NEMESIS FOR TANKS

The new 37-millimeter gun that hurls its two-pound armor-piercing shells with the speed and force of small thunderbolts. They break through the walls of their target and burst inside. (See page 330.)

PHYSIOLOGY

Vitamin A Therapy Aid In Matching of Colors

VITAMINS have received advertising promotion almost unequalled by any other science achievement, but here is a story not from a drug house or a doctor, but a factory. Vitamin A therapy, giving of carotene in oil, sharpened the color discrimination of inspectors of porcelain so that more than $5,000 a year was saved on assembly of ranges at Mansfield, Ohio. Fewer changes were necessary because of off-color parts after assembly, less customer complaint. Vitamin A regenerates the visual purple in the eye's retina vital to seeing.

Science News Letter, November 18, 1939

PHYSICS

To Heat and Air Condition House With Solar Energy

Experimental House Built By MIT Will Try Several Types of Heat Traps and Store Energy in Basement

TRAPPING the heat of the sun as it falls on the roof of a house and storing it in the basement for future use is to be attempted at the Massachusetts Institute of Technology soon, as part of a long-range program on the possibilities of using solar radiation as a direct source of energy.

An experimental house, which the scientists plan to heat during the winter, air condition during the summer and possibly even supply with power, all with the energy of sunlight, has already been constructed and the research is expected to begin at once.

One of the major features of the house is a large, well-insulated water storage tank which is to be used in ironing out the fluctuations in heat which are inevitable with a source as variable as the sun.

The heating system is based on a method of forcing air either over the hot surface of the tank or through the coils of a refrigeration system which is also to be run on energy stolen from the sun.

Prof. Hoyt C. Hottel, who is in charge of the program, plans to try several types of "heat traps," or energy collectors, during the research. First attention will be devoted to a shallow, box-like device which will be placed in a recess in the building's roof.

For a bottom this box has a thin sheet of metal, painted black to absorb as much of the sun's heat as possible. Firmly fixed to this bottom is a series of small, thin-walled metal tubes which are to be heated by contact with the sheet and which will then pass this heat on to water circulating through them.

This box has a series of glass covers, separated by dead air, through which nearly all the sunlight can pass but through which little heat can escape back to the outside. The sunlight is converted to heat as it strikes the metal sheet and the whole arrangement has a layer of mineral wool beneath it to prevent heat escape in that direction.

The warm water in the coils is then piped, through carefully insulated tubes, to the well-insulated storage tank where the engineers expect to keep it hot anywhere from a few weeks to six months, depending on the size of the tank.

Just what size units will be used has not been determined. A large sunlight trap, one big enough to heat the house directly, and thus needing but a small tank, may be used or they may try a small collector which would trap heat all summer with a huge tank capable of hoarding an entire winter's supply of heat.

The best size for these units, the most heat-absorbent paint, the most effective number of glass plates and the best angle at which to slope the roof are among the problems to be investigated. The experimental house, Prof. Hottel pointed out, is more a laboratory than a model dwelling, small but with a large wall surface in proportion to volume. This has been compensated for by extensive insulation.

Prof. Hottel also emphasized that he and his colleagues are well aware that the amount of solar heat in New England would make domestic heating by solar radiation uneconomical in comparison with other heat sources but there is sufficient sunshine in this region to test the efficiency of heating systems for those localities where the climate is less rigorous.

● RADIO

Dr. J. C. Steinberg and H. C. Montgomery of the Bell Telephone Laboratories will entertain with synthetic deafness as guest scientists on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, November 27, 4:30 p.m., EST, 3:30 CST, 2:30 MST, 1:30 PST. Listen in on your local station. Listen in each Monday.

The research is one of several projects planned at M.I.T. under the terms of a gift of nearly $650,000 from Dr. Godfrey L. Cabot of Boston "for research on the utilization of solar radiation for the tasks of man." In addition to the house-heating project the program calls for various fundamental investigations of direct physical and chemical methods of tapping this almost limitless source of energy, a source that on an average day yields as much as a horse-power per square yard of earth.

Science News Letter, November 18, 1939

CONSERVATION

Snowplows Build Ridges To Keep Moisture

SNOWPLOWS have something to do in the wheat-growing Northwest besides clearing roads. Snow is more than a bothersome traffic obstruction there, it is the farmer's principal frozen asset, especially after a droughty autumn like the one just past. Recommended off-highway job for snowplows therefore is to conserve snow on the fields.

The technique developed by Prof. H. F. McColly, of the agricultural engineering department of North Dakota Agricultural College, is to run the snowplow through the fields when the snow is about five inches deep on the level, building up ridges 18 inches high and about eight feet apart. This should be done when the snow is wet enough to pack; if straw and stubble are mixed in, so much the better. The ridges follow contour lines on sloping fields, and in flat country they are made to lie at right angles to the direction of prevailing winds.

Between the ridges midwinter snow is not blown away, but is trapped and held, as in the lee of a snow fence. Soil, too, even if not yet covered, is guarded from the scouring blasts. When a thaw comes the ridges, now compacted and perhaps frozen fast to the earth, serve as levees to hold the water and let it seep into the soil, not to rush away as runoff and perhaps carry eroded soil with it.

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