

the work for his doctorate with Dr. Olivier. The other, part time, is Dr. Roy K. Marshall, assistant director of the Fels Planetarium of The Franklin Institute.

For the present, the observatory will remain on the Cook estate, Roslyn House, but the work will be coordinated with that of the Flower Observatory at Highland Park, a few miles away. Later, it is expected, both observatories will be moved to a new location, but the Cook unit will maintain its identity and Dr. Cook's name will be perpetuated.

Dr. Cook, 72 at the time of his death, was president of the South Chester Tube

Co. and of the South Chester Terminal and Warehousing Co., and a director of a national bank and two trust companies. He received the honorary degree of Doctor of Science in 1936 from the University of Pennsylvania for his astronomical work. In addition to being an amateur astronomer of note, he also had many other interests, for he built ship models, was an enthusiastic amateur photographer, collected rare orchids and rare books. It is estimated that he spent approximately \$200,000 to equip the observatory, over a period of about ten years.

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gun in both directions of motion when desired, but which can instantly be released to shift to another target.

To Paul Kollsman, of Stamford, Conn., went patent 2,206,506 for a compass that can be used on airplanes, speedboats or other craft, indicating by a dial on the dashboard. A rather large magnet, hung on a jewelled pivot, and supported by the buoyancy of a liquid surrounding it, responds to the earth's magnetism. Below this are a pair of smaller magnets, which follow the large one. These, in turn, are geared to the hand which moves around the dial, indicating direction.

Captain Leslie A. Skinner, of the U. S. Army, received patent 2,206,057 for a rocket projectile, which, he suggests, may be used for signalling, or for carrying an explosive or incendiary charge, a message or a parachute. In ordinary rockets burning black powder, the flow of gases to propel the rocket can be discharged through a hole of fixed size. More powerful nitrocellulose explosives used by Captain Skinner for the driving force require high pressure to start the ignition. When the pressure increases, the burning rate also is raised. Thus, it is necessary to regulate the pressure as the burning takes place. This is done by discharging the gases through a small opening made in solder, or some other material having a low melting point. The diameter of the hole is increased, and the pressure reduced, as the rush of hot gases melts away the lining of the opening.

The day when participants in a telephone conversation will be able to see each other may be brought nearer with the invention of Dr. Vladimir K. Zworykin, of Philadelphia, granted patent 2,206,654, by which two-way television may be accomplished over a single pair of wires. Essentially this consists in sending both ways over the wires at once. A blurred image, like a photographic double exposure, would normally be obtained at each end. Dr. Zworykin provides "blinking out" amplifiers at each end of the line, which permit the transmitting tube to send and the viewing tube to show only alternate pictures in the series that is constantly coming over the line. These automatically switch back and forth so that first a picture is sent in one direction, then one goes in the opposite direction. All this is so fast that the persons at each end see a continuous picture, though not with as good quality as if the transmission were continually in the same direction.

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*Turtle shells were cradles for Indian babies in Lower California.*

## INVENTION

## Latest Patents Include Airplane Gun Turret

### Gunner Is Protected From Wind, Yet Can Turn and Aim His Weapon as Freely as Was Possible on Open Mount

**L**ARGE caliber machine guns can be fired from modern high speed airplanes with greater accuracy than heretofore, using a flexible gun turret invented by Clem G. Trimbach, Eggertsville, N. Y. and Camille R. Lemonier, Kenmore, N. Y. They have just been granted United States Patent 2,206,065 for the device.

In older planes, the machine gunner was exposed, and could aim in all directions. However, as the patent states, "it has been found in practice that the conventional flexible gun mounts of the past have been found inadequate in present high speed aircraft, due to the terrific air reactions on exposed parts of the mount by which the gunner is prevented from accurately training the gun and holding an aimed position. Since the use of a flexible gun mount in aircraft is mandatory from a military standpoint in certain types of craft, the present invention pro-

vides for full flexibility, and by its organization, will enable a gunner to maintain an accuracy of fire even better than that which was obtainable in the older type gun mounts used on low speed aircraft."

The gun is pivoted at the center of a hemispherical dome made of transparent plastic material. This can turn around its base, so that the gun, pointing through it, may be moved from side to side.

Up and down motion is arranged without an open slit through which air can enter. The inventors accomplish this with a sliding shutter. When the gun is horizontal, the shutter extends from the barrel to the top of the dome, but as it is aimed higher, the shutter slides on tracks down the other side. Below the barrel is a flexible curtain, wound up on a spring roller, like a window shade, as the gun comes down. There is also a movable seat for the gunner, and a clamp to hold the

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