

to the vertical position of the cylinder it is thoroughly lubricated, since the piston rings wipe uniformly the entire circumference, and thus prevent any oil getting into the firing chamber, which does away with obnoxious odors and keeps the spark plugs clean. Both grease cups and force feed lubricators are used throughout the machine, and all are situated on the dashboard before the driver. The mufflers used produce very little back pressure and yet almost eliminate the noise of the exhaust.

Ignition is by the jump spark system, the make and break of the circuit being accomplished by means of a mechanically operated vibrator of unique and entirely original design, which requires no adjustment for months. Heavy insulated cable is used in all the wiring.

A circulation of water through all the engine jackets is obtained by means of a centrifugal pump operated by a friction disk against the flywheel. The water is pumped through a very effective system of radiating coils at the front of the car, and only two or three gallons are used.

An atomizing float feed carbureter of improved design, requiring absolutely no adjustment to the varying speeds of the motor, is used to furnish gas for the latter. The motor is started by a half turn of the crank, which is placed at the front of the car. The speed gear is connected with the driving gear by a flexible shaft and with the motor by a universal coupling, which protects the bearings, gears, and clutch from any strain due to an inequality of the road. The gears are inclosed in an aluminium case and run in an oil bath which automatically lubricates all bearings. The speed changes are obtained by means of a single lever at the right, which gives three speeds forward and one reverse, while the speed of the motor is regulated by varying the time of the spark.

The changes of speed are made by friction clutches that go in without clatter or vibration, and the gears operate without noise. A powerful band brake on each rear wheel is operated by a lever at the right and held by a ratchet until released. A foot brake operates on a drum on the change gear shaft between the motor and the compensating gear.

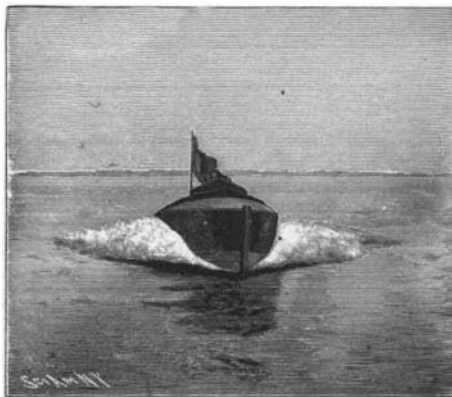
All two-passenger cars have a rear platform which may be used for luggage, rumble seat, or two-passenger tonneau. The driver's seat is either double or divided into individual seats. The cars are geared to make 30 miles an hour at a speed of 1,200 R. P. M. of the engine, but are capable of being speeded up to 40 miles an hour. They are equipped with two kerosene side-lights and a very powerful acetylene headlight, or with two side-lights and two acetylene headlights having a combined power about equal to the single headlight which is offered as an option. The mudguards are of aluminium with front guards flared out, protecting both occupants and the car from mud when the wheels are at an angle.

HIGH SPEED TWIN-SCREW YACHT "VIXEN."

There are few cities in the world that are so advantageously situated as New York city for the running of a system of suburban transportation by water, and we venture to think there is no city where these natural advantages are so little taken advantage of. It is true there has been some talk recently of running a line of high-speed passenger steamers between New York city and suburban towns on the Hudson River, which was to be capable of making a speed of 30 knots an hour, and competing with the railroad service; but the scheme seems to be in abeyance, if it has not altogether fallen through. Practically the only travel of this kind that is done is due to the owners of private yachts, many of whom make the journey every day by water between their residences on the Hudson and along the Sound and New York city. The convenience and pleasure of this method of travel are obvious.

We present illustrations of a high-speed yacht which has been built by the Gas Engine and Power Company, Morris Heights, New York, for Mr. Archbold, who will make use of it principally for the run between his home in Tarrytown and his business in New York city. The dimensions of the

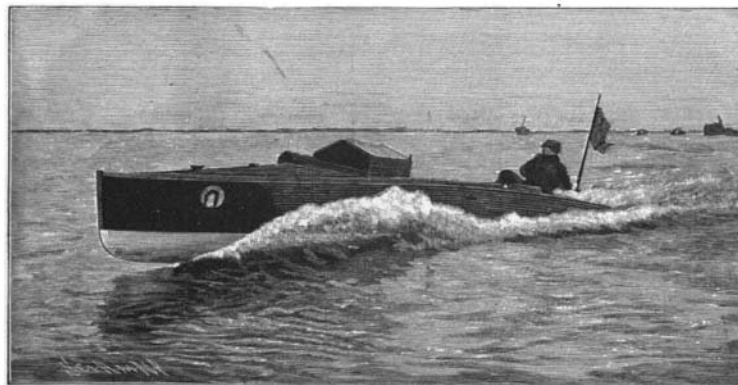
vessel are: Length over all 100 feet, load waterline length 96 feet, beam 12 feet, and draft 4 feet. The "Vixen" has been modeled for high speed, and she has the fineness and sweetness of lines which are seen on the fast torpedo craft. The framing and planking are of wood, the boat being double-planked and copper fastened; the sheer strake, deck stringers, floors and keelsons are of steel, as are also the bulkheads. The vessel is driven by twin-screw engines which, when running at a speed of 450 revolutions per minute, will, together, indicate 500 horse power. The guaranteed



BOW VIEW.

speed is 20 miles per hour, and the builders expect to get between 21 and 22 knots an hour on the trial trip.

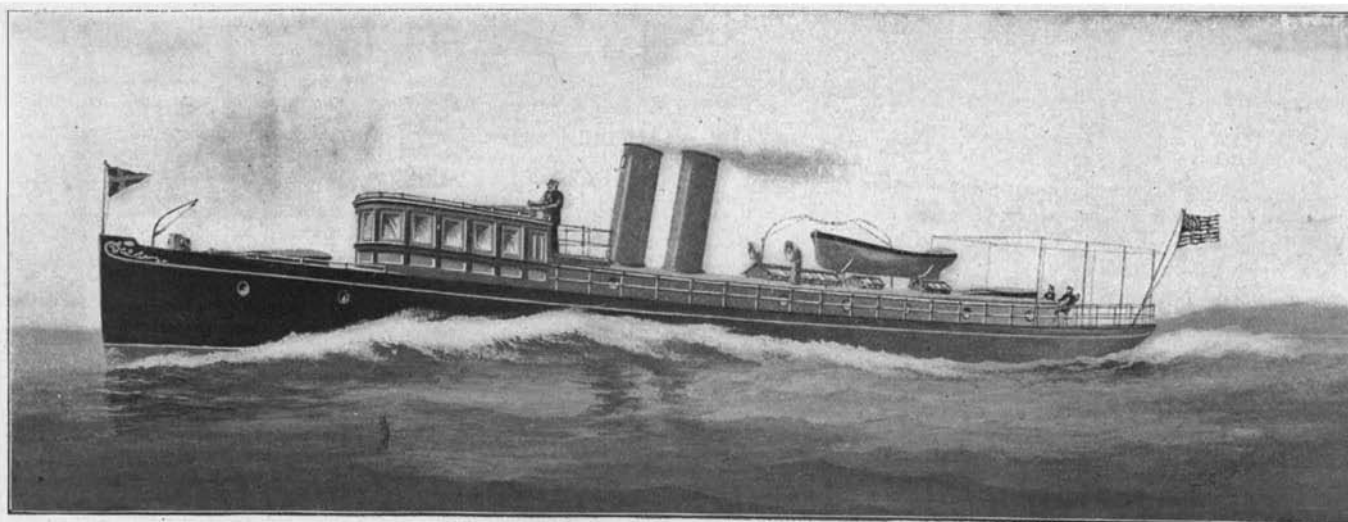
A steel trunk-house extends for about two-thirds of the length of the vessel amidships, and forward of this is a deck-house or pilot-house of red mahogany, paneled, which will be utilized as a dining room, for which purpose it can accommodate six persons. Im-



Length, 39 feet 3 inches. Beam, 4 feet 3 inches. Horse power, 25.
"ROLLO" AT EIGHTEEN KNOTS AN HOUR.

mediately abaft of this structure comes the trunk-house, which extends from the deck-house to the after end of the owner's quarters. The accommodations below deck are as follows: In the forecabin are the quarters for the crew. Aft of these is a large galley in which a dinner can be prepared and served by connection to the dining saloon above. Aft of the galley are the boiler room and coal bunkers. Then follows the engine room, and aft of this is a large stateroom for the owner, which extends to the full beam of the vessel and is fitted with two berths, a dresser, lockers, etc., and has a toilet adjoining. Aft of this, again, is a large saloon. The stateroom and saloon are finished in white enamel and gold.

The motive power is of what might be called the torpedo-boat type; that is to say, it consists of water-tube boilers and triple-expansion, fast-running engines. The object aimed at in the motive power is the reduction of dead weight by securing a high average indicated horse power per pound of weight. The boilers are of the well-known Seahury safety water-tube type.



Length, 100 feet. Beam, 12 feet. Speed, 20 knots.

NEW HIGH-SPEED TWIN-SCREW YACHT "VIXEN," NOW BEING BUILT FOR MR. ARCHBOLD,

Particular attention is given in the design to the circulation of water. By using the outer water-tubes for returning the water to the bottom of the boiler a much larger area is secured for the return water than could be obtained by using large return pipes. The furnace is surrounded by water-tubes that have the same opening between them as the diameter of the tubes, and ample room is thus left for the gases to pass freely among all the tubes for their entire length. The firebrick baffle-plate between the tubes above the furnace absorbs a part of the heat when the fire is very hot, which is given off again when fresh fuel is put in the furnace, a certain amount of reverberatory effect being thus secured. There are a series of horizontal tubes on each side of the steam drum for the purpose of superheating the steam. The triple-expansion engines have cylinders 7 inches, 11¼ inches and 17½ inches diameter by 10 inches stroke. Care has been taken to remove all superfluous metal from the revolving parts, and it is thus possible to secure a high rotative speed with a minimum of vibration.

The yacht is finished with a stern of the torpedo-boat type; and with her twin funnels, low trunk, and single deck-house forward, she has a decidedly smart and rakish appearance.

THE MARINE AUTOMOBILE.

THE RECENT FRENCH INVENTION OF THE AUTOMOBILE LAUNCH.

Automobiling on water has now become an accomplished fact. French engineering skill has turned the features common to the racing automobile into use for propelling the long, slim body of the automobile launch through the water at a furious rate of speed. The machinery is the same as in a high-power automobile, the manner of transmitting power is the same, the fuel, the motive power and the manipulating devices are practically identical. The only actual differences are that the motive power instead of being carried on wheels is incased in a smooth wooden canoe skin, offering a minimum of resistance to the water, and that the device steers by rudder instead of by mechanism acting on the front axle. In all other essential respects the automobile launch and the automobile carriage are virtually alike. A competent chauffeur can handle either type, and it would not be impossible to build a motor vehicle out of the machine parts belonging to a motor launch—so closely identified are these otherwise apparently dissimilar means of travel.

It is quite natural that the sport of automobile launch racing should receive its baptism in France, the native home of automobilism, for the French, though poor at yachting as a nation, enjoy a well-merited reputation in the line of light craft for pleasure boating.

The motor as well as the hull herewith shown were specially designed for racing, and it was found that the motor worked perfectly under all conditions, starting with a half turn of the handle and maintaining its speed smoothly and regularly. The type of motor adopted was that made famous by the Panhard & Levasseur establishment, makers of the Panhard automobiles. The superintendent of the factory, M. Krebs, selected a 24 horse power gasoline motor and made some minor changes in it to fit the marine equipment of the launch. After considerable experimenting it was found that the motor under favoring circumstances actually developed more horse power than its indicated rating, and then the idea of racing this new and strangely unfamiliar craft occurred to M. Giraud. He applied to the Helix Club of France for a series of trials over measured distances of salt water, entering his craft under the name of "Rollo"—an automobile canoe measuring 39 feet 3 inches in length, with a beam of 4 feet 3 inches and 24 indicated horse power. The

first race took place at a course near Argenteuil, in which "Rollo" was entered among a number of high-power launches of her class. She finished a winner of the 24-kilometer (14.90 statute miles) course in 1 h. 17 m. 31 s., a speed of 11.53 statute miles. In a subsequent race at the Cercle de la Voile de Paris at Meulan the course was 52 kilometers (32.30 miles) and