

do plain—traditional Armageddon in Palestine—to be harvested for the benefit of his troops.

Likewise true to form with ancient blitzkriegers, runs the oft-reported Nazi concern for their own people. Many

ancient rulers, says Dr. Dubberstein, insisted that they were deeply concerned about general economic welfare of peoples of their country, and particularly the poorer groups.

Science News Letter, August 24, 1940

INVENTIONS

Air Electricity Warns Planes When Approaching Mountains

Other Inventions of Week Include Improvement In Automatic Rifle Mechanism, by Browning

ELECTRICAL differences in the atmosphere will, even in a fog, warn air pilots of their approach to a mountain, if the invention of Dr. Ross Gunn, physicist of the U. S. Naval Research Laboratory in Washington, D. C., is put into use. The Patent Office has just granted him U. S. Patent No. 2,210,932 for the discovery.

"It is well known," says Dr. Gunn in the specifications accompanying the patent, "that the earth's surface normally carries a negative electrical charge and that an electrical current constantly flows toward the earth. This current sets up a potential difference of such a magnitude that near the surface of the earth two points separated vertically by about a meter are at a difference of potential of approximately 150 volts."

Because of the uniformity of this effect, there are surfaces in the air, parallel to the ground, along which the voltage is the same. These are called "equi-potential surfaces." They curve up and over a mountain, or other rise in the ground.

In his apparatus, Dr. Gunn makes use of instruments for measuring this voltage. One detector is placed at the front of the plane, the other at the tail. As long as the aircraft is flying along one of these surfaces, there is no difference between them. If, on the other hand, it passes over a rise in the ground, the equi-potential surface slopes upward, and the forward detector being nearer the ground, indicates a lower voltage than the rear. Even over level ground, says Dr. Gunn, the method can be used to tell whether the plane is flying on a level or not.

To Jonathan E. Browning, of Ogden, Utah, inventor of the Browning machine gun, went patent 2,211,405, for an improvement on an automatic rifle which

is operated by the expansion of gases from the explosion. Usually, in such automatic firearms, the gases, after the bullet has passed, are admitted to a cylinder below the barrel, where they push back a piston that operates the breech, ejecting the used cartridge and inserting a new one. In the new gun, however, the piston consists of a tube in a chamber surrounding the barrel. This scheme, it is claimed, prevents any cramping or binding of the piston, which would jam the gun. Mr. Browning has assigned the rights for his patent to the Western Cartridge Company.

Invisible contact eyeglasses, which are worn under the eyelid, are covered in a patent (2,211,086) issued by Edgar D. Tillyer, of the American Optical Company, Southbridge, Mass. Such lenses have been extensively used in the past, but their close contact with the eyeball prevents the tear solution from circulating properly, and also interferes with the circulation of blood in the outer part of the eye. As improved by Mr. Tillyer, the part of the lens that is in contact with the eyeball is not perfectly smooth, but pebbled, like an orange peel. The roughness is not enough to be felt, but, he says, it does permit the blood to circulate and the tear solution to flow freely, and prevents discomfort and possible injury to the eye.

Two German inventors, Paul Kotowski and Kurt Dannehl, both of Berlin, received patent 2,211,132 for a system of transmitting secret messages by radiotelephone. This superimposes on the voice an extraneous noise, generated by a rotating disk, marked with a saw-toothed pattern. Light passes through this, as it does through a sound movie film, and, in the same way, is converted by an electric eye into a changing elec-

trical current which is fed into the radio transmitter.

Thus, to anyone listening with an ordinary set, the noise completely drowns out the message. The deciphering equipment makes use of a disk identical with the first one, which moves in synchronism with it. This is fed into the receiver in such a way that it exactly counteracts the noise, and the message can be clearly heard. The Telefunken Radio Telegraph Company, of Germany, has been assigned the rights to the invention.

A new kind of photographic film is covered by patent 2,211,323, granted to Charles R. Fordyce, of Rochester, N. Y. Instead of gelatin, usual material for the emulsion which holds the light-sensitive silver bromide, this uses a synthetic resin of the vinyl acetate type, which is soluble in cold water, but not in warm. Thus, it can be applied when near freezing. When the film is developed, in solutions at room temperature, it is unaffected.

Two other patents for photographic films, which, like the one to Mr. Fordyce, were assigned to the Eastman Kodak Company, were granted Gale F. Nadeau and Alfred D. Slack, also of Rochester. These were numbers 2,211,346 and 2,211,347. A common photographic trouble is halation, in which the back of the film reflects light to the front again, and the picture is blurred. This is prevented by covering the back of the film with a layer of a dye or some material that absorbs the light, but it must be removed in the processing. To hasten the removal of the coating, these patents call for the use of certain chemicals in the coating that increase the "wettability" of the material. Then the water of the developing solution is very quickly brought into contact with the dye and its removal is hastened.

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Boys who *quit school* early almost invariably wish they had not, according to a ten-year study of a Pennsylvania educator.

● RADIO ●

Dr. Cassius Way, president of the American Veterinary Medical Association, will tell about "Keeping Animals Well," as guest speaker on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Aug. 29, 4:00 p.m., EDST, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.