



AN AUTOMOBILE OUTING.

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THE AUTOMOBILE: ITS PRESENT AND ITS FUTURE.

BY CHARLES BARNARD.

FOR three thousand years, perhaps for a much longer time, men have used horses in peace and in war. In all this time no one appears to have imagined that the time would ever come when we might not need so many horses. If we examine an old map of this country, we may trace a

black line beginning at Cumberland, in Maryland, and extending across the mountains to the Monongahela River above Pittsburg. This line indicated the great national road built by the United States as a highway from the East to the then far West in the Ohio

Valley. Over this great road thousands of horses traveled in endless processions, dragging great covered wagons; swift stage-coaches ran, day and night, carrying passengers and mails. This road with its enormous traffic was regarded as one of the wonders of the New World. Washington considered it a most important public work, and believed that all the country needed in the future were more horses and more national roads. To-day this long and costly road is almost forgotten. The great wagon-trains and swift stages long ago disappeared.

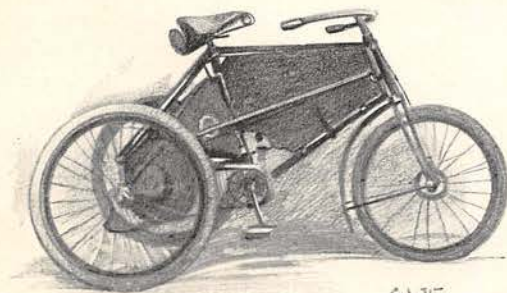
When, about sixty years ago, the railroads came, many people thought that horses would no longer be needed. This was soon seen to be a mistake. It was found that it took more horses to carry the freight and passengers to the railroad stations than were used before the railroads were built. When, about twelve years ago, the trolley-cars appeared, then many people said, "This time the horses will certainly retire, for there will be nothing for them to do." Has it been true? And now, within two years, people have said the horses will surely disappear, for here are carriages without horses. Do you believe that will be true?

In December, 1876, there appeared in *ST. NICHOLAS* the story of "The Horse Hotel." There then lived in New York thousands of horses that have since moved out of town or have passed away, after an honorable career as car-horses in our streets. Horses were so numerous at that time that they lived in great hotels, as you may see if you look at the volumes of *ST. NICHOLAS* read by your father and mother when they were children. To-day the great horse hotels, with guests, attendants, waiters, and all, are gone. Only in a few streets can the jangling bells of the poor old car-horses be heard, and in other cities than New York many readers of *ST. NICHOLAS* have never seen a horse-car. The trolley-car has thrown perhaps a hundred thousand horses out of work, and these horses have been moved away to farms and smaller towns, or have found new employment. Naturally, in the twelve years that this change has been going on many thousands of horses have died of work and old age, and, while many young colts constantly come in from the farms, there are not so many horses in our streets as in the days before the trolley-cars. There will be a new census of the country next year, and then we shall know, for the first time, whether it is true that we are not using so many horses as ten years ago. Up to the last census the number

If, on the other hand, the next census shows that we do not own as many horses, or that increase is less rapid, we shall be glad, because we are now learning to get along without them. With fewer horses we shall have better horses. We have had too many horses in all our cities, and the trolley lines have proved to us that it would be far pleasanter if there were no horses at all, except in the country. The light, fast-walking horse used on the cars is rapidly disappearing. We do not want him any more, so the farmer does not bring that kind of colt to market. We have now only two kinds of horses—the truck- or work-horse, and the pleasure-carriage and riding horse. The truck-horse stays downtown, and it is the carriage-horse who chiefly occupies our uptown streets. And now the question has come as to whether we need even this horse in our streets. He is a road-horse, and his place is on the road; and when he leaves the city streets, never to return, New York will be a sweeter, cleaner, pleasanter, safer, and far more healthful place than it is now. Already, in some cities, it is proposed that all horses be excluded from certain streets, because it is believed we can get along very well without them.

This will be a more remarkable change than the change from horse-cars to trolley-cars, and we may well wonder what it is that can have started so remarkable a change in the streets of our cities. To understand this, we must observe that every new thing is preceded by others somewhat like it. When the safety bicycle came we had already seen the high-wheel bicycle. That machine was a failure, and disappeared, just as did the velocipede before it; yet it led the way to the present bicycle. Inventions sometimes come too soon, before the people are ready for them. The bicycle is in general use, but we are not yet ready for it, because we have so few good roads. We are hard at work trying to mend this by improving our roads, and with better roads more wheels will be used.

Now appears a new invention, and, like many others, it was preceded by a very similar invention, out of which it grew, so that we might say that one came from the other. To



G. A. W.

A MOTOR TRICYCLE.

of horses rapidly increased. This increase may stop and it may not; because, while the railroads, steamboats, and trolley lines have thrown so many horses out of employment, new work has been found for them, and we may find that, as they became cheaper, more private families were able to own horses.

understand the new invention, let us study the one we already have. Look at the wheels of your bicycle and compare them with the wheels of a wagon. The wagon wheel consists of a hub, a rim, and stout wooden spokes.

Compare this with your bicycle wheel. Here the weight is supported by the axle in the hub of the wheel, but in place of a stiff wooden spoke we have a slender wire that would not support even a very small



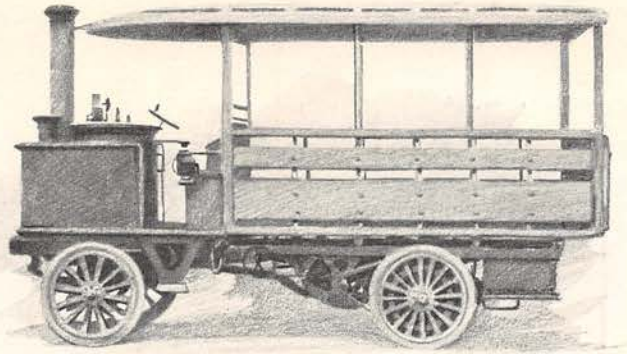
A MODERN HANSONM-CAB IN A NEW YORK STREET.

We see that the whole weight of the wagon is carried on the axles, and that one end of each axle is supported by the hub of a wheel. The hub is supported by the stiff spoke that stands directly under it at any particular moment. When the wagon moves, each spoke, in turn, comes under the hub and assists to support

weight. Wires support a pulling strain, and not a pushing or compression strain. So we find the weight is transferred from the hub to the rim by the wires *above* the hub. The weight is suspended on the wire spokes, and we call this a suspension wheel. In such a wheel all the spokes tie the rim together, and

the rim itself supports the weight in every position of the wheel.

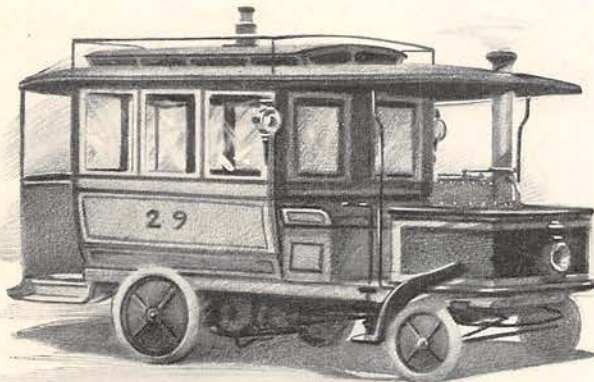
In the wagon wheel the axle rests directly on the inside of the hub. This wheel has a steel tire on the rim. In the bicycle wheel the axle rests upon steel balls inclosed in a casing in the hub of the wheel. The effect of this is to reduce the friction and make the wheel turn easily. The bicycle rim is inclosed in a rubber tire filled with compressed air that acts as a soft cushion or spring. Were your bicycle fitted with wagon wheels, it would require so much strength to move it that there would be no pleasure in riding for any long time.



AN ENGLISH STEAM-WAGON.

spin them along the road. Mr. Horse must think he has found a rather fine thing in the way of vehicles in these low bicycle-wheel carriages.

Then, we must observe one thing more: With these rubber-tired vehicles and with the bicycles came a demand for smooth, hard, even roads with easy grades. We learned, to our mortification, that our roads and streets were very bad indeed, and that we must have far better roads everywhere. All these things—better roads, lighter, easy-running wheels, and rubber tires—led the way to the new invention. They made it possible to make a carriage that would not need a horse. We have seen steam traction-engines

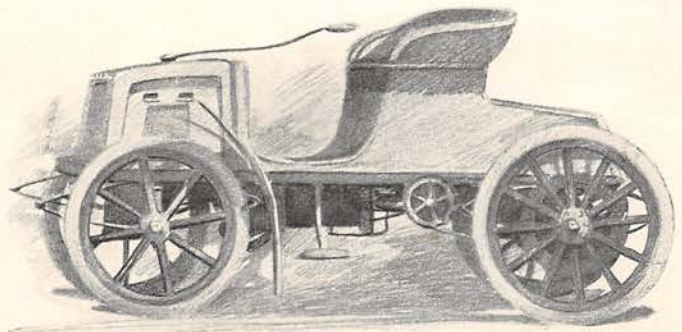


Geo. A. Williams '11

A FRENCH STEAM-OMNIBUS.

When it was seen that the bicycle could be moved so easily, some one said: "Why not put such wheels under a carriage? If it requires less strength to move it, the horse can travel faster and go farther." This was tried in buggies for speeding horses, and so great was the relief to the horse that very soon wire suspension wheels with ball bearings and rubber tires began to be applied to light pleasure-carriages. To-day we often see such carriages in the street, and we cannot fail to notice how easily and swiftly the horse can

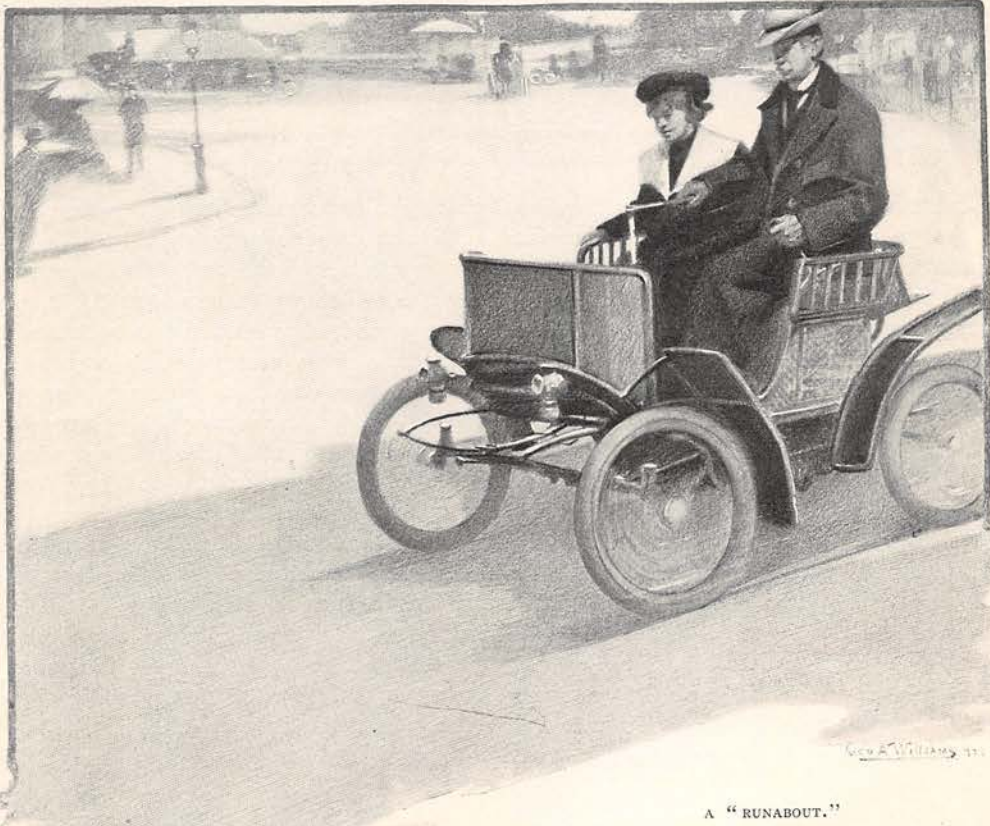
and self-moving steam-rollers, and long before railroads were invented there were attempts made to construct steam-carriages that would



LONG-DISTANCE GASOLENE RACER (FRENCH).

travel on our roads and carry passengers and baggage. Such carriages would hardly work at all on our bad roads, and it is hard to see what fun there would be riding on a steam-roller. The old steam-carriages failed and were abandoned because they were too early. The conditions were not right. There were no

The seat is in front, and there is a closed and covered box behind and under the seat. Take a seat, please, on the right, while I turn this crank. Don't be alarmed; she will not start. This crank fits into a socket in the side of the buggy, and a few turns set the motor going. There! Now we are ready, and I'll put the



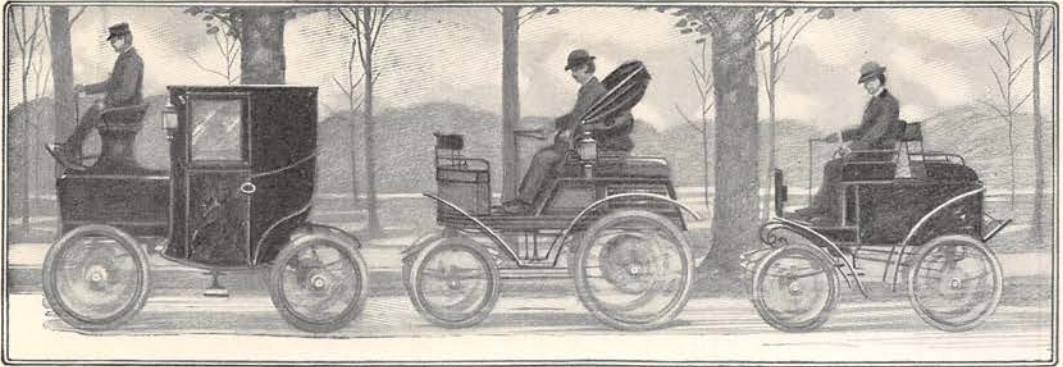
A "RUNABOUT."

bicycle wheels, no ball bearings, no rubber tires, and no good roads. To-day the conditions are just right. The bicycle taught us what to do, and on the smooth, hard asphalt street or the macadamized road we hear the electric bell of the new carriage without horses. "The carriage waits." Let us take a ride on a "runabout" with seats for two.

Why! it's really a buggy—on bicycle wheels.

crank inside. Yes, he does tremble a little, as if eager to rush away. Now! All ready! I'll sit on the left, where I can see the road.

How perfectly delightful! The runabout is well named; for it can certainly run. No horse in front; no reins to handle; no whip; no big creature with a will of his own to be guided, urged, and controlled; and nothing to obstruct the clear view in front, nothing to obstruct the rush of pure air as the carriage flies swiftly over the asphalt. Eight, ten, twelve miles an hour. It could be more—could be twenty-five miles an hour; but twelve miles an hour is as fast as is safe in city streets.



A PROCESSION OF AUTOMOBILES.

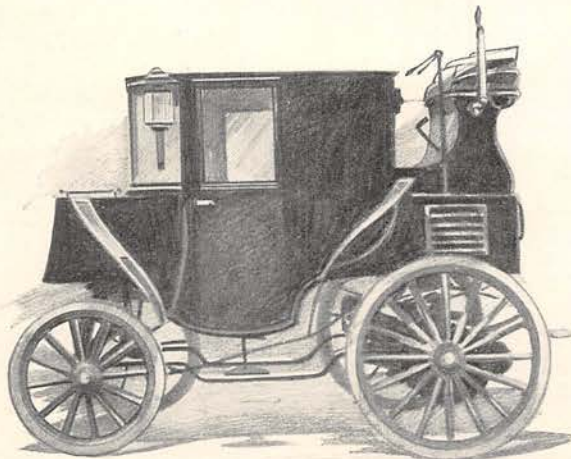
We overtake teams, carriages, and bicycles, and pass them all. We meet a trolley-car on a cross-street, and slow up to let it pass. As we stop we feel the slight jar of the motor, for it is working away while we wait. On again, turning neatly round the end of the car and rushing swiftly forward. Look out!—man crossing the street. He sees us and stops, and stands frightened and irresolute. If he would go right on he would be safe. The carriage runs swiftly, turns completely round him, and goes on. Danger? Not the slightest, because the carriage is under complete control.

The carriage is steered by this steel bar in front of the seat. Try it. See how lightly it moves to the right or left. The gentle pressure of a finger on the bar guides the carriage, and, should you wish, it can turn round and round in a dizzy circle on one spot. It steers quicker and better than a boat, much more surely and evenly than any horse. How far can we go without stopping? At ten miles an hour, it will travel ten hours, or one hundred miles. Then, to return or to go on, we have only to stop at a grocery store and buy a few quarts of gasolene, load up the reservoir, and

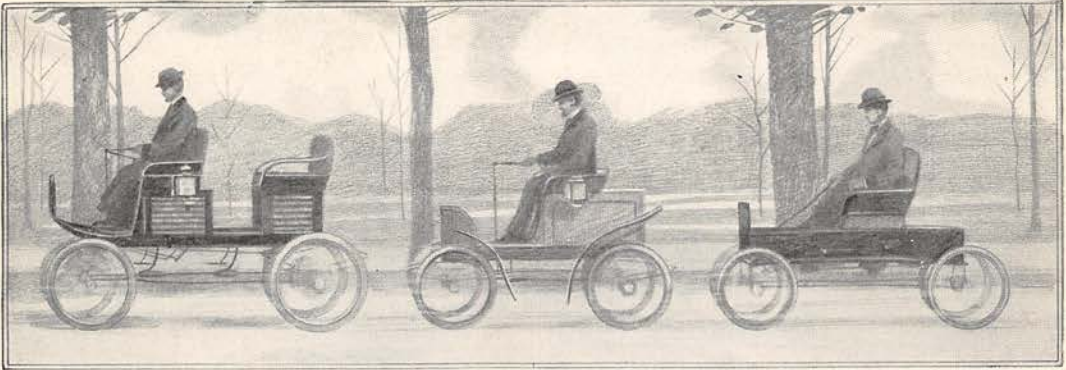
travel on for another hundred miles at the same rate of speed as before.

We ride on, up hill and down, over pavement, asphalt, macadamized road, or plain country road, now fast, now slow, stopping, starting, backing, turning sharp corners and wide corners, and, if necessary, stopping quickly—in fact, far more quickly than a horse can stop. And all of this without a horse, in absolute safety, certainty, and precision, at the touch of a hand or a foot. As no horse beats the road with iron shoes, there is no warning of our approach, so we touch an electric bell to warn all who may be in the road to look out. At night, electric lamps light up the road before us and warn other teams of our approach. The seat is roomy and comfortable, and the carriage rides smoothly and with very little jar or noise. Above all, we

have not to think for or care for the horse. He must be told, every step of the way, just where to go, where to turn, and when to stop. He will stop of his own sweet will if he wishes to, or if he feels hungry or tired, or if he wants to go home. He may be sick or lame, and that would destroy all



AN ELECTRIC COACH.



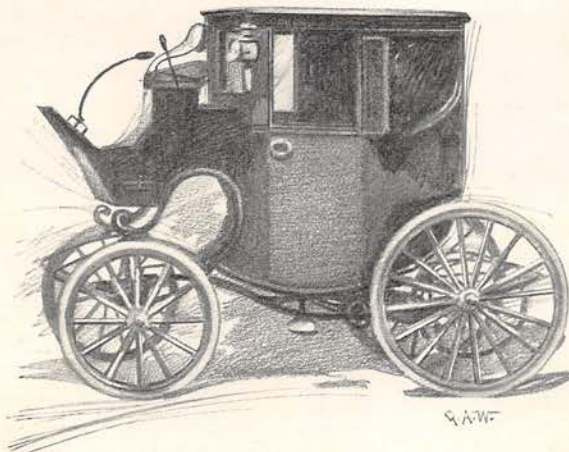
VARIOUS TYPES OF LIGHT WAGONS.

the pleasure of the ride, because we could not be so cruel as to make him suffer for our pleasure. Now we forget all that, for the whirring motor that is making us fly along the road will never grow tired, never suffer, never try to go one way when we want to go another. There is no horse living that could carry us a hundred miles in five hours. On a clear, good road this carriage could easily do it, and, in ten minutes, do it again. Had we used a horse to take a ride of twenty-five miles, we should be obliged to give him a supper, let him rest all night, and give him breakfast next morning, before he could carry us another twenty-five miles. This carriage might run all day and all night and all the next day, and several days and nights, with only stops of a few moments each to get fresh fuel for the motor. We should be tired out long before the machine.

When we return, the carriage is run into its stable and halts. A touch of the finger, and the motor stops. There is nothing to be done to it, except to wipe off the dust and see that the motor is oiled and cleaned. There it can stand for an hour, a day, or a month, and it will cost nothing. It may rain for a week, and we may

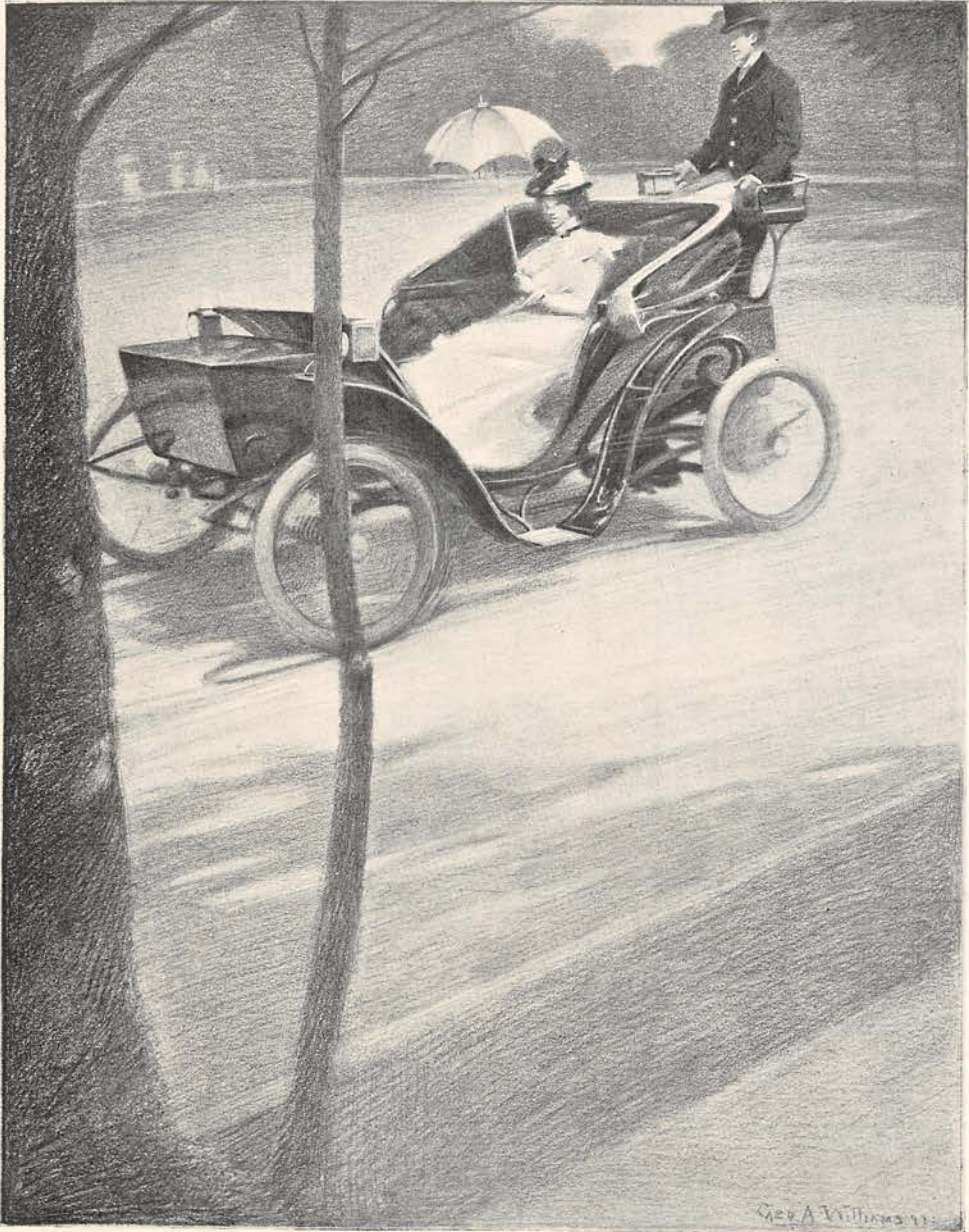
not care to ride. If we kept a horse, he would have to be fed, groomed, and exercised, whether we wished to ride or not. This all costs us time, labor, and money. The motor-carriage costs nothing until it is used again.

We open the cover of the box at the back of the seat, and find all the machinery stowed neatly away, safe from rain or dust. It consists essentially of a tank for holding the gasoline, a motor or gas-engine, a cooling-tank filled with water, and the connections for controlling, starting, and stopping the engine. There are also batteries for the electric lights and bell, and for assisting the operation of the motor. There are also brakes for stopping the vehicle, and the proper connections for changing the speed, steering, and backing. With the box at the back closed, the carriage is a neat vehicle, and looks precisely like any single-seat buggy on low wheels.



AN ELECTRIC BROUGHAM.

In New York we take the trolley-car downtown, and we transfer at Twenty-ninth Street. Here is a large car that looks exactly like a trolley-car, except that here there is no trolley-pole overhead. We see there is no slot in the track, so it cannot be a cable or underground-electric car.



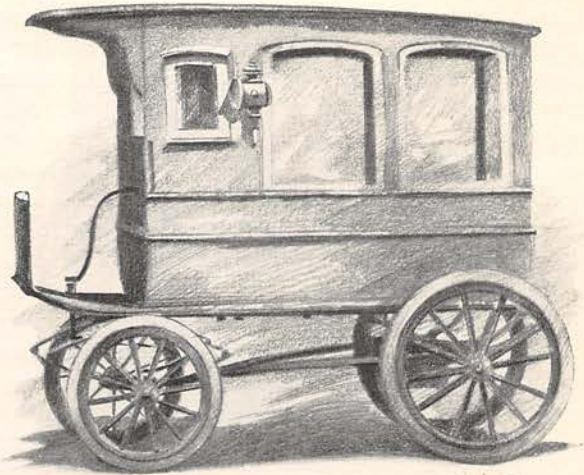
A PARK VICTORIA.

We enter the car, and find that it is just like any car, except that the seats are a trifle higher than usual and are all closed in below. The car starts slowly and easily and without jerk or jar, and is soon running swiftly toward the Hudson River. This is another motor vehicle, and, if we listen carefully, we hear a

faint puffing sound like a steam-engine. Presently the car reaches the West Twenty-third Street Ferry, and we get out to examine this new motor-car. We see a large building with a sign,—“Air Power Company,”—and looking in at the big door, see great steam-boilers, and, beyond them, see and hear a powerful steam-

engine. This engine is compressing air—squeezing it, under great pressure, into steel tanks. We go to another door, and see an empty car arrive from its trip on the road. A man brings a long pipe, that hangs from the ceiling, up to the side of the car. He connects it with the car and opens a valve. In the car, under the seats, are steel cylinders. He is now charging these cylinders with compressed air. In a moment or two the gage on the car shows that they are full. He shuts off the air, disconnects the pipe, and the loud explosion tells us something of the power he has forced into the tanks in the car. The motor-man turns his lever on the front platform, and the car rolls out into the street, ready for another trip. Here again is a motor-car—a horse-car without horses. Under the car is a motor connected with the wheels precisely as on a locomotive—with, however, this difference: a locomotive uses the elastic pressure of steam from its boiler; this car uses the elastic pressure of compressed air stored in its tanks.

We go back toward Broadway in one of these self-moving cars, and, reaching the neighborhood of Madison Square, soon happen on an electric cab. Let us try another ride in a self-moving carriage. This time it is a hansom-cab, with small wheels and rubber tires. We tell the driver we wish to go to the cab company's stables. The driver is behind us, so we are not able to see exactly what he is doing. We need not care, for we cannot fail to admire the skill with which he guides



A DELIVERY WAGON.

us through the maze of carriages on Fifth Avenue. The cab goes fast or slow, stops, starts, backs, turns in any direction, and in a moment we forget all fear and give ourselves up to the delightful sense of speed, freedom, and safety. It is a real pleasure to be free from the too close companionship of a horse. We can ride close to the ground and with a free view in front, and in open air. It is not surprising that these cabs are so popular, for this is the perfection of pleasure-riding.

Presently we turn into a side street and cross to Broadway, and near an uptown street our cab enters a large door and stops within its stable. How different from a horses' stable! There, hostlers and harnessmen; and here, motormen and carriages. It is a little dark, and there is a faint smell of acids, but this is better than the unwholesome and



A FRENCH MAIL-COACH.

even dangerous air of a stable. Our motorman turns the cab about and backs it upon a platform, while an assistant opens a door at the rear of the cab. An iron arm is thrust forward toward the cab, and at once draws back again, dragging from the cab a large black box. It disappears, and another box is pushed into the cab. The door is closed, and the cab moves forward and takes its place with the others ready for the next trip.

This seems something like the compressed-air car. We go to another part of the stable, and see hundreds of these black boxes. We see wires leading to them, and the man in charge tells us they are electrical storage batteries. He has a powerful current of electricity from the power-station downtown, and turning it into one of these batteries, he so changes its condition that it will afterward give out almost as much electricity as is put into it. He says he "stores electricity" in these boxes, or batteries.

Under the cab is an electric motor that, after it has been connected with the storage battery long enough to charge it, will give its power to the wheels of the cab and cause it to travel for twenty miles.

Observe the difference between this cab and the runabout and the street-car. In the car we had a tank filled with compressed air. Here we have a battery charged with electricity. In the runabout we had a motor using vaporized gasolene. These three vehicles represent the three principal methods of driving a vehicle that is automatic, or self-moving—electricity, compressed air, and a gas-motor.

There is also one more horseless vehicle—a steam-carriage using gasolene or naphtha to make steam for a little steam-engine. This method is practical, though not yet used so much as the gas-engine system and the electric system. Each of these four systems has its advantages. The gas-motor carriage can go farther than the electric carriage, and it is lighter. The electric carriage is cleaner, simpler in management, and makes less noise. The compressed-air motor will carry its car or carriage only as far as the supply of the air holds out. Then it must be reloaded at the

power-house. The same is true of the electric carriage. The gasolene, petroleum, or steam carriage can go wherever it can find fuel, and this it can obtain almost anywhere.

Horseless vehicles are now made with wire suspension wheels, and also with wooden wheels, and all have either pneumatic or solid rubber tires. They are usually quite low, because it is not necessary to use high wheels when there is no horse in front, and a low vehicle is safer than a high one. Horseless vehicles are made in all the styles in which horse vehicles are made—road-wagons, buggies, surreys, phaëtons, victorias, delivery wagons, etc.

There are also two-, three-, and four-wheel motor-cycles, or self-moving bicycles, for one, two, or three passengers, and driven with every sort of motive power.

There are now in Europe about ten thousand public and private vehicles that are self-moving. They are usually called "automobiles." Of these, fifty-six hundred are owned in France and three hundred in Great Britain. It is thought that there are now about three hundred such vehicles in this country. This small number will rapidly increase, and within a year there may be three thousand, perhaps many more.

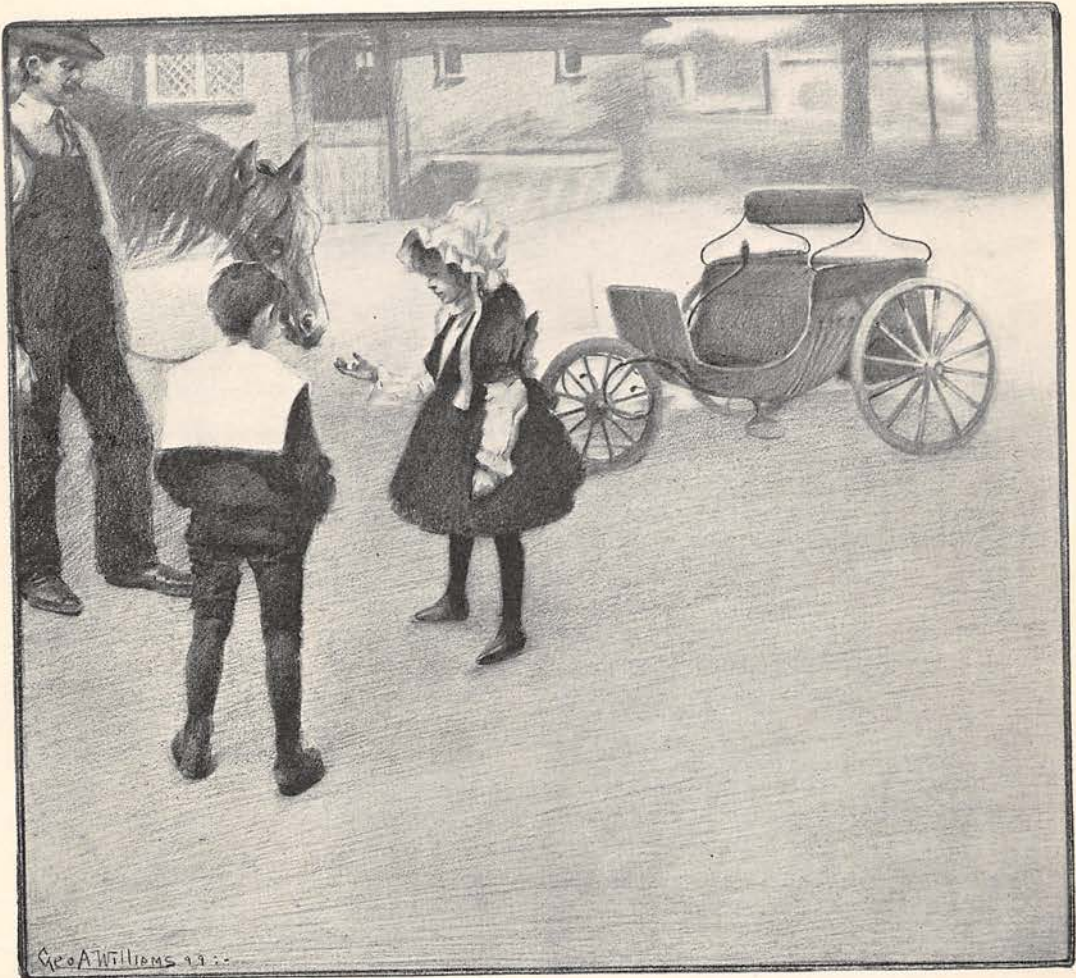
The automobile is the coming vehicle. We shall see it in all our cities and along our country roads. They are safe, fast, comfortable, and to use and ride in one is a pleasure we all want to enjoy. They are now, while new, comparatively costly; but, like the sewing-machine and the bicycle, they are useful tools, and what is useful all the people want, and what every one wants soon becomes cheap, because of a large demand.

The automobile is a practical, useful vehicle. It gives us an entirely new pleasure—the pleasure of guiding and controlling a splendid piece of scientific machinery, the pleasure of traveling without a horse.

There will always be horses. Such a grand, strong, swift, and patient creature is too good a friend to send away. There will not be so many horses, and those we have will be better horses. There are too many horses now, and when we see the advantages of teams, cars, trucks, and carriages without

horses, we may wonder that we were obliged to use the great beasts so long. On the farm, on the road, and in the park they will still be useful and valuable. There they will be in the right place; for a crowded city, where so many people live so closely packed, is not precisely the best place for a horse to live, too.

We may imagine the child of the twentieth century saying: "Good-by, Mr. Horse! Your city hotel is closed. We thank you for all you have done for us. Go back to your farm and live in peace and comfort. Do the work you can do, and please don't feel offended if we prefer to go to ride without you."



"GOOD-BY, MR. HORSE!"