

## PUBLIC SAFETY

# New Road Barriers for Safety

Slaughter by automobile may be reduced by newly designed road divider barriers. Toughness, flexibility and practicality all must be considered by testing engineers.

By WILLIAM McCANN

► ENGINEERING has found a way to prevent deadly head-on collisions on many highways even if cars or trucks get out of control through driver carelessness.

Newly developed barriers for the center of the road between rushing expressway traffic should help save thousands of lives each year.

Driving 50 miles per hour usually is not considered an excessive speed. But if a driver coming the other way is also going 50 mph, the closing speed is 100 mph, leaving deadly results if one car should suddenly veer into the wrong lane.

Effective barriers must not only be tough enough to keep a speeding car out of oncoming traffic, but also be flexible enough to keep occupants of the car from getting injured when the barrier is struck.

On the other hand, the barriers cannot be too flexible or they may bounce a car right back into the stream of traffic.

Driverless test cars were crashed into 15 barrier types at speeds of 60 mph in a recent study by the California Division of Highways. The cars, driven into the barriers by remote control, had dummies sitting in the driver's seat. The dummies' reactions in the crashes were studied by a high-speed camera to find out if there would have been any injuries had a real driver been behind the wheel.

## Two Designs Effective

Two designs—the cable-chain link and the blocked-out metal beam—were the most effective barriers, according to test results.

The cable-chain link barrier looks somewhat like a back yard wire fence with metal posts every few feet apart. The fence, however, is reinforced by rows of heavy cable strung from post to post.

The beam barrier, a standard traffic divider for many heavily traveled highways, consists of steel guard rails on each side of three-foot-high posts. Between the rails and the posts are six-inch-wide blocks of wood to help absorb the shock of collision.

The cable barrier is normally installed when the area dividing the opposing lanes of traffic is 16 feet wide or more. This is because a cable barrier may deflect a vehicle up to about eight feet when struck.

The beam barrier, however, can be used in narrower dividing strips, since a speeding vehicle rarely will go through or over it. Also, when a car hits the more rigid rail, chances are it will not bounce back into its own lane of traffic.

Barriers down the middle of the road have caused more accidents, but have saved

*One September afternoon 75 years ago, H. H. Bliss stepped from a New York trolley and was promptly struck down by a passing horseless carriage. He died the next day, and on the authority of the National Safety Council, became the first traffic fatality on record.*

*This traffic-death list has stretched into the hundreds of thousands since then, prompting more and more research for safety along the road as the number of drivers, cars and trucks continues to swell.*

more lives on many California freeways, reported Roger T. Johnson, California Division of Highways, Sacramento, in a recent study of the effectiveness of the cable and beam barriers.

The number of accidents per million-vehicle miles increased 32% with the installation of the cable barrier and 20% with the beam, the study showed. The total number of fatal accidents, however, has been reduced by 23% at barrier locations.

When fatalities did occur at barriers, they were almost always the result of a passenger being thrown out of the car, Mr. Johnson said in his report. This means that if the occupants of the cars had been wearing seat

belts, probably no one would have been killed, he added.

Following years of testing on highways throughout the nation, the "middle-of-the-road" guard rail has been gaining wide acceptance as a highway lifesaver.

A few months ago workers finished bolting on the last beams of the steel barrier that runs the entire length of the Pennsylvania Turnpike. This 359-mile divider, which extends from the Ohio Turnpike in the West to the New Jersey Turnpike in the East, is the world's longest. Joseph J. Lawler, Pennsylvania Turnpike Commission chairman, reported that the rail helped make the Pennsylvania Turnpike one of the nation's safest highways, and moved it from tenth to third safest of the superhighways in miles traveled.

## Guard Rails Decrease Collisions

Steel guard rails also have been installed on the New Jersey Turnpike, busiest of the nation's toll roads, on Connecticut's Merritt Parkway and the Detroit Freeway in Michigan, to name a few. Death by head-on collision has now almost completely been eliminated on each of these roads.

Metal guard rails and fences have not been the only types of dividers proposed for highways, however. Concrete slabs, hedges—and even Christmas trees—have undergone extensive road tests for effectiveness on the middle of the road.

Corrugated concrete slabs were set in a row along the center of a highway divider

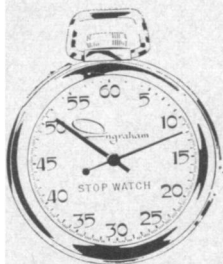
*(Continued on p. 46)*



Steel Products News Bureau

**CLOSE CALL**—Tough steel guard rail took quite a beating from a big, skidding tractor trailer, but managed to keep it from plowing into heavy rush hour traffic on snow-slick Mill Creek Expressway in the heart of Cincinnati, Ohio.

## SCIENCE! FUN! MYSTERY!

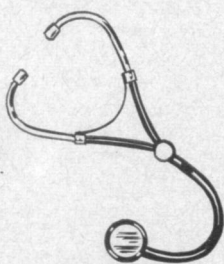


**STOP WATCH**

Time lab experiments, study periods, sports events, etc. Accurate—time up to 60 minutes—Dozens of uses. Perfect for track and field, swimming, etc. Time against world record holders.

No. 607

\$4.95



**STETHOSCOPE**

Real working stethoscope. Actually hear heartbeat. Amazing low price. Full 2 1/2" x 7 1/2".

No. 500

\$1.25

### HOME BATTERY CHARGER

Bring rundown batteries back to full life again! Recharge batteries up to 15 times. Saves you up to \$3.00 on every 15¢ battery. Recharge up to 4 batteries (radio, flashlight, small cell, etc.) for less than 1¢. Simply plug into AC outlet. Perfect for any battery operated toy or kit.

No. 601

\$5.95



### BUILD YOUR OWN POCKET WATCH

A sturdy, precision-made master engineered watch that really works. In lifetime plastic with two springs, it has 21 precision parts that snap in place.

Keeps dependable time from 16-24 hours on a single winding. Winds and sets at the back. 14K applied gold dial. Complete with case. Use as pocket watch, fob, pendant. Full written guarantee.

No. 6178

\$2.98

### X-RAY SPECS

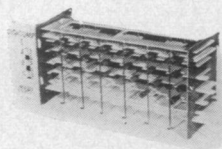


Fun-provoking, interesting, unusual X-Ray Specs. For optical illusions. Is that really outline of body or objects you see? See bones through hand.

No. 701

\$1.00

### ELECTRIC COMPUTER BRAIN

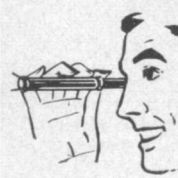


A real working digital computer designed to demonstrate the operations hidden within the circuits of an electronic brain—12"x13 1/2"x4 1/2"—in kit form—28 page operation manual shows fascinating experiments that can work—Solve missile countdown, satellite re-entry, etc.

No. 503

\$4.98

### POCKET SCOPE

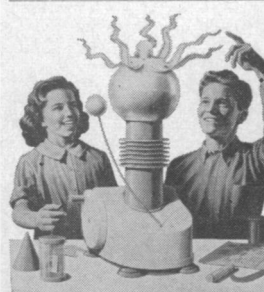


Pen size—clips on your pocket—6 Power Magnifier and 30 power full microscope. Not a toy, but a real optical instrument. 6-Power Wide Field Magnifier and 30 power microscope concealed in a pen-sized pocket scope.

No. 402

\$2.98

### ELECTROSTATIC GENERATOR



Van De Graaff uses no wires, no batteries, yet creates harmless static electricity for dozens of interesting experiments. Create experiments of classic complexities. Observe basic functions of insulators and conductors. Assembled.

No. 810

\$6.95

Please order by item #. Full Money Back Guarantee On All Merchandise. Send cash, check, or money order, or order COD (\$1 deposit) from:

**ROYAL ADVERTISING CORPORATION**

DEPT. 593

LYNBROOK, N.Y.

## New Road Barriers

(Continued from p. 38)

strip in one test. The slabs, which were about two feet high and only a few inches wide, were placed about two feet apart along the divider and facing one another.

A test car then took aim at the slabs, which were reinforced with metal to keep pieces of the concrete from scattering.

The three California researchers conducting the tests found that the slabs could slow up an out-of-control car without a sudden jerk, yet could help keep the car out of the lane of oncoming traffic.

The researchers admitted, however, that further study was needed with this type of barrier to get improved performance and to find an inexpensive way of replacing damaged slabs.

### Tests with Rose Hedges

In another series of crash-tests, an instrument-equipped automobile was driven into multiflora rose hedges to study the possibility of a living guard rail. A dense hedge, about ten feet wide, nine feet high and more than 300 feet long was rammed a dozen times by the car from all angles at speeds ranging from 22 to 50 mph.

The hedge did, indeed, make a good barrier, according to the test results. The car, which was slowed up gradually by the hedge, wasn't damaged at all—and neither was the driver.

This type of barrier requires wide divider strips, however, so the hedges can have enough room to grow without stretching their branches out over the highway to annoy drivers. In addition, the hedges need regular garden care and take a long time to grow back when damaged.

## MAKE MONEY WRITING

.. short paragraphs!

You don't have to be a trained author to make money writing. Hundreds now making money every day on short paragraphs. I tell you what to write, where and how to sell; and supply big list of editors who buy from beginners. Lots of small checks in a hurry bring cash that adds up quickly. No tedious study. Write to sell, right away. Send for free facts. **BENSON BARRETT**, Dept. 163-G, 6216 N. Clark St., Chicago 26, Ill.

### LANGUAGES? Easy!

Listen & Learn. Only course designed for travel, everyday life. 3 12" records, full of practical phrases, English & language recorded. Full manual with record text, phonetic transcription. Separate sets: Spanish, French, German, Italian, Russian, Japanese, Portuguese, Greek. \$5.95 each. Money-back guarantee. Dept. **SNL**, Dover, 180 Varick St., N.Y. 14, N.Y.

## MICRO-ADS

Equipment, supplies and services of special interest to scientists, science teachers and students, science-minded laymen and hobbyists. 25¢ per word, payable in advance. Closing date 3 weeks prior to publication (Saturday).

**SNL, 1719 N St., N.W., Washington, D.C. 20036**

**BINDERS FOR SNL — BUFF-COLORED BUCKRAM.** Snap-in metal strips hold 52 copies. \$4.00 pp. Send order with remittance to Science News Letter, 1719 N Street, N.W., Washington, D.C. 20036

**BOOKS ON WILDFLOWERS. FREE LIST. LEW'S,** 2510 Van Ness, San Francisco, Calif.

**SURPLUS OPTICS-ELECTRONICS CATALOG. 72** pages 20¢. Meshna, Nahant, Mass.

Hundreds of old Christmas trees were used in yet another test. The trees were nailed and tied to center posts on stretches of two Chicago expressways to find whether live evergreens could help make the highways safer.

These trees were found to have two important advantages. First, they helped keep drivers from getting blinded by the headlights of oncoming cars. Second, they helped keep the driver on the highway and off the median strip by breaking the monotony caused by a continuous row of hedges or steel barrier.

Planted on a divider strip, these trees certainly would not stop a speeding out-of-control car from slicing into an opposite lane, but they can prevent many drivers from losing control as a result of being temporarily blinded by the glare of headlights.

Safety barriers, whether they are wire fencing, steel beams, hedges or even tiny trees, are not expected to eliminate all highway traffic deaths, but they will help halt the most deadly of highway accidents—the head-on collision.

• Science News Letter, 88:38 July 17, 1965

### MEDICINE

## Unusual Arthritis Type Linked to Excess Iron

► THERE IS SUCH a thing as having too much iron.

A former newspaperman admitted to Yale Clinical Research Center, New Haven, Conn., for study of mild polyarthritis was found to have a disorder of iron metabolism, hemochromatosis. A team of physicians of the Yale University School of Medicine reported that it seems possible that his arthritic condition was caused by the excess deposits of iron.

Bloodletting, or phlebotomy, reduced the content of iron in the liver, but biopsy of the painful knee joint revealed large deposits of the granular iron-containing pigment called hemosiderin. The joint had a distinctive rusty color.

"This unexpected finding," the physicians say, "supports the suggestion that iron deposition in hemochromatosis is occasionally responsible for symptomatic arthritis."

Tests for rheumatoid arthritis were negative but X-rays showed an unusual mixture of osteoarthritis and osteoporosis, conditions of the bone often seen in aging persons. The patient was 64 years old.

This patient's case is similar to another that was reported in 1964. In both patients, arthritis developed insidiously at about the same time the hemochromatosis became severe enough to "manifest pancreatic insufficiency and diabetes."

The physicians say their view suggesting that the hemochromatosis caused the joint symptoms cannot be proved, but "alert clinical observations" with joint biopsies and attention to the joints when others are autopsied after hemochromatosis should establish whether or not the excessive iron condition causes arthritis.

Drs. Siegfried J. Kra, J. W. Hollingsworth and Stuart C. Finch reported the study in *The New England Journal of Medicine*, 272:1268, 1965.

• Science News Letter, 88:46 July 17, 1965