

RECENT PERFORMANCES OF FRENCH HYDROPLANE BOATS.

BY OUR PARIS CORRESPONDENT.

The gliding boat, or hydroplane, has been occupying considerable attention of late, mainly owing to the remarkable performance of the boat which the Count de Lambert constructed not long since and equipped with a light-weight, high-power motor. This craft succeeded in outdistancing all the racing boats of the usual build in a race held October 15 last upon the Seine near Paris, and it was this performance especially which directed the attention of the public toward the question of gliding boats, seeing that heretofore it was not generally known what could be expected from the new craft. Owing to the good results which have now been obtained by the hydroplane, there seems to be no doubt that it is quite in the line of progress, and we may expect to hear of still more remarkable performances from this class of craft in the future. The question is being actively taken up in the vicinity of Paris, and no less than three different forms of hydroplane boats have been run upon the Seine, with very encouraging results. As regards the principle which underlies all the recent forms of gliding boats, it consists in making the craft glide upon the surface of the water with scarcely any immersion of the hull. This is done by giving the boat a sufficient speed from the use of a light and powerful gasoline motor and at the same time placing a set of planes under the boat which are slightly inclined and turned upward from back to front, so that when the boat reaches a sufficient speed the action of the planes causes it to be lifted partly or almost entirely out of the water, the latter being the ideal condition. While the usual practice of the first experimenters was to use a boat of about the ordinary section and then adapt underneath it a set of separate planes whose angle was adjustable, in all the present boats the plane surfaces are formed simply by the bottom of the boat, this being constructed so that there are at least two surfaces of this kind. What is essential for the hydroplane action is to have the boat light enough to be easily lifted out of the water and at the same time to provide sufficient power to give the proper speed for bringing about the lifting action. This is now easy to accomplish in the

present state of gasoline motor construction, especially since the new light-weight motors for aerostatic purposes have been brought out. In the early days of the hydroplane, inventors were handicapped, since they had only the steam engine available for the purpose,

in making his craft work practically, as afterward he ceased to experiment with it and appeared to have abandoned the idea. This was no doubt due to the fact that at that date the gasoline motor was not sufficiently developed to be of service for gliding boats. Count de Lambert built his first gliding boat in 1897 and tried it in England, where he worked for some time upon the question. He used the idea of a catamaran formed of two long and pointed floats and between them he placed a set of flat pieces which constituted the planes and lay below the surface of the water. The planes were adjusted at the proper angle, which was found by experiment. On the craft he mounted a small steam engine of the Field type, together with its boiler, but as this gave him a heavy weight for a small power he could not bring the boat up to the speed which he is now able to secure with a light gasoline motor. Nevertheless, his results were encouraging, and he found that his idea was a good one. Since the advent of the gasoline motor he has been at work upon the question and has already built a number of boats. The most recent type which he is now running upon the Seine still holds to about the same construction, using two main floats running along the whole length and joined at the top by a light platform. In the present form the planes extend clear across underneath the floats so as to cover the whole width of the craft. The planes are formed of flat surfaces and there are a number of them (five) in the length of the boat. However, the plane which forms the front end of the boat has the end somewhat curved upward, as will be noticed in the photographs. During his experiments Count de Lambert has found the best angle to give the planes and the proper length, width, and spacing that they should have. The right spacing of the planes is one of the most essential points for the proper working of the boat. These are 10 feet long by about 4 feet wide and spaced about a foot apart. Toward the front end of the craft is mounted a 50 horse-power gasoline motor

which weighs only $2\frac{1}{2}$ to 3 pounds per horse-power. We have already described this type of motor, which has been adopted by Santos Dumont, Capt. Ferber, and other aeronauts, and which will go far toward solving the problem of the gliding boat, since for the solution of this problem a motor of high power and



The Hydroplane Gliding Boat of Count de Lambert Getting Under Way and Rising to the Surface.

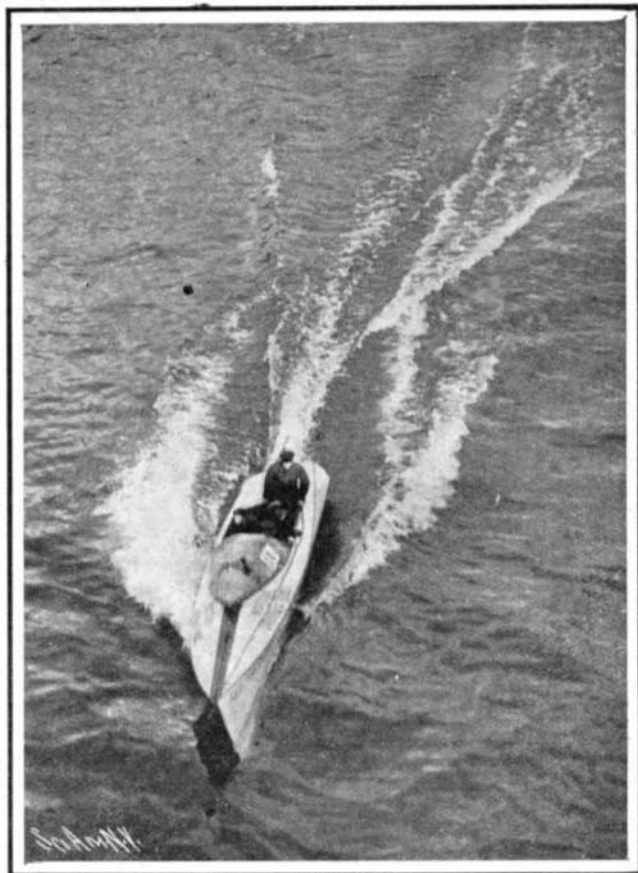
The boat consists of a catamaran mounted on five planes, each of which is about 4 feet wide by 10 feet long, giving a total lifting surface of about 200 square feet. The planes are set upon five per cent incline, with the exception of the front one, which is at a slightly greater angle. The 50 H. P., 8-cylinder motor has driven this boat, the inventor claims, at a rate of speed of thirty-four miles an hour.

and thus a heavy weight had to be lifted, a weight which was out of all proportion to the power which the motor would give.

As far back as 1876 M. de Sanderl had the idea of a hydroplane which consisted of a simple flat-bottomed boat of rectangular shape. At each of the four corners of the boat he mounted a propeller which worked horizontally in the water and was mounted on a vertical shaft. The boat also had a main propeller placed in the rear in the usual way. By giving the proper speed to the four screws at the corners, the boat could be lifted more or less out of the water so as to lessen the resistance to forward movement, and then the main propeller would cause the craft to glide on the surface of the water. He was not successful at that time in realizing this idea, since he found that the boat would require a considerable motive power, and hence that it could not be lifted by the use of a steam engine. Later on, M. Ader, of Paris, who is well known for his experimental work in different fields, took up the idea, and as late as 1895 he built a model of a gliding boat which somewhat approaches the present types. In this case he used a boat which was pointed at each end and was provided with a series of separate planes. At the front of the boat there were two planes spreading out at the sides and lying under water. They could be adjusted at any desired angle from the inside of the boat. At the rear there was a single plane which formed a tail and could also be adjusted. M. Ader had also the idea of injecting compressed air underneath the surface of the three planes, so that they would work more or less upon an air cushion and in this way the resistance of the boat would be still further diminished. It seems, however, that he did not succeed



Rear View of Count de Lambert's Hydroplane Boat Traveling at a Speed of $25\frac{1}{2}$ Miles an Hour.



"Nautilus B. V. Jacqueline" Under Way. This Boat Won the Cruiser Race at a Speed of 16.84 Miles an Hour.

light weight is essential. It is to be remarked, however, that this power is needed only in starting up the boat and bringing it up to the speed where the planes cause it to lift out of the water, for it is evident that as soon as it commences to glide upon the surface it requires much less power to run, owing to the great diminution of the resistance. This, at least, is the theory of the hydroplane, although in practice the large catamaran shown made only 25.46 miles an hour with the motor developing 50 horse-power at 1,000 R. P. M., while a smaller one of about one-half the size and one-fourth the hydroplane surface made the same speed with from 12 to 14 horse-power. The present motor is of the eight-cylinder V pattern and is rated at 50 horse-power, running at the standard speed of 1,000 revolutions per minute, at which it runs when driving the boat. The displacement of the present boat, without fuel or water, is stated by the inventor to be 1,100 kilogrammes (2,425 pounds), and with three men the displacement is brought up to 1,500 kilogrammes (3,306.9 pounds), although as many as five persons, inclusive of the mechanic, can be carried. The displacement of the smaller boat, loaded, was 1,763 pounds. From the motor the slightly-inclined propeller shaft passes to the rear. The blades of the propeller are each pivoted so that they can be turned and the pitch of the propeller altered. This is found very convenient for handling the boat. There is also a rudder which is mounted in the rear in the usual way. As to the size of the boat, the length is 7 meters (22.96 feet) and the width about 3 meters (9.84 feet). The whole is of a very light and solid build, and the top platform is made of the usual slat work.

This craft made the remarkable performance which we mentioned above during the races which were held last fall upon the Seine at Maisons Laffitte, in the suburbs of Paris. In spite of the fact that there were entered some of the fast racing boats, the hydroplane carried off the honors and made the record for speed over a 100-kilometer (62.1-mile) course, covering this in 2 hours, 25 minutes, which is equivalent to a speed of 25.46 miles an hour. The boat carried three persons and besides was obliged to make a number of turns, which are a decided disadvantage for this class of craft. In a straight line, Count de Lambert says, he made a speed of 55 kilometers (34.175 miles) an hour upon the Seine. At present he is constructing a new hydroplane, which is even of a simpler form. It is made up simply of a series of box floats placed between two long timbers on each side. Each float has the required plane surface on the bottom, and the assemblage of floats forms a kind of raft which has a number of gliding surfaces. It may be mentioned that Count de Lambert has been granted fundamental patents for the use of hydroplanes.

Another hydroplane boat which follows the same

general principle, but which is much smaller in size, is the "Ricochet-Nautilus," constructed by the Bonnemaison boat-building firm of Paris. Its general appearance is shown in the illustration. The bottom is formed of two inclined plane surfaces one of which

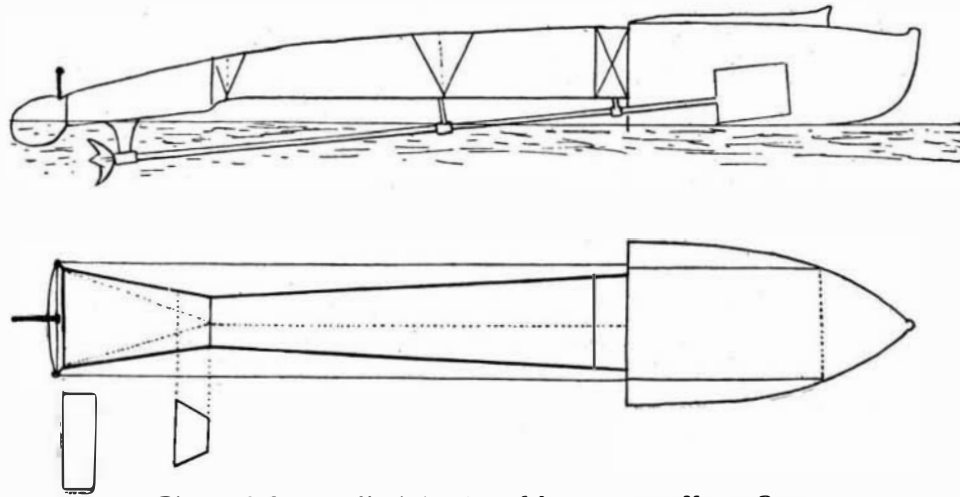
extends from the stern to the middle of the boat. Commencing a few inches lower down, at the middle, is the second plane, which also runs upward toward the front and forms the bow of the boat. A cross-section of the boat one-third of the way back from the bow shows that the forward plane is not quite flat, but has a slight curve. Upon the boat is mounted a three-cylinder, air-cooled, Buchet motor of 10 horse-power, from which a shaft runs to a propeller at the rear. The latter runs at the motor speed of 2,000 revolutions per minute when at full speed. The new craft has been tried upon the Seine, and is stated to run at 48 kilo-

meters (29.825 miles) an hour. It is built to carry a single person. The oiling of the motor is carried out from an air-pressure oil tank, and the air pressure is given by a bicycle air pump. The rudder of the boat is shown at the front in the photograph, although two rudders at the stern are generally used.

The "Antoinette" speed boat is built on somewhat different lines. In front it carries a flat-bottomed boat of somewhat the usual form, while in the rear is attached a float forming a tail-piece which aids in obtaining the gliding action. The front boat carries the motor and passengers. From the motor a shaft runs to a propeller carried in the rear of the tail-piece. The latter (see diagram) has at the end a box-shaped piece whose under surface forms a plane, and the whole device gives a constant angle for the front boat in order to secure the gliding action. By using the front boat, the craft can stand bad weather and run even upon rough water, although its speed will be slower in this case. It will run on the hydroplane principle in smooth water.

The craft is built for the Levavasseur motor firm, who have mounted on it one of the light motors previously described and rated at 50 horse-power. Alone, the motor weighs 132.27 pounds, or 176.36 pounds with all accessories and ready to run. The displacement of the craft is 200 kilogrammes (440.9 pounds) counting the motor, and the total length is less than 9 meters (29.52 feet). It has already been run upon the Seine and showed a good speed. Capt. Ferber and also Santos Dumont piloted it on different occasions and were favorably impressed with its performance, stating that it had a good balance and gave almost the same sensation as an aeroplane in the air. Owing to the use of the long tail, there is but little spray at the back of the boat, seeing that this is forced to the rear. Since it has entered the field the new craft promises well and gives the gliding effect without losing its qualities of good floating and balance. Another point is the low consumption of fuel, which is claimed to be below what the ordinary craft use, while a higher speed is obtained.

In the cruiser class, the record for 15½ miles was made by the "Nautilus B. V.-Jacqueline," which covered the distance in 52 minutes 36 3-5 seconds, at an average speed of about 16.84 miles an hour. This boat is noteworthy from the fact that it was driven by one of the new Bourdreaux-Verdet Duplex motors, which works on a new principle, and which we had occasion to describe in SUPPLEMENT No. 1597. The Duplex motor seems to be coming to the front on account of the different merits which it possesses in the way of low gasoline consumption per horse-power and the small space it occupies. One of the photographs on the preceding page shows the new cruiser at full speed. The clean way in which it cuts the water shows the design of hull to be a good one.



Plan and Longitudinal Section of Levavasseur Motor Boat.



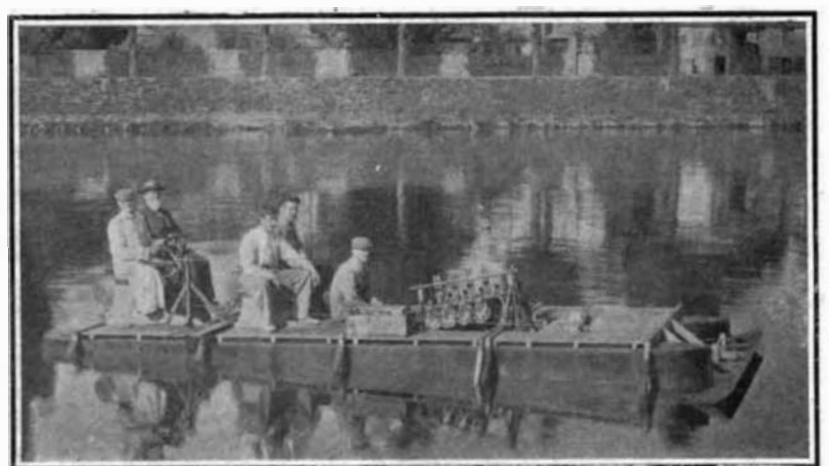
The Levavasseur Freak Motor Boat, "Antoinette."



Tail of the Curious Two-Part Levavasseur High-Speed Boat.



The "Ricochet-Nautilus," Which Has Attained a Speed of About 30 Miles an Hour With a 10-Horse-Power Motor. This Boat is About 11 Feet Long.



Count de Lambert's Hydroplane Boat at Rest, Showing the Normal Submergence When Stationary.