THE TURBINE-DRIVEN STEAMER "MANXMAN."

BY EMILE GUARINI.

The turbine-driven steamer "Manxman," lately built at Barrow-in-Furness by Messrs. Vickers, Sons & Maxim, Ltd., for the Midland Railway Company's Isle of Man service, comprises three sets of expansion turbines, the center shafts being driven by the high-pressure turbine, and each of the two side shafts by a low-pressure turbine, the astern-driving turbines being mounted also on the side shafts. These latter take steam direct from the boiler.

In respect of speed, the "Manxman" is three-quarters of a knot faster than the "Londonderry," another Midland vessel with smaller turbines taking steam at 150 pounds pressure. Two trials were made over the measured mile, and the results were the following: mean speed of two runs, 22.141 knots; boiler pressure per square inch, 192 pounds; steam in high-pressure turbine, 180 pounds; in low-pressure turbine, port, 20 pounds; steam in low-pressure turbine, starboard, 20 pounds; vacuum in condenser, port, 28.25 inches; vacuum in condenser, starboard, 28.4 inches; revolutions per minute, high-pressure turbine, 533; low-pressure turbine, 609; temperature of feed water leaving heater, 180 deg. F.; air pressure in stokehold, 1.5 inch. The results for the official six hours' trial were as follows: mean speed, 22.60 knots; revolutions, high-pressure turbine, 520; low-pressure turbine, 590; vacuum, port, 28.6 inches; vacuum, starboard, 28.4. The vacuum was frequently as high as 29 inches. In this respect a great improvement has been effected by the use of a "vacuum augmenter." In it the air pumps are placed about three feet below the bottom of the condenser. From any convenient part of the condenser, preferably near the bottom, a pipe is led to an auxiliary condenser, generally about one-twentieth the cooling surface of the main condenser, and in a contracted portion of this pipe a small steam jet is placed, which acts in the same way as a steam exhauster or the jet in the funnel of a locomotive, and sucks nearly all the residual air and vapor from the condenser, and delivers it to the air pumps. A water seal is provided to prevent the air and vapor returning to the condenser. The small quantity of steam from this steam jet, which is only about 1½ per cent of that used by the turbine at full load, together with the air extracted, is cooled and condensed by the auxiliary condenser, which is generally supplied with water in parallel with the main condenser. Condensation in a condenser takes place much more

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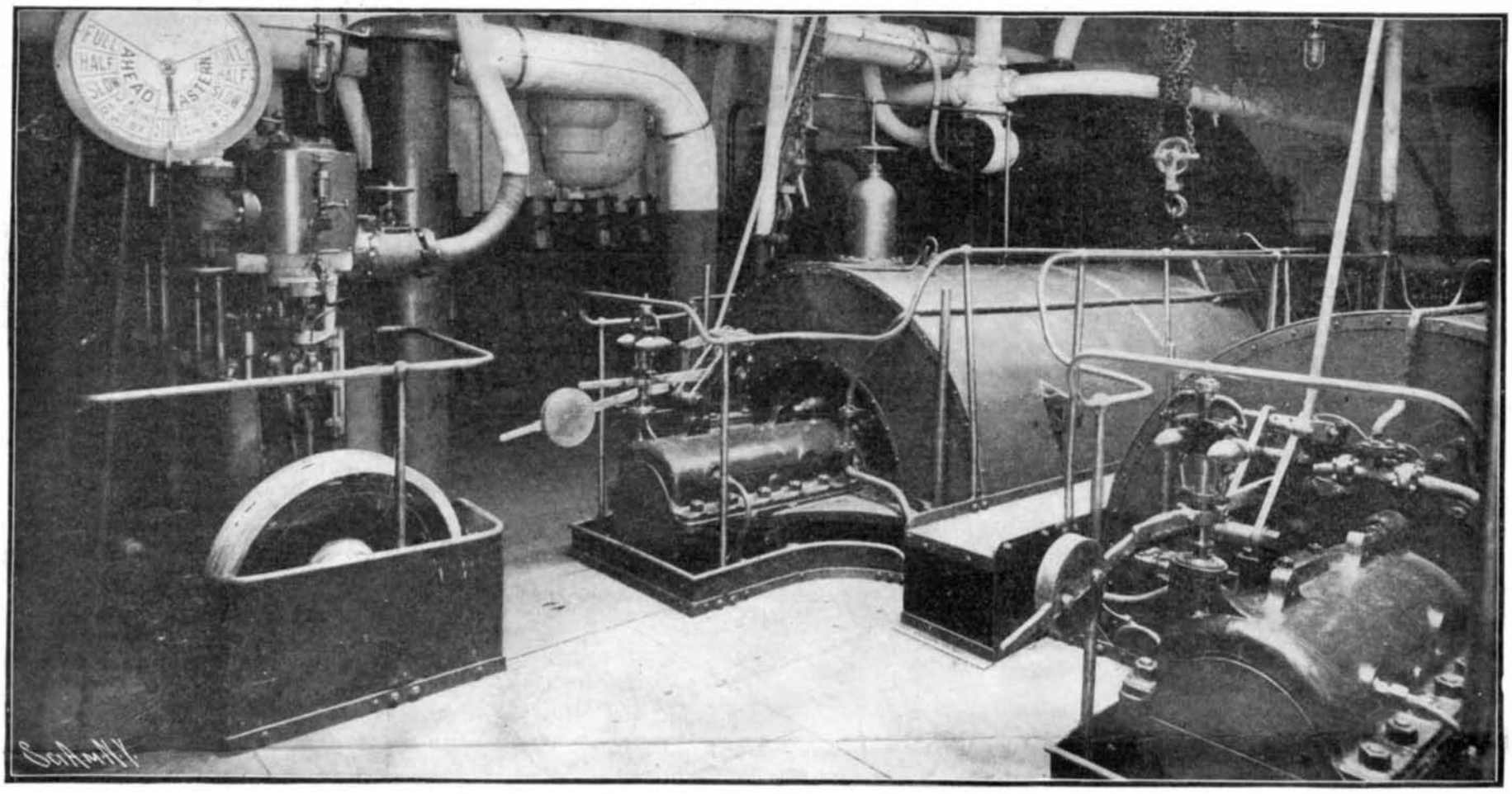
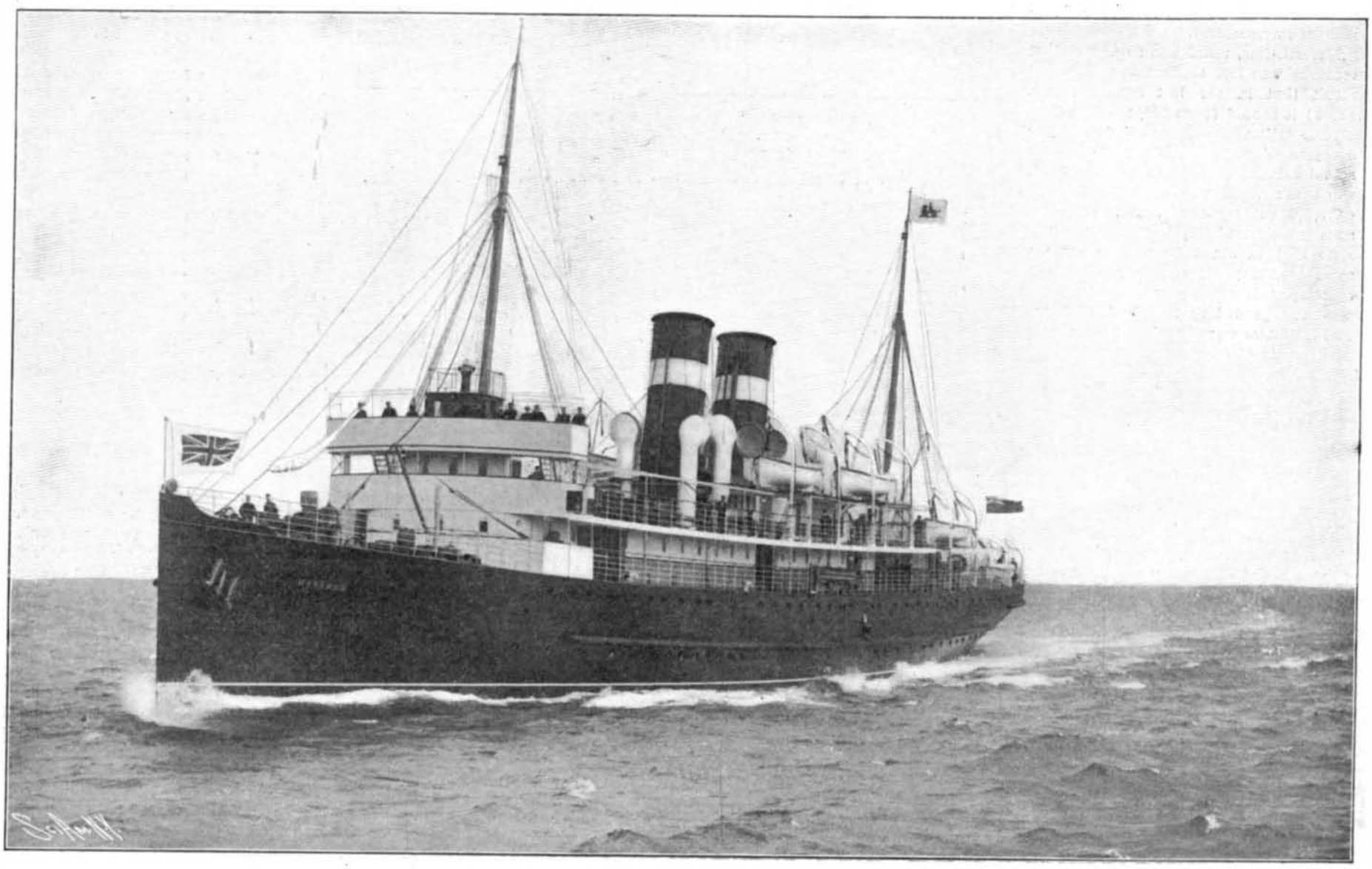


Vertical reciprocating engines of the same power would extend through the deck above, and occupy space that is now available for passenger accommodations.

Engine Room, Showing the Small Space Occupied by the Turbines.



THE NEW TURBINE STEAMER "MANXMAN" MAKING HER TRIAL SPEED OF 22.6 KNOTS AN HOUR.

California were shoots from the "Pettite" and "Epineuse" varieties from France. These original varieties have been greatly improved upon.

In preparing the ground for planting, repeated plowings and harrowings are required thoroughly to pulverize the soil and destroy surface vegetation. Year-old seedlings are planted in holes, round or square, about two feet in dimensions each way. After planting, which is done in the rainy season, the shoots are cut down to a uniform height of about two feet. The orchard is cultivated several times during the first year. In the second year the trees are pruned, from three to five branches being left, and are again pruned in the third and fourth years. Some orchardists prune every year, no matter what the age of the tree may be. The soil is repeatedly cultivated in all orchards.

Twice during the spring and summer the orchard is irrigated, water being procured from wells of moderate depth. In September the fruit ripens, and is gathered by spreading sheets under the tree and shaking the branches. The green fruit is then taken to the warehouse, where it is graded to size and afterward passed through a boiling-hot liquid, in which process it is cleaned and the outer skin softened. It is then spread out in trays 8 by 3 feet in size, and exposed to the heat of the sun for three to eight days, depending upon weather conditions.

Ten thousand trays of fruit spread out in one unbroken tract may be seen in Santa Clara in the drying season. When sufficiently cured the prunes are stored in separate bins and there allowed to "sweat," this process taking from ten to twenty days, when they are ready for marketing. Ten different grades are required, ranging from an average of 35 to the pound to the smallest size, averaging 140.

The cured fruit is packed in boxes, sacks, or barrels. Many buyers for the domestic or foreign market buy in gross, and afterward repack in smaller boxes.

Large quantities are thus attractively packed in Santa Clara, and many women are employed in this work, which requires special care and deft fingers. Boxes of the proper size with one glass face are used. Lace paper and ornamental labels add to the handsome appearance of the package. Carefully selected and perfect fruit is flattened by the hands, and spread out on the glass to form the exposed layer. The box is then filled to the required weight by fruit of corresponding grade. In fancy packing the French only can equal the Santa Clara standards.

The prune is the source of the remarkable prosperity which the community enjoys. The city of San José is the prune metropolis of the world, as nowhere else is this fruit handled in such amount or by equally scientific methods. The climate is mild, and the floral growth is amazingly luxuriant and beautiful. Of the thirty thousand inhabitants of this beautiful city, there is not one but is dependent upon the staple crop for much of the prosperity enjoyed.

THE TURBINE-DRIVEN STEAMER "MANXMAN."

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rapidly and effectually if the air is thoroughly extracted than if there is much air present, as the air seems to form a blanket round the tubes, and prevents the steam from getting free access to them.

The turbine machinery was constructed by the Parsons Marine Turbine Company, Wallsend-on-Tyne. There are two double-ended boilers and one single-ended boiler, and the principal dimensions of these are, for the double-ended boilers: length, 22 feet; diameter, 15 feet 7 inches; number of furnaces, six; diameter, 3 feet 11 inches; length of grate, 6 feet 6 inches; heating surface, 4,984 square feet; grate area, 161 square feet. For the single-ended boiler: length, 11 feet 6 inches; diameter, 15 feet 7 inches; number of furnaces, three; diameter, 3 feet 11 inches; length of grate, 6 feet 6 inches; heating surface, 2,493 square feet; grate area, 80 square feet. The total heating surface is 12,461 square feet, and the total grate area 402 square feet. The two double-ended boilers are placed side by side in the after part of the boiler room, while the single-ended boiler is fitted in a recess in the center of the boiler room forward, with large coal bunkers on each side. The boilers are worked under forced draft, the stokeholds being closed, and four fans are located on the upper deck, and are driven by high-speed engines, supplied by Messrs. Gaul & Co., Dumbarton.

For the Isle of Man traffic, the principal requirements are extensive promenade spaces and large saloons, and these are a special feature of the new vessel. The "Manxman" has a length on the waterline of 330 feet, a breadth, molded, of 43 feet, and a depth of 25 feet 6 inches. She has four decks, one of these—the shade deck—being entirely devoted to a promenade, while the promenade deck has a considerable width on each side for the same purpose.

The dining saloon occupies the full width of the ship, and has seating accommodation for one hundred passengers. The saloon is situated at the forward end of the promenade deck, and occupies, with the smoking room, a deckhouse which extends for over 130 feet of the length of the ship. With its lounges, etc., it will form a very welcome retreat in rough weather on the Irish Sea. On the deck below there are arranged the principal sleeping rooms in the ship. Many of these cabins have been made portable.

The heating and ventilation are by the thermo-tank system of the Thermotank Ventilating Company, of Glasgow. This system aims especially at insuring to all the living quarters of the ship a continuous supply of fresh air, which is not only warmed to the requisite degree, but is also humidified, so that none of the bad effects of overdrying can be felt. In cold weather the warmed air is discharged through a regulator into each apartment near the level of the ceiling; as it cools, it gradually sinks to a lower level, carrying with it any carbonic acid gas to the passageways, where means are provided for allowing it to pass outside. The circular thermo-tanks for circulating the warm air are placed on deck. The thermo-tank consists of an electric motor operating a fan which discharges air to the outside of a tube heater. The air then passes through the tubes, and comes in close contact with the heater surface, flowing thence to the main distributing trunks. Tests have shown that where the steam-heated system took three hours to attain a given temperature, the thermo-tank only required fifteen minutes.

THE LARGEST LOBSTER ON RECORD.

In our issue of May 17, 1902, we published an illustrated description of the largest lobster which up to that period had been caught. This giant crustacean is 3 feet long, weighs 34 pounds, and is preserved in the collection of the American Museum of Natural History. Since the writing of this article another lobster has been caught much larger in size. The new crustacean is 45 inches long, weighs 36 pounds, and is large enough to encircle a man with his two large claws. The accompanying illustration gives one an excellent idea of the size of the creature.

THE LARGEST LOBSTER EVER CAUGHT.
Length, 45 inches; weight, 36 pounds.

Another Successful Flight of the Baldwin Airship.

One of the most remarkable flights which the Baldwin airship has yet made took place at Los Angeles, Cal., on December 25.

The "Arrow" started from Chutes Park baseball grounds, in the southeastern part of the city, at 3:17 P. M., sailed with the wind northeastward between eight and ten miles, thence eastward for two miles, and returned in the face of a twelve mile gale to a point directly above the starting place. The supply of gasoline ran short, and Knabenshue, the aeronaut, was unable to effect a landing at exactly the desired spot. From the time the airship arose from the baseball grounds until it was safely anchored at Pico and Stanford Streets, it was in flight an hour and thirteen minutes, and in that time sailed a distance of probably twenty miles. When flying with the wind the "Arrow" traveled at a speed of twenty miles an hour, and returning directly in the face of the strong southeastern gale, was able to make a rate of speed reckoned at between six and eight miles an hour.

The French Admiralty has sanctioned the construction of the light type of submarine boats which are to be utilized strictly for defensive purposes. These vessels will each weigh 44 tons and are essentially of small range and power. Ten of these craft are to be built, six being constructed at Cherbourg and four at Rochefort. They are to be known as "wasps" and will be numbered from 1 to 10 consecutively.

Automobile Notes.

At the Crystal Palace a series of experiments were made by Mr. S. F. Edge to prove that damage to tires is not a common cause of motor-car accidents. The experiments were carried out on a specially-prepared road, on which broken bottles, chisels, and spikes were laid down, and over these a touring car and the car which Mr. Edge used in the German Gordon Bennett contest were driven at a speed of between 40 and 50 miles an hour. The first result was the discovery that the puncturing of a tire is no easy matter. The touring car went over the spikes, chisels, and broken glass about a dozen times before a puncture was made, but so little effect had the accident upon the car that the occupants did not know what had happened till they pulled up. The trials with the racing car were more exciting. A puncture was made early, and the tire became deflated. Mr. Edge, however, paid no attention to this, and rode on, but nothing untoward occurred. The deflated tire was next loosened at one side with the object of running it off while the car was going at full speed. The tire when thrown off whirled to a considerable distance, but the car kept its course, and neither it nor its owner was one whit the worse. These trials go to show that, provided the car is properly designed and of reasonably good workmanship, damage to tires will not endanger the occupants.

Several routes have been proposed for next year's Bennett Cup race, which is to be run in France. The Eure and Loire Department recently submitted a project to the Automobile Club for the eliminating trials and the cup race. It proposes a circuit situated in that region and lying mainly in the flat plain of the Beauce, where an excellent ground can be obtained. The circuit will run from Chartres to Nogent (33 miles), thence to Chateaudun (31 miles) and return to Chartres (26 miles), with three grade-crossings and three neutralizations in the course. Another route is proposed by the mayor of Clermont-Ferrand. It has a number of points in its favor. This circuit lies in the Auvergne region, one of the most agreeable and picturesque in the country. It forms a loop having a total length of 80 miles, starting from Clermont-Ferrand, taking in a number of villages. One advantage of this circuit is that all the roads which will be passed over are national routes and in good condition, having 45 feet width between ditches for the most part. The route, without being dangerous for high speeds, has a series of long and steep grades which will afford a good test for the cars. In this case no part of the road will need to be neutralized, seeing that it passes the villages, which are insignificant, at its full width, and is not narrowed anywhere. This is an advantage both regarding high speeds and absence of danger. The Automobile Club will no doubt decide upon the best circuit for the cup race before long.

It is proposed to organize a series of competitive tests for electric automobiles in Paris, with especial reference to electric cabs, in order to stimulate the interest in this class of vehicle and show the progress which it has made within recent years. The first contest of electric cabs, which was held in 1898, did a great deal toward promoting the interests of electric cars. It seems to be the general impression in France that the electric automobile is very expensive and cannot keep up a hard service in a regular way. But in the present state of the question this can be easily shown to be untrue, and it can be proved that it is cheaper than the horse vehicle for city use. It is stated that it costs only half as much as the horse coupé and besides can stand a daily service of 30 to 40 miles, which the former cannot accomplish. The former objections to accumulators, their fragility, small capacity, and heavy weight, can no longer be urged, seeing that there are now in Europe nearly a dozen types of battery which are solid and light. If the actual facts can be brought before the large cab companies there is no doubt that they would seriously consider the question of replacing horses by electric cabs. The experiment was tried a few years ago, but with a type of electric coupé established on the old lines, and it did not succeed. But there is no reason why it should not do so at present, in view of the recent progress which has been made. America is taking the lead in the matter of electric automobiles, but this is to be attributed to the widespread use of this type of machine rather than to any superiority of manufacture, and it is hoped to secure a like success in France, if the question is properly promoted. There are a number of first-class cars now manufactured in or near Paris, such as the Krieger, Vedrine, Jeantaud, Gallia, Electromotion, Mildé, and others. A concourse of electric cars therefore seems to be in order, and it will bring out an interesting series of official data as to the modern electromobile, especially as regards electric cabs.