

## RADIO

## Radio Waves Pass Through Non-Metals

► RADIO WAVES, in a new instrument, do the work of light rays in combination with the well-known electric eye. For some purposes, it has a special advantage. It uses high frequency waves that can pass through a brick wall.

The new microwave instrument was revealed by the General Electric Company's research laboratory. Like the photoelectric cell, it can be used for counting, opening and closing, discarding and signaling. Microwaves, unlike light waves, can pass through non-metallic materials. For this reason the new device can operate through walls and partitions. Its microwaves, also, can be directed around a corner by means of a hollow metal pipe.

The transmitter of the instrument, as assembled, resembles a large flashlight, but weighs only four pounds and is small enough to hold in one hand. It is operated on ordinary household current which it converts into electromagnetic waves of about five inches in length. It uses a parabolic reflector to focus the microwaves in a beam which can be reflected from objects in a manner similar to the way radar impulses and light beams are reflected.

For receiving the radiated beam, an antenna is used, placed at the focal point of another parabolic reflector. A silicon crystal detects the microwave beam, resulting in an electric output that can be registered on a meter, or made to operate a relay which in turn activates a bell or other signaling device.

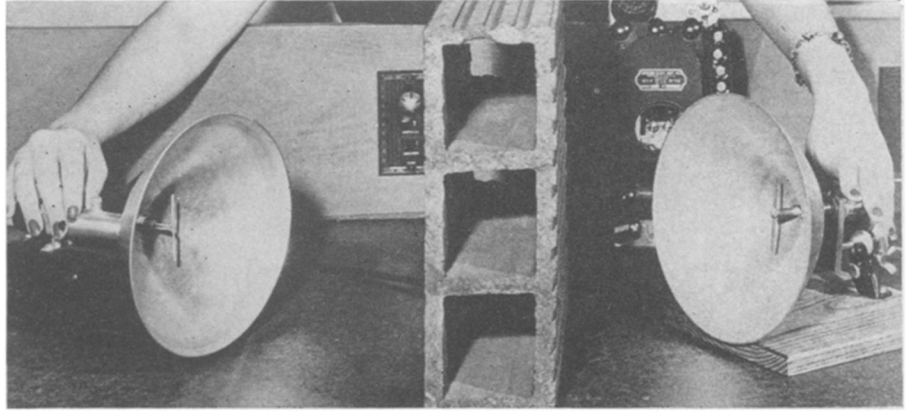
*Science News Letter, November 30, 1946*

## INVENTION

## Same Pedal Can Be Used For Acceleration, Braking

► LOTS OF PEOPLE try to use the same pedal for both acceleration and braking—and get into trouble. But Nelson I. Perry, Chicago inventor, has devised a combination pedal that will turn the trick. To step on the gas, you tilt your foot forward. To put on the brakes, you push your foot straight down. An ingenious arrangement of links under the pedal keeps you from doing both at the same time. U. S. Patent 2,411,167 has been issued on this invention.

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**SEEING THROUGH TILE**—"Microwave units," General Electric devices, use high-frequency radio waves to "see" through or around solid walls.

## AERONAUTICS

## Infra-red Locates Planes

Infra-red rays detect planes as far away as 12 miles by the heat from their engine exhausts. German-developed devices used cesium-silver oxide.

► DETECTING a plane 12 miles away by the heat discharged from its engine exhausts was one of the accomplishments of the Germans in their war uses of the invisible infra-red rays. The development came too late to serve the Nazis to any great extent.

Germany made greater strides in developing infra-red equipment for war purposes than America or any of the other Allies, the Institute of Radio Engineers was told by Earl A. Underhill of Wright Field, where much captured Nazi equipment is being studied. The German equipment was bulky and heavy, but more efficient than American infra-red apparatus.

Image-forming detectors for night vision were one of the important devices. They shot out invisible beams of infra-red rays which were reflected back to a receiver by any object in their path. In the receiver the reflected rays were converted into a visible image. The instrument is similar to the sniperscope and snooperscope used by American soldiers, but the German device had a range of 328 yards, more than five times the range of the American equipment.

In the German instrument cesium-silver oxide is used. In this Nazi scientists may have copied an American development. Scientists of the Radio Corporation of America, using cesium, had developed in 1936 an electronic tube

which enabled its user to view a limited field illuminated only by infra-red rays.

In the receiver of the German instrument, the invisible infra-red reflections enter the cesium photocathode and are transformed to electrons which pass through grids where they are impressed with high voltage and emitted to a phosphor screen, forming a visible image of the reflecting object.

Another German development was a detector to reveal heated objects such as tanks, aircraft and seacraft motors. All heated objects emit infra-red rays, the principal heat waves given off by radiation from a heated body. The German instruments in some cases were image-forming, and in others not. With either the movements of a tank or airplane could be followed.

To detect a plane 12 miles away, an infra-red telescope was used. Variable potentiometers were provided to aid in focussing. With it, objects having a heat radiation no higher than the boiling point of water could be "seen."

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Some prefabricated houses are of flimsy construction but over 30 of the leading manufacturers of "prefabs" meet construction standards approved by the Federal Housing Administration which assure durability, warmth and sanitation.