

# Current Patents

## BIOTECHNOLOGY

### Body powers electric heart aids

An implantable power source for heart pacemakers, telemetry transmitters or other instruments has been designed to draw power from the body itself, with no need for batteries or external connections.

An electrode made of platinum screen is placed just below the skin. A second electrode, made of platinum black sandwiched between platinum screens, is placed in one of several locations—the intestine, rectum and abdominal cavity have all been tried successfully. Body fluids serve as an electrolyte to establish a path for electrons emitted by the first electrode. The working unit completes the circuit.

Such a unit “will not require replacement during the life of the device which it is intended to power,” according to Luther W. Reynolds, who developed it when he was with the General Electric Co. in Philadelphia.

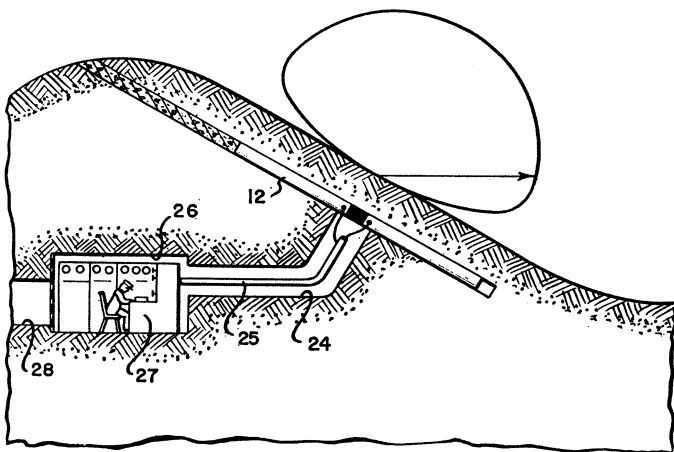
PATENT 3,345,989

## COMMUNICATIONS

### Underground antenna

The military underground is growing. More than a thousand ICBMs are buried in silos around the country, and the North American Air Defense Command lies protected beneath a Colorado mountain. Such protection becomes futile, however, unless communications between the sites and the command post are equally capable of surviving an attack.

The Achilles' heel of buried communications equipment is the antenna, which would ordinarily stick out in the air. A possible remedy is a newly patented antenna that operates while buried beneath a layer of solid rock on a hill or mountainside. “Weather disturbances such as



tornadoes, hurricanes, heavy snow or ice storms and their damaging effects are avoided,” says the antenna’s developer, Gregory J. Harmon of Northrop Corp.’s Page Communications division, “as are the effects of such military action as shelling or bombing.”

Buried antennas have been proposed before, Harmon says, but they have been much too inefficient. Either they were aimed so that the signal had to travel entirely underground, and could thus be used only over short

distances, or they were placed horizontally to radiate the signal into the air, resulting in most of the signal strength going, uselessly, straight up.

Harmon’s design also sends its signal through the air, but it is placed on enough of a slope—a 20-degree angle has been tested successfully—that a strong signal can be sent horizontally. The antenna works best when buried beneath a layer of rock equal in thickness to one-tenth wavelength or more at the frequency being used. Possible frequencies range from a few thousand cycles per second (VLF) to about 50 megacycles (VHF).

PATENT 3,346,864

## WEAPONRY

### Auto-rifles for caseless ammunition

One of the U.S. Army’s newest weapon developments, ammunition that has no brass shell but is completely consumed in firing, has been posing problems in the design of automatic rifles to handle it. In automatic firing of such ammunition, the heat in the firing chamber becomes so great that it has been damaging the gasket used to prevent propellant gas from leaking out the back of the breech. In addition, since the cartridges are made of molded propellant, they are fragile and must be precisely and gently placed in firing position by the automatic mechanism.

John J. Scanlon Jr. has just been granted patents for a pair of solutions. To get around the heat he supplanted the standard O-ring gasket, which is mounted in the breech, with a seal mounted on the back of the firing pin, where it is farther from the burning propellant. To position each incoming cartridge properly, he devised a ramp onto which the upcoming shot is spring-forced, holding it in perfect placement for the bolt as it moves forward.

A difficulty with the ammunition itself—irregular density of the propellant around the primer—was solved by Scanlon and Joseph B. Quinlan by molding the propellant as an open-ended cylinder, then setting the primer in on a separately molded plug of propellant.

PATENTS 3,345,770 and 3,345,945

## ELECTROACOUSTICS

### ‘Seeing’ vocal cord waves

The technique of voiceprinting—visually portraying the sounds of human speech for analysis—has been carried a step further with the development of a way of visually observing vocal cord waves.

Using a special microphone that picks up vibrations by measuring them through the wall of the trachea, two Japanese scientists have designed a system which they claim would be useful in “linguistic education, vocal training and medical diagnosis in which defective functioning of vocalization is to be detected.”

An oscilloscope or chart recorder can be used to display the signals from the microphone, which are first run through a series of filters to compensate for the distortion of recording through the throat wall. Tanetoshi Miura and Tsuneji Koshikawa developed the device for Hitachi, Ltd., Tokyo.

PATENT 3,345,979