SCIENCE NEWS

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"CANNING" URANIUM SLUGS

LEARNING how to "can" uranium slugs was one of the most difficult problems encountered in making atomic bombs, Dr. H. D. Smyth, of Princeton University, consultant on the project, relates in the technical report released by the War Department. The failure of a single "can" might have caused an entire operating unit to be shut down.

The most efficient way of cooling the uranium would have been to let the water flow in direct contact with the radioactive metal in which the heat was being produced. This seemed out of the question, however, since uranium would react chemically with the water. It was feared direct contact between the two would put a dangerous amount of radioactive material into solution and probably even disintegrate the uranium slugs.

No one who lived through the period of design and construction of the Hanford, Wash., plant is likely to forget the problem of sealing the uranium slugs in protective metal jackets, according to Dr. Smyth. The state of the "canning problem" could be roughly estimated by the atmosphere of gloom or joy to be found around the laboratory.

A sheath had to be found that would protect uranium from water corrosion, keep fission products out of the water, transmit heat from the uranium to the water and not absorb too many neutrons.

Metal jackets or cans of thin aluminum were feasible from the nuclear point of view and were chosen early as the most likely solution of the problem, but alternative ideas continued to be explored. Both the problem of getting a uniform heat-conducting bond between the uranium and the surrounding aluminum, and that of effecting a gas-tight closure for the can proved troublesome.

Even up to a few weeks before it was time to load the uranium slugs into the pile there was no certainty that any of the processes under development would be satisfactory. A final minor but apparently important modification in the canning process was adopted in October, 1944, and up to the time the report was written there had been no canning failures.

ITEMS

AN electronic navigator for ocean, lake and river ships, that will detect above-water obstacles such as other vessels, icebergs, land, lighthouses and buoys by radar, is under test on shipboard by the U. S. Maritime Commission, it is now announced. It will detect these obstacles through darkness, fog and storm at distances up to 30 miles, depending on the size of the object. The tests are being made on the SS American Mariner, training ship of the WSA's Maritime Service training program. Additional sets will be placed soon on other vessels. When materials are available the equipment will be obtainable by commercial shipping, both on inland waters and on the sea. The device operates on the radar principle of radio waves which are reflected from objects and are measured to give true bearing and distances of the object from the point of sending. It has a rotating antenna, located on top deck of the vessel, sending out powerful radio microwaves capable of penetrating fog or other atmospheric conditions. If these pulses hit an object, some of them are reflected back to the rotating antenna, which also contains a receiving antenna. The apparatus is an adaptation of radar equipment that has served a valuable war purpose. The set under test was developed by the General Electric Company laboratories at Schenectady, N. Y.

WITH the return of heavy automobile traffic to the nation's highways, drivers in three additional states will find themselves operating under financial responsibility laws to protect innocent parties in case of accidents. These three, Nebraska, Minnesota and Georgia, have enacted such legislation during the present year. Some thirty-two others had previously passed such laws. The main features of the Nebraska and Minnesota legislation are similar. In accidents involving more than $50 damages, the driver and owner must pay the damages within sixty days, or forfeit driving license. Reinstatement of the license is contingent upon the driver taking out an insurance policy or equivalent bond to cover future accidents. Under the Georgia law, the driver against whom damage claims are assessed by the court must pay in thirty days or have his license suspended. It is not returned until the licensee has taken out liability insurance. Nine other states have legislation similar to these three, according to the Public Administration Clearing House of Chicago. Some of the other states have laws much more severe. The Massachusetts statute is the most stringent. In that state a driver must obtain responsibility insurance before any permit to drive is issued to him.

MUSTARD seed is now scattered by airplanes over fire-devastated mountainous areas in California to start a quick growth to form a cover to prevent soil erosion. Of a hundred kinds of seeds tested for this purpose, black mustard proved most desirable. A report relative to the use of mustard seed to prevent erosion on burned-over areas in California has been issued by the U. S. Department of Agriculture. Erosion of many of the California hill and mountain soils is extremely severe if the chaparral or forest cover is destroyed by fire. The problem is to restore growing plants to cover the soil with their leaves and hold it with their roots before rain can get in the soil and wash it away. The black mustard seed is satisfactory because it is light and fine, and smooth so that it settles rapidly and evenly when blown from a plane. It sprouts quickly with even slight moisture and roots rapidly. Its first growth is a rosette of leaves that forms a protective pad at the soil surface. It is an annual that reseeds well, but dies the first year and forms a litter of dead tops.