

SOME AUTOMOBILES EXHIBITED AT THE PARIS EXPOSITION.

A great number of light vehicles are now being made by the leading firms, to supply the increasing demand for this type of machine; most of these use petroleum motors. The illustration shows a typical machine of this kind for two places, built by the Créanche Company. The same machine may be adapted for three places by adding a light seat in the rear supported upon brackets. The motor is of the De Dion type, of three horse power, with water refrigeration; it is increased to four horse power for the three-seated machine. The motor is mounted in front upon a movable plate, which slides upon the truck. The plate carries not only the motor, but most of the apparatus, the carbureter, water and gasoline reservoirs, etc. It is worked by a lever, which displaces it so as to stretch a belt which passes over a wide pulley which has three times the width of the belt, and allowing the latter to be shifted upon a set of three pulleys placed upon the shaft of the differential. From this shaft a chain passes to the rear wheels. This arrangement gives three speeds, 5, 10 and 20 miles an hour, besides the back movement. The motor is

induced and the piston stroke; they have twin cylinders whose cranks are 180 degrees apart. The motors have several improvements; the admission of gas from the carbureter is by vertical valves and the exhaust by horizontal valves, operated by cams placed on the shaft which carries the governor. The latter has two masses whose displacement by centrifugal force acts upon the cams and changes their position with relation to the valves. When the motor is working at full load, the two cylinders make their complete admission and exhaust, but when working at less power, at times of slower speed, the regulator eliminates automatically the first cylinder, then the second in whole or part. This is accomplished by acting upon the exhaust and leaving a certain proportion of burned gas in the cylinders. Thus for the first cylinder the action is such that the cam does not operate the escapement valve, and the whole of the burned gas remains in the cylinder, preventing further admission of fresh gas, and consequently the cylinder is inactive. For the second cylinder the cam is arranged so that by shifting it, one-third or two-thirds of the cylinder may be left full of burned gas, with a consequent slowing down, or when entirely full, the whole motor is stopped.

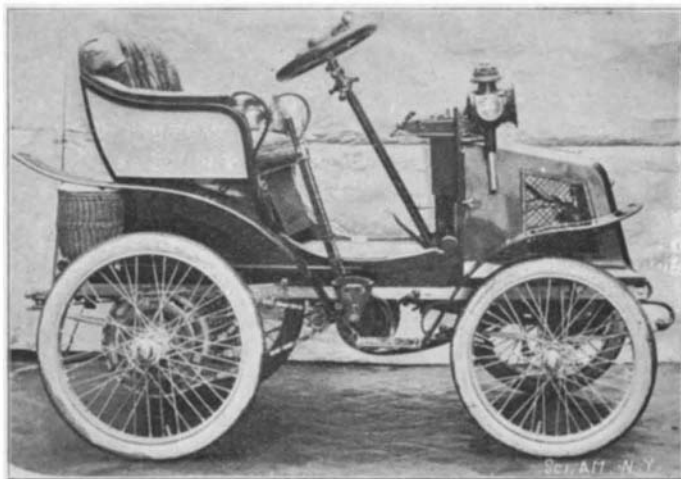
The speed of the motor may be varied at will by acting upon the regulator by a small lever placed in front of the conductor. The lever acts upon the spring of the governor and varies its movement, and thus speeds from 400 to 1,200 revolutions per minute may be obtained; the normal is from 700 to 800. The

Economical Production of Water-Gas.

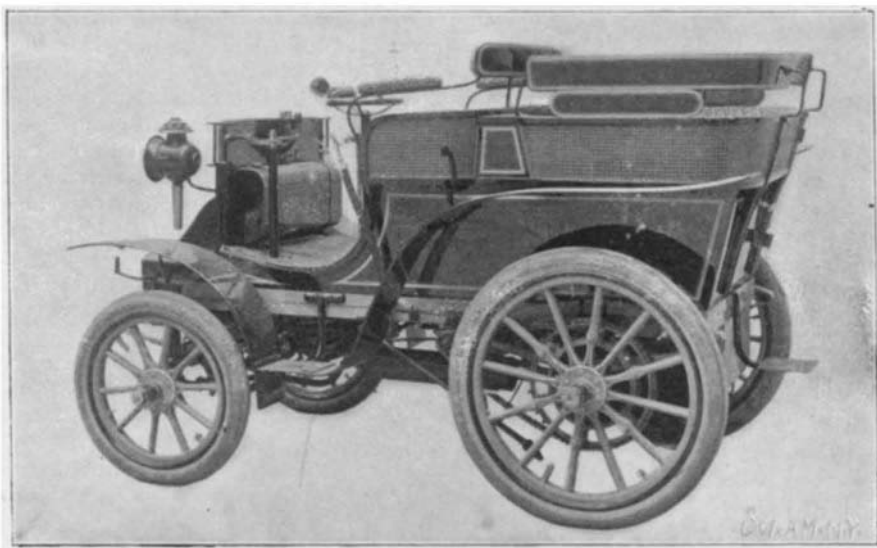
A new process for the production of water-gas is that known as the Dellwick-Fleischer system, which is now being used with some success in different places in Europe. In this process the production of gas is divided into two periods; in the first, hot air is forced into the grate for about ten minutes, so as to bring the coke to the highest possible temperature; in the second part, steam is sent into the generator, while the temperature is high enough to obtain the decomposition of water, that is to say, from four to five minutes. During the first period the apparatus works like a Siemens generator and permits the dissociation of carbonic acid and nitrogen compounds. The first series of experiments were made at Warstein, in Westphalia, with Essen gas coke containing 87.6 per cent of carbon; 95 cubic feet of gas per pound of coke were thus obtained, but this figure should be reduced to 80, taking into account the coke necessary for the heating of the air and the production of steam. In this way the quantity of gas is doubled. The gas has a density of 0.536 and a calorific power of about 2,000 per pound. It contains 0.75 of hydrogen, 0.20 of carbon monoxide, 3.93 of nitrogen, and 0.88 per cent of other gases. Although the Dell-



AUTOMOBILE SECTION IN THE TRANSPORTATION PALACE AT THE PARIS EXPOSITION.



CREANCHE MOTOR CARRIAGE FOR TWO PERSONS.



RICHARD MOTOR CARRIAGE.



RICHARD DOUBLE PHAETON.

controlled by a small lever in front, while the large hand-lever seen at the side controls the starting of the machine, stopping, and the different movements without stopping the motor.

Another type of electric vehicle is built by the same firm. It has two places. The motor, of the B. G. S. type, is of four horse power, and operates directly the differential carrying the chain pulleys which drive the rear wheels. The speed-changing, forward and back movement, and electric braking are all controlled by a small handle placed to the right of the conductor, which works the controller cylinder. The batteries are contained in seven rectangular boxes placed three in front and four in rear of the vehicle, and may be easily taken out by doors which let down in front and rear. The accumulators have a duration of over five hours upon a 15 ampere discharge. The motor takes in normal running about 10 amperes at 90 volts. The batteries are arranged so as to be charged without taking them out of the vehicle.

The George Richard Company showed a number of machines, two of which will be seen in the illustrations. Types similar to these were used in the recent army maneuvers. The motors used are 7 and 10 horse power, these differing only in the diameter of the cyl-

induced and the piston stroke; they have twin cylinders whose cranks are 180 degrees apart. The motors have several improvements; the admission of gas from the carbureter is by vertical valves and the exhaust by horizontal valves, operated by cams placed on the shaft which carries the governor. The latter has two masses whose displacement by centrifugal force acts upon the cams and changes their position with relation to the valves. When the motor is working at full load, the two cylinders make their complete admission and exhaust, but when working at less power, at times of slower speed, the regulator eliminates automatically the first cylinder, then the second in whole or part. This is accomplished by acting upon the exhaust and leaving a certain proportion of burned gas in the cylinders. Thus for the first cylinder the action is such that the cam does not operate the escapement valve, and the whole of the burned gas remains in the cylinder, preventing further admission of fresh gas, and consequently the cylinder is inactive. For the second cylinder the cam is arranged so that by shifting it, one-third or two-thirds of the cylinder may be left full of burned gas, with a consequent slowing down, or when entirely full, the whole motor is stopped.

AN electric railroad between Rome and Naples is proposed, the line being 133 miles long. The idea is to furnish fast trains, with frequent service.

wick-Fleischer process has existed for only two years, it is already considerably used on the Continent, and there are no less than thirty generators in operation which furnish gas for various uses. It is employed specially for tube-welding, in boiler furnaces, etc.

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With the present issue, which will be the last in the century, the SCIENTIFIC AMERICAN closes the fifty-fifth year of its existence. In this long period of time it has chronicled the scientific progress of the times and the important discoveries and inventions, and the history of the latter half of the nineteenth century can be better written from its pages than from any other source. Many subscriptions expire with the present issue, and our subscribers are urged, therefore, to renew their subscriptions promptly, in order that the paper may be received without interruption, as an expired subscription will not be continued after this issue. Those who are not subscribers to the SUPPLEMENT would do well to include this issue in their new subscription, and thus derive the benefit of the reduced combined rates. The progress in the twentieth century bids fair to eclipse even that made in the nineteenth, and all those who desire to keep abreast of the times should subscribe to the SCIENTIFIC AMERICAN.