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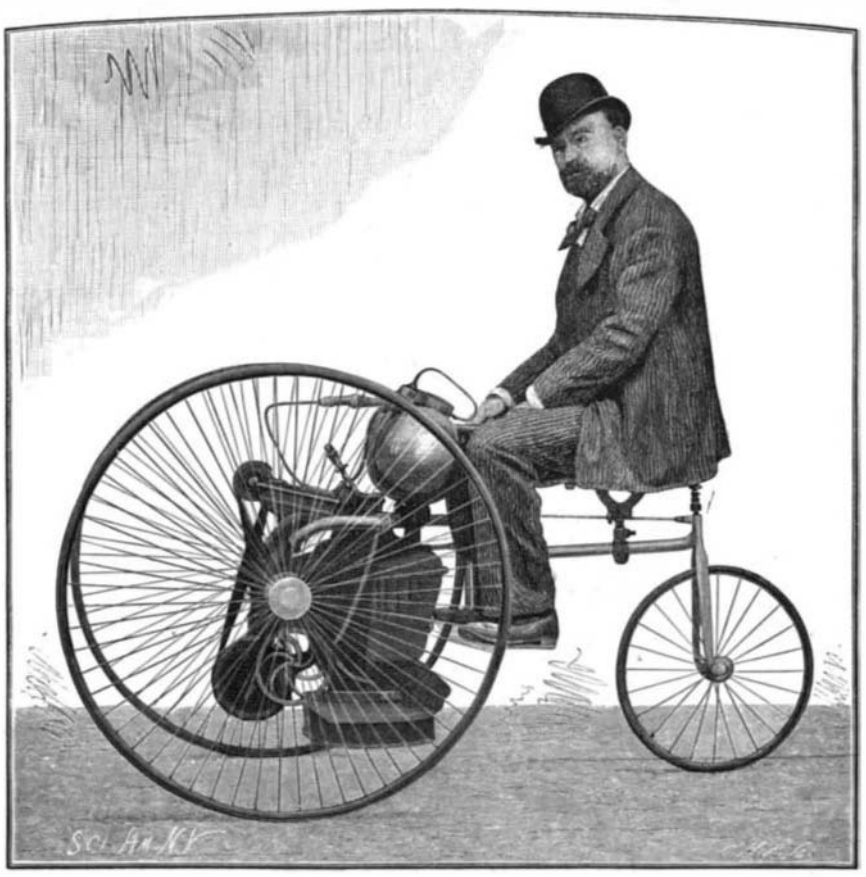
A NEW STEAM TRICYCLE.

We present an illustration of a French device, the steam tricycle, built by MM. Hildebrand and Wolfmuller, in which the mechanism is reduced to its simplest form. The motor consists of two cylinders which are arranged to impart motion to the large driving wheels of the tricycle by the medium of a twisted belt and gear wheels. The boiler is placed behind the engine, is spheroidal in shape and is made of steel. It is completely covered with asbestos or other non-inflammable material almost one-half inch thick. This asbestos is soaked with the inflammable material. When the machine is to be operated the combustible liquid is lighted, and at the end of fifteen minutes the pressure of the steam in the boiler is sufficent to actuate the motor. The pressure required is 60 pounds of steam, but the boiler is tested to 180 pounds, so the pressure can be increased when greater speed is desired.

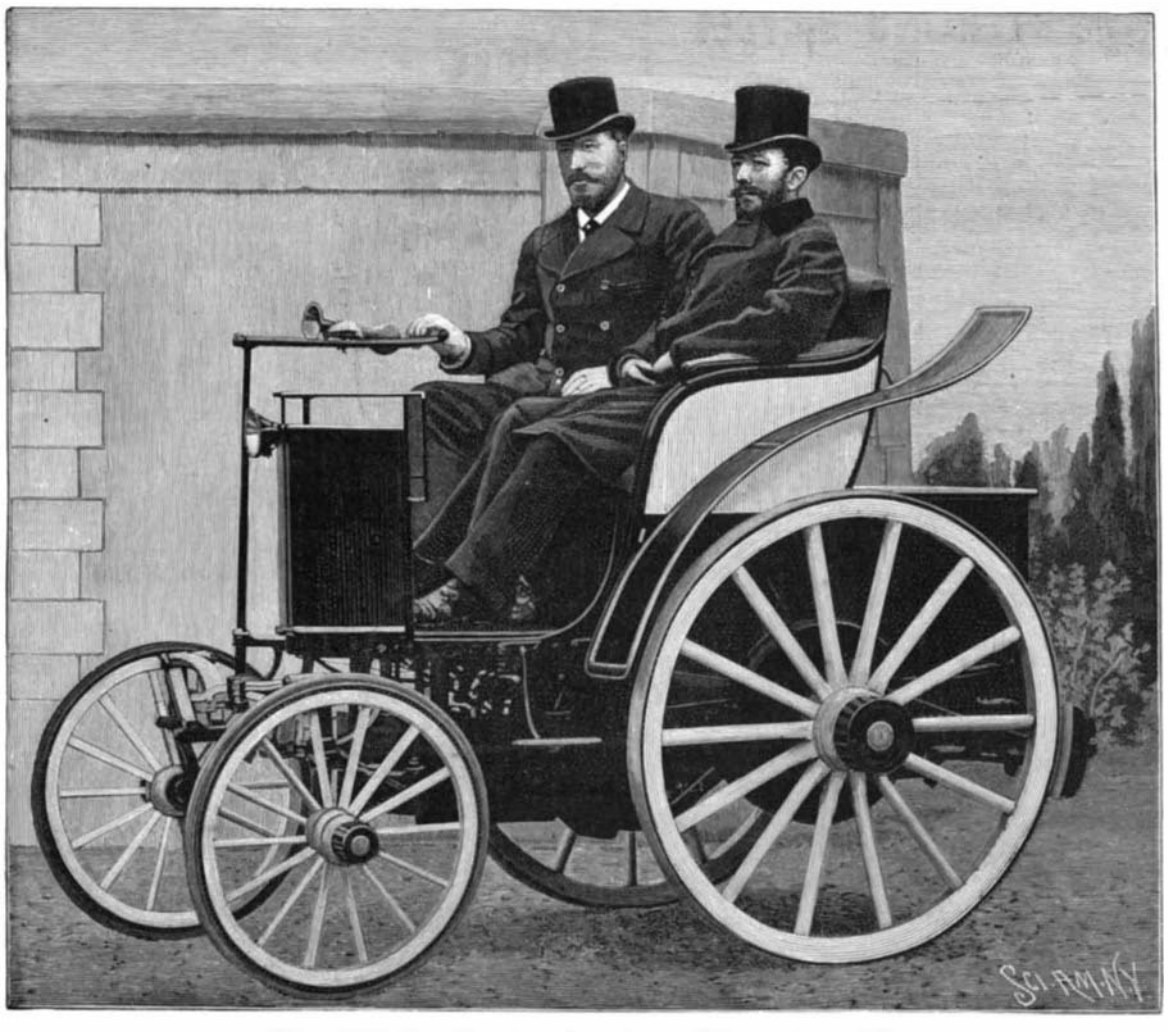


A STEAM TRICYCLE.

AN ELECTRIC CARRIAGE.

In SUPPLEMENT 979 we described the race of the automobile carriages which began July 19, 1894. In 1895 a similar race will be held over a course between Paris and Bordeaux, and promises some interesting developments in the line of steam, petroleum and electric carriages. M. Charles Jeantaud, the head of an important carriage establishment of Paris, commenced experimenting on an electric carriage in 1881, when the accumulators of Faure first appeared, but at this time the dead weight of the accumulators was so great that M. Jeantaud was forced to stop his experiments; but he was spurred into activity by the recent success of petroleum and steam motors for carriages, and the result of his labors is the electric carriage which we illustrate herewith. He found it necessary to obtain a source of electricity lighter and less cumbersome than those in use. He found it in the "Fulmen" accumulator. The plates are covered by a perforated celluloid envelope filled with the active material. In the center of this envelope are the lead plates which serve to collect the current. The celluloid is a perfect non-conductor and is not attacked by acids. The plates are carried in wooden receptacles, which are lined with celluloid. They are composed of two parts, the box proper and the cover, which is absolutely watertight and is transparent as well. The accumulator thus constructed presents a small bulk and light weight compared with its great capacity; it resists perfectly the shocks to which it is subjected. The batteries which propel the carriage of M. Jeantaud consist of 21 elements of the type just described, which give a current of 100 amperes of a pressure of 40 volts. In ascending slopes the current is increased.

The general appearance of the new carriage, as shown in our engraving, resembles that of a petroleum-propelled carriage. None of the actuating mechanism is in sight. The 21 elements are inclosed in seven small boxes, each containing three accumulators. These boxes are stowed away under the seat. The hands are free to steer the carriage and to control the speed; the switch, as well as the brake, is controlled by the foot. The foot is placed on the switch and the carriage starts with ease; on removing the foot the carriage stops and the momentum which it has acquired may be checked, if desired, by applying the foot to the brake. The brake is of the ordinary variety, a wooden shoe binding on the rear wheel; a circuit breaker is placed on the brake pedal, so that when the brake is applied the current is cut off at the same time. On a good level road a speed of 20 kilometers (12½ miles) per hour has been obtained, while in a hilly country the speed is reduced to 12 kilometers. The weight of the carriage is distributed as follows: Carriage, 490 kilogrammes; accumulators, 420 kilogrammes; motor, 110 kilogrammes; two passengers, 150 to 180 kilogrammes; total, 1,200 kilogrammes. As the kilogramme is equivalent to about 2·2 pounds, it will be seen that the carriage and contents weigh only about 2,645 pounds. The electric carriage has a future, and already in London there is a firm which displays a sign saying that they are prepared to charge accumulators of all sizes at any hour of the day or night. "L'Energie Electrique," from which we have translated this description of the electric carriage, draws a glowing picture of France when the electric carriage shall have come into more general use, when travel in the vehicles which move without the aid of steam or animal power can be used for extensive trips, the accumulators being charged at any of the 10,000 establishments in France which have electrical plants.



THE ELECTRIC CARRIAGE OF M. JEANTAUD.

The Income Account of American Railways.

The "Preliminary Report of the Income Account of Railways in the United States," prepared by Mr. Henry C. Adams, statistician to the Interstate Commerce Commission, shows the great depression in our industries following the panic of 1893. On the basis of 149,559 miles of railway open for traffic, the passenger earnings for 1894 show a decrease of $53 per mile; the decrease in the freight traffic is still more marked, being $774 per mile. The total decrease per mile was $840 under the average earnings of the four preceding years. In 1894 the gross earnings of the 149,559 miles of railway were $949,639,075; the operating expenses in the same period were $643,428,331; this left $306,210,744 to be divided among the holders of the stocks and bonds. This may at first sight seem a large sum, but nearly one-quarter of the railways in the United States are in the hands of a receiver. The operating expenses for 1894 show a gratifying decrease of $574 per mile over the previous year. In 1893 the gross earnings per mile fell to $7,190, while the operating expenses increased from $4,809 to $4,876 per mile. In 1894 the gross earnings sank to $6,350 and the operating expenses were $4,302. This decrease of $574 per mile shows that a rigid economy must have prevailed, as many of the expenses of the railways are constant, without regard to whether business is good or bad.

A METHOD of detecting fire damp by sound has been invented by M. Hardy and approved by the French Academie des Sciences. It is based on the fact that the sound emitted by an organ pipe varies according to the density of the air supplied. M. Hardy's apparatus consists of two small pipes, the size of a penny whistle, one of which is connected with the air in the mine and the other with the ventilator shaft. The presence of fire damp produces a discord at once between the two sounds, which increases with the quantity of gas and can be measured. By this contrivance the presence of 1 part in 500 of fire damp can be detected.