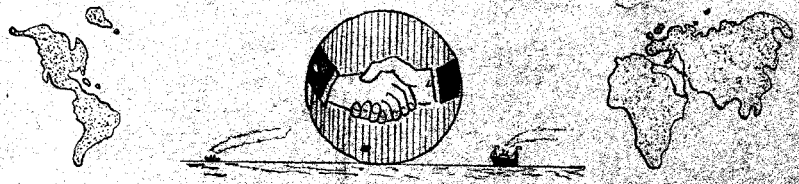


Hands Across the Sea Club

Scrapbook No. 1

TULSA

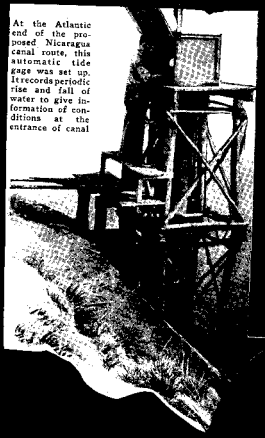
WORLD

Illustrated News
of Science and Invention
By
Gordon Shumard

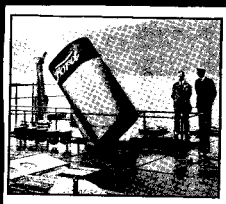
MOTORBOAT CAN TURN FLIP FLOP

Above, motorboat turns somersault while running at full speed. Right, entering craft's water-tight compartment, seen below.

fins on his unique rolling boat and throws the steering wheel hard over while roaring at full speed through the water. If the fin is in the wrong place the boat does a complete somersault and lands safely on its flat bottom. His tests at Lake Manhassett, N. Y., show, he says, that a seventy-five mile speed is possible.

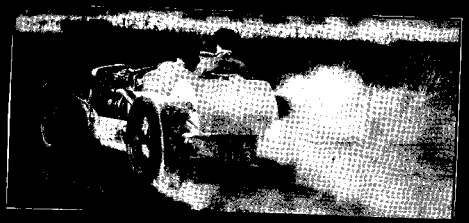


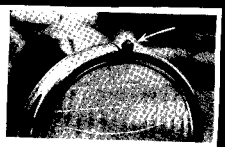
At the Atlantic end of the proposed Nicaragua canal route, this automatic tide gage was set up. It records periodic rise and fall of water to give information of conditions at the entrance of canal



BARGE TAKES SMOKESTACK DOWN TO PASS BRIDGE

"Low bridge," the old cry of the inland waterways, will have an entirely new meaning for the captain of the barge Edgewater as it goes on its way between the Ford plants at Dearborn, Mich., and Edgewater, N. J. Bridge tenders will not be worried by the passing of the strange craft, but the crew of the barge will be on the lookout for low bridges and when one comes in sight motor operated machinery will be set going. As the wheels fly around, the smokestack of the barge will bend over and lie flat on the deck. Other high parts will do the same thing.





CLIP TELLS CAR DRIVER WHEN HEADLIGHT FAILS

AN INCONSPICUOUS attachment for an automobile headlight now tells the motorist whether the bulb is burning properly. The telltale, a metal clip of polished stainless steel, snaps over the headlight rim. Its curved back reflects a spot of light when the lamp is on, thus averting the possibility of driving with one light out, incurring risk of a fine by a traffic officer.

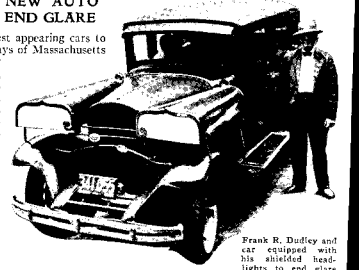
NEW ARMY RIFLE LOADS ITSELF

FASTER and more accurate shooting may follow the adoption by the American Army of a semiautomatic rifle, two different models of which are now being subjected to final tests. One of these is the invention of J. D. Pederson, inventor of the Remington pump shotgun, and the other is the work of John C. Garand who has designed many valuable models for the government. The advantage of the new rifle lies in the fact that part of the power of the gun is used to eject the empty shell and put a new cartridge in the firing chamber. With the present rifle this is done by hand, interfering both with speed and precision. The new arms are expected to be especially effective against enemy airplanes.

At top, the present U. S. Army rifle and below it the two models of the semiautomatic rifle, one of which may be put in use when final tests are completed. At right, arms expert studying the Army rifle now being used at the Government's Bureau of Standards

SHIELDS ON NEW AUTO HEADLIGHTS END GLARE

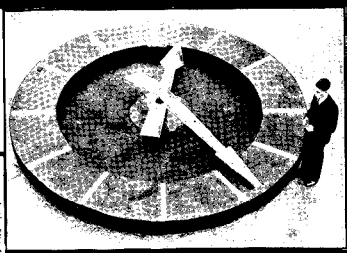
ONE of the strangest appearing cars to be seen on the highways of Massachusetts is that driven by Frank R. Dudley, Boston inventor. Its lines are altered by a pair of enormous headlights which Dudley has designed. Because of their odd shape, he says, glare is entirely eliminated. The bulky sheathing serves to confine the beam to the road just ahead. Dudley is trying to get state motor officials to recommend the use of his device.



Frank R. Dudley and car equipped with his shielded headlights to end glare

BIG CLOCK GUIDES FLYERS

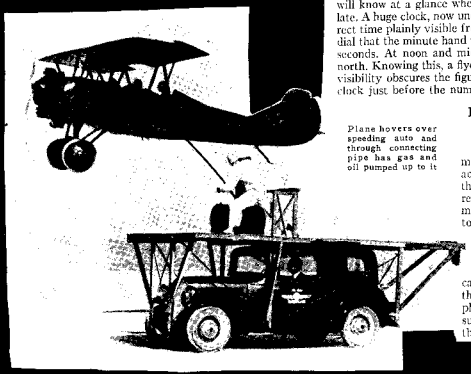
PILOTS of aircraft passing the airport at Heston, England, will know at a glance whether they are ahead of schedule or late. A huge clock, now under construction, will make the correct time plainly visible from the air. So large is its horizontal dial that the minute hand will move nine inches in every sixty seconds. At noon and midnight the hands are to point due north. Knowing this, a flyer can tell the time even when poor visibility obscures the figures. The photograph shows the big clock just before the numbers were painted on the dial.



FLYING PLANE REFUELS FROM SPEEDING AUTO

TRANSFERRING gasoline from an automobile to a speeding airplane was a feat accomplished at Muroc Dry Lake, Calif., the other day, demonstrating a new way of refueling on the fly. Hitherto an airplane making an endurance flight has been able to take on fuel only from another plane.

For the unusual stunt, a small sedan was fitted with a special superstructure to handle the hose, and contact was successfully made between plane and car after a few minutes' maneuvering. When the fuel tanks had been replenished a supply of oil was pumped to the plane. The success of the stunt depended on keeping the machine at the same speed.



Plane hovers over speeding auto and through connecting pipe has gas and oil pumped up to it

New Search-light to Trap Planes

A RADICALLY NEW IDEA in search-lights, which, it is claimed, can trap hostile aircraft in a few minutes, has just been demonstrated at Fort Totten, New York, by its inventor, Col. A. M. Jackson, commanding officer of the Sixty-second U. S. Coast Artillery.

By means of a series of mirrors in a frame in front of the search-light lens the high-intensity beam is broken up into nine or more separate beams, thus greatly increasing the area lighted up. To quote a recent press bulletin:

"None of these beams will interfere with one another, yet the entire area is illuminated evenly. Strange as it may seem, previous attempts at training several search-light beams at a target in the sky have actually shielded the target, because search-light beams are opaque. This can not happen with this Army officer's invention which, it is claimed, can quickly locate enemy aircraft and, due to its design and the large area covered, can prevent the escape of the hostile aircraft regardless of the pilot's trickery or movements. A battery of these new-type search-lights placed at strategic positions could protect the entire area of New York City or any other place. Experts claim that it is the first major advancement in antiaircraft protection. This search-light could, of course, be used for any other type work as well as antiaircraft."

Photogravure by Halbran

"How Far That Little (800,000,000) Candle Throws His (12) Beams."

The big horns of the sound locators detect the raucous buzz of enemy airplane motors, then the beams of the new 800,000,000 candle-power search-light are thrown in that direction and the aircraft are trapt in its blinding glare.

SAYS the New York *Sun*, in an account of another demonstration, within the city itself:

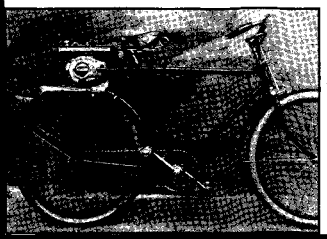
"Hundreds of thousands of New Yorkers saw a fan-shaped series of search-light beams cast into the sky from Bryant Park last night and disclose a squadron of Army planes making a mock attack on the city.

"The occasion was the first public demonstration of an anti-aircraft device recently invented by Col. A. M. Jackson, commanding officer of the Sixty-second Coast Artillery at Fort Totten.

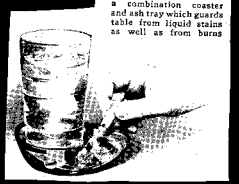
"It consists of a series of twelve reflectors which break up the single high-intensity beam of an ordinary 800,000,000-candle-power antiaircraft search-light into twelve separate beams, thus greatly increasing the area lighted up.

"Four of the huge search-lights were used last night. Their beams were cast across Bryant Park into the reflectors, which sent forty-eight shafts of brilliant light two miles into the sky. By rotating the reflectors various patterns were obtained as the planes from Mitchel Field came across the city and were revealed by the lights."

BICYCLE MOTOR FITS BEHIND SADDLE



DESIGNED to be installed behind the saddle, a new motor attachment for bicycles has been introduced in Germany. Because of its unusual position, the rider is protected from spattering oil and the noise of the exhaust is minimized. Power is transmitted to the bicycle's rear wheel through a chain drive and a gear fixed upon the hub. Except for a control lever it is entirely self-contained.



PROTECTS YOUR TABLE. Below is shown a combination coaster and ash tray which guards table from liquid stains as well as from burns

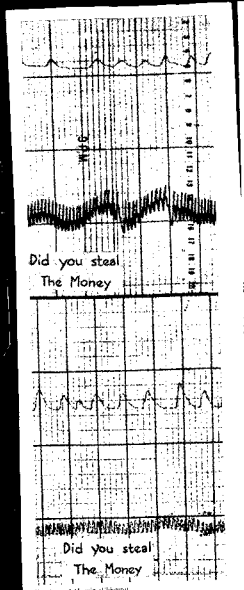
This photo at your left is an illustration of modern speed and science. . . . the Twentieth Century train speeding along, while a through plane passes slowly overhead. The scene is along the Hudson.

Roving Galloway

SUIT GUARDS BOMB OPENER

DRESSED in his official costume, the German police officer charged with the responsibility of opening bombs found in the mail looks like an ancient warrior clad in armor. The mask and padding are designed to protect him if an explosion should occur, despite his delicate handling of an infernal machine. In the illustration above, a suspicious package is being opened.

THIMBLE HOLDS NEEDLE. Those who sew will appreciate this combination thimble and needle holder. It is especially useful when work is being done on heavy material through which it is hard to pass the needle without letting it slip



Courtesy of Motion Picture Herald

Lie and Truth

One subject made both records. The upper is the "lie" record, the lower one is when he told the truth.

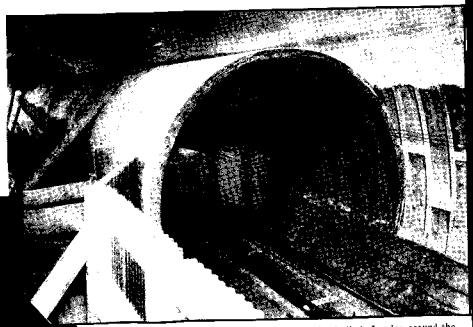
ent, varying between 10 and 20 per cent, on nearly
ation-to-station calls where the day rate is more
35c. At 8:30 the rates drop approximately 40 per
under daytime cost. These unusual values last until
in the morning.

or social and personal long distance calls, these
ng and night rates are always popular.

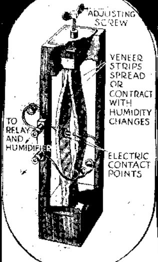
nd now business men are finding evening and
telephone calls a most economical way of trans-
out-of-town business after hours. Branch man-
for instance, hold helpful, inexpensive discussions
executives at their homes. Salesmen report to their
s; or make appointments with customers for the
day. Officials in different cities confer as easily as
h in the same city block.

oday, business men are turning to Long Distance
conomy. It gets results—at a saving of time and
y. Long Distance rates have been reduced four
in the past few years. Consult your local telephone
tory to see how low they really are.
sk the operator for the rate to any city.

as New Subway Is Built Around Old One



This unusual photo shows the new subway that is being built in London around the old tube, each of which is seen in picture, without interfering with the train service

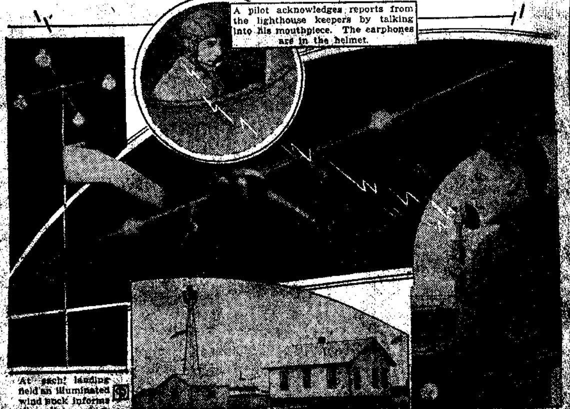


ELECTRIC SWITCH RUNS HUMIDIFIER

INVENTED to keep moisture constant in lumber-drying kilns, an automatic hydrostat developed at the U. S. Forest Products Laboratory will operate any electric humidifier. The device is a form of electric switch. Two bowed wooden strips shrink in dry air, starting the humidifier, and spread in moist air, shutting it off.

MILK BOTTLE CAPS. With a spear-pointed rod, fastened to a wooden handle, milk bottle caps can be lifted out

Four Hundred Lighthouses of the Air Guide Nation's Many Planes to Safety



A pilot acknowledges reports from the lighthouse keepers by talking into his mouthpiece. The earphones are in the helmet.

At each landing field an illuminated wind sock informs [illegible] which way the wind is blowing.

[illegible] keeper's house and airway beacon at [illegible], Wyo., an intermediate landing field.

A lighthouse [illegible] an incoming pilot a report of local weather conditions.

CHICAGO.—Uncle Sam's lighthouse keepers of the air guide the nation's transport and air mail planes through fog and storms to safe landings through the several means known to science—lights, radio beacons and human voices flying through the air via the radio.

Beacon lights from 10 to 15 miles apart and intermediate landing fields spaced at 20 to 30-mile intervals offer havens of safety to pilots and passengers flying through the night and, when necessary, through storms. Four hundred of these "lighthouses of the air" have been [illegible] at as many emergency fields [illegible] [illegible] airways.

The lighthouse keepers are part of a vast interconnected organization embracing the weather bureau's observers, department of commerce representatives and radio men employed by private companies, all working together toward the one end of safety in the air.

How does the system function? As the pilot takes off on a 200-mile flight to his next stop, the operator below sends a code message ahead saying:

"Airplane, bearing department of commerce license No. NC4, Pilot Jones at the controls, departed from Cheyenne at 1:20 a. m. for Reno."

Automatically every lighthouse keeper along the route receives this message. Too, they hear the pilot as he reports his position every few minutes. As he speeds along, Pilot Jones sees, at 10-mile intervals ahead the flash of the beacon lights. Every third light marks an emergency field, with a lighthouse keeper in attendance.

On murky nights, when he cannot see far ahead, the pilot throws a switch, which opens the circuit from the radio beacon stations to his ears. If this is not sufficient, he can spiral downward when he sees a green instead of a red light, for this marks the emergency field. There he will find the keeper of the light, who can give him assistance until he takes off again into the darkness.

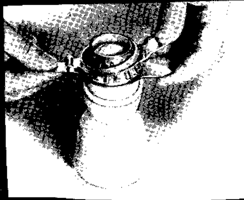
As he approaches the station where he will land, suddenly the radio beacon signals stop and a voice speaks into his ear:

"Reno calling . . . three-twenty o'clock . . . ceiling 1,000 [illegible] . . . mild rain . . . visibility [illegible] . . . seven-mile south wind . . . [illegible]eter falling . . . [illegible]"

The lighthouse keeper, instead of braving a storm [illegible] tower watching the lights, [illegible] the window at his first [illegible]. He holds a "press [illegible]" in his hand. From time to time he looks out through the window to note any changes in the visibility and wind, to warn the pilot of these changes. He's [illegible] lighthouse keeper [illegible] all the information [illegible] and radio can bring. Then, as the plane['s] engine roars he floods [illegible] light, bringing the pilot down to a safe landing.

Each year Uncle [illegible] $5,000,000 in maintaining [illegible] ways. There are today some [illegible] miles of federally [illegible] with [illegible] intermediate [illegible] the [illegible].

"THE FLYING HA[illegible] [illegible] train between points, Berlin to [illegible] [illegible] International News



EGG OPENER. The device seen at left is fitted over the top of an egg and when a lever is pressed down, knives are forced through the shell. When the opener is lifted up, the shell comes with it and the egg is ready to eat. If desired, the opener can be used conveniently to separate the yolk from the white of an egg

What Gar Wood's motors can teach you about buying an automobile

WHEN you're buying a car, it's well worthwhile to give more than a passing thought to the motor. For the motor is the most important part of the car.

Motors must meet more exacting requirements perhaps on the water and in the air than on land. So we believe you will be interested in some of the recent achievements of Packard motors in these two fields.

Take the four Twin-Six engines which Packard created for Gar Wood, king of motorboat racing.

On September 20th, these motors sent the "Miss America X" hurtling over the St. Clair River 124.91 miles an hour to a new world's speedboat record.

A few days before, these same motors and this same boat enabled Gar Wood to defend the Harmsworth Trophy against the best pilot, the best boat and the best motors that England could produce.

Yet these feats form only a chapter in the four-year story of these motors —a story of rugged dependability that is probably without equal in motor history.

Four times these motors have set the world's speedboat record. And even now Gar Wood says that their full power has not been used.

Their 48 cylinders generate 6400 horsepower—three times as much power as the locomotives that haul the "Twentieth Century Limited".

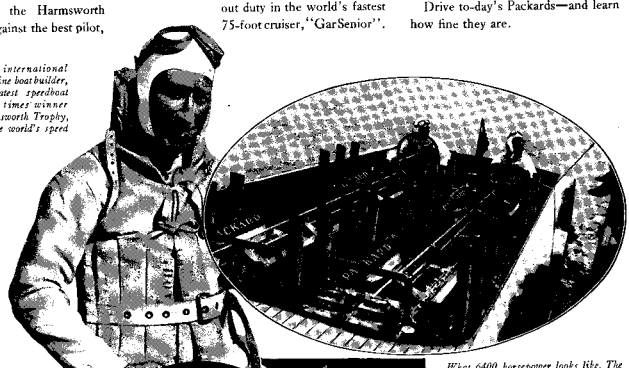
And it is not power that must be petted and treasured for special occasions. When these motors have not been speeding "Miss Americas" to victory, they have been doing day in, day out duty in the world's fastest 75-foot cruiser, "GarSenior".

Earlier this year, boats using Packard motors finished one, two, three, four, in the Gold Cup Race. Packard motors have five times powered "Miss Americas" to international victory.

In the air, Packard achievements are equally outstanding. Packard received the Collier Trophy for the greatest contribution to aeronautics in 1931—the Packard-Diesel aircraft engine. Packard engineers were primarily responsible for the Liberty motor.

The same engineering skill, the same precision workmanship, that have given Packard its victories on the water and in the air, created the motors that drive today's Packard cars. Is it any wonder that these cars are setting new records for performance, for low upkeep, for dependability?

Drive to-day's Packards—and learn how fine they are.



Gar Wood, international sportsman, fine boat builder, world's greatest speedboat pilot, eight times winner of the Harmsworth Trophy, holder of the world's speed boat record.

What 6400 horsepower looks like. The four Packard Twin-Six motors that drove ... 124.91 miles an ...

SUBMARINE LIFEBOAT PASSES HARD TEST

When young Menotti Nanni, Italian-born American, came to POPULAR SCIENCE MONTHLY five years ago with a plan to save trapped crews from sunken submarines, he had only a working model of a valve to exhibit. It was to be a part, however, of a submarine lifeboat for which he had already evolved complete plans (P.S.M., Aug. '27, p. 15).

With the successful test of a two-ton model of his invention in New York harbor the other day, Nanni saw his dream near realization. Entering and sealing the torpedo-like chamber of metal, the young inventor was hurled into the sea. The chamber sank from view. After nearly half an hour it bobbed up again and Nanni emerged none the worse for his experience. The test proved, he said, that men aboard a disabled submarine could climb into such chambers, seal the entrance hatch, and float to the surface.

Left, submarine lifeboat bobs up after being immersed half an hour. Above, boat's inventor emerging after the dangerous test

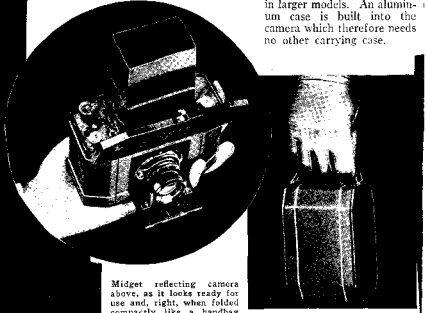
This measuring club, with a movable head that registers angles on a graduated scale, is used by a golfer in selecting clubs that are best suited to his particular stance

GAGE HELPS GOLFER FIT CLUBS TO HIS STANCE

A "measuring club," invented by a Manchester, England, golfer, helps players in selecting golf clubs suited to their stance. While all players require clubs of such shape that the sole lies flat on the ground, variations among individuals in length of arms and legs make it impossible for all to use an identical design. A prospective purchaser may therefore be fitted with the aid of the measuring club. When its movable head is adjusted to suit the player, an indicator on a scale shows the angle of the head to the ground that will be most satisfactory for him.

MIDGET REFLECTING CAMERA

So COMPACT that it may be carried like a handbag when folded, a new reflecting camera dispenses with the bulk usually characteristic of this type, while preserving the ability to view the picture full size and right side up until the moment that the shutter is snapped. The midget model takes a picture two-and-a-quarter by two-and-a-half inches in size. It is equipped with a fast F/3.5 lens, and a focal plane shutter like those ordinarily used in larger models. An aluminum case is built into the camera which therefore needs no other carrying case.



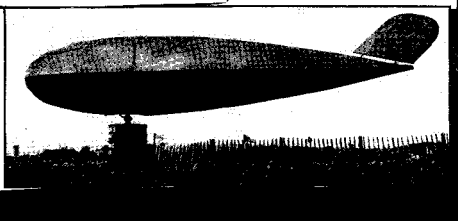
Midget reflecting camera above, as it looks ready for use and, right, when folded compactly like a handbag

NEW AQUAPLANE IN TWO PARTS

You can take your own aquaplane with you when you set out for a southern vacation this winter. A portable aquaplane, capable of supporting a man weighing 200 pounds, is now available. It consists of two pieces clamped together with turnbuckle bolts. The two hollow parts come strapped together with a carrying handle and turnbuckles and tightening wrench.

NEW WIND INDICATOR SHAPED LIKE AIRSHIP

High flying planes easily get the wind direction, when they want to land, from a gigantic indicator shaped like an airship and recently put into use at the Heston airdrome, England. The indicator is balanced on a pivot joint and its great, flat tail keeps its nose constantly to the wind. Painted a light shade on top, it is plainly visible to pilots and removes all doubt as to the wind direction and the manner in which a landing must be made in order to avoid a "crack-up."

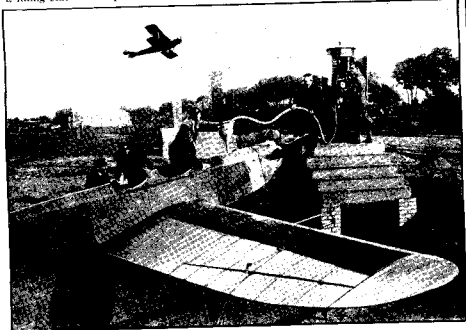


Three-Wheeled Auto Looks Like An Airplane

WITH wings for fenders and a streamlined metal body that resembles an airplane fuselage, a three-wheeled, front-drive automobile recently underwent tests at Indianapolis, Ind. The auto-plane, said to be capable of seventy-mile-an-hour speeds along a highway, is the invention of Grover E. Olds, an aviator. Steered by the "caster" wheel at the rear, the fifteen-foot-long machine can turn in a radius of fourteen feet. A four-cylinder, seven-horsepower motor within the body turns the front wheels. The two passengers sit in cockpits.

FILLING STATION OPENED FOR PLANES

PILOTS of light airplanes may now taxi up to a row of gasoline pumps, choose their favorite brand, and tell the attendant to "fill 'er up." The picture below shows a filling station for sport aircraft recently opened near a Berlin, Germany, air field. A featherweight craft of the powered glider type is fueling up. A good-sized funnel insures that the gas will go where it is wanted without spilling.



Light sport aircraft taking on gas at filling station for planes near Berlin

ELECTRIC CUTTING TORCH CAN VAPORIZE DIAMONDS

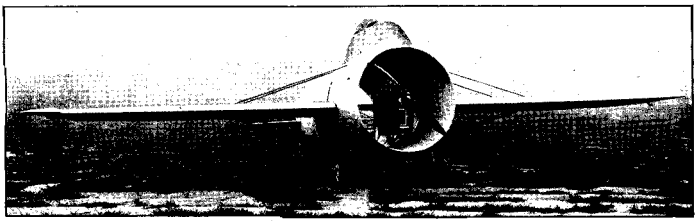
HOT enough to vaporize diamonds or to melt tungsten is the arc of a new electric cutting and welding torch, designed by a Los Angeles, Calif., engineer. Twin electrodes in a special mounting enable it to form its own arc, independently of the material to which it is applied, as shown in the photograph above. The temperature attained is about 6,500 degrees F.

MATCH CAN BE LIGHTED 100 TIMES

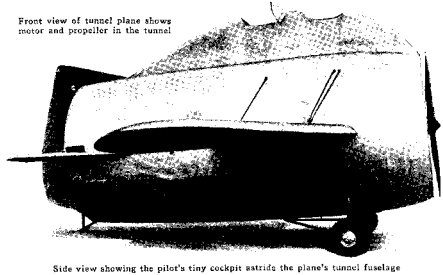
IF YOU borrow a match from the gentleman pictured at the right, he is likely to want it back! He is one of the users of a new repeating match recently produced in England. The match may be struck and relighted more than a hundred times. A small box, coated with a special composition used as the striking surface, serves as a holder for the repeating match when it is not in use. The device is much thicker than an ordinary parlor match and gives a correspondingly larger flame.

BURNED OUT BULB GLOWS

WHEN a string of miniature low-voltage lamps of a new type for Christmas tree and ornamental use goes out, a telltale glow appears in the one that caused the trouble. A burnout impresses full voltage across the lamp terminals, causing a small quantity of neon gas in the bulb to glow. This is visible through a window of clear glass near the base of the bulb.



Front view of tunnel plane shows motor and propeller in the tunnel



Side view showing the pilot's tiny cockpit astride the plane's tunnel fuselage

NEW ITALIAN PLANE HAS TUNNEL-LIKE FUSELAGE

Fit a hollow, wooden cylinder with wings and a propeller and you will have something resembling a flying tunnel that has just been built and successfully flown by an engineer of the Caproni airplane works in Italy. The pilot sits in a tiny cockpit astride this strange machine, while motor and propeller are mounted within the tunnel-shaped fuselage. According to the inventor, the plane's radical design utilizes the propeller's thrust to maximum advantage. Since the slipstream of the propeller does not impinge upon wings or fuselage, there is little retarding drag; but the tail control surfaces are exceptionally responsive. With the success of his first two-seater, 120-horsepower sport model, the inventor sees future application of the design to much larger aircraft with far greater carrying capacity.

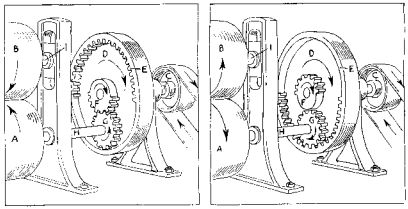
Air Brakes for Planes Greatly Reduce the Landing Speed

Air brakes for planes have appeared on some of the newest machines, following the success of the innovation in tests. Hitherto pilots have resorted to the risky practice of side-slipping to avoid overshooting a landing space of limited area. The new air brakes, consisting of expanding fins designed to create an air drag, slow down a plane and enable it to settle safely to earth at far less than its usual landing speed. One type, designed by a California inventor, is mounted on the wing struts. Its two halves when closed form a streamlined profile like a wing, and unfold to present a broad impeding surface. Another style, hinged to the trailing edge of the wings, has been installed on the big metal monoplane that will carry Lincoln Ellsworth, noted Arctic explorer, and Bernt Balchen on a projected 3,500-mile flight across the Antarctic over unmapped territory. It will insure safe landing on runways in the polar ice.

TWO TYPES OF PLANE BRAKES

Above, air brake for a plane, designed by a California inventor, is mounted on wing struts and unfolds to check plane's speed. Left, Bernt Balchen points to air brake on his Antarctic plane

MANGLE ROLLS CHANGE DIRECTION

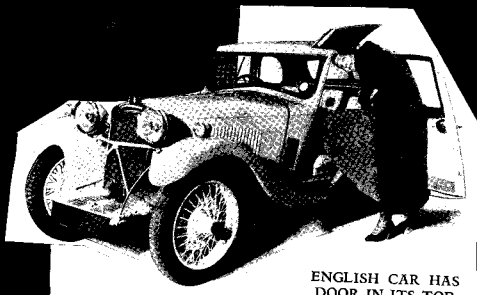


Diagrams showing how mangle gears must be made to mesh and disengage so the rolls will turn slowly inward and reverse to turn outward with a much faster motion

HERE is the solution of the "Can You Invent It?" problem published in November. In that problem you were asked for the best way to make mangle rolls turn slowly in and then, reversing their motion, turn rapidly out. Necessary gear modifications, with the action produced, are shown in the diagrams above. It is evident that the power transmitted to disk D causes the rolls to turn slowly inward when G is in mesh with F. When the teeth of G reach the toothless part of F, and start to mesh with the internal gear ring E, the direction of the rolls is reversed and the larger number of teeth in E will speed up the motion of the rollers.

STEEL BAND MAKES ODD CURVES EASY TO DRAW

ODD-SHAPED curves, beyond the draftsman's range with ordinary drawing instruments, are easily reproduced with the aid of a novel tool. By varying the position of a sliding anchor and locking it with a setscrew, a band of steel is automatically formed into one of a practically infinite number of curved shapes. Rubber backing forms a rest for the fingers, and also grips the paper. Sizes with a working edge up to thirty-eight inches long are available.



ENGLISH CAR HAS DOOR IN ITS TOP

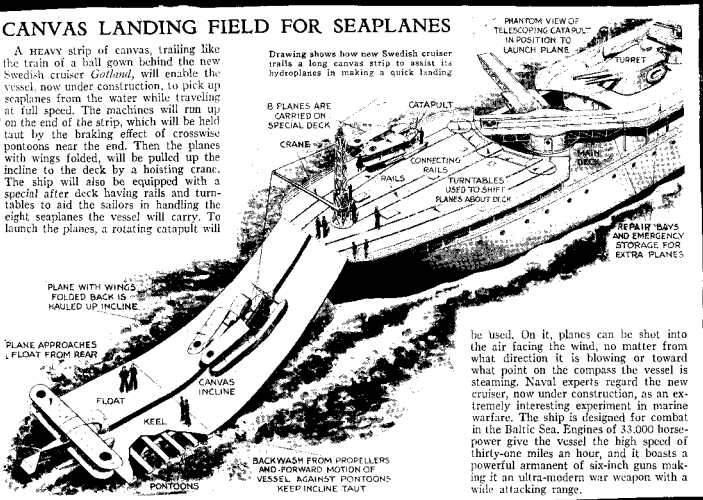
DOORS in roof and side admit a motorist to a new low-slung English car, recently exhibited in London. As the side door opens, a section of the top above the door automatically tilts upward, making entrance or exit easier. When the odd machine was placed on exhibition at the Olympia, not long ago, it attracted considerable attention, crowds gathering around the stand to watch the roof-door and the side-door work in unison.

BANK'S BLACK BLOTTERS PREVENT FORGERIES

BLACK blotters now foil would-be forgers in a Seattle, Wash., bank. Hitherto a crook could follow a depositor into a bank and study his reversed signature upon a white blotter he had used, but on the black blotter the signature is invisible.

CANVAS LANDING FIELD FOR SEAPLANES

A HEAVY strip of canvas, trailing like the train of a ball gown behind the new Swedish cruiser *Gotland*, will enable the vessel, now under construction, to pick up seaplanes from the water while traveling at full speed. The machines will run up on the end of the strip, which will be held taut by the braking effect of crosswise pontoons near the end. Then the planes with wings folded, will be pulled up the incline to the deck by a hoisting crane. The ship will also be equipped with a special after deck having rails and turntables to aid the sailors in handling the eight seaplanes the vessel will carry. To launch the planes, a rotating catapult will be used. On it, planes can be shot into the air facing the wind, no matter from what direction it is blowing or toward what point on the compass the vessel is steaming. Naval experts regard the new cruiser, now under construction, as an extremely interesting experiment in marine warfare. The ship is designed for combat in the Baltic Sea. Engines of 33,000 horsepower give the vessel the high speed of thirty-one miles an hour, and it boasts a powerful armament of six-inch guns making it an ultra-modern war weapon with a wide attacking range.



HOT AIR KILLS DEATH WATCH BEETLES

SUPERHEATED air is England's latest weapon against the ravages of the "death watch beetle." The ticking sound made by this curious insect is thought by superstitious persons to be an omen of death. Actually its unwelcome activities take a more practical form. The grubs attack the wooden beams of ancient structures and reduce them to crumbling shells. Such historic buildings as Westminster Hall and Checquers, the official residence of the Prime Minister, have been riddled by the pest. When it recently attacked a famous old barn near Beaconsfield, which is supposed to have supplied the timbers for the Pilgrim vessel *Mayflower*, strenuous eradicating methods were called into play. Huge pipes have been rigged up leading into the barn, and extremely hot air is being forced from them to kill the beetles.

Barn near Beaconsfield, England, that supplied the timbers for the famous ship, Mayflower, is being saved from ravages of death watch beetles with hot air pumped into it through big pipes

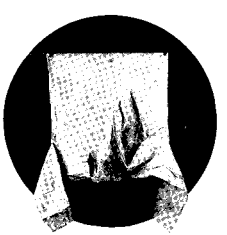
ELECTRIC PLUG CONTAINS FUSE

A SHORT-CIRCUIT in a household iron or toaster will not plunge the room into darkness when a new connector plug is used. The plug contains a pair of miniature fuses of such a rating that they will blow, and thus disconnect the appliance from the household circuit, before the fuses in the main wiring system are affected and the current supply cut off.

X-Ray Photo of Skull May Be Used to Identify Crooks

Dr. Thomas A. Poole, with the apparatus he uses to make photos of the skull. Upper right, typical X-ray picture of man's sinuses

X-RAY photos of the sinuses of the skull of a habitual criminal may identify him, one of these days, instead of his fingerprints, Dr. Thomas A. Poole, of Washington, D. C., who proposes this method of identification, declares that he has examined these skull cavities in thousands of persons without ever finding a pair alike. Even twins show a different confirmation of the bone arches. A criminal might injure his finger tips accidently or purposely, and destroy the pattern of lines, but the telltale pattern within his skull would serve to identify him as long as he lives and even after death. Dr. Poole suggests that police stations keep a library of sinus X-rays, taken like fingerprints immediately upon the arrest of a first offender. Taking such photos would require little time, and a vast number of them could be stored in a small space for ready reference.

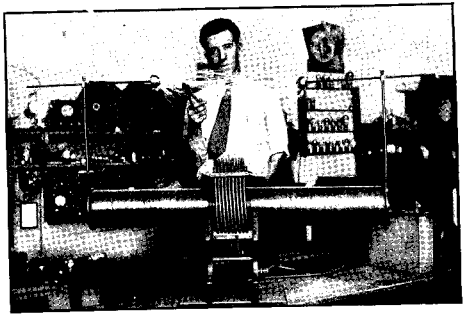


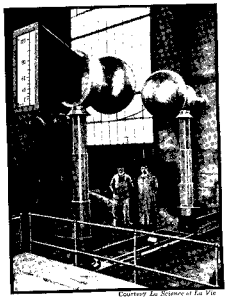
CLOTHES, DRYING IN AIR, DAMAGED BY SMOKE

NO LONGER a mystery are the rents and holes that appear without warning in cotton garments—even relatively new ones—hung out to dry during the winter. This phenomenon, known as "winter damage," is now explained by the U. S. Bureau of Standards after an investigation of several months. It has been traced to the smoke which contains a chemical, sulphur dioxide, that forms sulphuric acid when it comes in contact with moisture in the air and on clothes. The remedy for winter damage is to add a small quantity of calcium bicarbonate to the final rinse water.

USE BALLS TO MEASURE MILLION-VOLT CURRENT

WHAT it takes to measure a million volts of electricity is seen in this photograph at right, taken in a high-tension laboratory at Lyon, France. A pointer within the box on the left-hand pedestal travels behind the translucent scale, which is graduated in thousands of volts. Overflow currents leap in a spark between the two balls, which are mounted on insulated pedestals eleven feet high.



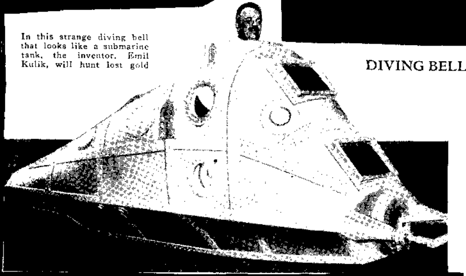


Courtesy La Science et La Vie

A million volts are measured by these balls

STUDIES ELECTRICITY WITH BIG TESLA COIL

A GIANT Tesla coil that he built himself helps Harvey Wilson, of Springfield, Mo., to study electricity. Thirty-inch sparks leap from its electrodes. Despite their tremendous voltage, they are harmless to human beings because of the small amount of actual current flowing. Electricity to run the forty-inch coil comes from a transformer which in turn is attached to the regular 110-volt lighting circuit. To make the coil of the transformer, Wilson wound thirty-two miles of wire by hand. In the circuit between transformer and Tesla coil is a homemade condenser that Wilson constructed from old photographic plates and tinfoil, immersed in castor oil. The rotary spark gap that serves to interrupt the circuit is also homemade, and a quarter-horsepower electric motor drives it. In the picture above Wilson is seen with his apparatus in action and a spark of electricity leaping the gap between the electrodes.

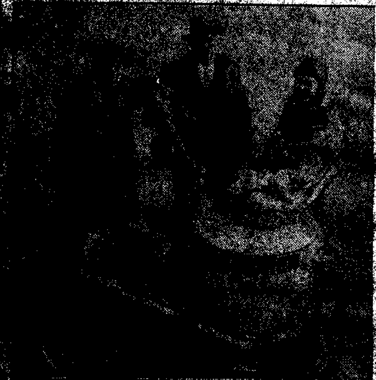


In this strange diving bell that looks like a submarine tank, the inventor, Emil Kulik, will hunt lost gold

DIVING BELL "SUB" TO HUNT TREASURE

A HYBRID between a submarine and a diving bell is the strange apparatus that Emil Kulik, of Brooklyn, N. Y., has built to hunt for sunken treasure. However, it has some features to be found in neither. Within the shell of steel and glass are oxygen tanks to supply air to the single occupant while he is beneath the waves. Movable arms, operated by compressed air tanks inside the shell, are designed to reach from the front and seize objects to be brought to the surface. The device is now on exhibition prior to its first practical test, which Kulik expects to make within a few weeks. It took the inventor two years to build the apparatus.

[illegible] Submarine Given Trial



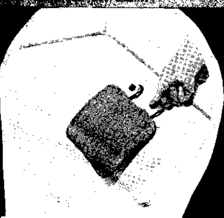
[illegible] invented by Simon Lake and de- [illegible] work and other peaceful pursuits was tested [illegible] New [illegible] in the presence of scientists and [illegible] William [illegible], naturalist, Lake and Frank Cril- [illegible] diver (left to right), are shown aboard the craft [illegible] called the [illegible], is only [illegible]

The Brothers Piccard Meet Again

—Associated [illegible]

Auguste Piccard, Left, and His Brother, Jean

[illegible] news reporters and cameramen had a [illegible] went to interview [illegible] Auguste Piccard, [illegible] stratosphere, when he arrived in New York, January [illegible] met by his twin brother, Jean Piccard, of [illegible] are [illegible] side by side [illegible] other [illegible] into the stratosphere [illegible]



PILLOW FOR BATHTUB. Made of soft rubber, the bathtub pillow shown above is secured to tub by means of vacuum cups and makes a convenient rest for the head

WEAPON FOR MOTORISTS BRANDS THUG WITH DYE

A NEW weapon for the protection of motorists and shopkeepers not only subdues the most vicious thug, but also brands him for identification in case he should escape. When he is struck with the club-shaped weapon, an air-tight membrane breaks, releasing a chemical similar to tear gas and also a spray of aniline dye that indelibly stains his face, hands, and clothing, thus identifying him.

Courtesy of *The Engineering and Mining Journal* (New York)

Meteor Crater, in Arizona: After Twenty Years' Search, the Meteor Is Found

Arizona Crater Meteor Found

FOR MORE THAN TWENTY YEARS, as already reported in these columns, search has been directed toward location of the buried meteorite at Meteor Crater, near Winslow, Arizona.

Reliable estimates place the cost of this search at more than $500,000

Recently, Meteor Crater Mining & Exploration Company, the present operators, drilled for the meteor at locations recommended as a result of studies conducted during the summer of 1930. These drilling operations have proved the correctness of the results.

The geophysical examination, conducted by International Geophysics, of Los Angeles, California, consisted of geological, magnetic, and electrical surveys, together with studies conducted at the company's research laboratory in Culver City. Says J. J. Jakosky, one of the associated geophysicists, writing in *The Engineering and Mining Journal* (New York):

"Meteor Crater, which lies in the high plateau of northern Arizona, about twenty miles southwest of Winslow, is a bowl-shaped, almost circular depression about 4,500 feet in diameter, and 600 feet deep. The depression is surrounded by the crater rim that stands about 160 feet above the general level of the plateau. Meteor Crater has long been a Mekka for tourists, and is visited annually by thousands of people.

"The origin of the crater has for many years been the subject of discussion. Two theories have been regarded as the most probable explanation. The first, now proved correct, held that the crater was formed by a meteorite, or swarm of meteoric material, striking the earth at high velocity, and burying itself. The other theory held that the crater was a result of a 'steam' explosion, attributed to the accumulation of hot solutions or gases."

Briefly, the reports gave the survey results as follows:

"1. Geological examination showed that the crater was meteoric rather than due to a steam explosion. It disclosed evidence that the meteorite still existed at depth in the southwestern part of the crater. Geologic evidence placed the age of the crater to be measurable in terms of thousands of years, probably about 50,000.

"2. The electrical survey located the meteorite in the southwestern part of the crater, and indicated it to consist of a shallow fragmentized zone, surrounding a more concentrated main mass occurring at an effective depth of 700 feet below the present crater floor.

"3. The magnetic survey revealed the presence of a shallow shattered area containing meteoric material above the deeper and more concentrated zone, indicated by the electrical survey."

The following information on the result of the drill holes was obtained from G. M. Colvocoresses, general manager of Meteor Crater Exploration & Mining:

"The first hole, placed in the center of the favorable area indicated by the geophysical survey, ran into the zone containing meteoric fragments at a depth of 414 feet. At 675 feet further progress was halted as the drill became lodged in the upper part of the more concentrated meteoric zone. The existence of the meteoric material was further proved by analyses which showed the presence of nickel.

"The second drill hole, as far as it has been carried out, revealed similar conditions to the first.

"These results are evidence of the reliability of modern methods of geophysical prospecting. In the field of ordinary mining exploration, the problems rarely present such difficulties. Such geophysical studies will secure subsurface geologic data that can be obtained in no other way, except at prohibitive cost."

The Highest Thing That Flies

AS he shoots upward into the rarefied air nearly two miles above the surface of the earth, the pilot of the new "stratosphere" plane finds that he is hermetically sealed in his cabin with compressors supplying him with air.

If tests now being carried out prove successful, this especially designed and built Farman plane will eventually attain the sensational altitude of 50,000 feet, or nearly ten miles. Constructed to attain a theoretical speed of 500 miles per hour, we read in a special dispatch to the New York *Herald Tribune*, the plane might cross the Atlantic in no more than six hours.

Describing the initial flight of this newest speed-conqueror at the Toussus-le-Noble airdrome near Versailles, France, the correspondent of *The Herald Tribune* cables these details:

"Built entirely of duralumin, it is a high-winged monoplane with total surface of seventy square meters (753 square feet); the weight a square meter (10.764 square feet) is thirty-six kilograms (seventy-nine pounds), compared with the average of 100 kilograms (220 pounds) in ordinary machines.

"The wings were much broader than usual.

"The propeller has four blades which can be adjusted at different angles to give greater grip on rarefied air.

"The 400-horse-power engine is set in an air-tight cabin, with three super-chargers to increase air-pressure.

"A special compressor brings air into the pilot's cabin, which is hermetically closed at 9,000 feet. The cabin design is along the lines adopted for submarines.

"Special devices maintain regular pressure and temperature for oil, air and water, while the gasoline fuel is made to pass directly from solid to gaseous state."

Photographing the Inside of the Eye

AT LAST THE INTERIOR OF THE EYE can be photographed as easily as we can photograph the inside of the stomach. This assertion is made in *L'Illustration* (Paris) by Jean Labadié.

Many experiments hitherto have had only partial successes. Now we are assured that the technical resources of modern

Courtesy of *L'Illustration* (Paris)

How It's Done: Photographing the Eye

physical science, through the expertness of Dr. Jacques Mawas, have yielded the results so long sought. We read:

"Among the innumerable difficulties presented by the photography of the depth of the eye, the most important are due to surface reflections, marking differences of level.

"To photograph the retina, it must first be flooded with light without at the same time 'burning' it.

"Moreover, the light-rays must return through an object lens, in order to form the desired image. Obviously, the returning rays could not be distinguished unless reflections of purely incidental light were eliminated.

"For success in getting an image, five simultaneous adjustments must be made. There must be due regulation of the illuminating electric arc and of the ensuing condensation. The light concentrated upon the eye must be of the right intensity. The region of the retina to be photographed must be well defined. And, finally, the photographic plate must be rightly placed.

"Naturally, the subject, placed as shown in the illustration, must not move any more than if being photographed in ordinary circumstances.

"Furthermore, the eye—the pupil suitably dilated with a harmless drug—must avoid any movements of its own. The slightest rolling of the eyeball would spoil the effect."

AND now, how are the photographs to be read?

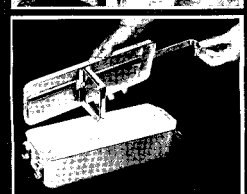
"The oculist finds here all that he looks for ordinarily without always finding it—capillary hemorrhages, microscopic stains and lesions with their differences of level. Not only does the enlargement of the pictures reveal things that he might otherwise not have noticed, but he is enabled to estimate their importance.

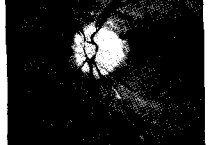
"The general medical practitioner finds in retinal 'accidents' indications of the state of the physical organism as a whole—indications of extreme interest.

"Consider, for example, on one of these photographs the rupture of a tiny vein. Its image, greatly enlarged, reveals to the practitioner a heart trouble which had escaped a previous examination.

"No experiment could better demonstrate the connection between medical progress and the application practically of an apparatus perfected through modern physics."

REFRIGERATOR FREEZES ICE CREAM. The freezer, two views of which are shown below, is filled with mixture and placed in refrigerator. As it begins to freeze, handle is pushed in and out to mix contents. Pictures show freezer in use and also with top removed





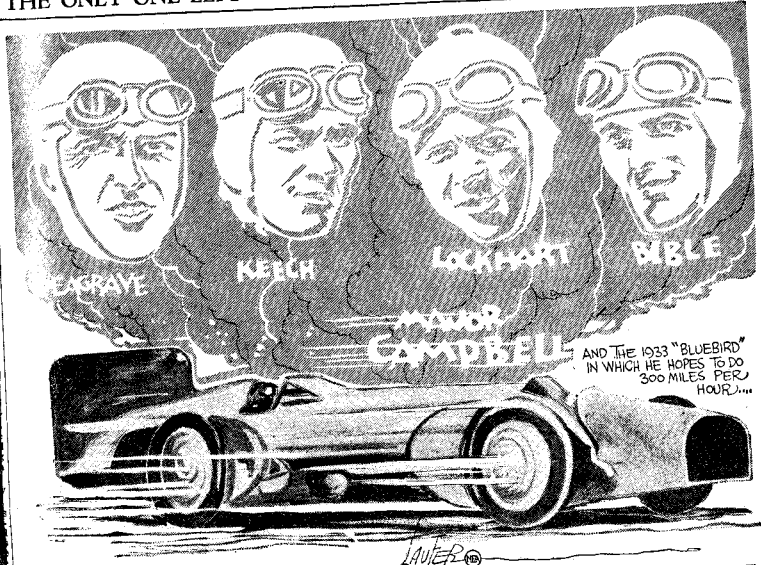
Courtesy of *L'Illustration* (Paris)

What the Eye Tells the Camera

Photograph of a normal retina, apart from a slight hemorrhage of a very fine vein visible below and to the right of the large, clear spot. The latter is the opening of the optic nerve.

Photograph of a retina suffering from a more serious hemorrhage. Here the blood-vessels are ruptured over a considerable surface. The blood has spread largely into the retinal tissue.

THE ONLY ONE LEFT - - - - - - - - - - - - - By Laufer



✧ Once more Sir Malcolm Campbell will send his roaring motor along the blazing path. Once more he will pursue the phantom, Speed, that has beckoned brave men to a dash that ended in disaster.

Four others have chased that furious fugitive at a rate of 200 miles an hour. And all four—Major Seagrave, Frank Lockhart, Ray Keech and Lee Bible—have found death the penalty of their wild journey. Sir Malcolm, who drove his Bluebird 254 miles an hour last year, is the only one left.

The "only one left" will try now for an unheard-of record. Beginning Feb. 10 on the sea-polished sands of Daytona Beach, Fla., he will flash in quest of the unbelievable.

The Bluebird—a strang name for such a fire-breathing monster—has been repowered for an effort 50 miles an hour better than Sir Malcolm's record of last year.

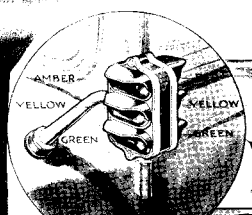
That means 300 miles an hour.

WINDOW CLEANING BRUSH IS WHIRLED BY MOTOR

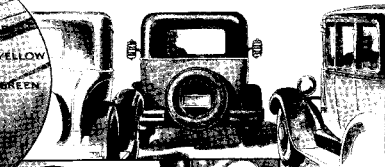
EVEN the task of the window washer is now made easier by labor-saving machinery. An electric window cleaner devised in England assures a thorough and a fast job. Its revolving brush of felt, mounted on a convenient pole, is spun at high speed by an electric motor. As shown in the photograph above, the device is sufficiently light to be handled with facility.

SHIELD FOR PARING KNIFE. This simple attachment fits any paring knife so potatoes are peeled quickly with no waste

Traffic Lights on Auto Signal Right or Left Turning



Traffic light attached to side of car to signal right and left turns and stop



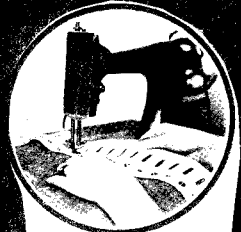
Left, photo of dashboard with switch that controls car's traffic lights. At right and above, drawings show how lights work and colors used

WILL miniature traffic lights for each car banish hand signals, and make driving safer in crowded city streets? Police officials of Oxford, England, recently saw such a system demonstrated by Sir William Morris, motor car maker. Installed in pairs one on each side of a car, and operated from a dashboard switch, the new lights use stop and go signals familiar to every motorist to warn of turns and other maneuvers. To signal a left turn, the lights first show yellow on both sides—a caution signal. Then they change automatically to red at left and green at right. The reverse of these signals is used in turning right or in pulling over to the right-hand curb to park. An all-green signal, straight on, indicates the driver will not turn at an important intersection. Signals are visible from front and rear, the front of the red light being shaded to amber because motor laws forbid a red light facing ahead. An automatic timer in the control switch makes each signal flash several times and then puts the light out without any further attention from the driver.

TREAT CANCER WITH BIGGEST X-RAY TUBE

TREATMENT of cancer patients has just begun at the California Institute of Technology, after months of preparation, with the biggest X-ray tube in the world. Artificial lightning of 1,000,000 volts operates the thirty-foot instrument. This is the highest voltage ever harnessed for medical use, and spectacular displays of sparks are to be seen in the adjoining room where the current is stepped up by two transformers. Radiation from the tube is declared more powerful than the rays that would be obtained from all the radium in the world. The unprecedented voltage gives the rays extremely deep penetration. Rats were subjected to the rays in lengthy tests before the tube was applied to human beings.

Windows in the vertical thirty-foot tube, left, emit X-rays to treat cancer patients. Above, million volt discharge from machine that runs the big tube

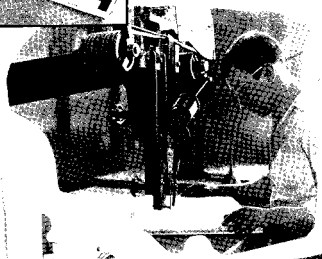


CHANGEABLE DRAPERIES. Headings for draperies, that attach with nickelplated snap fasteners and equal spaced slots, make it possible for the housewife to change the style of her draperies with little trouble

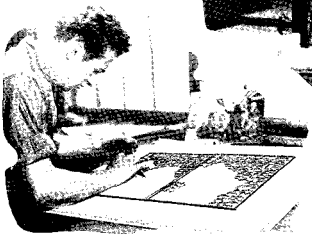
How JIG-SAW PUZZLES *Are Made by the Million*

PUTTING jig-saw puzzles together is the latest craze to sweep over America. It has replaced the cross-word puzzle, the Tom Thumb golf course, and in many places has ousted contract bridge. On this page are photos showing the steps in the manufacture of the millions of jig-saw puzzles sold each week.

1 On a block of wood, a draftsman draws the outline of the irregular pieces that later will make up the jig-saw puzzle



2 As the second step, right, a jig-saw is used to cut out the pieces in accordance with the pattern already drawn. The cut block leaves machine with pieces in place



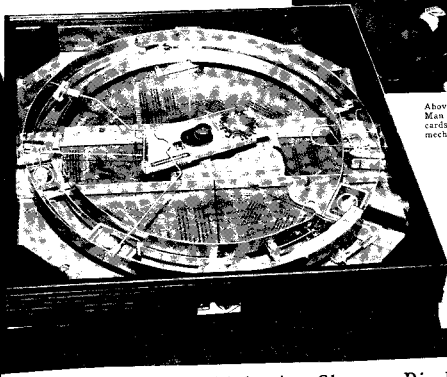
3 Next comes the job of setting the steel knives into the design of the puzzle. These are blades that will cut the puzzle into bits as it is when you finally sit down to it

4 With the cutting knives in place, the die goes to the press, a big thirty-ton machine, that stamps out the puzzles. The press is set so the knives do not pass entirely through the cardboard but leave the pieces still clinging tightly together

5 From the press, as the last step of all, the puzzles go to these girls who break the pieces apart and dump them into a hopper, whence they are collected and boxed for delivery to distributing agents

Automatic Bridge Table Shuffles and Deals Cards

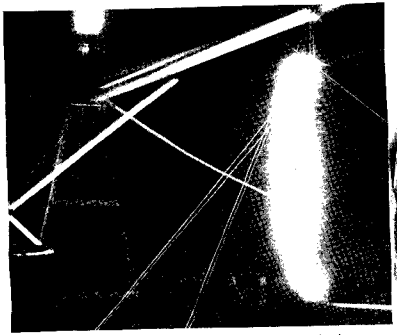
A BOON to impatient bridge players is a new electrified table that shuffles and deals the cards automatically. So smoothly and rapidly is this accomplished that a new hand is dealt by the time the used pack has been picked up, thus speeding up the game and making it more lively and interesting. Any household outlet furnishes current for the table. The heart of its remarkably ingenious mechanism is a tiny electric motor, that starts of its own accord when a pack is inserted



Above, players using electrified bridge table. Man at left is receiving a hand while girl inserts cards for next deal. At left, close-up of the mechanism that distributes cards to players

in a corner drawer and the drawer is closed. A magic arm picks up the cards, shuffles them, and delivers them to receiving compartments in front of each player. This is done by distributing them at random instead of in rotation, stopping when each player has thirteen. The mechanism is so contrived that nothing but the laws of chance can influence the distribution of cards, insuring a fair deal. According to the makers, more than 535 billion different hands of thirteen cards can be dealt by the machine, one hand being as likely as another to appear.

Man-Made Lightning Shatters Big Redwood Timber



Above, 3,000,000-volt lightning flash made in laboratory tearing its way through an eighteen-foot redwood timber in a spectacular demonstration of a new machine. At right, experts examine timber shattered by the lightning

MAN-MADE lightning of 3,000,000 volts shattered an eighteen-foot, four-by-four timber of redwood in a spectacular demonstration of a new high-voltage machine at Stanford University the other day. The apparatus operates on the principle of a Leyden jar, storing up electricity in a huge condenser and then liberating it all at once in a blinding discharge. It will be used to find the best type of insulators for the high-voltage transmission lines from Boulder Dam to Los Angeles, Calif.

Electric Key Fires Old Volcano

Man-Made Eruption in Lassen Crater Seen for Miles

WITH an explosion that threw columns of smoke five hundred feet into the air and detonations that reverberated thunderously among the surrounding peaks of the Cascades, Mount Lassen, California's dying volcano, suddenly sprang into life recently, with the strangest eruption ever witnessed. For probably the first time in history, the spectacle of a mighty volcanic eruption was reenacted by man.

With rumblings and heavy explosions the aged peak flung a plume of smoke high above its 10,000-foot summit and belched forth fire, smoke, and steam, in a spectacular display visible miles away. This man-made volcanic demonstration was patterned after Lassen's 1915 eruption which destroyed thousands of acres of timber and devastated the countryside for a distance of ten miles.

Behind the brilliant display that thrilled thousands of spectators by weeks of patient study and preparation by pyrotechnic experts. For days, pack trains, laden with rockets, mortars, and a vast quantity of other equipment, including 6,000 pounds of powder, toiled up the steep trail to the summit.

Crater of Mount Lassen ablaze as the result of the explosion by electricity of a quantity of fireworks designed to imitate a real volcanic eruption

Fred G. Hitt, engineer in charge, placing bombs used in the man-made eruption

The artificial eruption, for which all this material was used, was under the control of a single operator seated at an electrical keyboard far from the point of explosion.

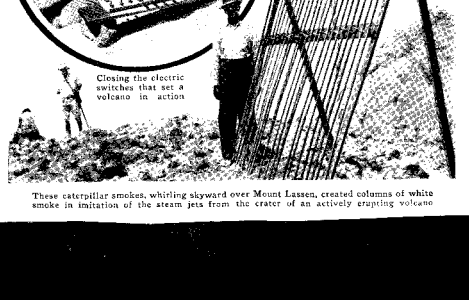
THE DISPLAY began at four P. M., following the formal dedication of the new Lassen Volcanic National Park by Dr. Ray Lyman Wilbur, Secretary of the Interior. Waiting at his electrical switchboard on the mountainside some distance below the crater, Fred G. Hitt, engineer in charge, watched for the signal rocket to be fired from Kings Meadows, five miles away, where the services were held.

When he heard a distant boom, and saw a puff of smoke float upward from the meadow, his hand moved over the controls. Upon the contact of a single switch, a mighty roar sounded from the old volcano's top.

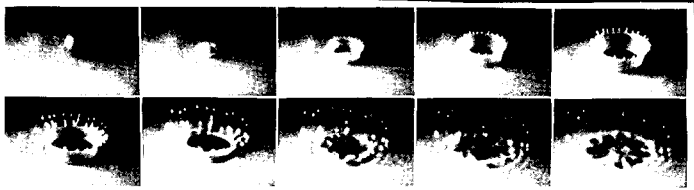
Following this activity, old Lassen seemed to quiet down for a period. But at eight-thirty o'clock in the evening, Engineer Hitt, working the electrical controls, again released tons of pyrotechnic material from the crater.

Geologists are of the opinion that Mount Lassen will never again flare forth in real eruption, although jets of steam still issue from among its heated rocks.

Closing the electric switches that set a volcano in action



These caterpillar smokes, whirling skyward over Mount Lassen, created columns of white smoke in imitation of the steam jets from the crater of an actively erupting volcano



With an exposure time of less than one hundred-thousandth of a second, these pictures of a falling drop of milk were made at the Massachusetts Institute of Technology. Note the crown shape, which becomes more marked as the drop strikes a hard surface. Pearl-like droplets tip the crown points

Dazzling Spark *takes* Fastest Photos

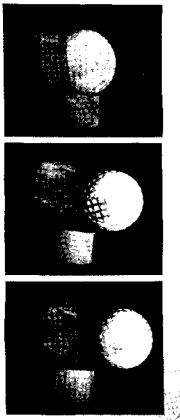
QUICK AS A WINK. From top to bottom, these photographs, taken at the rate of 500 a second, show the closing of an eyelid. This new circuit method of taking pictures proves wink takes one-fortieth of a second

PHOTOGRAPHS at the rate of 4,000 a second, with exposures ranging from 1/100,000 to 1/500,000 of a second, have been made at the Massachusetts Institute of Technology by means of an electrical circuit that produce light of great actinic intensity. The instantaneous flash is many times more brilliant than sunlight.

The misshapen figure of a golf ball in flight has been recorded by means of this latest development in high speed photography.

The new circuit, employing either mercury arc tubes or spark gaps, was developed by Professor Harold E. Edgerton and Kenneth J. Germeshausen of the electrical engineering department. By means of this circuit it is possible to make both still and motion pictures. For the latter, special cameras are necessary.

The light produced by the new circuit occurs in pulses or flashes, and the intensity of each flash is equal to the concentrated light of approximately 40,000 ordinary fifty-watt bulbs—brighter than the noonday sun. The scientific importance of the method lies in the fact that the frequency of the flashes or the moment of starting may be controlled.



FLAT GOLF BALL. Flash pictures, made as illustrated below with the impact of club on ball compressing wires and closing circuit, show how ball, flattened when hit, regains spherical shape

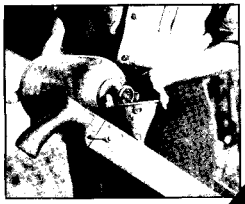
In making motion pictures, the pulse of light is synchronized with the speed of the film which moves past the lens aperture at velocities up to 200 miles an hour.

The light has already been used to make photographs in which familiar things are shown in astonishing new forms. The splash of a drop of milk on a hard surface is revealed in the shape of a miniature crown tipped with infinitesimal pearl-like drops. Photographs of the human eye show that a wink occurs in approximately one-fortieth of a second. Picture of golf club hitting ball shows a most surprising flattening of the ball at the point of contact.

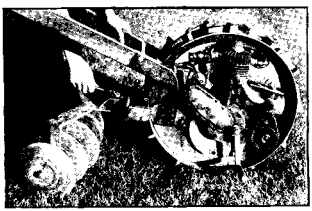
The chief feature of this circuit consists of mercury arc tubes which are made to produce intense flashes of a bluish-white light.

Homemade Tractor Has One Wheel

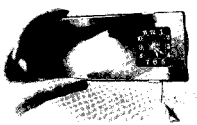
WITH a power plant that is suspended securely inside of a big ring-shaped wheel, a garden tractor has been built largely from odds and ends by R. D. Read of Akron, Ohio. It operates like the unicycle automobile developed in England. (P.S.M. May, '32, p. 63.) A single-cylinder motorcycle engine was used without modification except for the installation of an additional gear for cranking, and a planetary type clutch operated from the plow handle. The wheel is of sheet steel. T-shaped lugs stud its outside surface to give the tractor a firm grip. Around the center of its inside surface is a steel ring of square cross-section, having steel pins running through it to form a rack in which the teeth of a straddle gear engage. This gear is driven by a chain from the planetary clutch. Each handle of the plow-tractor is hollow, being made from channel-iron stock. One handle carries gasoline and the other oil. Controls are near each handle grip. To a coupling at the rear practically any farm tool can be attached. The tractor with a four horsepower motor, will run for eight hours, as fast as a man can walk, on a gallon of gasoline.



Handle on right of tractor holds gasoline and photo above shows it being filled. Left handle holds the oil



Above, tractor with engine inside its one wheel has plow attached and photo at left shows the tractor pulling a disk harrow. The machine, made of odds and ends, will run for more than eight hours on one gallon of gasoline

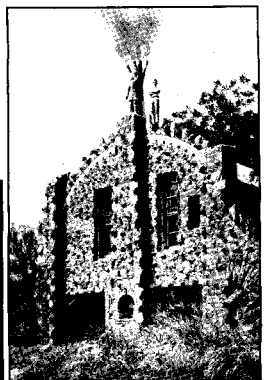


REAR VIEW MIRROR AND AUTO CLOCK COMBINED

CLOCK and rear view mirror are combined in a new accessory for motorists. A few pulls of a small cable beneath the timepiece wind it. Thus a driver can wind it without slackening speed or taking his eyes off the road.

TREE-LIKE CHIMNEY ON STONE HOUSE

STONE of many kinds is going into a house being built by Mrs. F. E. Routledge of San Antonio, Texas. Not yet completed, after three years of labor, the house already has become one of the city's attractions. One of its unusual features is a chimney in the shape of a tree with branches through which smoke escapes. A carved figure of a huge snake in combat with an eagle adorns one side of the rock house. The building is to be used as an apartment and studio.



House built of many kinds of stone at San Antonio, Texas, has tree-like chimney with several branches, through each one of which the smoke easily escapes

PAPER SHEETS FOLDED TO DRY RAZOR BLADE

SAFETY razor blades can be dried and cleaned without taking the razor apart by means of paper driers recently put on the market in France. The absorbent papers are cut and folded so they slip over the blades between the loosened guards and can be moved back and forth to dry the blade. The driers come in small booklets from which the sheets are easily torn.

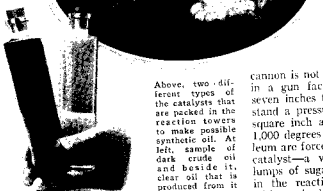
Folded paper sheets used to dry razor

Oil and Kerosene Made to Order

Startling New Process Tears Molecule Apart and Recombines It To Create Synthetic Fuels

First published photograph of the gun-like reaction towers that rise within concrete stalls. Within the seven-inch alloy steel walls of these forty-foot towers, hydrogen and oil, at 3,600 pounds pressure per square inch and at temperatures up to 1,000 degrees, are forced to combine and thus form products hitherto found only in nature

Here is an oxygen detector, one of the safety devices to keep the reaction towers from blowing up. This gage is constantly on the job and sounds alarm before danger point is reached



Above, two different types of the catalysts that are packed in the reaction towers to make possible synthetic oil. At left, sample of dark crude oil and beside it, clear oil that is produced from it

Massive cylinders of alloy steel rise forty feet within concrete stalls. They are the reaction chambers in which the chemical miracle takes place. Their resemblance to huge cannon is not accidental; they were made in a gun factory. Their massive walls, seven inches thick, are designed to withstand a pressure of 3,600 pounds to the square inch and temperatures of 750 to 1,000 degrees as the hydrogen and petroleum are forced together through a packed catalyst—a white substance, resembling lumps of sugar, that, mysteriously aiding in the reaction, is afterward recovered without the loss of any of it.

If only five percent of oxygen entered the reaction towers, they would be likely to blow up. Special oxygen detectors constantly stand guard over the daily stream of 5,000,000 cubic feet of gas—about the same amount that is consumed by the whole population of Cambridge, Mass.—that is pumped into the towers. Before the oxygen proportion ever becomes perilous, a siren sounds and the tower is shut down until cleared of its contents.

Successful laboratory experiments presage new wonders of hydrogenation. When wells have sucked the earth's crust nearly dry of petroleum, hydrogenation will turn coal into oil, and oil into gasoline, as small-scale tests have shown.

WITH the birth in this country of a new industry devoted to the manufacture of synthetic petroleum products, among them a "tailor-made" motor oil, a new chapter is written in the dramatic history of "hydrogenation."

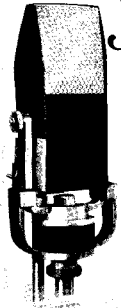
Born of a war-ridden country's desperate need, this amazing process of synthetic chemistry all but won the world war for Germany. It enabled her chemists to make explosives for her big guns with nitrogen captured from the air, after Allied blockades shut off her supply of Chilean nitrates. Mystery still clung to the process years after the war. Industrial chemists, seeking peacetime applications, guarded their secret experiments from prying eyes.

How far it has been developed at the Bayway, N. J. plant of a great oil company is revealed by a recent announcement. Its engineers now literally tear apart molecules of crude oil and re-form them at will into new and valuable compounds, of which four are already being manufactured on a commercial scale. They include a synthetic motor oil said to be especially adapted to the high compression and power of modern automobiles; a hydrogenated "safety fuel" for aircraft and motorboats; a superior, synthetic kerosene; and a series of hydrogenated solvents for the paint, varnish, and other industries. Soon to appear on the market is a hydrogenated aviation oil.

What is hydrogenation? To the chemist, it means a process in which hydrogen gas is forced into reluctant chemical combination with nitrogen, with coal, or with petroleum, to form brand-new substances. To the layman, as applied commercially at the Bayway plant, it takes on the fascination of titanic forces at work.

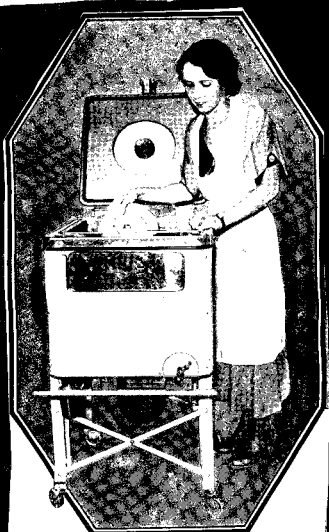
New Electric Ears

Buttonhole Microphone Catches Platform — Gigantic Reflector

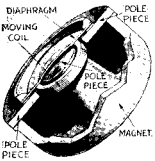


Left, new velocity microphone in which there is no diaphragm, thus doing away with a source of distortion. Right, speaker wearing buttonhole microphone, with trailing wire, so that his movements on the platform are unhampered by the mike

Field glasses with lapel microphone attached to lenses so announcer can talk and watch game

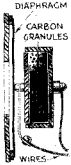


WASHES DISHES ALL BY ITSELF. When dishes are placed in this electric dishwasher, all you need to do is add water and soap powder and then you can go away and leave it to its own operations. It will wash the dishes in soapy water, rinse them off a couple of times in clear water, sterilize them and dry them, and finally shut itself off when the job is done. All of these things are done without the touch of human hands, which is a good thing as the machine uses water hotter than you could stand. As shown above, the machine is extremely compact. A surprising feature is its simplicity, there being only two movable parts in it



TYPES OF TWO MIKES

Above, simplified diagram showing construction of floating coil microphone. At right, diagram of carbon mike of the kind now generally used



GIANT MIKE REPORTS MEETING

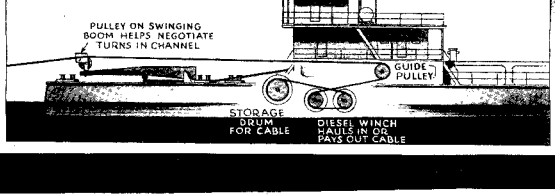
Parabolic reflector microphone put in place to catch the speeches and cheers at big convention

PARER EASY TO CLEAN. A removable blade on the new paring knife shown at left makes it easy to keep clean. The blade is springy and easily snaps in or out of place. A small metal ring on the handy device may be used for peeling an orange

TUGBOAT HAULS ITSELF THROUGH RIVER'S SWIFT RAPIDS

A TUGBOAT that hauls itself upstream on a cable is used on one of South America's strangest water routes—a mile-and-a-half stretch through treacherous rapids of the Magdelena River, in Colombia. Previously all cargoes had to be trans-shipped by rail past this point, which was the only unnavigable section of the river for 500 miles. Now the odd Diesel-powered tugboat carries loaded barges straight through.

Designed especially for its unusual task, the tugboat, when it maneuvers alone, is driven by four propellers. Additional traction is needed to ascend the rapids with a towload, however, and for this reason a 7,200-foot cable was laid along the course of the river and anchored at the upstream end. A motor winch on the tug winds up this cable, enabling the craft to haul itself slowly up the rapids, propellers churning meanwhile. On the return trip downstream, the winch pays out the cable. A pulley on a swinging boom helps negotiate turns. If the cable should break, an emergency control would automatically unleash the reserve 1,000-horsepower of the Diesel motors and keep the boat from being dashed upon the shore by the current. When it reached a point below the rapids where smoother waters made it safe to anchor, it could tie up until the cable was spliced. In this way the boat would escape serious damage.



Tugboat, above, running the treacherous rapids of a South American river using its own power to make the ascent. At left, drawing shows how cable is wound in by a Diesel winch as boat advances

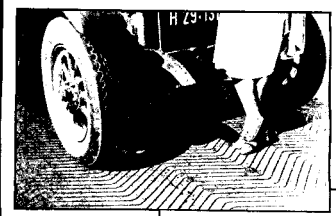
Garden Fish Ponds Made of Rubber

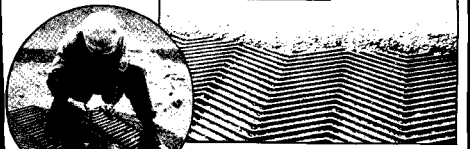
A RUBBER fish pond, said to be more durable than concrete, has been put on the market by an Ohio inventor. It consists of a metal frame supporting a basin or tank of sheet rubber with a layer of copper screen-wire embedded in it for added strength. In installing the rubber pool, the iron-pipe rim of the tank is laid on the ground and twenty-inch iron stakes driven at intervals around it. These stakes act as guides in digging the pond to the standard depth of about twenty inches. After dirt is tamped around them, they become supporting posts for the tank edge. The sheet-rubber lining is attached to the iron-pipe rim by cementing and sewing before the tank is set down in the ground.

Below, adjusting the iron supports of a rubber fish pond. At left, the pond as it appears when sunk in garden and ready for use

STEEL GRID IN ROAD ENDS SKIDDING

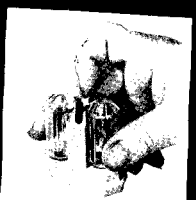
ZIG-ZAG metal frameworks that suggest grids for roasting meat are being used in Austria to produce highways with non-skid surfaces. After the road has been leveled, the steel roasting grid is placed on top and gravel is pounded into the spaces between the bars. These zig-zag lines of steel, protruding slightly above the gravel, give the surface of the road a tread that prevents skidding. At the same time, it is said, they lengthen the life of the highway and prevent the formation of ruts or washboard depressions in the gravel. One of these unique roads, built by the Austrian Experimental Society has been in use for more than a year and has proved highly satisfactory in preventing skidding and maintaining its surface in spite of the wear of heavy trucks and severe weather.





Zig-zag grid of steel laid in Austrian highway to prevent cars from skidding. At top is a section of the finished road and above is uncompleted portion. At left, workman locking the bars of steel into place in the roadway

THERMOMETER TO TEST ROAST. At left is shown a sharp-pointed thermometer which is thrust into a cooking roast to find out if the meat is being kept at the correct temperature all the way through. In this way you are able to tell the instant the meat is thoroughly cooked

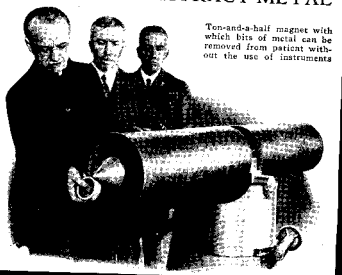


BUTTON ON SALT SHAKER. Salt flows from this shaker when a white button is pressed and pepper comes at pressure on a black button. Movable cork breaks up salt lumps so they will flow easily

LOOSENS ICE TRAY. Tipped with rubber, this tool is specially designed for use in prying out ice trays. Handle shoved forward against shank jars the tray loose

MAGNET HELPS DOCTOR EXTRACT METAL

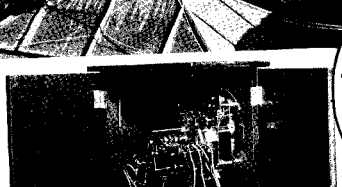
FOREIGN bits of metal may be removed from the throat, chest, or abdomen of patients with a minimum of laceration, surgeons predict, with a ton-and-a-half magnet just completed for the St. Louis University Medical School. A fifty-horsepower dynamo furnishes electric current for the giant magnet, which, without difficulty, can lift a metal operating table from the floor. It has been used to extract metal from patients' eyes.



Ton-and-a-half magnet with which bits of metal can be removed from patient without the use of instruments

LOUDSPEAKER, INSTALLED IN TOWN, SERVES AS BELL CHIMES

This loudspeaker on the roof produces synthetic chimes every quarter hour. At right, the control mechanism with an electric clock at upper right



LOUDSPEAKER chimes, recently developed for use in the clock towers of buildings, make the installation of an expensive system of bells unnecessary. Small tubes serve as miniature chimes and are struck at every quarter hour by automatic mechanism under the control of an electric clock. A sensitive microphone picks up the sound, which is amplified and made audible through powerful loudspeakers on the roof of the building. One of the new installations is said to duplicate the clang of a 400-pound hammer upon a six-ton bell.

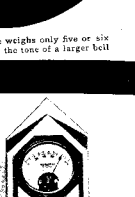
This tubular chime weighs only five or six pounds but it gives the tone of a larger bell

LIGHT PRINTS TIME ON CLOUDS

This clockface, set in the projector, throws time on clouds

With this gun-like projector, a powerful light ray throws the time on clouds that are far away

ONCE engaged in the development of a death ray for possible military use, H. Grindell-Matthews, British inventor, has developed a new gun for projecting light rays. A motor carriage supports the cannon-like projector, which is designed to throw signs upon clouds miles away, and is an improved model of one he demonstrated in New York City not long ago. By inserting a special clock with a transparent face and opaque hands and figures in the projector, the correct time is also thrown on clouds.



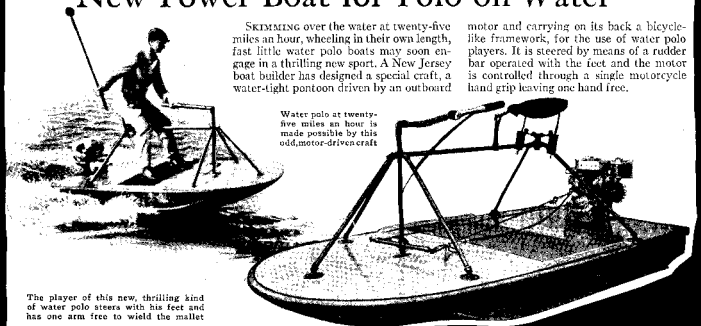
Turning knob at bottom of this thermometer gives temperature in any room in house

NINE THERMOMETERS COMBINED IN ONE

BY TURNING a knob at the bottom of a new household thermometer, the user may learn the temperature in any room of his home. The device works by electricity, and extension wires lead from it to nine indicators suitably distributed. A sufficient number is provided, according to engineers who developed the instrument, so that the temperature within the home refrigerator and the hot-water heater may be observed as well as that of any room in the house.

New Power Boat for Polo on Water

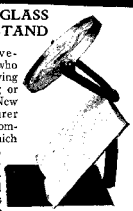
SKIMMING over the water at twenty-five miles an hour, wheeling in their own length, fast little water polo boats may soon engage in a thrilling new sport. A New Jersey boat builder has designed a special craft, a water-tight pontoon driven by an outboard motor and carrying on its back a bicycle-like framework, for the use of water polo players. It is steered by means of a rudder bar operated with the feet and the motor is controlled through a single motorcycle hand grip leaving one hand free.



Water polo at twenty-five miles an hour is made possible by this odd, motor-driven craft

The player of this new, thrilling kind of water polo steers with his feet and has one arm free to wield the mallet

READING GLASS HELD BY STAND



FOR the convenience of those who require a magnifying glass for reading or in their work, a New York manufacturer has produced a compact outfit in which the enlarging lens is held by adjustable arms attached to a broad base that rests upon a table or desk. The reader can use both hands to hold a book and turn the pages, once the glass is set in the proper position.

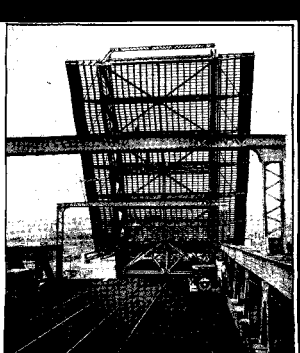
USE SEESAW TO START STOPPED HEART

A LIFE-SAVING seesaw has been invented by a University of California scientist to revive those whose hearts have stopped, as the result of certain kinds of accidents. While oxygen is forced into the lungs and heat is applied to the body, the patient will be rocked steadily up and down on the pivoted plank, to which he will be strapped lying on his back. The theory is that the steady change in position will cause gravity to send the blood coursing through the veins and will start the heart beating. The apparatus, the inventor points out, is for use only in certain cases where the patient has met with an unusual accident.

The patient is rocked while oxygen is administered

BRIDGE FLOOR IS MADE OF STEEL MESH

WHEN engineers in Seattle, Wash., recently decided to widen a bridge in the city, they found the machinery that elevates the center section would be unable to handle the additional weight if the span were floored with concrete. So they fitted the enlarged bridge with a floor of steel mesh. Automobiles and street cars cross the bridge, running on the mesh floor which is fifty per cent air. The photograph clearly shows the open-work floor of the bridge as the picture was taken when one section was raised.



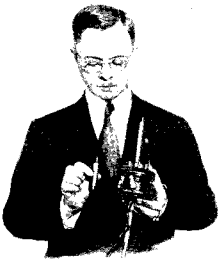
TWO NAIL SETS IN ONE

One point of this tool sets large nails, the other tacks and brads

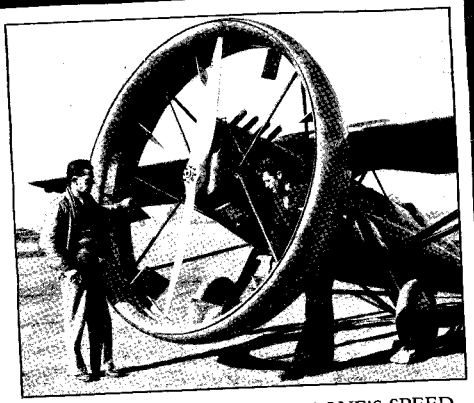
Two nail sets are combined in one tool recently invented to save time in driving home nails of different sizes. One point drives small nails and brads, while a second, at right angles to the first, is for use with larger nails. The odd shape of the tool makes it convenient to use.

VALVE IN PLANE'S FUEL LINE ENDS FIRE DANGER

FIRE following an airplane crash is prevented by a new magnetic valve devised by a Westinghouse engineer. The valve, inserted in the gasoline line, is held open as long as the plane's ignition is turned on. When a pilot, sensing danger, cuts off the ignition switch, the valve automatically closes under the pressure of a spring. This makes it impossible for a broken fuel line to spray the hot motor with gasoline. The magnetic valve will also control many steam-driven devices.



Plunger, held in right hand, opens or closes the valve, left, and automatically cuts off gasoline

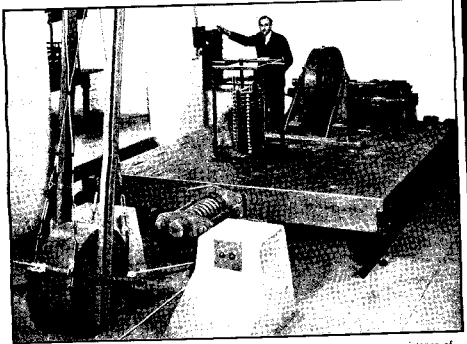


PROPELLER RING RAISES PLANE'S SPEED

THAT the speed of an airplane may be increased from thirty-nine to 140 percent by putting a ring around the propeller is the discovery announced by two Compton, Calif., inventors. The circular cowling is said to straighten out the air blast of the propeller and increase its effectiveness. Vanes within the ring, which the inventors are indicating in the picture above, may be adjusted during flight to increase the air drag and so serve as brakes in landing.

MODEL SKYSCRAPERS GET QUAKE TEST

How to make buildings earthquake-proof is the object of an unusual series of tests in progress in the engineering laboratory of Stanford University, at Palo Alto, Calif. Model skyscrapers are subjected to artificial earthquakes on the vibrating table illustrated below, to determine their relative ability to withstand shocks. Impacts of a massive pendulum at the lower left in the picture are transmitted to the table through a spring plunger, causing it to oscillate realistically. Another type of vibration is provided by an off-center flywheel.



Model of skyscraper set on this table is subjected to earthquake shocks to test resistance of material. Pendulum at the lower left and the flywheel at rear produce the artificial vibrations

The upper sheet is of thin glue and when cut to size is applied to plywood without moisture

GLUE IN THIN SHEETS USED WITHOUT WATER

IT LOOKS and feels like paper—but the dark sheet in the picture above is actually glue, in a new ready-to-use form. The thin yellow-brown sheet comes in rolls and is cut and applied as needed to plywood or veneer. Requiring no moistening, it is said to give a strong, waterproof bond between sheets of plywood subjected to heat and pressure in a hot plate press. Since the sheet is uniformly .005 of an inch thick, the same glue spread is always obtained over the entire surface of the plywood.

PAPER TUBES NOW FORM HOMES FOR OYSTERS

PAPER tubes, coated with cement, form new incubators for baby oysters. The tubes, to which the microscopic oyster larvae cling until they develop into seed oysters, have been developed by the United States Bureau of Fisheries, at its Beaufort, N. C., station.

Homemade Instruments Guide Sailor Across Ocean

This eighteen-foot sailing skiff crossed the Pacific from Australia carrying a one-man crew and guided by his homemade instruments

WHEN Fred Rebell ended a lone 8,000-mile voyage from Australia, the other day, by sailing his eighteen-foot skiff *Elaine* into Los Angeles harbor, Calif., he owed the success of his perilous adventure to homemade instruments and the knack of using them.

At forty-six, Rebell determined to end his twenty-year career as a building contractor in Sydney, Australia, and rejoin his parents in their Latvia home. Three weeks' browsing among textbooks on navigation, in the Sydney public library, convinced him he could make the Pacific crossing himself. Sea-faring men shook their heads dubiously, however, as Rebell headed his frail craft out to sea.

He took bearings with a crude sextant he had fashioned from a Boy Scout telescope, three bits of colored glass, and scraps of old iron. A dollar watch served as his chronometer. From time to time, Rebell trailed astern his homemade log, a corkscrew-shaped piece of metal. A flexible shaft connected it to a second dollar watch, in such a way that moving hands on the dial would indicate the distance covered as the log spun in the water. Standard pilot charts of the north and south Pacific completed the lone navigator's equipment. With his homemade instruments, Rebell held his course through stormy seas.

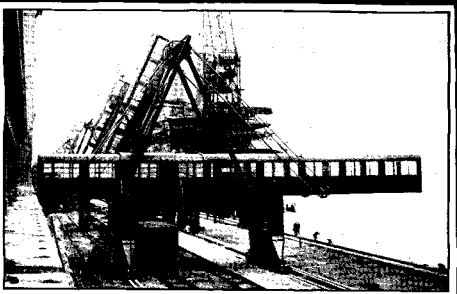
In the circle, Fred Rebell, lone navigator of the tiny skiff, exhibits the sextant he made for the voyage. At right, a close-up of his instruments consisting of sextant, chronometer, and corkscrew log

BIG ELECTRIC VIBRATOR HELPS BUILD BRIDGE

To AID in building the great San Francisco-Oakland bridge and other large structures, research engineers of the University of California have perfected the oversize electric vibrator pictured above. It will be used in tamping down concrete, and will cause the material to settle to a more compact mass than is obtained by usual methods. Another achievement is a cement that develops little heat in setting.

RUBBER COVERS THAT PROTECT HANDS AND WALLS. When the rubber cover, shown at right, is slipped over the valve wheel of a radiator there is no danger of burning the hands in turning it on or off. The covers can also be used on door knobs to keep them from marring walls if they fly back accidentally

ELECTRIC MIXER AND CAN OPENER. Driven by a small motor, this new kitchen utensil, which is said to cause no radio interference, combines a meat chopper, can opener, and also a knife sharpener



MOVING GANGWAY SPEEDS TRAVELERS

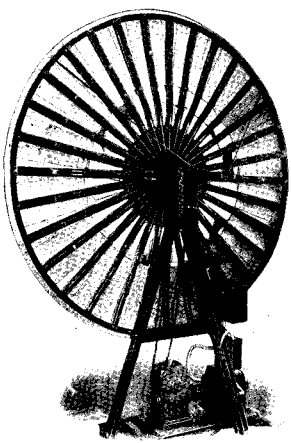
PASSENGERS leaving transatlantic liners at Cherbourg, France, will soon use motorized gangways designed to speed their disembarking and the handling of their luggage. The gangways, operating like escalators, or moving stairways, can be elevated or lowered to any level to meet the requirements of different-sized vessels. Covered over to give protection to passengers in bad weather the moving gangplanks will roll along on tracks and lock securely in place for operation.

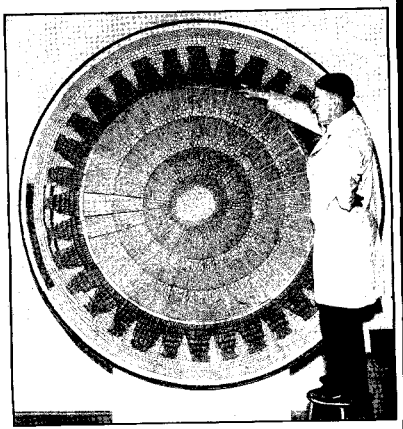
GOLFERS' NEW PUTTER HAS GUIDE ON BLADE

A NEW putter for golfers has a metal flange, three-quarters of an inch wide and nearly three inches long, extending backward from the blade. With a correct stroke, this flange is parallel to the ground at the bottom of the swing. If the flange digs into the earth, the swing is wrong.

Professional golfer exhibiting the putter, with guiding flange, he has just designed

Gears In Young Tree Model Make It Grow as Though Alive



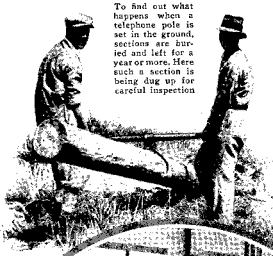


This model of a tree, for the Chicago World's fair, will grow, adding new cells, when driven by the motor and mechanism shown in picture at left

A MECHANICAL twig, seven and a half feet in diameter, will show visitors at the Chicago World's Fair next summer how a tree grows. Sliding plates and moving canvases will add an eighteen-inch ring to the model and reproduce a year's growth in a minute and a quarter. The model represents the cross-section of a three-year-old basswood tree a quarter of an inch in diameter. Its cells are magnified 360 times. Basswood was chosen because it is the type of wood studied by practically all students of trees. Through worm gears, an electric motor will slide the new cells into place, forming an outer ring that represents the fourth year of growth. The motor and gears are hidden in an enclosed case at the back, and the mechanism is so arranged that the model automatically returns to its three-year size at the end of each demonstration.

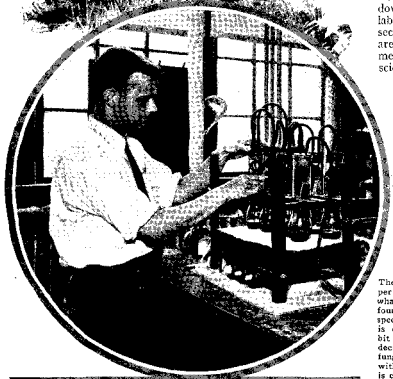
Bury Telephone Poles

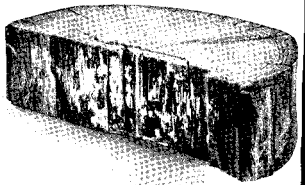
To Make Them Live Longer



To find out what happens when a telephone pole is set in the ground, sections are buried and left for a year or more. Here such a section is being dug up for careful inspection

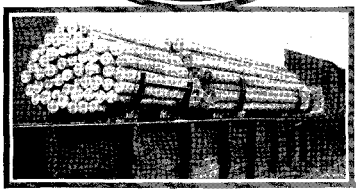
SHORT sections of telephone poles, coated with creosote and buried in three widely-separated laboratories, are expected to show how poles can be made to last longer. Every year foresters employed by the Bell Telephone Co., bury sections of poles at Limon, Colo., Gulfport, Miss., and Chester, N. J. After a year or more, they remove the logs, cut out their hearts with augurs, and study them. They have learned that telephone poles rot because fungi eat the wood. Moisture and warmth speed up this eating. So they introduce creosote into the wood which remains there for several decades despite exposure to sun, wind, rain, and soil moisture. In the three pole-testing grounds, conditions are quite different as to soils, climate, wood-eating insects, fungi, and moisture. Before cutting down a forest, specimen poles are shipped to the Mississippi laboratory. There they are treated with preservatives. One section of each pole is buried at Gulfport and two others are shipped to New Jersey and Colorado for similar treatment. A year later, the poles are dug up and subjected to scientific tests to learn what changes have taken place.





The photo at upper right shows what is sometimes found when a test specimen of a pole is dug up. This bit is obviously decayed and the fungus growing within the wood is easily seen. In the circle, borings from the treated sections are being dried in calcium chloride powder

In the laboratory at right, samples of the poles are being subjected to chemical analysis in an effort to discover what chemical changes occurred while the poles were in the ground



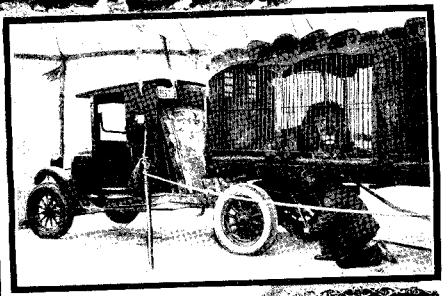
Cars are loaded with test specimens of telephone poles, as is shown above, and then moved into the treating cylinder where they are impregnated with creosote which acts as a good preservative

The lines of poles, left, are all test sections set up in the exposure plot at Limon, Colo. Sections of these same poles are also buried at Gulfport, Miss., and at Chester, N. J.

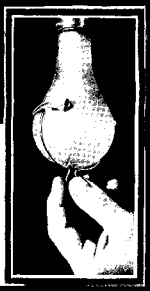
CIRCUS Back on Roads

Our Machine Age Brings Revolution in Method of Moving Tent Shows in America

All the paraphernalia of the circus clowns and acrobats go into trucks for swift transportation



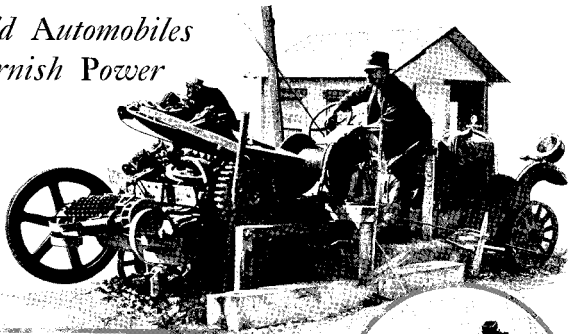
With the sides of the trucks removed, above, the menagerie animals are ready for exhibition in the big parade. Below, photos show several of the various kinds of big trucks that are used now to move the tent shows over the roads



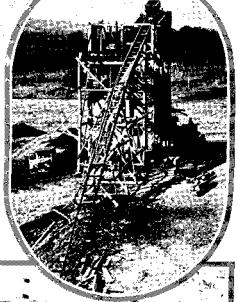
PERFUMED LIGHT. A wire spring clip to which perfume is attached, is slipped over a light bulb. The heat from the bulb releases the perfume which is carried into the room by the hot air currents so that all disagreeable odors are destroyed

Emergency Coal Mines

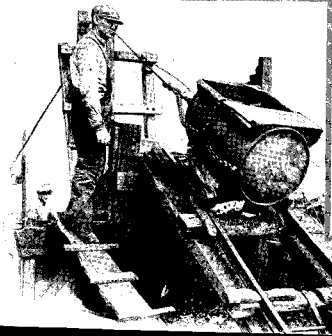
Use Old Automobiles to Furnish Power

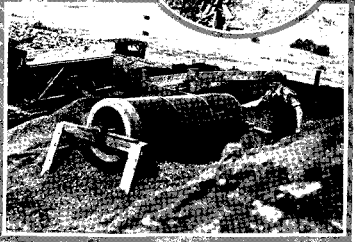


Out of work and unwilling to remain idle, men in Pennsylvania have formed small groups and are working coal mines on their own, selling the output in neighboring towns. To supply the necessary power, they have rigged up old automobiles. The one at the right, geared to a shaker, is used to sort coal



Not only is the auto, left, a power plant by means of which the loaded coal car is dragged out of the mine, but when the drum on the rear wheel is removed, it carries the miners home. At right, a general view of breaker and plane with a loaded coal car at the top





With this home made screen, the boy is screening the finer sizes of coal. The screen is made of cheese boxes bound together with two hoops from an old barrel. The crank, with which it is turned, is from an abandoned auto. Left, a loaded coal car at the top of the incline ready to be dumped into the shakers which separate the coal into various sizes. Note, mine car is made from an old oil drum with top and side cut away

Making Movies in a Volcano

University of Illinois

URBANA, Ill., Feb. 1—(AP)—Toward the south in the evening skies of February there is a starry scene which has puzzled astronomers for a long time.

The puzzle is to explain why the band of brilliant stars does not lie along the Milky Way. It is shifted to the west of the Milky Way, as anyone can see.

At two seasons of the year the Milky Way forms a luminous arch across the sky passing directly overhead. In September its course runs from northeast to southwest. In the early evenings of February we can trace it from the northwest through the zenith to the southeast horizon, when the sky is very clear and the moon is not shining.

FAINT PART SEEN NOW

It is a rather faint part of the Milky Way that we see just now, especially the part extending from the zenith toward the southeast. Astronomers believe that we are nearer the edge of the great flat galaxy in this direction, so that we see fewer stars and star clouds.

In this direction we look through 25,000 light years of the star fields, while the thickness is three times as great toward the region of the Milky Way that we see in the south in the late summer.

After the moon has withdrawn from the evening sky (the full moon occurs on February 10) it is easy to follow the stream of the Milky Way from the zenith southward, past the horns of Taurus, the feet of the Twins and through regions east of Orion and the Great Dog, where there are few bright stars. This is the interesting thing about it.

WEST OF MILKY WAY

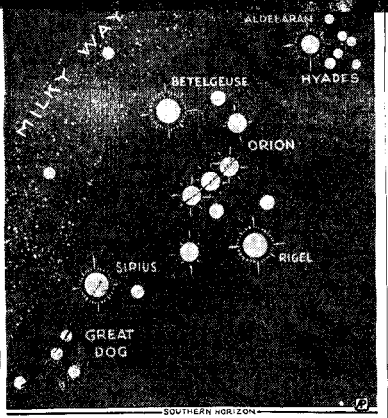
The stream of bright stars lies west of the Milky Way and parallel to it. The fine Pleiades and Hyades clusters of Taurus are high in the south. Orion, brightest of the constellation, is somewhat lower and a little to the left of Taurus; on the first of the month we can find this upended rectangle of bright stars directly in the south at 9 o'clock.

Three stars in line in the center of the rectangle point upward to the V-shaped Hyades and downward to Sirius, the Dog star, brightest of all the stars.

If our Milky Way system is a flat disk of stars and star clouds, perhaps having the spiral form, then as we view it from the inside everything in the system should crowd toward the circle of the Milky Way. But this band of bright constellations in the south lies definitely outside the Milky Way.

Some astronomers suppose that this band of bright stars is part of a star cloud immediately around us, a flat cloud of millions of stars tilted some twelve degrees to the plane of the larger structure.

Whatever the true explanation may be, it is evident enough to anyone who observes the scene in the south this month that the two star streams run parallel and not together.



A band of bright stars west of the Milky Way offers a puzzle to sky watchers in February. The reason for the stars lying outside the Milky Way long has been sought by astronomers. Chart above shows the band of stars.

THE LIGHT OF THE STAR, ARCTURUS, focussed by telescope upon a photo-electric cell, will open the exhibits in this great Hall of Science of Chicago's "Century of Progress" World's Fair on June 1st, 1933. *International News*