

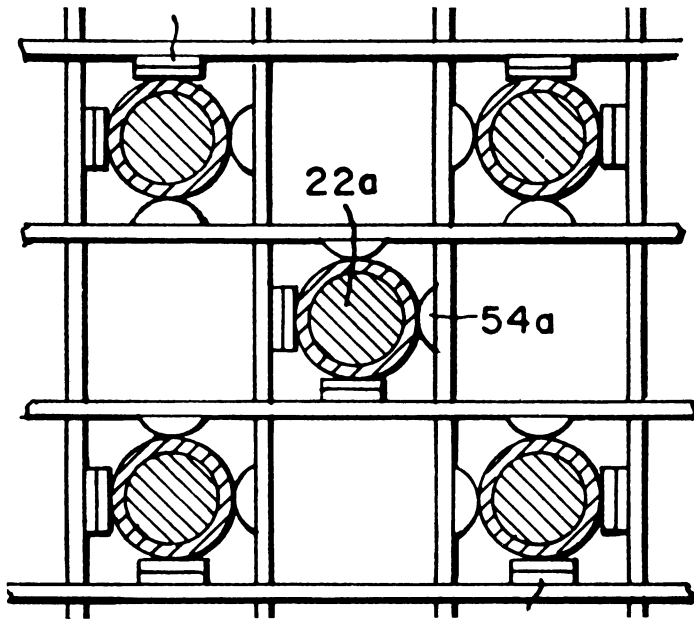
# current patents

## NUCLEAR POWER

### Basic reactor design

A method for arranging fuel elements in nuclear reactors, already used in many utility power plants, was patented last week by Westinghouse Electric Corp. engineers.

The patented arrangements allow fuel elements to be



inserted in a grid at a precise spacing so that the coolant, usually boiling or pressurized water, can pass through to take off the heat produced by the nuclear reaction.

Spacing is important because neutrons from the fission of one uranium atom are used to cause further splitting of other atoms, and the distance they travel has to be short enough to allow sufficient fission to keep going—but not so short that the reactor burns too fast.

The basic patent, by Erling Frisch, provides for a grid with four spring-like projections to hold the fuel rods in place. A refinement, by H. N. Andrews and H. W. Keller, replaces two of the projections with rigid supports for better alignment of the rods. Before the inventions, the rods had to be welded or brazed together to provide support and separation in the fuel assembly.

Patents 3,379,617; 3,379,618.

## NAUTICAL ENGINEERING

### Anti-seasickness cabin

For ocean passengers who can't get their sea legs, or for sea-going patients who shouldn't move, a newly patented self-stabilizing cabin could be a boon.

The non-rolling cabin, invented by John Lovrich of Nanuet, N.Y., is spherical and mounted on gimbals to allow rotation independently of the ship.

The cabin floor is mounted across the middle of the sphere, and a compartment under the floor is filled with water for ballast. When the ship pitches or rolls, the ballast keeps the cabin level. A snub pin at the bottom of the sphere can be inserted to keep the cabin unmovable in calm weather.

Patent 3,379,159.

## MEDICINE

### Fluidic respirator

Breathing aids are valuable both for emergency situations and as aids for sufferers of pulmonary diseases such as emphysema. They are expensive because they require high pressure operating through complex valves and diaphragms, to switch the air from inhalation to exhalation.

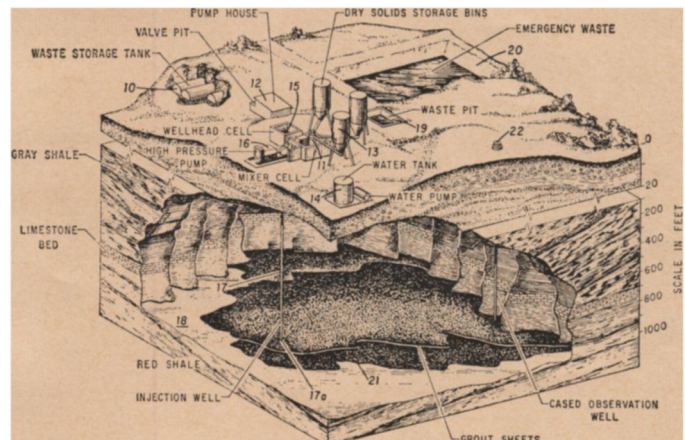
Using a fluid amplifier, a United Aircraft Corp. engineer has developed a respirator that can deliver up to 90 liters of air per minute with pressure of as little as two to four pounds per square inch. The slight effort of breathing by the patient is used as a control jet to switch the power flow from inhalation to exhalation modes. The invention, by Hermann Ziermann, has been used successfully on dogs and humans.

Patent 3,379,194.

## DISPOSAL

### Underground reservoir for nuclear wastes

Nuclear reactors, becoming continually more important in electric power production, develop radioactive wastes that remain dangerous for years. While some of these radioactive isotopes can be used, the major portion will have to be disposed of.



One way of getting rid of nuclear wastes is to bury them. By digging a well deep into non-porous rock, such as shale, an area can be reached in which the waste material can be pumped. With high enough pressure, the deep rock will break up and the radioactive wastes be absorbed in the fissures.

In the process of fracturing, however, the earth formation above the well sometimes is moved so that openings are formed which could lead the deep wastes to water supplies or even to the surface.

To keep the waste products safely below, a newly patented method contemplates mixing the radioactive material with cement so that it stays put.

The patent, issued to Knox A. Slagle and Tsuneo Tamura, was assigned to the Halliburton Co., Duncan, Okla.

Patent 3,379,013.

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