

• New Machines and Gadgets •

☼ **QUICK-FROZEN** baked beans are now wrapped in cellophane and packed in paperboard containers. All the housewife needs to do is heat the beans for a few minutes. One firm producing 40,000 pounds a week plans to double this figure soon.

Science News Letter, May 15, 1943

☼ **A NEW ADHESIVE** holds heavy masking paper in place to protect highly-polished surfaces of transparent plastic enclosures on aircraft against scratching and marring during shipment and assembling. When protection is no longer needed the adhesive permits the paper to be stripped off easily and cleanly.

Science News Letter, May 15, 1943

☼ **AN AIR-COOLED** welder tip has been perfected by a workman in a western aircraft factory where a great deal of welding is being done. The welder tip is "finned" with dural, a metal alloy, which keeps the handle and mixing chamber cool and prolongs the life of the tip.

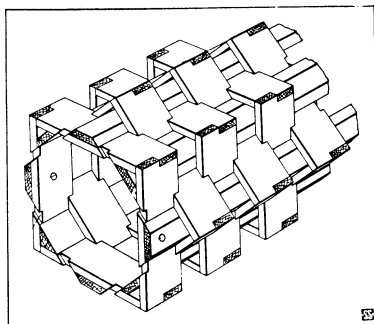
Science News Letter, May 15, 1943

☼ **AN ELECTRIC PLUG** is made with a small lever placed between the prongs which automatically breaks the circuit in case of overloading, short circuit, or motor stalling on the extension line. The lever is actuated by heat. After a circuit break the lever is easily pushed back into position.

Science News Letter, May 15, 1943

☼ **A WOODEN CULVERT**, octagonal in shape on the inside, is a recently patented invention which saves metal. It is an assembly of identically cut pieces of wood which interlock in slots cut in the pieces as shown in the illustration. The whole is held together by four flat beveled strips without nails, screws or bolts.

Science News Letter, May 15, 1943



☼ **A NEW BLACKOUT** street lamp invisible to enemy fliers, gives light enough to keep a person on his homeward path. It permits a person to make out the figure of another pedestrian 40 feet away. The shade is of plastic and cast iron. The light is about one-sixtieth as bright as the full moon.

Science News Letter, May 15, 1943

☼ **WET CONCRETE** may be sealed and the moisture locked in it during setting by a new clear liquid. It is sprayed on the concrete immediately after finishing. Its use in highway construction is said to produce the equivalent of 14-day water-cure without the labor and expense of hauling earth, applying water, and other steps necessary in the water-cure method.

Science News Letter, May 15, 1943

☼ **A NEW TYPE** of Army jungle boot is made with uppers of green canvas and soles of heavy rubber with cleats. It is designed to protect the soldier during fighting in underbrush and while marching in rough mountainous country.

Science News Letter, May 15, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 156.

ENGINEERING

High-Frequency Field Used in Metal Work

➤ **HIGH-FREQUENCY** electric field heating in the interior of materials is now used in case-hardening metal machine parts, in the manufacture of plywood and in many other industrial operations. Developed only within the past few years, it is a process similar to the one used by physicians in electro-therapy, in which heat is applied internally to parts of the body. "Penetrating heat" it has sometimes been called by them, to distinguish it from surface heat.

The manufacturing of plywood illustrates how the high-frequency electric field is used. A metal sheet, connected to one terminal of a high-frequency transformer, is placed in the center of a stack of glue-coated veneer sheets two or more feet high. The other terminal is connected to the upper and lower plates of the plywood press itself. Pressure is applied, and at the same time electric energy sent from the middle

metal sheet to the plates of the press. The heat sets the glue. Two heavy slabs of plywood may be formed, or many separated plywood boards may result, depending upon the glue application.

In this interior heating, a high-frequency electronic oscillatory system is generally used. It is basically similar to a radio transmitter but usually more powerful. The oscillator is operated on direct current, and gives an alternating current of frequencies from a few cycles to many millions per second, depending upon the setup. In passing from one terminal to the other, much of the electric energy is turned into heat.

Case-hardening of small machine parts such as gears and bearings is now being done by a similar electric heating process. In case-hardening only the surface wearing area is hardened.

Tinplate, applied to other metals by the electrolytic method, requires polishing. This also is now done by a similar high-frequency electric field process.

Other uses include the heat treatment of tobacco without removing it from the hogshead, and the killing of insects in grains and cereals. Other industrial uses are made of the process, and many additional ones are promised for the near future.

Science News Letter, May 15, 1943

The shipbuilding industry was the largest user of steel in the United States in 1942.

Cutworms, which destroy many vegetable gardens, have been called "fifth columnists" because they work in the dark.

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