

CROSSING THE CONTINENT BY AUTOMOBILE.

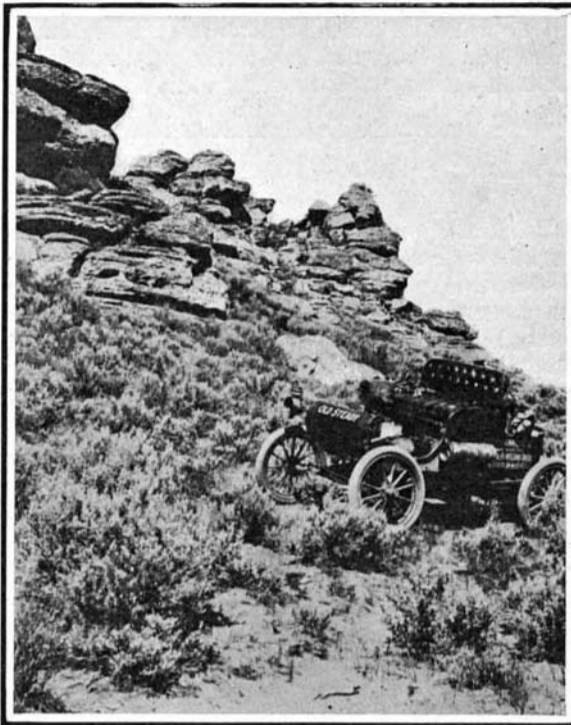
There can be no question that the idea of a transcontinental automobile trip was considered by motorists almost as soon as this sport began to assume its prominent position in America. Apparently the first serious attempt which has been recorded was that made by Alexander Winton and Charles Shanks in a Winton car in 1901. This expedition ended unsuccessfully, for after the Sierras had been overcome with difficulty, the sands of the Great American Desert were found to present an unsurmountable obstacle. It was not until 1903 that the continent was actually traversed from ocean to ocean in a motor car. The first successful machine was a Winton touring car carrying Dr. H. Nelson Jackson and Sewall K. Crocker, a professional chauffeur. In this year no less than three parties were able to perform the journey, the other two trips being made in a Packard car and an Oldsmobile runabout, respectively.

Dr. Jackson and Crocker left San Francisco on May 23, in a double-opposed-cylinder touring car of 20 horse-power. The route from San Francisco lay northward along the Sacramento to Redding at the upper end of the valley and thence into lower Oregon, striking boldly across that State and then along a course over the Rockies entirely off the line of all railroads and one that fairly bristled with difficulties. The most annoying troubles were often the minor ones; for not only were these very frequent, but they were of great diversity as well. At only one place did the travelers run out of gasoline, and on this occasion the unhappy Crocker walked 29 miles to procure a fresh supply. At one time they were without food for thirty-six hours and were indebted to a lone but friendly sheep herder for a generous meal. A block and tackle with which the travelers had provided themselves proved invaluable in rescuing the machine from sand, mud, or streams which had been "rushed" unsuccessfully. The steep, rough, and boulder-strewn grades were overcome one after the other, though the narrowness of the roads, or rather trails, necessitated the most careful driving. A very difficult portion of the journey was that between Redding and Pocatello, Idaho. At Caldwell, in that State, a third person was added to the party in the shape of "Bud," a bulldog, who soon became an expert autoist and a pleasant companion.

As was repeatedly found in later trips in the West, the deeply worn ruts of many of the roads gave almost as much trouble to the low-built cars as the sands. Frequent stallings in mountain streams were no unusual occurrences, but, on the whole, fairly good time was made in crossing the mountains, notwithstanding the loss of a set of ball-bearings from a front wheel with subsequent inefficient repairs by a wayside blacksmith. Travel through the "Bad Lands" was rough in the extreme, as the roads, almost impassable originally, had been rendered still worse by recent cloudbursts. The hardest climb was over Elk Mountain in Wyoming. The stretch through Laramie and Cheyenne, clear across the great plains to the Mississippi, was monotonous, but not very troublesome. From Omaha to Chicago, following the general line of the Chicago and Northwestern Railway, and thence through Cleveland, Buffalo, and Albany, to New York, the journeying was good, and was accomplished pleasantly and without much difficulty. So, on July 26, 1903, with the arrival at the great eastern metropolis, was completed the first automobile journey across the American continent, thus adding one more to the number of the expeditions, beginning with the ox-

wain and the mule-team, which started nearly a century ago.

Of the three transcontinental trips made in 1903, the journey of the 12-horse-power, single-cylinder Packard, with E. T. Fetch as driver and M. C. Krarup as observer, was the most direct and central between San Francisco and Denver, through California, Nevada, and



"Old Steady" in the Bad Lands.

Utah. The start was made on June 20, and the journey was completed on August 21, in a wild night drive into New York city. The entire time on the road was 62 days, including a four-day stop at Denver for rest and necessary repairs. The car was of the regular stock type, and with two people aboard weighed nearly 3,000 pounds. Despite the severe strain to which the mechan-

one point the machine descended 800 feet in two miles, practically sliding that distance in 9½ minutes under brakes. The troublesome sand in Nevada was successfully combated by using two 24-foot strips of canvas to give traction in the worst places. The alkali marl and innumerable washes encountered in the 300-mile stretch across the Humboldt Valley taxed the endurance of the car and travelers to the utmost. Even more annoying were the ravines and gulches of the desert, and here further trouble was caused by the depth of the ruts, the higher middle portions of the road frequently lifting the wheels of the low-built car clear off the ground. The tough sage brush not only whipped off the canvas under the engine, and the paint from the car body, but completely wore away, as well, the tough wooden handle of a shovel strapped underneath. The steep sides of many ravines were climbed by "jumping" the car by fly-wheel momentum. The worst stretch of rocky, tortuous, and boulder-strewn road was encountered in Soldiers' Canyon, Utah.

The hardest portion of the trip was over when Denver was reached, though beyond that city barbed-wire cattle fences and irrigation ditches were often annoying. Through parts of Nebraska and Iowa the muddy condition of the roads made the travel almost amphibious, but through Illinois to Chicago, the conditions were excellent. From that city to New York, little trouble was found beyond occasional muddy stretches, and during this part of the trip a good daily average was maintained.

The third journey of the year, the remarkable trip in the little single-cylinder Oldsmobile, was made by L. L. Whitman and E. L. Hammond, who left San Francisco on July 6, bearing a letter from Mayor Schmitz of that city to Mayor Low of New York. The machine was of the regular 5-horse-power runabout type, and carried, besides the occupants, only the most necessary articles. The road lay through Sacramento, Placerville, and Carson City to Reno, and was followed in a leisurely manner, no attempt at record time being made. Ogden, Utah, was reached after a hard struggle with the Great Desert of Nevada, which entailed considerable suffering from the alkali dust. During runs, which would last entire days, nothing was to be seen but sand and sage brush, but a two days' rest at Ogden

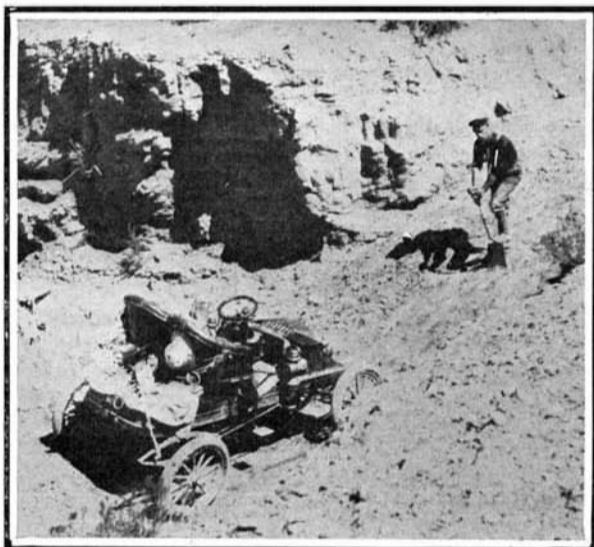
thoroughly refreshed the travelers. On several occasions the trail of the Packard party was noticed in the desert sands.

The trip to Denver from Reno lasted eight days, following the line of the Union Pacific Railway through Wyoming. This portion of the route was extremely difficult and after passing through Webber Canyon the terrible roads, rocks, washes, and alternate adobe mud and sand gave a great deal of trouble. Some good roads were

found over the Laramie plains, but otherwise it was almost necessary, at times, to make the road. The Rockies were crossed amid clouds and rain, and to Omaha the journey was enlivened by continuous rains and seas of mud. A nine-day wait at that city for better weather conditions proved to be of advantage, for with drier roads, the 600-mile run to Chicago was made

in four days. The mud was still bad, however, and the season seems to have been one of exceptionally heavy rains. From Detroit to New York the conditions for travel were far better, and in one afternoon 125 miles were covered. The city and the Atlantic were reached on September 17, after days and weeks of untiring effort. The travelers were enthusiastic about the machine, which was found to have stood the grueling journey splendidly.

The transcontinentai



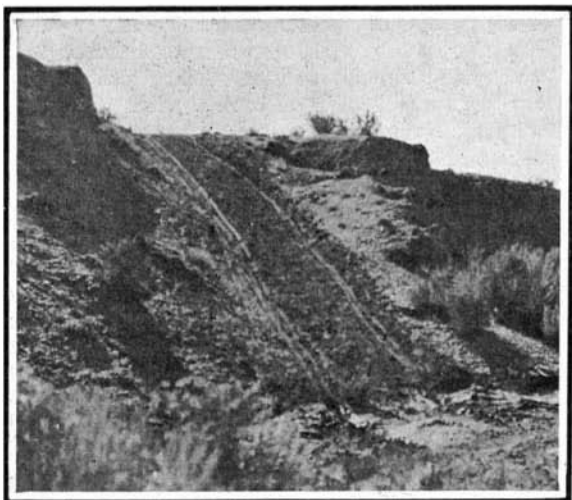
Preparing the Way for the Franklin to Climb Out of a Canyon in Wyoming.



Looking Over the Packard in the Desert Near Wimmemucca, Nevada.

ism was constantly subjected, the interruptions due to breakdowns were trivial. The course, east of Denver, lay through Omaha, Chicago, Cleveland, Buffalo, and Albany.

Crossing the Sierras from Placerville was often exciting, particularly the descent from the summit of the divide to Lake Tahoe, about 8,000 feet below, where at



A 50 Per Cent Grade 100 Feet Long.



Navigating Through Iowa Mud.

SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class Matter. Copyright, 1906, by Munn & Co.]

Vol. XCIV.—No. 2.
ESTABLISHED 1845.

NEW YORK, JANUARY 13, 1906.

[10 CENTS A COPY.
\$3.00 A YEAR.]



Water Toboggaming in the West.



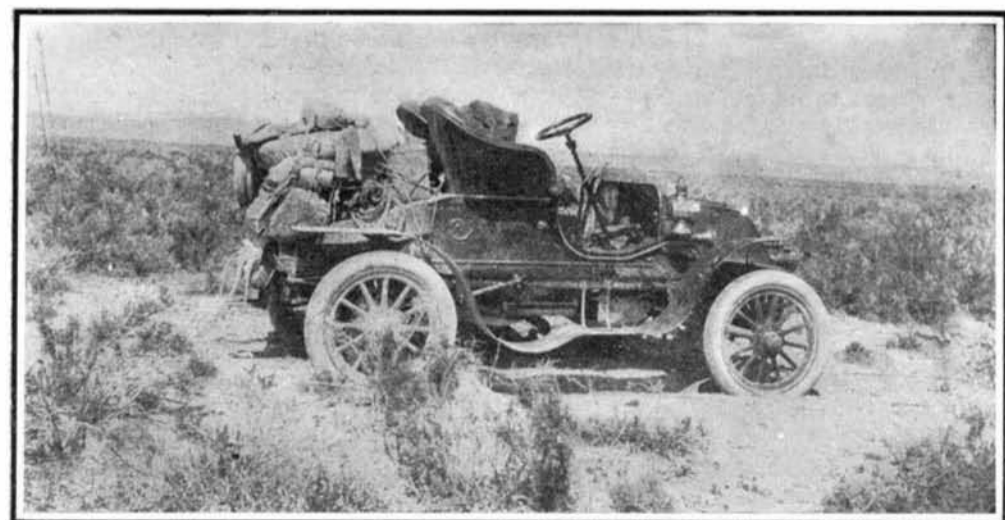
Reo "Mountaineer" Among the Hills and Sage Brush of Central Oregon.



The Air-Cooled Franklin Framed in the Walls of a Wyoming Canyon.



The Packard Proceeding Cautiously Through a Grand Western Gorge.



The First Car to Cross the Continent Resting in the Desert Sands.



The Winton Undergoing a Severe Tire Test.

TRYING EXPERIENCES DURING THE TRIPS OF CARS THAT HAVE CROSSED THE CONTINENT.—[See page 24.]

trip accomplished by L. L. Whitman and C. S. Carris, in a 10-horse-power Franklin car, in 1904, was remarkable in several ways, primarily as this was the first

Huss and Milford Wigle, reached the goal first, June 21, followed just one week later by P. F. Megargel and Barton Stanchfield, in "Old Steady." The cars, which

the cars were forced along through the mud under great difficulties. The distance from Omaha through Cheyenne to Laramie was safely accomplished, but the



A Western Hostel, Cottonwood Ranch, Idaho.



The Reo Experimenting. A Combination of Sand and Snow in Central Oregon.

air-cooled car to perform this arduous journey, and as the entire time between start and finish was less than 33 days, cutting the previous record of 61 days nearly in half. The start was made from San Francisco on August 1, in a regular four-cylinder stock car, and on September 3 the wayfarers entered New York city, having made the excellent daily average of 155 miles, the highest day's run being 325 miles. The entire journey was performed without serious accident of any kind, and at the finish the machine barely showed even the slightest evidence of the numerous hard knocks and the unmerciful driving it had undergone. The most difficult portion of the trip, naturally, was that which included the crossing of the Sierras, the Rockies, and the deserts. The Sierras were crossed through Emigrant Gap, from Colfax to Reno, and here the roads were terrible. At one point a descent of 1,200 feet in one mile was accomplished. From Reno through Utah the roads were almost a negative quantity, and the deep sand, canyons, and gulleys gave the travelers a hard time of it. The performance of the air-cooled motor in the blazing heat of the desert was splendid, 600 miles of this Sahara being crossed in seven days. Through Wyoming the course followed the Northern Pacific Railroad, and was difficult in the extreme. At one place, while running at full speed, the rear axle of the car struck a concealed sawed-off telegraph post, and this resulted in a dead stop, which precipitated the occupants of the car over the dashboard. Strangely enough, the only damage caused by this accident was a bent truss rod. Good roads were found across the Laramie plains, and the descent through the Rockies was safely concluded. Good weather permitted record speed to Omaha, and from there to the Atlantic the conditions were excellent, so that this portion of the trip was a mere pleasure jaunt.



The Packard Ready for the Mountains or the Desert.



Rough But the Last Resort in Nevada.

An interesting tour was that of the two Oldsmobile runabouts from New York to the Lewis and Clark Exposition last summer, for not only was the journey made by a partly new transcontinental route, but the two machines were racing for a prize of \$1,000 besides. "Old Scout," driven by Dwight D.

were of the ordinary runabout type, left New York May 8, and remained in company until Omaha was reached. Two weeks' rain had made the roads across Illinois, Iowa, and Nebraska almost impassable, and

journey from there to Boise, Idaho, appears to have been more of an athletic contest than a road race, as to begin with the roads were usually conspicuous by their absence, or, if present, almost beyond description. Through Idaho and Oregon they encountered the best roads west of Chicago, though there was some thrilling traveling across the Cascades. The time of the winning car was 44 days, 40 days being the actual running time.

The first round trip from ocean to ocean and return ever attempted was that undertaken by Percy F. Megargel and David Fassett, who left New York in the 16-horse-power double-opposed cylinder Reo touring car "Mountaineer," on Saturday, August 19, 1905. The Atlantic-to-Pacific portion of the trip has been successfully concluded, and the travelers are now on the return journey from San Francisco.

From New York westward to Wyoming the journeying was under excellent conditions, and 100 miles a day was easily covered. Crossing Wyoming the sand was often bad, especially in the Red Desert, and sand tires with which the "Mountaineer" was provided were very useful. The deep snow and terrific gales of the Rockies made the six days' travel over the mountains extremely dangerous, while at Bitter Creek a four days' delay was caused by an 8-foot rise of the water after heavy rain. Despite the hard going from Cheyenne the party reached Portland safely on November 10. At the present writing the tourists are nearing Albuquerque, New Mexico, on the southern return trip from San Francisco. This part of the trip has been far more thrilling and difficult than that to Portland. Coming over the Cajon Pass in California, the travelers had a very narrow escape when the car, skidding on a sandy road, turned over completely and rolled down a steep embankment though strangely enough, without material damage to mechanism or passengers.

The trip across the Great Desert was enlivened by a fierce sand storm. In the Arizona Mountains the snow was very troublesome, and near Flagstaff the travelers nearly perished in a terrible storm, being without food and gasoline for 36 hours. They were



An Unfortunate Investment in Illinois Real Estate.



Temporary Bridge of Railroad Ties Near Bitter Creek, Wyoming.

rescued by a search party seeking a lost ranchman, whose body was later found within a mile of the Reoites' camp.

The brief summary given above of cars which have crossed the continent would not be complete without mention of the trip made in 1904 by Mr. Charles T. Glidden in his English Napier. This machine ran to St. Louis in the tour to the Exposition, and thence to Minneapolis, Minn., where flanged wheels were placed upon it, and it completed the trip to the coast on the railroad track. For pleasure purposes this method of making the trip would seem to be ideal. But from a sporting and machine-racking point of view, the journey as accomplished by the six American cars was immeasurably superior. The record-holder, the air-cooled Franklin, is the only car fitted with a four-cylinder vertical motor, as well as the only air-cooled automobile that has ever made the trip. The other machines, also, are all of typical American construction, having horizontal single- and double-opposed-cylinder engines. Of the six successful cars, four are light runabouts, and three of these are of the same make. The American light car has thus proved itself the stanchest and most speedy of machines in a test such as has never been undertaken by European makers. Not only this, but the trip has also been made twice by motorcyclists—first in 1903 by George A. Wyman on a Yale-California machine, and second, last fall by W. C. Chadeayne on a Thomas Auto-Bi. The time of the former was 48½ days, and that of the latter 47 days, 11 hours, and 35 minutes.

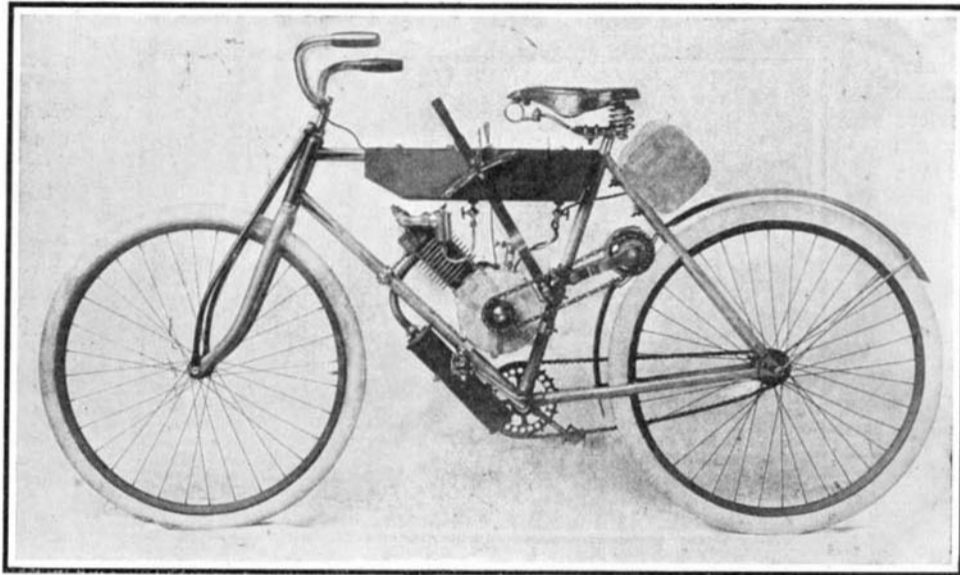
A MOTOR EQUIPMENT FOR BICYCLES.

Our illustration shows a compact power outfit for converting an ordinary bicycle into a motor-driven machine. This outfit can be readily attached by anyone with the aid of a few ordinary tools, as all the parts are clamped to the frame with bolts and nuts, and there is no brazing or soldering required. As can be seen from the cut, the motor drives, by means of a chain, a rubber-covered friction wheel placed in the rear triangle of the diamond frame, directly over the bicycle wheel. This friction wheel is carried in a fork pivoted upon the vertical post, and adapted to be pressed against the tire by means of the long lever shown in front of the seat. The machine is started with the friction wheel raised, and when the rider has it fully under way, he can throw in the friction, start the motor, and proceed under its power. In coasting or when riding in a crowded street, the motor can be stopped and the friction wheel raised. This is a very advantageous arrangement, as it is not necessary to run the motor except when it is in use. The whole outfit weighs but 45 pounds, and, with a 2-horse-power motor, the machine will carry its rider about 30 miles an hour.

A LIGHT FOUR-PASSENGER RUNABOUT.

The single-cylinder runabout with a box behind which opens and forms an extra seat, is one of the new light cars for 1906. In our illustration, Mr. R. E. Olds, the inventor, is shown at the wheel. This car is fitted with a 4½ x 6 engine, two speed, planetary transmission, and inclosed expanding ring brakes on the rear wheels. It is an extremely powerful little machine, capable of carrying four people 25 miles in

an hour with a consumption of but one gallon of gasoline. The chassis resembles closely that of the Reo touring car, which has two 4½ x 6 cylinders. The layout and construction of both cars is the same. The positive drive of the water pump directly from the engine crankshaft is a commendable feature, as is also the covering of the valve stems and springs with sheet-metal protectors to keep out dirt. The engine and transmission are mounted on a separate frame which is fastened in place on the main frame. The valves and spark plugs are in chambers placed above the cylinders and thus out of the way of oil. Individual carbureters and spark coils are used on the touring car, which is also fitted with a mechanical oiler. The Reo "Mountaineer"—the car which has crossed the continent and is expected back in time for the automobile show—is one of the regular double-opposed-cylinder touring cars. The Reo Company also makes a coupé on this same chassis, besides a new light four-cylinder touring car having three-speed transmission, shaft drive, a new type of universal joint, illus-



A 2-HORSE-POWER MOTOR WITH FRICTION DRIVE FOR CONVERTING AN ORDINARY BICYCLE INTO A POWER-DRIVEN MACHINE.

trated on page 38, and other interesting features.

A LIGHT AND SPEEDY RUNABOUT.

The light-weight runabout shown below is the new 10-horse-power Maxwell car intended for light and high-speed work. This machine is fitted with the usual double-opposed-cylinder Maxwell motor, placed crosswise beneath the bonnet and having a two-speed planetary transmission in the same case with the cranks of the motor, which makes it impossible for any of the movable parts to get out of line. The motor, which is a 4½ x 5, has been considerably improved over that used last year. The heads and valves are water-cooled, which enables a higher compression to be used. The transmission is fitted with a multiple disk clutch and runs in oil. The same automatic compression oiler is used as was employed last year on the Maxwell cars, and the rear axle and bevel gear drive are also identical. The propeller shaft has two universal joints, packed in grease. The rear axle is mounted on roller bearings. The side thrust of the bevel driving pinion is taken up by a blank roller of the same size as the driving pinion, and which is fitted against the smooth bevel face of the drive gear so as to hold the latter in position. The car is provided

with a steel body and pressed steel frame. Its official record of a mile in 1:18 is an indication of what may be expected of it in the way of speed on the level.

The Maxwell-Briscoe Company is another firm to this year bring out a new 4-cylinder 32-40 horse-power touring car. Besides this car, the company also makes a truck and a Limousine body car. The double-opposed-cylinder touring car and runabout, which were so successful last year, will also still be manufactured. The company now has three factories, and is turning out eight different models.

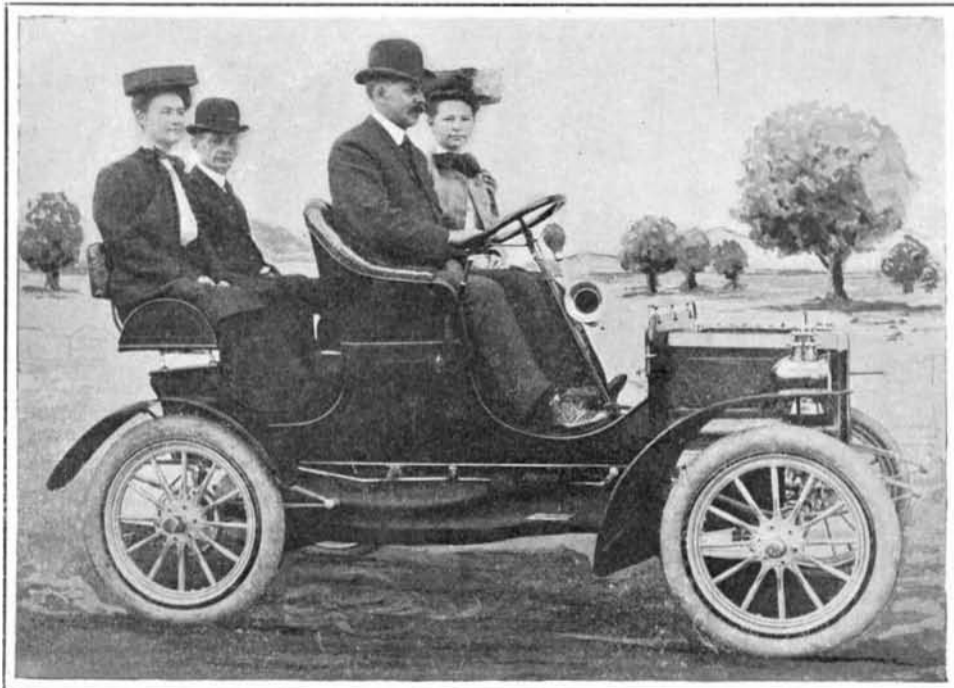
A Motor House Boat.

A luxurious motor house boat is in course of construction for the Marquis de Dion, who is so closely identified with the internal combustion engine of that name. The craft is 124 feet in length, with a beam of 16 feet 6 inches and of shallow draft. The boat will be provided with a sitting and sleeping compartment combined, a dining saloon 20 feet long by 15 feet broad, bedrooms, bathrooms, kitchen, captain's apartment, and quarters for the crew. With this motor water villa the owner intends to tour the various waterways and canals of France, accompanied by automobiles, with which he can indulge in land excursions when he so desires. Later the boat will wend its way through France to Marseilles, and thence round the coast to Monaco, where the owner will winter. The vessel will have a speed varying from eight to nine miles per hour.

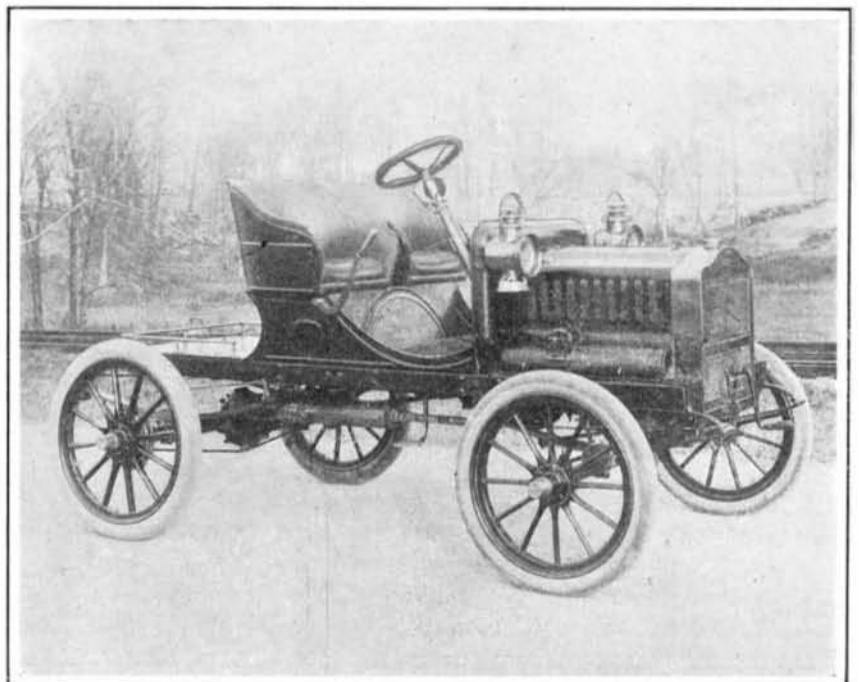
One of the most important moves in automobile building has been made by the American Locomotive Company. It involves the manufacture of the Berliet car in America, on the same plans and designs as are followed in the factory in France.

French workmen in Lyons and American workmen in the United States, working simultaneously, but three thousand miles apart, in the production of automobiles, the parts of which will interchange across the ocean, is a manufacturing accomplishment worthy of note. The French and American workmen might be standing side by side, so closely and exactly do they follow the same standards, templates, patterns, and gages. This is done in the construction of the Berliet car, so that an American-built car may be taken for a tour in Europe, or a Lyons-built car may be brought over for a tour in this country, and repair parts which are sure to fit are available nearby in either case. This will avoid months of such delays as are very familiar to the users of foreign-built cars. This is rendered possible by the use of the metric system and by maintaining the strictest conformity to standards, patterns, and gages and the closest adherence to specifications for material.

A new station for wireless telegraphy, according to the Neue Freie Presse, is being installed at Norddeich, in Germany, on the North Sea. The area covered by its operations will have a radius of over 900 miles, and will include Germany, Austria, Switzerland, France, Great Britain, and Denmark, as well as the greater part of Italy, Sweden, and Norway, and portions of Spain, the Balkan peninsula, and Russia. The station is being equipped with the Telefunken system.



THE NEW 8-HORSE-POWER, SINGLE-CYLINDER REO RUNABOUT FITTED WITH A FOLDING REAR SEAT FOR CARRYING TWO EXTRA PASSENGERS.



A 10-HORSE-POWER GENTLEMEN'S SPEEDSTER FITTED WITH DOUBLE-OPPOSED-CYLINDER ENGINE AND BEVEL-GEAR DRIVE.