formerly these short-lived isotopes, widely used as tracers in medicine, were produced at Atomic Energy Commission plants. However, since most of the half lives were under 12 hours, shipping time prohibited any practical use.

Inventors of the reactor and irradiating system are Richard S. Stone of Del Mar and George P. Kraker, La Jolla, San Diego, Calif., who assigned rights to General Dynamics Corporation.

Sweetening Salt Water

An improved method for sweetening salt water by freezing earned patent 3,093,975 for Alexander Zarchin of Tel Aviv, Israel.

His method removes brine from the ice crystals after the water is frozen. Earlier methods have involved rinsing the ice crystals with water vapor, liquid carbon dioxide or precooled sweet water to remove the brine, resulting in melting many of the ice crystals.

Mr. Zarchin's method is based on using precooled unsweetened water to rinse the ice crystals, leaving them with a surface film of unsweetened water instead of brine, which is frozen during the sweetening process.

Musical Typewriter

A musical typewriter that will enable persons to learn to type by ear instead of touch received patent 3,093,911. The invention will be especially useful to blind persons since each time a letter is typed a musical note is heard.

The musical scale will help to teach the typewriter keyboard quickly. Typing a sentence or paragraph will produce a particular tune.

The typewriter was invented by Harry R. and Emma A. Hagelstein of 100 Fifth Ave., New York City.

Other Patents

Patents also include:

An improved remote control system that operates a road condition sign and earned patent 3,094,682 for Amnon Brosh of Philadelphia and Douglas N. Lapp of Woodbury, N. J. In response to electrical signals the sign reflects, for example, snow, rain or ice, for the benefit of motorists.

An autopilot that controls an aircraft through all stages of a flight earned patent 3,094,299 for Robert W. Bond and George R. Keller, Whittier; John H. Ladd, Downey; Roy L. Roberts Jr., Fullerton, and Harold G. Markey, San Jose, Calif. Rights were assigned to North American Aviation, Inc.

A method for determining plant and animal deficiencies such as nitrogen, calcium, potassium and other elements by radioactive means, for which Warner W. Schultz of Schenectady, N. Y., received patent 3,094,621. Rights were assigned to General Electric.

A portable garbage disposal unit that may be removed after use, which earned patent 3,094,291 for Joubert Lindstrom and Fred W. Moore of Louisville, Ky. Rights were assigned to General Electric.

• Science News Letter, 84:13 July 6, 1963

ENGINEERING

Man Can Build A Better "Brain"

➤ IT IS THEORETICALLY possible to build a new type of computer that will rival the human brain better than any of the present so-called "thinking" machines, a noted psychiatrist who turned engineer said.

Dr. William Ross Ashby, an electrical engineering professor at the University of Illinois, Urbana, said if man would try to build a high-grade mechanical chess player he would see how "inefficient" present computers are.

"The future of brain-like mechanisms is dominated by the number ceiling," he said in a report prepared for Northwestern University's symposium on information systems at Evanston, Ill.

"No physical process can realize anything in excess of 10 to the 100th power. Meanwhile, such problems as chess playing and almost all processes involving patterns, relations, orderings, groupings, demand vastly greater numbers."

He said his own current research has demanded computations of 10 to the 18,000th power.

He called for a new computer that would retain memory better than the analogue and work more parts than the digital.

"The living brain keeps almost everything working almost all the time," he said.

"The main danger to developing new computers is that those who have mastered the present analogue and digital types will think that those are the only two types possible."

• Science News Letter, 84:13 July 6, 1963

GEOPHYSICS

Messages May Be Sent Through Earth's Crust

➤ "WIRE BY EARTH" may be the next step in man's communications systems.

The earth's crust is being closely studied as a means of carrying radio waves from one point to another.

Earth-relayed messages would be completely protected from ionized changes in the atmosphere, Dr. A. Marzoli of International Telephone and Telegraph Corporation stated at Paramus, N. J. At depths of a thousand feet or more, he said, there is no danger of the messages being intercepted or tampered with by enemy agents.

An electrical model of the earth's crust is now being studied by Dr. Marzoli and Dr. L. M. Vallese and G. Rakowsky of the ITT Federal Laboratories, Nutley, N. J. With laboratory experiments on this model, they have found it feasible to transmit radio signals at low speeds through the ground.

Radio frequencies would be extremely low, explained Dr. Marzoli, about 10 to 100 cycles per second. Entertainment radio broadcasting begins at carrier frequencies of about 500,000 cycles per second.

These radio waves would travel through the dense granite rock mass lying about 500 to several thousand feet below the earth's surface.

Special transmission launchers and receivers would be needed to send and pick up the faint frequencies, said Dr. Marzoli, who estimates that one kilowatt power can travel about 20 miles. The distance radio waves can travel depends upon the noise that exists in the underground, he said. As they travel, the waves weaken far more rapidly than when traveling through the atmosphere. This weakening may be due to the electrical conductivity of the ground.

Sending radio messages through the earth's crust is a complicated procedure, Dr. Marzoli said, but there is vital interest in setting up this system, which cannot be molested by any atmospheric or outside human force.

• Science News Letter, 84:13 July 6, 1963

TECHNOLOGY

Crewless Freight Train Aids Ore Mining

➤ LIKE A TOY electric train, a crewless freight train at Labrador City, Labrador, runs back and forth on a six-mile track with the push of a button.

Run by one of Canada's leading mining companies, the automated railway is operated by coded a.c. current transmitted continuously in the rails. When a train is loaded, the operator pushes a button and off it goes to the dumper picking up speeds to 30 miles per hour along the way. It slows down for unloading and then rushes back to be loaded again. Four 18-car trains are operated simultaneously along the single track, transporting 55,000 long tons of ore a day, all without manpower. The 18-car trains are powered with 1,750-horsepower diesel-electric locomotives.

• Science News Letter, 84:13 July 6, 1963

Science Service, Inc. is collaborating with JSTOR to digitize, preserve, and extend access to *The Science News-Letter.* www.jstor.org