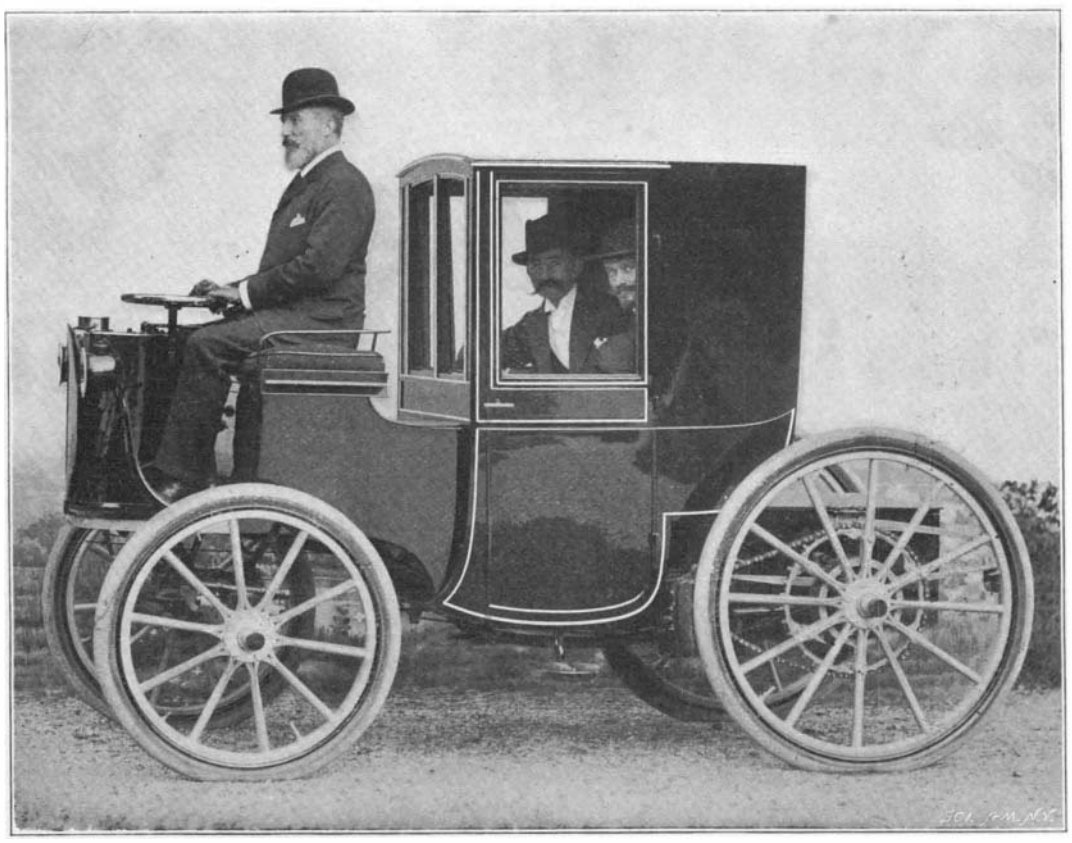
SOME FRENCH TYPES OF AUTOMOBILES.

BY C. DE KUBICKI.

Among the most important of the systems of electric vehicles now constructed in France may be mentioned that of the Jeantaud Company. M. Jeantaud is one of the pioneers in automobile work, having taken up the question several years ago, when the subject was new and first attracted attention in France. Being at the head of a large carriage establishment, he was well equipped for entering the new field, and at the present time the automobiles made by this company are among the best known in Paris. M. Jeantaud was one of the founders of the Automobile Club of France and is one of the leading members of the Civil Engineers' Society.

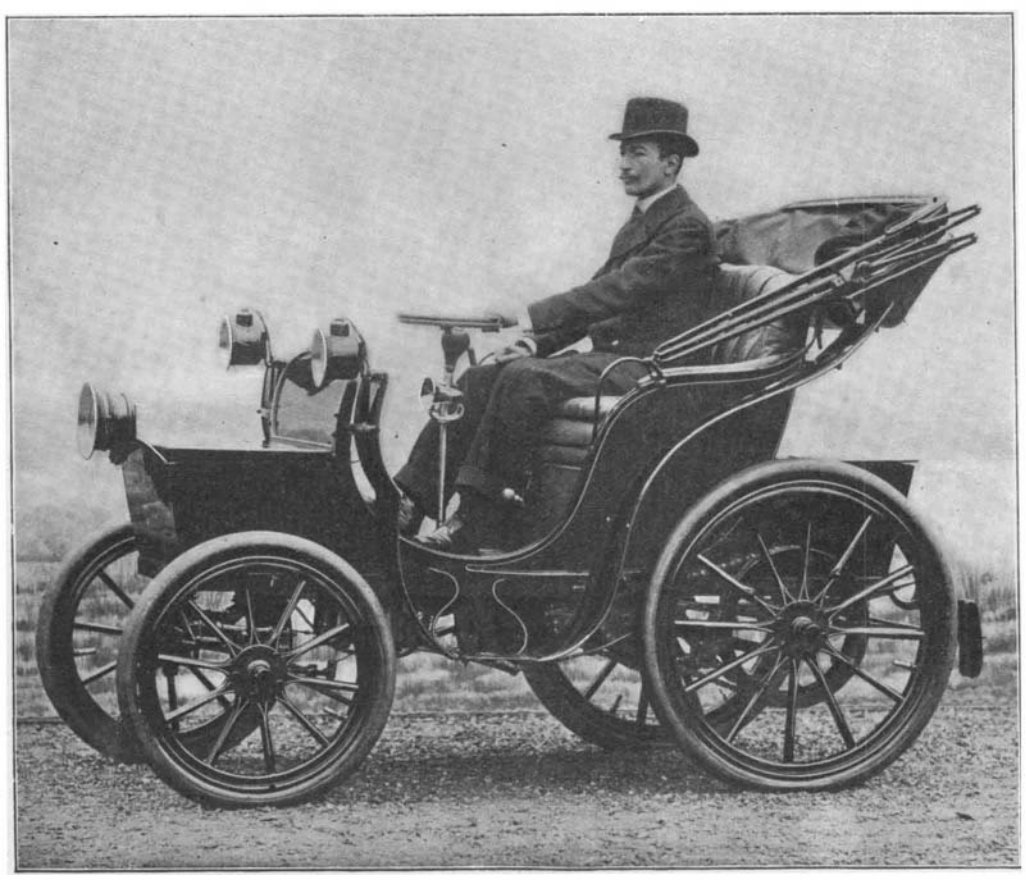
The figures show two of the leading types of vehicles made by this firm. Our first illustration shows a two or three-seated cab for use in city service, with M. Jeantaud acting as driver. The two seated carriage shown in our other engraving is conducted by the Count of Chasseloup-Laubat, one of the leading spirits in automobile affairs and an energetic promoter of the various exhibitions and tests which have been made in Paris under the direction of the Automobile Club.



JEANTAUD ELECTRIC CAB, WITH M. JEANTAUD ON THE BOX.

The type of motor adopted by M. Jeantaud for all of his vehicles is that in which the exterior of the motor is arranged to entirely inclose the working parts, somewhat similar to the motors used on electric railways. The speed of the motor is reduced by a pinion and large gear wheel, which, with the differential gearing, are completely inclosed in the envelope of the motor, thus forming a compact whole. In this way the working parts are protected from dust and moisture. The motor is fixed in a convenient place upon the framework of the vehicle between the front and rear axles. At each end of the casing projects a shaft of the differential, carrying a small chain-wheel, over which the chain passes to a similar large wheel on the rear axle. M. Jeantaud prefers the method of driving the rear wheels of the vehicle by chain-wheels in this way, but has also experimented with different methods of transmission. In one of these the rear wheels are driven each by a separate motor. A large gear wheel is fixed to the main axle, on the inner side of the driving wheel, and engages directly with the pinion of the motor. This disposition has the advantage of doing away with the use of differential gearing and makes the system less complicated, each wheel with its motor becoming an independent unit. A system similar to this is now used with success by the Krieger Company. The motors, however, drive the front instead of the rear wheels. Another method, used by M. Jeantaud has been that in which the motor is mounted like a motor for electric traction, that is to say, suspended from the axle driving it by means of a single reduction gearing, the whole being inclosed in a tight case.

In all these different arrangements, the rear wheels are driven by the motor, and the front wheels used to guide the vehicle. Another system has been tried, by which the front wheels are driven. A single motor is fixed to the frame near the center of the vehicle which operates the differential by means of single reduction gearing. The differential drives the two front wheels by a system of bevel gearing which permits the vehicle to be steered in any direction without interfering with the working of the driving mechanism.



ELECTRIC PHAETON DRIVEN BY COUNT DE CHASSELOUP-LAUBAT.

The motors used in these different arrangements are of the Postel-Vinay type, and weigh from 60 to 150 kilogrammes, according to the size of the vehicle. The speed varies from 1,200 to 2,000 revolutions per minute. The same type of controller is used in all these vehicles; it is a vertical drum carrying the different contacts and operated by a horizontal handle, as will be seen in the figure; it is arranged to give different speeds of 4, 8, 12, and 16 kilometers per hour, 12 being the normal speed. A backward motion of 4 kilometers per hour is also provided for. In order to avoid abrupt changes in passing from one speed to another, M. Jeantaud uses a pedal which, acting upon a resistance in the circuit of the motor, modifies the current before the change is made by the controlier. This arrangement has proved very satisfactory in practice, and insures easy running; however, the introduction of resistances is always accompanied by a corresponding waste of energy.

The different French constructors are about equally divided as to the question of using resistances in connection with the controller; some prefer to use only the different combinations of accumulators and windings of the motor. The system of M. Jeantaud has the advantage of obtaining a variation of speed from zero up to the maximum without abrupt changes or shocks. By means of the pedal spoken of, the current may also be cut off, and the electric brake put on with increasing effect up to the maximum, in which case the motor terminals are connected directly to the brake. The electric brakes on these vehicles, as well as on those of most of the French makes, work very satisfactorily, as was shown in this year's tests of electric vehicles; they were made to run down a steep grade at full speed, and the brakes were applied at a given signal. Most of them were able to come to a full stop within a distance of 8 meters.

In the annual competitive tests just mentioned, which were held under the direction of the Automobile Club, M. Jeantaud entered a number of electric cabs and four-seated carriages, all of which made a good showing, and covered the distance of 60 kilometers laid out over the streets of the city and suburbs in less than four hours, making an average time of 15 kilometers per hour. The maximum consumption of energy has been about 10 kilowatt hours. The tests were made during ten days, and the total distance covered was 6,000 kilometers.

In his presentation of the subject of electric vehicles before the Society of Civil Engineers of France, M. Jeantaud describes his system as well as those of his principal competitors which are in general use. He is of the opinion that the problem of city service will be solved by electric cabs. The competitive tests held in Paris this year seem to favor this idea, and with the influence of the Automobile Club united to that of the prominent manufacturers, there is no doubt that this subject will assume a continually increasing importance.

Some Electrical Terms Explained.

A consulting electrical engineer, who was asked to put one of the less common electrical terms in plain language, The Boston Transcript tells us, said: "I am frequently resorted to for just such explanations, and nothing surprises me more than the haziness which still exists in the minds of even intelligent folks in regard to the simplest electrical terms. To most people the electrical units are still mere Greek, and comparatively few go to the trouble to take hold of the more common of them, such as 'volt,' 'ampere,' 'resistance,' 'electro-motive force,' etc., and fix their meaning, once for all, in the mind. A man who knows me only by reputation wrote to me the other day that he had done this with much satisfaction to himself, as he has now a far more intelligent idea of electrical doings than he had before. But still, he said, from time to time some electrical words creep into the daily press which conveyed nothing to him. He mentioned as one of them the term 'watt hour.' Now, this is quite simple. The watt is the unit of electric power. It means the power developed when 44·25 foot pounds of work are done per minute, or 0·7375 foot pound per second. A foot pound is the amount of work required to raise one pound vertically through a distance of one foot. When this is figured down so as to be defined in 'horse power,' which is understood by everyone, it can offer no difficulty, and if anyone to whom the word watt is puzzling will remember that a watt is the $\frac{1}{746}$ of a horse power, he will have no more uncertainty about it. Having got so far, it is an easy graduation to the 'watt hour,' which is the term employed to indicate the expenditure of an electrical power of one watt for an hour. In other words, the energy represented by a watt hour is equal to that expended in raising a pound to a height of 2,654 feet. An even easier way of fixing it is to remember that two watt hours correspond almost exactly to raising a pound to a height of one mile. The understanding of such terms opens out some very curious facts to the uninitiated. For instance, a certain dry battery, weighing 6·38 pounds, was known to yield 100 watt hours. If this force were applied in raising the battery itself, it would lift it to a height of over ten miles. Again, in one hour the energy translated in an ordinary 16 candle power lamp weighing about an ounce would raise that lamp to a height of four hundred miles at a velocity of nearly seven miles per minute. Yes, it pays a man to expend a little pains on mastering the ordinary electrical terms."

IN a recent patent for a trolley wire guard porcelain insulator connects the trolley wire with the guard wire, and at intervals the latter is electrically connected with the railway return circuit.

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