BETTER ROADS FOR MOTOR CARS

FROM CHEVROLET REVIEW

The road and the vehicle as usual are running a race, and in the contest between the automobile and the modern improved highway, the automobile is still leading, because of a splendid start. The old dirt single trackway to town was good enough for one-horse shays and such, and it took some time to reform it into a highway fit for motor cars. The revolution has now passed into the stage when roads are designed as well as built.

Sixty to 70 of the leading engineers and scientists of the country recently met in Washington to discuss and exchange data on the experiments in progress on roads. This advistory board of highway research, organized under the National Research Council, was told that over $1,000,000 is being spent on learning how to build so as to give the best and longest service per dollar. A million dollars may seem a large sum to be spent on research instead of actual roads, but it will pay interest of at least several thousand per cent. When people are digging down in their own pockets and mortgaging the future of their children to pay for roads, they deserve the best that can be built. Roads cannot be allowed to "just grow" with safety.

It should not be necessary to offer proof of the value of research. If, however, there ever was a prompt and definite profit from an investment in a program of tests it is evident in the highway work of the state of Illinois, as a direct outcome of the Bates Experimental Road work.

The state of Illinois is engaged in the construction of a highway system which will have a length of about 5000 miles and will cost about $100,000,000. To undertake a program of that size without definite knowledge of the type and design of pavement best able to carry legal traffic under the conditions existing in the state seemed unwise; so, early in 1920, the state highway officials decided to pave a state highway officials decided to pave a road and test the pavement by driving trucks over it until it was destroyed.

The location selected for the test road is typical of a large part of the Middle West. It is in the heart of the corn belt and has a soil as nearly uniform as can be found on any two miles of highway. The ground is nearly level and the road is straight.

Concrete, brick and asphalt were the paving materials selected for the test. With each of these materials, sections varying from thin to thick and having differenn foundation courses were built, so that nearly every design that has been extensfvely used or advocated in the United States was represented. There were 63 of these sections, each from 100 to 250 feet long. Construction was begun in June, 1920, and finished in July, 1921.

Research work wes begun before the whole 2 miles of pavement was completed. Subgrade moisture, bearing power and uniformity, as well as frost action, temperature effects, impact, fatigue, the position of loads for maximum stresses and the effect of doweled expansion joints, were investigated.

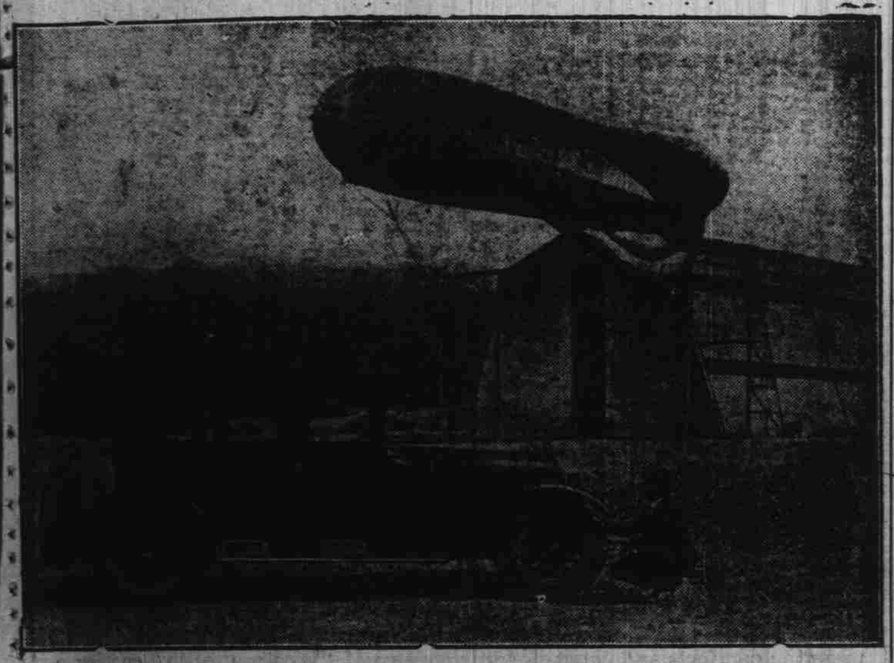
Traffic tests were not begun until March, 1922. Traffic consisted of 12 to 18 three-ton army trucks equipped with solid tires. The trucks made regular, timed trips up one side of the road and back on the other side. Beginning with the bare chassis and cab, loads were increased until the maximum legal load for the state was reached.

During the first two load increment the trucks traveled with outside rear wheels at the extreme edge of the pavement on all sections except those with a macadam base. On the latter the outside wheel traveled 18 inches from the edge. During the second increment the path of the outside rear wheel on the north side of the pavement was changed and made 2 feet 6 inches from the edge. This was done so that the effect of trucks traveling on the edge of a pavement might be compared with that of trucks traveling nearer the center. Guide lines were painted on the pavement and drivers held their trucks accurately in the prescribed path.

Before the traffic test started, it was observed that, during the day, when the surface was warmed by the sun, the upper part of the pavement would expand more than the lower part, causing the slab to "curl so that it bent downward toward the edges, while the center was raised from the subgrade. At night, conditions were reversed; the upper part of the pavement became cooler than the lower part and contracted so that the "curling" lifted the edges clear of the subgrade, leaving these edges to act as cantilever beams. The effect of this "curling" action on the life of a pavement was in doubt, so part of the truck traffic was applied at night. In nearly every case more breaks occurred at night than in the daytime under equal loading.

While the traffic test was in progress the whole pavement was continually patrolled by observers who covered definite sections and recorded each failure and the approximate time it formed. When a failure had been recorded, it was painted; the color of the paint indicated the increment under which the break occurred. When breaks disintegrated to such an extent that traffic was impeded they were repaired by filling the holes with gravel. Some sections were so badly broken down by the heavier loads that travel over them was nearly impossible. Traffic was stopped on such sections when their location made it possible to eliminate them.

Clifford Older, Chief Highway Engineer, Department of Public Works and Buildings of the state of Illinois, under date of July 20, 1923, wrote Concrete Magazine that "upon the conclusion of the traffic runs on the Bates Test Road and the knowledge gained therefrom, we awarded sufficient road contracts to effect a total saving to date of three million, six hundred and some odd thousands of dollars. The Bates Test Road has cost to date about $250,000. We estimate that already it has paid us 1440 per cent in dividends."



AUTOMOBILE WITH BALLOON TIRES FLOATS ON AIR

Balloon tires take their name from their large diameter and air capacity, but the new tires and real balloons have something else in common—their smooth riding qualities—both float along on air.

Spitzbergen Coal Fields To Meet Norway's Needs

(By Mail)

CHRISTIANA, March 23.—Exploitation of the coal fields of Spitzbergen, which have never been more than scratched, will be started at once. The Norwegian government acquired the land by the terms of the recently published Spitzbergen treaty, and has already granted rights to several companies to carry on mining operations. The annual output will be sufficient to fill the requirements of Norwegian consumers and will leave a surplus for exportation, it is estimated.

Under a draft bill which has been introduced in the legislature, citizens of all states which have ratified or assented to the Spitzbergen treaty, are entitled to acquire and exploit coal and other mines in Spitzbergen. The bill also provides that a duty not exceeding one per cent may be assessed on mineral products and contains other regulations regarding mining, trading and political administration of Spitzbergen, all of which are designed to bring in operators who would develop the mines.

A Norwegian company has been formed which will begin operations this summer. It expects to employ 600 men and to produce 300,000 tons of coal a year.

Gateway to Siberia Urges Japan to Recognize Soviets

(By Mail)

TOKIO, March 9.—Tsuruga, the principal port for communications between Japan and Siberia, wants the Japanese government to recognize the Soviet.

The action of the soviet authorities in stopping the direct mail service between Siberia and Japan and in refusing recognition of the Japanese consul in Vladivostok, thereby practically cutting off travel from Russian territory to Japan, has proved a serious blow to the trade of Truruga. A mass meeting of Tsuruga citizens has passed a resolution urging recognition of the Moscow government.

INTERESTING MAP AT GREASE SPOT

Boys Who Have Adopted Slogan of "Let Us Do Your Dirty Work" Offer Aid

All car owners who are anticipating a trip this summer will do well to stop at the Grease Spot and get one of the free highway maps that they are distributing. These maps are particularly complete. They have one table showing distances between all the principal towns in Oregon, another showing the distance of the prinipal towns from Portland, a map showing all the highways entering Portland, and on the other side a large map of the state of Oregon showing distances and all paved and rock roads.

A greasing chart is a very useful novelty that the boys at the Grease Spot are putting on their customers' cars; these charts are made of aluminum and are about the size of a calling card. Spaces are provided whereby when the car is greased the next speedometer reading is recorded at which the differential, transmission, and crankcase should be attended to. These tags are ornamental and attached in such a manner as to be of permanent value.

JOHN N. WILLYS PAYS A TRIBUTE TO THE PRESS

In a recent address before a gathering of several hundred newspaper men John N. Willys, president of Willys-Overland, attributed the 'come-back' of his company and the high rank it now holds in the automobile field to the power of the printed press.

"In the incubator days of the automobile it was classed as a 'freak' and its successful operation furnished material for special and feature stories. At the same time newspapers believed in its eventual success as a transportation medium, and they devoted much space and energy to its development and exploitation. Through this activity was developed the desire of the man in the street to own and drive a car. This brought about further cooperation in the shape of educational articles for the owner and driver.

Richenbacher Man Will Attend London Convention

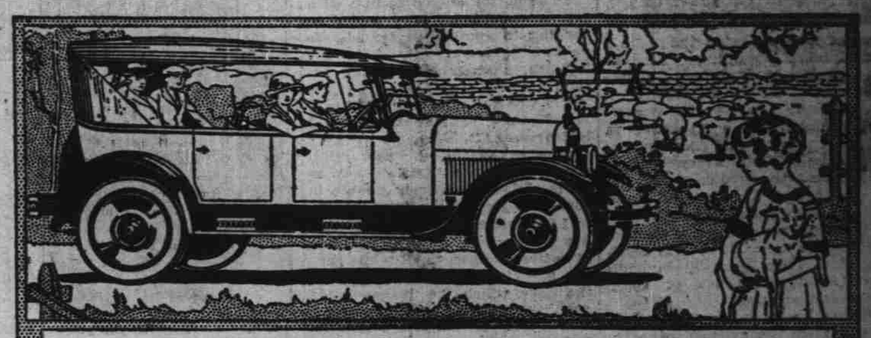
E. LeRoy Pelletier, manager of advertising and sales promotion of Rickenbacker Motor company, is one of six Americans selected to represent this country at the International convention of the Associated Advertising Clubs of the World, London, England, next July.

Mr. Pelletier will represent the Newspaper Division and his address will be on the subject of "The Successful Use of Newsptpers in Developing the Automobile Industry."

Having been one of the first advertising men to use large space in daily newspapers throughout the country and hooking them up so as to constitute a national campaign; having been from the first an ardent champion of the daily and a consistent user of this medium, he was the unanimous choice of the committee to represent this division.

Mr. Pelletier's address will be delivered either on the 16th or 17th of July. It is expected that more than 1500 leading advertising men from all countries of the world will be present.

The American delegation have chartered three entire ships, new ones now under construction and which will make their maiden trips as the official transports of the American advertising men.



A Sport Car—a Six—$1095

Until you see it, you cannot adequately picture the distinctive beauty nor fully appreciate the mechanical goodness of this five-passenger Sport Touring. And the gratifying fact is that both its appearance and performance—*endure!*

Its finish—a striking Oakland Blue—cannot fade nor check because it is an entirely new substance—Duco.

The Oakland engine and chassis, because of their correct design and advanced construction, are ideal for a real sport car because they assure snappy getaway, as well as sustained high speeds.

And how necessary and desirable, in a fast Sport Car such as this, are Oakland's safe and practical four-wheel brakes—and its large steering wheel on which are mounted the driving controls.

Then, too, its equipment includes everything that insures completeness and full value.

There is genuine satisfaction in owning a car as distinctive and able as this. Be sure to drive it before you buy any car this spring.

VICK BROS.
High Street at Trade

Touring Car . $995
Roadster . . 995
Sport Roadster . 1095
Business Coupe 1195
Coupe for Four $1345
Sedan . . . 1445
Glass Enclosures—Touring $60, Roadster $40. All prices f. o. b. factory

Oakland
PRODUCT OF GENERAL MOTORS

The True Blue Six

C. T. C.

Distinction to Any Wheel

The custom-made appearance of these great oversize C-T-C hand-built low inflation cords is as pronounced a distinction as is their extraordinary wearing qualities.

Designed by some of the oldest and most experienced tire engineers in America and hand-built by expert craftsmen under restricted production and rigid inspection, C-T-C cords reflect every inch of their superior materials and more powerful construction both in looks and in extreme mileage economy.

There is also a C-T-C hand-built Balloon tire for extreme low inflation, which fits any standard wheel and rim.

C-T-C Tubes add mileage to almost any casing.

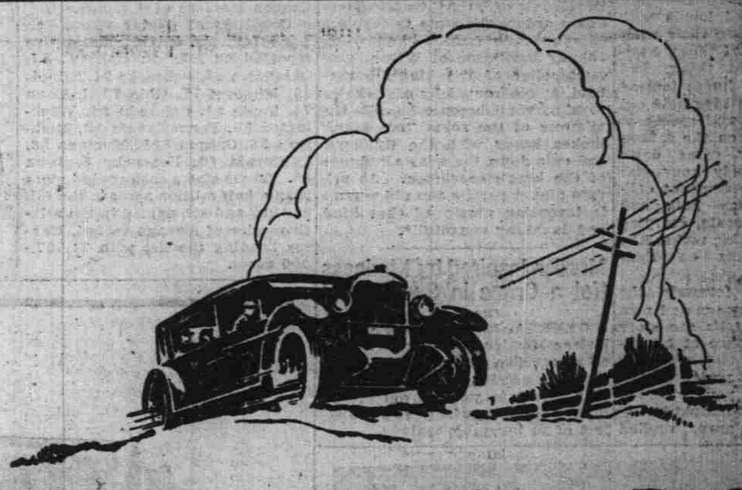
Marion Automobile Co.
Salem Automobile Co.
Valley Motor Co.
Ira Jorgenson
Vick Bros.
Columbia Tire Corporation
Factory Branch 477 Court St.

CTC
TIRES & TUBES

WILLYS-KNIGHT
5 Passenger Sedan
Now $1695
f.o.b. Toledo

Now you can afford to make that dream a reality! To own and drive this luxurious sedan, powered by the same type of engine used in Europe's finest cars. Silently gliding sleeve valves instead of hammering cams and clicking poppet valves. An engine that *improves with use!* An all-season car you'll want to drive season after season. For *no Willys-Knight engine has ever been known to wear out.*

VICK BROS.
High Street at Trade



Where Do You Want Your Car to Perform?
On Paper or on the Road?

PERFORMANCE is now the popular theme in automobile advertising—particularly among the makers of moderately priced sixes.

Over-bold claims and counter claims are being hurled at the public to establish some sort of performance supremacy.

Manufacturers whose engineering staffs have not yet developed a compact, powerful, efficient motor, dwell on the bigness of their power plants.

To impress the layman they print statistics; and the engineer who knows the tendencies of modern motor design, enjoys a smile.

Please forget the statistics—many a perpetual-motion machine performs beautifully on paper.

Please remember this unarguable fact: There is only one place to prove automobile performance, and that is on the highways and up the hills!

If a car takes the hardest, stiffest hill with masterful ease; if it sweeps along at high speeds with Pullman car smoothness; if it can literally leap from a crawl to twenty-five miles an hour, statistics and over-bold claims are unnecessary.

We make the simple statement that, in each and every phase of performance, *the Cleveland Six has no equal in its class!*

Will you come in and let us convince you? We promise to do it on the road, not with a pad and pencil.

TOURING CAR $1045 NEW FIVE PASS. SEDAN $1295 NEW FOUR DOOR SEDAN $1395
f. o. b. Cleveland

Genuine balloon tires (31x5¼) optional, $70 extra. Cleveland chassis design permits their use without affecting road, frame, or fender clearance.

F. W. PETTYJOHN CO.
219 North Commercial St. SALEM, OREGON

CLEVELAND AUTOMOBILE COMPANY • CLEVELAND
CLEVELAND SIX