

## • New Machines and Gadgets •

⚙️ *A METAL-SPRAYER wearproofs wooden core boxes and foundry patterns against the abrasive action of sand. It contains an electrically heated melting pot in a compact housing with a gun handle for air pressure control. When a low fusing alloy in the sprayer is melted, compressed air sprays the molten metal on the surface to be wear-proofed.*

*Science News Letter, March 27, 1943*

⚙️ *AN IMPROVED THROAT microphone worn around the neck over the throat box is now available for use in factories and other noisy places, doing away with shouting. The device weighs only two ounces. Words spoken by the wearer, even in a low tone, are picked up and may be amplified and transmitted through a public address system.*

*Science News Letter, March 27, 1943*

⚙️ *THE RECEPTACLE contained in a newly patented umbrella handle is designed to hold a pair of rubbers or other articles.*

*Science News Letter, March 27, 1943*

⚙️ *THE HALF BILLION fence posts replaced by American farmers annually can now be protected from termites and decay by the trough method, a simple soaking process with chromated zinc chloride. This replaces the former treatment procedure employed by most farmers which used old inner tubes as part of the equipment.*

*Science News Letter, March 27, 1943*

⚙️ *AN IMPROVED method of sealing the ends of pyrex tubes will now protect chemists from breakage in the laboratory. By a procedure of thoroughly annealing the seals, tubes were found to withstand over 2,500 pounds pressure per square inch, a force far greater than that generated by most chemical reactions.*

*Science News Letter, March 27, 1943*

⚙️ *NEW RUBBER insulated bushings capable of absorbing vibration and shock, and of taking torsional and radial movement without lubrication, require only 20 per cent as much synthetic or natural rubber as that used in previous conventional designs, the manufacturer states. Thinner walls are used, but this seems to lengthen the life and increase the efficiency of the assembly.*

*Science News Letter, March 27, 1943*



⚙️ *A MAGNETIC RIVETING device, shown in the photograph, speeds certain riveting operations in warplane construction. The device magnetizes a bucking bar which is pulled through narrow channels by a wire, permitting a new type of assembly impossible under old riveting methods in which a buckler, teaming up with the riveter, holds a bar in place manually.*

*Science News Letter, March 27, 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 149.*

### ENGINEERING

## Copper-Covered Wire Good For High-Frequency Lines

➤ IMPROVED design of high-frequency telephone wires and other wartime communication lines, effecting a saving of strategic copper, may be possible from research work by Dr. B. R. Teare, Jr., and his assistant, Mrs. Josephine R. Webb, of the Carnegie Institute of Technology.

Copper-covered steel wire is just about as good as solid copper wire except at the lowest frequencies, the scientists discovered. Wide use is being made of a copper covering welded to a steel core because the great strength of this wire permits poles for the wires to be spaced far apart and saves large quantities of copper.

Resistance of copper-covered steel at ordinary power frequencies was known, but performance in the increasingly important range up to 150,000 cycles had not been charted previously.

By using the formulas announced by Dr. Teare and Mrs. Webb, communication systems can be designed to fit both the material available and wartime requirements without the delay of testing the conductor.

*Science News Letter, March 27, 1943*

### ENGINEERING

## No Engine Changes Needed To Use Low Anti-Knock Gas

➤ NO MAJOR ENGINE changes will be necessary in buses, trucks and other commercial carriers because of the reduced anti-knock value of gasoline. Only if octane rating falls below 65 is performance likely to be noticeably altered.

Even fuel consumption and power output is very little affected if spark timing is properly retarded, D. P. Brenz, H. H. Maxfield and A. B. Culbertson of the Shell Oil Company told the meeting of the Society of Automotive Engineers.

Experiments show that closer maintenance will probably be necessary, the engineers warn. Results are likely to vary with cars of the same model, so that optimum spark timing should be determined for each engine.

Although tests showed that about a 5% loss in power could be expected, truck drivers on actual road runs reported that they could detect no difference in performance between gasolines of 65 and 72 octane number.

Carburetor adjustment does not appear to be worth while, the engineers report, judging from the results of their tests. Such enrichment of the gasoline mixture apparently causes much greater relative loss in power and economy than is suffered from retarded spark timing.

Passenger cars, as well as the commercial vehicles, can just as easily be adapted to the lowered anti-knock quality of gasoline, earlier investigations revealed. Most motorists have found that they can avoid knocking by merely easing up on the accelerators. At the same time, this extends the life of tires and increases mileage obtained from the gasoline ration.

*Science News Letter, March 27, 1943*

Certain *bacteria* in sea water induce calcium to combine with carbon dioxide, thus causing a finely divided limestone to settle out.