

INVENTION

Invention for Detecting Airplanes at Night

Can Be Used on Plane to Avoid Collision With Another Or on Ground for Gunfire Control; Works by Radio

RADIO waves about 20 inches long form the fingers which detect invisible airplanes at night, according to a new invention just granted patent 2,231,929 by the U. S. Patent Office. This patent went to Joseph Lyman, of Huntington, N. Y., who assigned it to the Sperry Gyroscope Co., Inc., of Brooklyn.

Repeatedly reports have come from England that R.A.F. fighter planes have some new equipment enabling them to detect Nazi bombing planes in full darkness. The exact nature of the device has not been revealed but, judging by Mr. Lyman's description of his invention, it might serve the purpose.

"The novel indicator," he states in the specifications, "is adapted for use on aircraft either for indicating the direction of approach of other aircraft, to thereby prevent collision under conditions of poor or zero visibility, or for use on the ground as when locating aircraft for purposes of gunfire control, or for controlling aircraft landings from the ground, and for other purposes."

He suggests the use of signals of 600 megacycles, or about 20 inches wavelength, because these can be generated and detected by simple means, and are not greatly interfered with by natural phenomena, such as solar radiation. These are about a hundredth of the wavelength of the 6 megacycle signals used for transatlantic short wave broadcasts.

The apparatus consists of a receiving antenna in a parabolic reflector which sweeps around several hundred times a second. At the same time, the axis of rotation itself turns, but more slowly, so that the antenna sweeps all the way around. Because of the reflector it will only receive signals originating in the direction to which it is pointed. Instead of one such antenna, two can be used, one sweeping vertically, the other horizontally.

In peace time, the approaching airplane might have its own transmitter

and send out a continuous warning. Since enemy bombers would hardly be so obliging, however, it can also operate with a transmitter on the defending plane, since the other would reflect the waves from its metal shell. In either event, the receivers pick up the signal only at one instant in their sweep, and this is shown by a spot of light on the end of a cathode ray tube, like that used in television receivers. The position of the spot shows the exact direction of the other plane.

For fire control from the ground, where more bulky equipment may be employed, parabolic transmitting antennas are also used, which turn in step with those of the receiver. This is more

efficient, because the signals are sent only in the direction where they will be detected, not broadcast.

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ZOOLOGY

Baby Gibbon Jealously Kept From Human Sight

ONE of the rarest babies ever born beneath the Stars and Stripes, an infant gibbon that first saw the light on Jan. 31, on the famous "monkey island" off the coast of Puerto Rico, is still the most jealously guarded. Its ape parents have thus far permitted only one person to see it—a gentle, slow-moving, easy-going Puerto Rican keeper named Juan Ramos. They hide it from every other human, stated Michael Tomilin, superintendent of the great simian colony, who is at present a visitor in New York at the College of Physicians and Surgeons, Columbia University.

So far as Mr. Tomilin's records show, only four gibbon babies have ever been born on American soil. Two of these died very young; the only other one known to be alive at present is in the Philadelphia Zoo. (*Turn to next page*)



AIRPLANE CREATION

This is the loft in the engineering department of the new Vega Airplane Company plant in California. Air conditioning, fluorescent lighting, and many other modern conveniences help to speed the defense program here.

There are at present 13 adult gibbons on Santiago Island, where the monkey colony is located. They were all brought there from Thailand as immature, newly captured specimens in December, 1938. Three matings have occurred, of which the new baby is the first product.

Gibbons, Mr. Tomilin explained, are much more difficult to deal with than are the rhesus monkeys that constitute

the bulk of the island's population — some 400 animals. The long-armed apes do not have such inoffensive manners as the good-natured monkeys, but are given to slipping up behind their keepers and biting them when opportunity offers. Hence they are not given the liberty of the place like the monkeys but are kept in cages.

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PHOTOGRAPHY—AERONAUTICS

Aerial Photographs Now Developed and Printed Aloft

Film, in Holders Not Affected by Developer, Plunged Into Tanks for Finishing; Prints Ready in 7 Minutes

AERIAL photographs, taken and printed in the air within seven minutes after exposure, are among the latest accomplishments of U. S. Army Air Corps technicians at Wright Field, Dayton, Ohio.

By making the pictures so rapidly, then dropping them to the ground in a metal container to which a streamer is attached to make it easy to find, information gained on flights over enemy territory can be quickly delivered to headquarters. Hitherto, the general practice has been for the plane to land with the undeveloped films, which were then finished.

According to H. F. Stiffler, Wright Field mechanical engineer, who describes the new system in an Air Corps publication, the advantage of such a system has long been realized, but earlier attempts were held back, chiefly through lack of interest, and also because of the danger to airplane structure and controls caused by corrosion from the photographic chemicals.

In 1939, he says, the photographic laboratory at Wright Field experimented with a quick-work unit, that made pictures on reversal-type paper instead of film. In the developing process, a positive print could be obtained without the intermediate stage of a negative.

Disadvantage of the method was that the paper is much slower than aerial film, so exposures could be made only under fairly good lighting conditions. In addition, its processing requires close regulation of the temperature of the solutions. This made necessary tanks with automatic cooling and heating.

High speed film is now used, with processing solutions that work satisfactorily as warm as 80 degrees Fahrenheit. The film holder is made of materials that are not affected by the solutions, which are contained in five one-half gallon tanks, each with a trap door lid, that keeps light out and prevents splashing.

"After a piece of the film has been exposed," says Mr. Stiffler, "and the dark slide of the holder closed, the holder is removed from the camera and inserted in the first tank, which contains the developer solution. The dark slide is then withdrawn. After one minute in this tank, the dark slide is again closed and the holder transferred to the second tank, and so on until the processing is complete. The wet negative is removed from the holder and placed on the printer.

"In printing, a thin piece of clear film over the negative keeps the paper dry. It is then placed in a dry film holder. This is then put through the five tanks, just as was the original film. Final result is the finished print which is dropped to the ground, still wet, in the metal container.

"While the present equipment is still in the experimental stage," Mr. Stiffler explains, "satisfactory prints have been produced with it while in flight in seven minutes from the time of exposure of the film. Tests indicate that a satisfactory solution to the quick-work program is within sight, and it is expected that standardization and procurement for service test will be accomplished in the near future."

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CHEMISTRY

Wool From Soy Beans Is Used in Auto Upholstery

"WOOL" from the soy bean will shortly be adopted for automobile upholstery padding, just as plastic fiber panels will replace steel for the automobile body.

Robert Allen Boyer, head of the chemical laboratory established by Henry Ford for research with soy beans, has developed in the laboratory a soy protein fiber processed with sprayed rubber which makes a springy, durable padding.

"The soy wool is the only protein fiber thus far developed from a vegetable source. All other protein fibers come from animal protein. You are reasonably sure of a good crop in virtually all agricultural parts of the world. Two acres of land devoted to sheep grazing will produce 8 to 10 pounds of wool per year. Two acres of land in soy beans will produce 400 pounds of protein suitable for fiber," he says.

Henry Ford has a suit of clothes in which the material is 25 per cent soy bean protein fiber.

With the tensile strength of soy bean plastic now about one-half that of steel, the Ford laboratories are experimenting to develop panels made with plant fiber, held together with a soy bean resin binder, which will resist blows as well, or better, than steel. Fibers of the ramie plant, which have great tensile strength, are being added to the soy bean plastic to strengthen it.

By way of illustrating what an automobile door panel, made of plant fiber with soy bean resin binder, will stand in resisting a blow, Ford will strike a panel lying convex side up on the floor with an axe head. With the blunt side of the axe, no dent results; with the cutting edge, a clean cut results, without denting the surrounding surface. A similar blow on a steel door panel will cut through the metal, bending in the edges of the cut and making a large dent in the surrounding metal surface.

The fiber panel weighs only half that of a steel panel, of the same pattern. It is composed of 70 per cent fiber and 30 per cent resin binder. The fibrous element is compounded of 50 per cent southern slash pine fiber; 30 per cent field cereal straw; 10 per cent, cotton; and 10 per cent hemp.

Henry Ford declares the entire superstructure of an automobile body, except the tubular welded steel frame, will be made from this tough fiber plastic.

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