PHYSICS

Electricity From Atom

Nuclear energy now can be converted into electric power without intermediate steps by a newly patented method, but security veils full details.

➤ ELECTRICITY CAN now be generated directly from atomic energy. This was revealed when a patent was granted for a "method and means for generating electrical energy from a radioactive source."

The patent was granted Dr. Ernest G. Linder, Princeton, N. J., a research physicist with the Radio Corporation of America, and assigned to RCA. Its number is 2,598,925.

The Atomic Energy Commission has constructed a reactor which generates electrical energy by first using the heat from an atomic pile to make steam and then using the steam to operate a turbine. Dr. Linder's method generates electrical energy directly from atomic energy without all the intermediate steps.

Dr. Linder's patent includes a high voltage direct current generator, an alternating current generator, a charged particle gun and a beam type alternating current generator.

The d.c. generator has a radioactive source, which can produce either alpha or beta rays. This is surrounded by a spherical highly evacuated conductive collector with a terminal for the radioactive source. The source might be radioactive phosphorus or polonium. Beta rays traveling between the source terminal and the collector electrode charge the collector electrode negatively.

"If a load is connected between the collector electrode and the source terminal," the inventor says, "a current will flow through the load."

Thus the radioactive energy emitted in the beta rays may be employed directly in its original electrical form to provide electrical energy.

Materials which produce beta rays do so in energies from almost zero to three million electron volts. And alpha ray emitters go up to ten million electron volts, the inventor points out. The generator can also use alpha particles, in which case the situation is reversed.

The alternating current generator is similar to the direct current generator, according to the patent. The beam type a.c. generator makes use of focusing electrodes.

Dr. Linder would not talk about his generators, or what they are being used for, or even what they might be used for. He told SCIENCE SERVICE that the matter is bound up in military security and nothing could be revealed beyond what is in the patent.

A fluidless battery which uses a radioactive isotope has also been invented. The inventor is Philip E. Ohmart, who reported his device to the Atomic Energy Commission 18 months ago. The battery uses the radioactive isotope to ionize a gas which is the medium carrying an electric current between two dissimilar metals. The amount of current generated by such a battery is extremely small.

Science News Letter, June 14, 1952

PSYCHOLOGY

Damp Salt Indicator Detects A-Bomb Fear

➤ WITH SUCH housewifely supplies as curtain material and a damp salt indicator chemical, Lt. Robert A. McCleary of the Air Force School of Aviation Medicine, San Antonio, Tex., has devised a test to show how much real fear the average person, particularly the average soldier, feels when about to meet the atom bomb face to face.

The curtain material, marquisette, was made into bags to hold the dampness indicator, cobalt chloride crystals used in summer-time salt cellar covers. The thousand soldiers who took part in the latest A-bomb test in Nevada held these bags in their hands while awaiting the explosion.

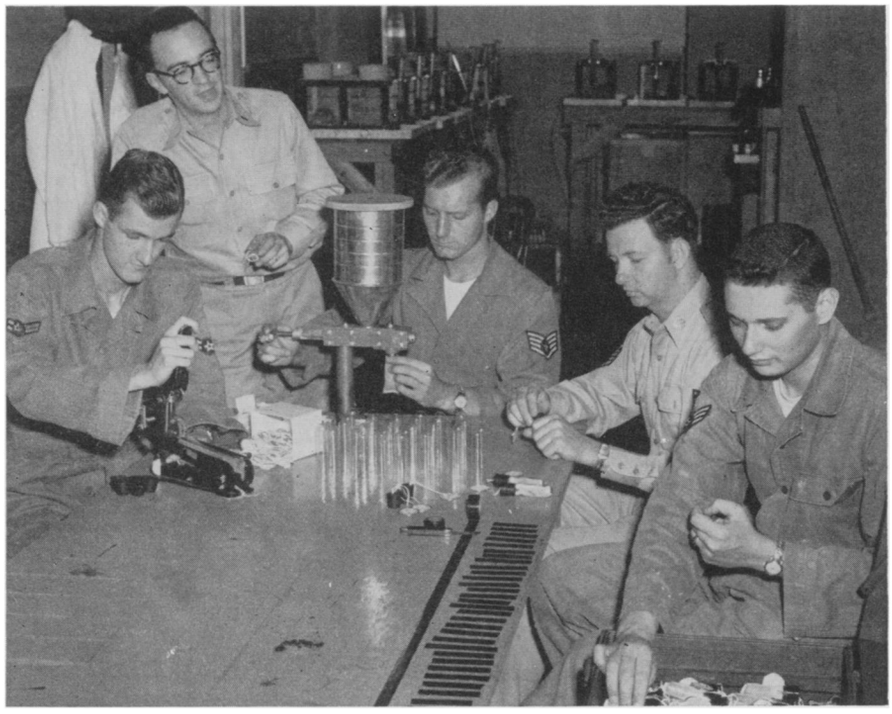
The crystals were blue at the start. They turned to light blue, lavender and finally a bright "sunset rose," as they absorbed more and more moisture from the palms of the hands.

Perspiration in the palm, as distinguished from sweating due to heat, is considered by psychologists a good indicator of emotional response. Other methods have been used to measure this. But electronic gear, dipping the hands in solutions and so on are not practical for tests of troops in the field. So Lt. McCleary devised the curtain bags of dampness indicator to give a fairly accurate mass record of the soldiers' emotional response.

The bags contain a weight of crystals carefully measured to make a complete change of color with one gram, or about 20 drops, of moisture. The various shades are compared with six well-defined tints on a set of color standards. The amount of perspiration is, of course, correlated with the normal dampness of the subject's hand, determined from a different set of bags before the test.

Although cobalt chloride has been used for industrial purposes, such as to detect humidity in sealed engines, it is believed that this is the first time that the chemical has been tried in a biological experiment.

Science News Letter, June 14, 1952



FEAR DETECTORS PREPARED—Airmen seated at the table are making 3,000 sweat bags, filled with cobalt chloride for a fear-detection experiment conducted by the Army during a recent atom bomb test in Nevada.