INVENTION

Shell "Sees" Target and Explodes Before It Strikes

Might Be Useful in Case of Fire Against Troops In the Open; Accomplished by Photoelectric Cell

A FIRING DEVICE for shells or bombs, that "sees" the target it is approaching and detonates the explosive charge at the most effective distance, was granted a U. S. Patent recently. It depends on the reaction of a photocell within an opening in its nose, picking up reflected radiation from a group of lamps that throw their beams forward through focussing lenses.

The novel fuse mechanism is the invention of Clyde B. Ferrel of San Francisco, and is protected by patent 2,255,245. For some types of attack, the inventor points out, it is highly desirable to have the projectile explode before it actually strikes the target. This is the case in fire against troops in the open, where a burst at a height of a few feet is more effective than an impact burst, because in the latter case the shell has time to bury itself in the ground, thereby muffling the violence of the explosion.

Time shell and shrapnel, designed to obtain these bursts in the air, have always depended on either powder-train, or, more recently, clockwork fuses. However, it is difficult to set a time fuse with unfailing accuracy.

With his photoelectric fuse, Mr. Ferrel claims, it will be possible so to adjust the focus of the lenses that a burst can be obtained at any desired distance above or in front of the target. While any type of radiation can be used, he prefers invisible infrared light, with suitable filters to prevent chance illumination from other sources from causing premature bursts.

Science News Letter, September 27, 1941

Many Aviation Inventions

A NUMBER of inventions in the field of aviation feature the recent crop of patents. One, issued to the noted German aircraft designer Claude Dornier, is for a brake to slow down dive bombers, or ordinary aircraft coming to a landing. It consists of a group (typically four) of scoop-like leaves or flaps, hinged at the tail of the fuselage, to open out like the petals of a giant flower and catch the air. They can be brought down to lie flat against the fuselage again by means of a screw-threaded central column. This patent, No. 2,254,591, was granted on an application filed in the fall of 1939, shortly after the outbreak of the war.

A type of airplane propeller blade construction is covered by patent 2,254,821, issued to an inventor in London, Jakob Heinrich Haw. Mr. Haw builds his blades out of transverse layers or laminae of wood, plastic or other light material, bolted together with metal rods running lengthwise through them. These rods have anchoring projections at suitable intervals, and nuts to keep them properly tightened.

Another British invention is an airplane gun turret, on which patent 2,254,678 was granted to L. G. Frise of Bristol, and assigned by him to the Bristol Aeroplane Company, Ltd. In most turnable gun mounts for planes, the turret and the gun or guns form a single unit. In Mr. Frise's invention, the gun mount is an independently operable central column within the turret.

A streamlined seaplane wing float, designed to reduce air resistance in flight, is the invention of Walter S. Diehl, U.S.N., on which patent 2,255,046 was issued. Right to use this invention without payment of royalty is granted to the United States Government.

Science News Letter, September 27, 1941

Unscrambling Metal Alloys

THE DIFFICULT job of unscrambling the metallic omelets known as alloys is undertaken by a process patented (No. 2,254,805) by two German inventors, Erich Junker and Willibald Leitgebel, of Berlin.

Their process depends on the fact that metals become most brittle at high temperatures, just short of their melting points. To separate, say, lead out of a lead-aluminum alloy, the metal is heated to a point a few degrees short of the melting point of lead (327 degrees Centigrade), and then violently pounded or shaken. The lead comes out as a powder, leaving the aluminum. Similar procedure is followed with other metallic mixtures of unlike melting points.

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ARCHAEOLOGY

Study Reveals How Spain Defended Early America

HOW Spain evolved a strong military and naval base at St. Augustine, Florida, to defend its holdings in early America, is revealed in a study of the settlement's evolution directed by Verne E. Chatelain of the Carnegie Institution of Washington.

The base had the duty, not only of keeping control of the vague and vast "Continent of Florida" that spread inland, but also of patrolling the Bahama Channel to guard Spanish treasure fleets from attack. Warlike Indians and pirates were recurrent enemies.

Making St. Augustine the center of Spain's northern New World Empire in 1565, settlers and soldiers built the first houses mainly of wood, copying Indian construction. Bare earth served as floors. Roofs, sharply pitched, were thatched with palm.

Later, more permanent houses had thick, solid walls and an upper story reached by outside stairs. Kitchens were outside the houses, and rudely fashioned.

In time, Florida's rock-like coquina, formed of small shells naturally cemented together, became the building stone of St. Augustine's important buildings and of many homes.

Streets of the early fortified town were unpaved, says Mr. Chatelain. Overhanging balconies of opposing homes nearly met, so narrow were the streets.

Life in the early base town was more colorful than in such places today. Religious processions, Spanish ladies in gay dresses, glitter and color of uniforms brightened street traffic, and behind high garden walls Spaniards grew masses of floral blooms. But it was no New World paradise, adds Mr. Chatelain. The people feared attacks, and common soldiers and their families lived in such deep poverty and debt that they rarely went beyond St. Augustine's walls.

The study which Mr. Chatelain has made was started by citizens of St. Augustine and Florida, cooperating with the Carnegie Institution and other organizations and individuals.

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