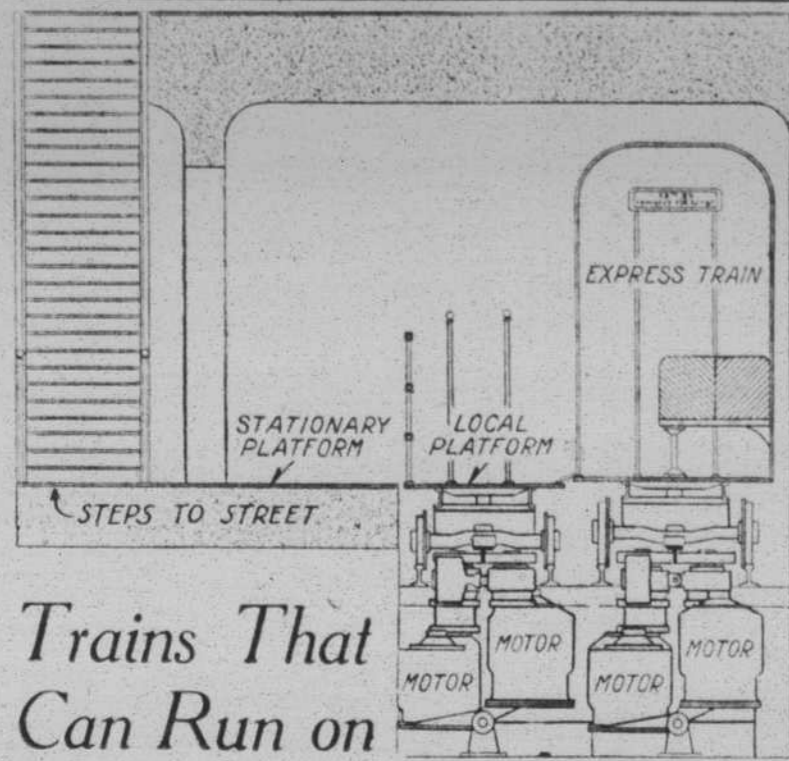


## How the "Biway," a New Merry-Go-Round Railroad, May Solve Traffic Problems



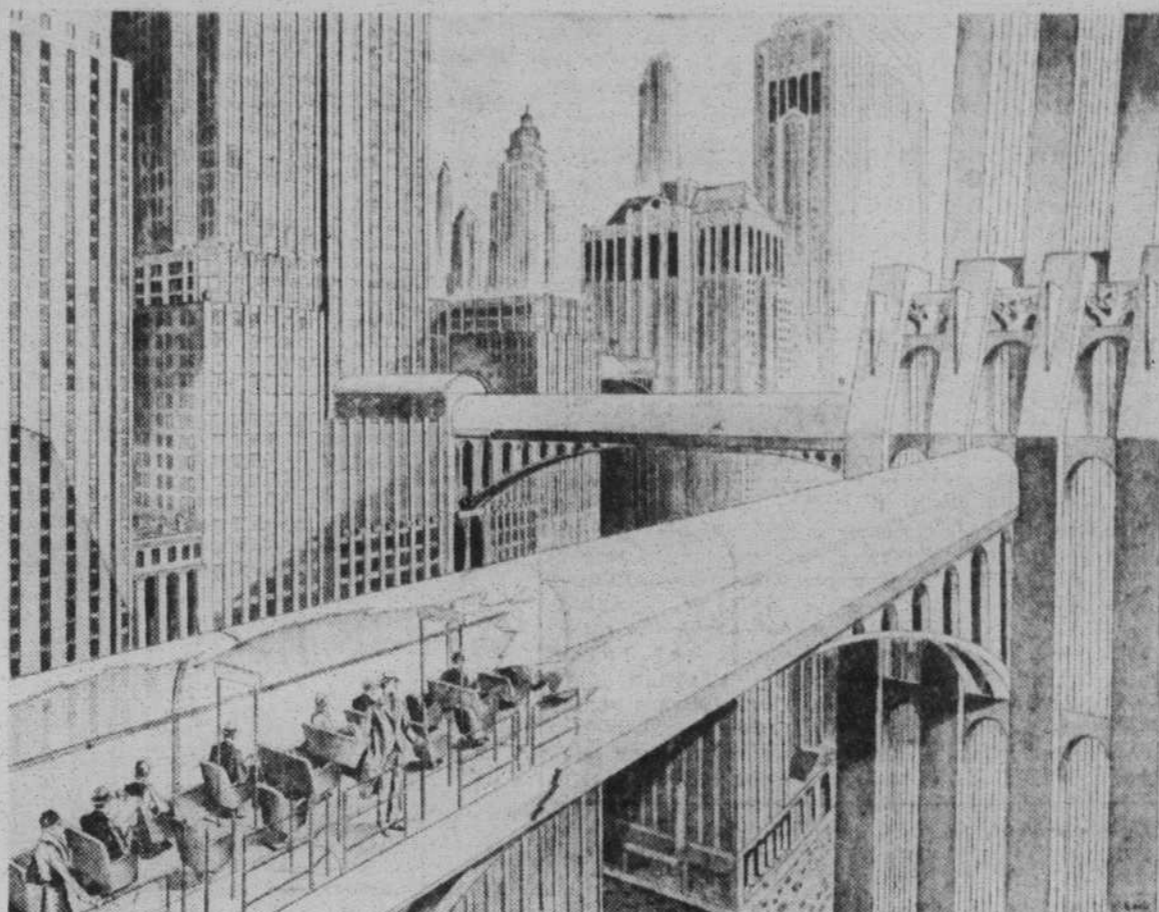
### Trains That Can Run on Greased Tracks Without Stopping and Need No Brakes or Any Signal Lights.

HOW would you like to take a trip on the "biway"? The biway, you know, is the latest system of mass transportation. It has a tremendous capacity and runs at a good speed, higher than local subway trains and nearly, if not quite as fast as express trains. It is easier to reach and one never has to wait more than 40 seconds for a train.

The biway is a continuous transportation system which Norman William Storer, an engineer of the Westinghouse Electric and Manufacturing Company, offers as a solution of the traffic problem. It consists of two continuous platforms or belts of cars on parallel tracks, with a stationary platform running the entire length. One of the trains, the express, made up of enclosed or semi-enclosed cars or sections of platform, is provided with seats and runs continuously at speeds varying from about 22 down to 17.5 miles an hour. The other, called the local, is an open platform provided only with a railing to keep passengers from falling or being crowded off, and a few posts for them to hold onto when the train is accelerating or stopping. The function of this platform is to transfer passengers from the stationary platform to the express train and vice-versa.

The biway runs under the sidewalk and there is an entrance to it from practically every building along the line. Turnstiles lead to the biway and spread out so as to avoid confusion on the platform. The local platform goes through a complete cycle of acceleration, running at the same speed as the express, stopping and standing every 50 seconds.

A gong sounds the signal for transferring. The doors on the express open, some passengers get out and some enter.



Upper Left: A Cross-Section Drawing of the Biway. Both the Local Platform and the Train Are Continuous and Are Propelled by Electric Motors Placed in Pits at Intervals of Approximately 1,000 Feet Beneath the Tracks. Power Is Transmitted Through Wheels Revolving Against Steel Flanges Attached to Fixed Axles Beneath the Train and Platform.

Above: How the Biway Would Appear If Constructed High Above the Streets, Running From One Skyscraper to the Next and on Glass-Covered Bridges Across Open Spaces.

Right: A Diagram of Stationary, Moving and Express Platforms with All Track Space Covered by Floors. Continuous Trains and Platforms Make the System Accessible at All Points So There Can Be No Congestion of Passengers at Stations.

of operation could easily be absorbed by the tenants along the route.

A sign at the front of the car not only tells you where you are at every instant, but tells you where to get off the express in order to land close to the street you wish. That is determined in this way: The express, running at 20 miles per hour, travels 1,470 feet each cycle of 50 seconds. The sign announces your street about 1,200 feet before you reach it. You

roller bearings. The axle is under one end of the car and the other end is resting on the axle end of the next car.

There are no brakes on the car and no loose pieces of any kind. Rubber cushions are freely used to absorb vibration and keep it from getting into the floor. The wheels run on a greased track, so there is no screeching on curves and less flange noise everywhere.

How can a train be driven when the track is greased? There is no driving through the wheels at all. The platforms are driven by the motors in the pits beneath the tracks, making a kind of stationary locomotive. The motors drive vertical shaft rollers or drive wheels which engage the T-rails that are carried under the fixed axles of the platforms. Each set of motors drives a pair of rollers between which the flange of the rail passes.

As the cars pass an inspector watches them so as to detect any defect before it can cause trouble. If a roller bearing fails, it and the wheel it carries can be replaced at one of the stations in about the time it takes to change a tire on an automobile. Lengths of open pit under the tracks on either side of the driving station give ample space for care.

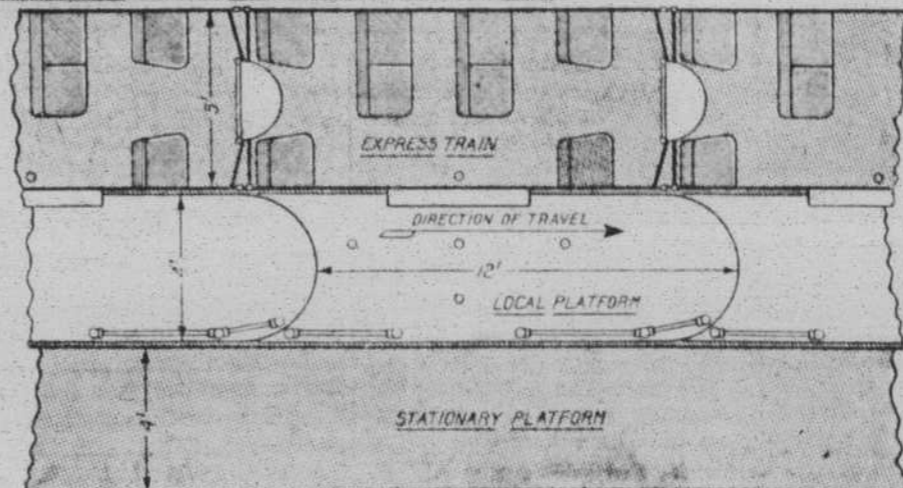
trains run at the same maximum speed at all points on the line.

How are these trains controlled? The apparatus for this purpose is in a space right beside the motors.

There are five driving stations per mile, with two sets of motors in each station. The express train has four motors for each set, while the local has two. Two of the express motors are rated at about 50 horsepower and the other two at 100. Those on the local are also rated at 100 horsepower each, being duplicates of the same size on the express. These stations are all controlled from a central point.

The biway is much more convenient than the subway because the passengers do not have to go to stated stations in order to get on the train. They can enter from any point along the line, which practically eliminates the terrific crowding that exists in the ordinary subway stations. Then, too, the time between stops is much less than half the average time between trains on the subway, so that there will be less time for people to gather at any point on the line. Furthermore, the distance the average person has to walk at the two ends of the trip will be very much shorter since the local stations on the subway average from one-third to one-half mile apart and express stations about one mile, while every point on the biway is a station.

Since there is only one train on each track which fills the entire track, collisions are impossible and there is no need for track signals. Also, since the train speeds are controlled entirely by electricity airbrakes are not necessary.



### Why Pellagra Is Due to Food

PELLAGRA, which has been known for nearly 200 years, is strictly a dietary disease, which may be uniformly produced or prevented at will by simply varying the quantity of the foods which carry the antipellagic vitamin, according to the United States Public Health Service. It is only recently that the nature of its cause has been made clear and practical and effective measures for its treatment and prevention have been established.

Pellagra is unlike most preventable diseases with which man has to contend, as infection appears to play no part whatever in its causation, and the sanitary and hygienic measures commonly employed against transmissible diseases offer no aid in its control.

It has been abundantly demonstrated that pellagra may be uniformly produced or prevented at will by simply varying the quantity of the foods which carry the antipellagic vitamin—vitamin G.

### A Toad That Gases Its Victims to Death

ADOPTING modern methods of warfare, a huge tropical toad that emits a deadly gas when frightened or in pain is among the weird Mexican amphibians described in a scientific monograph just issued by the Smithsonian Institution. This creature inhabits the hottest portion of the North American continent, its range extending over the Mexican line into Arizona and California. Although the exact nature of its poison is unknown, according to Dr. Remington Kellogg of the Smithsonian staff, some of the accounts of persons who have come in contact with it indicate that it may even kill animals from a distance with some effusion from its body.

Mr. M. E. Musgrave, of the United States Biological Survey, gives an account of an adventure with this poisonous toad, one of which his terrier attacked and shook to death while he stood about five feet away. When the terrier dropped the amphibian a large police dog came up and barely touched its nose to the dead creature, which was again grabbed by the smaller animal.

"I thought no more about it," says Mr. Musgrave, "and started back to the house, the police dog following. He had gone no more than 100 feet when his front legs crumpled under him and he pitched forward. His legs and body appeared paralyzed.

"Immediately I realized that something was wrong and, looking over to where the little terrier had been, I saw her lying on the ground, her feet crum-

pled under her and her face in the dirt. I felt her heart, and found the action slow. She could get no air into her lungs. Within two or three minutes from the time she first bit the toad she died. Bloody foam oozed from her mouth and nose.

"About this time I became very sick myself. My head was swimming and there was a lifting feeling in my lung cavity. It affected me rather peculiarly, as I wanted to walk and keep on walking. The effects did not wear off for about 30 minutes. The old police dog

revelled in about three quarters of an hour."

Mr. Musgrave does not know whether he received the poison dose while the terrier was shaking the toad or when he was trying to revive the dying dog. He detected no odor at any time. Later he handled without bad effects a toad of the same species sent to the Biological Survey headquarters.

Other similar incidents are recorded and some veterinarians in the region frequented by the toad are said to be familiar with the effects of its poison.

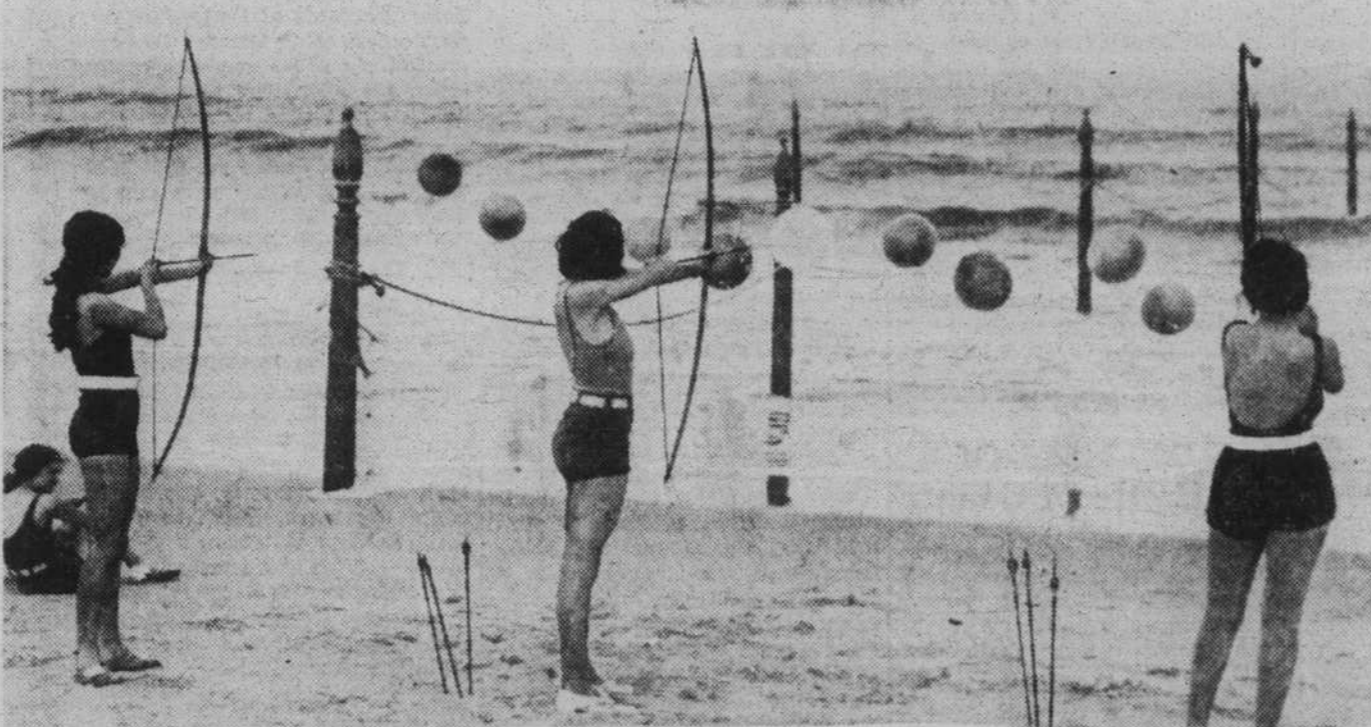
### The New Beach Sport of Balloon Archery

ARCHERY, which is one of the most ancient of sports, today has been given a new sport thrill which is making it a popular pastime on the beaches. The bow and arrow was one of the first weapons developed by primitive man who not only used this invention in both offensive and defensive warfare, but also in hunting. Often upon

his marksmanship depended his escape from starvation.

Even in mythology, Diana, the Huntress, is pictured with the bow and arrow as her popular weapons of the chase. The beach Dianas of 1932, however, use this ancient weapon for a far different purpose, as the accompanying illustration shows.

Toy balloons are tied to wooden floats and set afloat. Then the archers take their stand near the water's edge and discharge their arrows at the drifting, bobbing balloons. Considerable skill as an archer is required to hit one of these floating targets, which at once explode with a bang as an arrow pierces its thin rubber sides.



Toy Balloons, Attached to Wooden Floats, Are Set Afloat and Used as Targets by the Bather-Archers Who Line Up Along the Beach and Shoot Their Arrows at the Spheres.

King Features Syndicate, Inc., 1932

### Jewelry Made of Aluminum

ALUMINUM, the Cinderella of metals, once more is being used in the manufacture of jewelry. In nineteenth century France this white, malleable and amazingly light metal was used in making jewelry by St. Claire Deville.

As late as 1854, aluminum was worth almost its weight in gold. The regal guests of Napoleon III were served from aluminum dishes; but as the commercial era for the metal dawned some 30 years later, aluminum threw off its aristocratic cloak and went to work in the kitchen.

In the past 45 years demands for lightweight metals, combined with the development of modern metallurgy, have brought out a group of aluminum alloys characterized by strength and beauty.

A hundred different materials are being made into novelty or "costume" jewelry—glass, silk, coral, natural and synthetic stones, plastics, carved and colored wood, shell, and what not. The metals involved include brass, silver, German (nickel) silver, Britannia metal, and

others. Because of its beauty, lightness and permanence, aluminum promises to become popular.

Two outstanding novelties in jewelry made of aluminum, which C. M. Hoke, a chemist, describes in *The Brass World*, are a wrist watch and colored bracelets. The colors are lively pastel shades of blue, green, yellow, rose, and so on, and when combined with the silvery whiteness of the metal, the effect is very pleasing.

The watch is 65 per cent lighter than a watch made from the usual metals, and it weighs, complete with the wrist band, a shade less than an ounce.

The process by which colors are applied is unusual. First the aluminum surface is given an anodic treatment. It is made the anode in an electrolytic bath and becomes covered with a firm oxide film. This film of aluminum oxide has a strong affinity for certain organic dyes and mineral colors. When these dyes are applied to the prepared surface, the result is a smooth, hard, highly lustrous and beautiful finish.

### How Smokeless Powder Is Tested

WHEN you fire a shotgun and the fast-flying duck drops in its flight, it is because the shot charge covers 40 yards in 0.144 seconds (368 miles per hour) with the duck has moved only 12.68 feet in this same time, assuming the duck to have been flying at the rate of 60 miles per hour. The velocity is measured by the chronograph—a marvelously precise instrument.

The shells loaded with the powder are fired in a standard shotgun. Stretched across its muzzle is a fine copper wire connected with the chronograph. The target is also connected by another electrical circuit to the chronograph. The time elapsing between the breaking of the wire at the muzzle of the gun by the shot and the breaking of the circuit by the shot striking the target is registered precisely on the chronograph. This time is then translated into terms of velocity.

To secure the utmost speed of the shot charge with safety to shooters, tests are made with a pressure gauge. This device is a very strongly constructed gun with a chamber made to standard dimensions. It is provided with a hole in the barrel directly above the chamber into which is tightly fitted a sliding piston. A lead cylinder is held securely between this piston and an adjustable anvil mounted on the barrel. The shells to be tested have a hole cut the same diameter as that of the piston and in a position that brings it directly under the piston.

When the shot is fired, the expanding powder gases drive the piston sharply against the soft lead cylinder and compress it. The amount of compression is a measure of the pressure developed.

The gunmaker likewise makes tests for safety, the most important of which is designated "the definitive proof of the gun." In this test the gun is subjected to a pressure from 25 per cent to 40 per cent greater than the service pressure, thus providing the necessary margin of safety. The use of elaborate testing equipment operated and supervised by ballistic experts ensures the uniformity of the performance of smokeless powders, and consequent satisfaction and safety.

### The Wobblemeter

A NEW apparatus has been designed for measuring fatigue and endurance and the effect of these conditions on man's sense of balance. It is known as the wobblemeter and is for use in the fields of aviation, motoring, psychology, psychiatry and many other departments of human enterprise and warfare.

The wobblemeter is made by the same manufacturer who developed the earth inductor compass, one of the chief navigational aids to Colonel Charles A. Lindbergh and many other cross-seas fliers.

### Why Motor Cars Are Safe in Storms

PASSENGERS in motor cars are almost never struck by lightning. Not only do accident statistics indicate the rarity of this event, the National Safety Council points out, but the United States Bureau of Standards is quoted as scientific authority for the probability that the more or less complete cage of electrically conducting metal formed by the chassis, frame and top of the modern auto is a good protection if lightning does strike.

Dry rubber tires are electric insulators, but in thunderstorms they are usually wet and thus provide an electrical connection to the ground. A person inside such a closed car is like one inside a steel-frame building such as a skyscraper. Although skyscrapers themselves are frequently struck by lightning no one in them is injured.