INVENTION

Patents of the Week

> A NOVEL METHOD for separating helium from other gases with which it is found in natural gas has been patented.

The helium-separation method was developed by Girard T. Kohman and Kenneth B. McAfee Jr. of Summit, N. J., who assigned rights to patent No. 3,019,853 to Bell Telephone Laboratories, Inc., New York.

Current methods for producing relatively pure helium in commercial quantities use a low-temperature process requiring considerable investment in plant, machinery and apparatus.

The only known substantial sources of helium are natural gas deposits, usually discovered during drilling for oil wells. This gas frequently contains only one to two percent helium, although some deposits have been found with three to seven percent helium.

Only about a tenth of the helium in the natural gas used annually in this country is being recovered. At least three billion cubic feet of helium per year escape into the atmosphere.

"This represents a most serious waste of a vital national resource," the inventors charge. To remedy this and to help keep up with the increasing demand for helium, they recommend their method of "separation of gases by diffusion." The process also removes trace amounts of neon from the gas.

In effect, their method uses tiny glass tubes of silica as a sponge to absorb helium from a mixture of gases. The gas mixture is then removed from the separation chamber and the helium allowed to diffuse out into the chamber, from which the helium is then removed and stored.

The method works because silicate and borosilicate type glasses are very efficient and effective sieves, allowing only the helium gas to pass through their atomic lattice structure under certain conditions. The helium atoms passing through such glasses progress step by step individually by finding a succession of vacant spaces within the lattice structure. Essential to this method for commercial production of helium is to make the gas pass through the glass more quickly by raising temperatures to more than 1,000 degrees Fahrenheit and using very high pressures.

For a method to reduce or eliminate thunderstorms or tornadoes, Dr. Bernard Vonnegut of North Scituate, Mass., won patent No. 3,019,989, rights to which he assigned to Arthur D. Little, Inc., Cambridge, Mass. His method consists of controlling the electrical disturbances of the atmosphere by modifying the existing space charge.

This modification, which could be either to decrease or increase the electrical storm activity, is brought about by introducing into the atmosphere a mass of particles all charged either negatively or positively.

Dr. Vonnegut calculates that the charged particles would have to be introduced at a rate of between about one and 20 microamperes per square mile. The distributing stations should be spread over an area of at least a thousand square miles to produce any significant results, he said.

A shower cap especially devised for today's bouffant hair styles won patent No. 3,019,444 for Shirley Pollack and Devora Finsilver of Detroit. The patent notes that the "elaborate coiffures worn by many women are easily spoiled when contacted by water," which many women would consider somewhat of an understatement.

The cap, which is made from a large circle of waterproof plastic film, has several stiffening ribs. These can be bent into the desired shape to accommodate a woman's hairdo without touching the hair.

To speed the calculations of computers, Albert Ernest Slade of Cochituate, Mass., and Dudley Allen Buck of North Wilmington, Mass., developed a cryotron translator for which they received patent No. 3,019,978. Rights were assigned to Arthur D. Little, Inc., Cambridge, Mass.

• *Science News Letter, 81:127 February 24, 1962*

Questions

MEDICINE—What new medical use has been found for space suits? p. 115.

PUBLIC SAFETY—Where was the worst mine disaster in U.S. history? p. 121.

SPACE—When was the first missile fired from Cape Canaveral? p. 117.

Photographs: Cover, Argonne National Laboratory; pp. 115 and 117, U. S. Air Force; p. 119, National Institutes of Health; p. 126, Eberson Enterprises.

TECHNOLOGY

Boiling Reactor Will Make Superheated Steam

See Front Cover

> AN ARGONNE National Laboratory experimental reactor achieved criticality for the first time Feb. 9 at the National Reactor Testing Station near Idaho Falls, Idaho.

The plant, known as Borax 5, was built at a cost of nearly two million dollars. It will test the feasibility of making superheated steam by utilizing uranium fuel. The steam, in turn, would be used to drive a turbine to produce power.

Borax 5 is designed to produce 20,000 kilowatts of thermal power at its maximum capacity. Nuclear superheated steam as used in the Borax 5 is expected to increase plant efficiency and eventually reduce the cost of nuclear fuel. The nuclear cores of the reactor are shown on the cover.
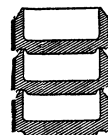
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