

THE ATLANTIC OCEAN AND THE "AMERICA" CUP.

The accompanying composite picture showing the new challenger for the "America" cup, "Shamrock III.," under both her cruising ocean rig and her racing rig of 14,500 square feet, naturally suggests the question as to whether the intervening three thousand miles of ocean water between England and America has been anything of a handicap to the challengers in their long half-century of plucky struggle to recover the cup—as many people assert that it has—or whether this supposed handicap is one of the many fictions associated with international cup racing which will not down, but present themselves with persistent regularity at every successive series of contests.

The theory is that the challenging yacht has to be built of sufficient strength to stand the stress of the heavy gales which she is liable to encounter in crossing to this side of the water; and that to give her this margin of strength she must necessarily be built of somewhat heavier scantling, and her plating must be of greater thickness, than is necessary in the case of the home yacht, which is nursed in the sheltered waters of Long Island Sound, and is at all times carefully tied by leading strings to its home cradle at the Bristol yard. Is there anything in all this? Candidly we have to confess that we think the handicap does not amount to much; possibly just enough to constitute the few minutes' handicap that means the difference in these days between winning and losing the series of races. The turbulent Atlantic Ocean puts a limit upon lightness of construction; it also puts a limit on exaggerations of form, for it is certain that no yacht of the scow type like "Independence" would risk the ocean passage. We have all heard how her bow plates were started, as she was being towed in half a gale round Point Judith, when the boat was in such a bad way that the question of abandoning her was raised. How "Reliance" would fare under similar conditions is one of the questions that all of us who are watching the defense of the cup are asking with more or less anxiety. It was hoped that the trials off Sandy Hook would have furnished the desired test of her broad, flat bow, which, while not so flat as that of "Independence," is still of such a very pronounced scow-type that as she is swinging round from tack to tack in a hammer to windward, the impact of the seas will be extremely heavy and will prove a severe tax upon the light framing and plating in the region of the waterline. It was noticeable when the yacht was hauled out at City Island that a large number of the rivets under the bow, and the butt joints of the plating, were clearly defined by circles and lines of red rust. Now, since the plating and the rivets are of bronze, the rust could not have come from them, but must have worked through from the nickel-steel frames on the inside of the hull. It could only have come from the frames by virtue of the fact that the whole structure was "working" sufficiently to allow the salt water to seep through at the rivets.

Now, "Reliance" has never experienced anything stronger than a fresh summer breeze; and if her hull is working under these conditions it becomes an interesting question as to what will happen when that tremendous sail plan is driving her at full pressure into a heavy sea off Sandy Hook. This condition, however, may never occur, and the great boat may be favored with those moderate winds and seas under which she would seem, on her showing so far, to be perfectly certain of defeating her coming antagonist. At the same time the interesting question is raised as to whether a boat of this extreme type and exaggerated rig would safely make the westward passage. We think not. On the other hand, it is claimed, with much

reason, that the strains to which a vessel is subjected when she is being driven to the utmost under her towering stress of racing canvas are fully as great as any that she may meet when jogging along in a gale of wind under snug cruising canvas. Probably in a thrash to windward, such as occurred in the famous race between "Vigilant" and "Valkyrie II.," the hulls are about as severely tested as they would be if hove to in an Atlantic gale. On the whole, however, it is probable that yachtsmen, and those who go down to the sea in ships generally, will be agreed that the three thousand miles stretch of the stormy Atlantic will always prove to be a very real handicap to the challenger, especially if the passage must be made from east to west against the prevailing winds.

THE PARIS-MADRID AUTOMOBILE RACE.

SPECIALLY PREPARED FOR THE SCIENTIFIC AMERICAN BY OUR PARIS CORRESPONDENT.

The Paris-Madrid race, which was held on the 24th of May, has certainly been a unique event in the history of the automobile. Never before has there been shown a greater interest on the part of the public in

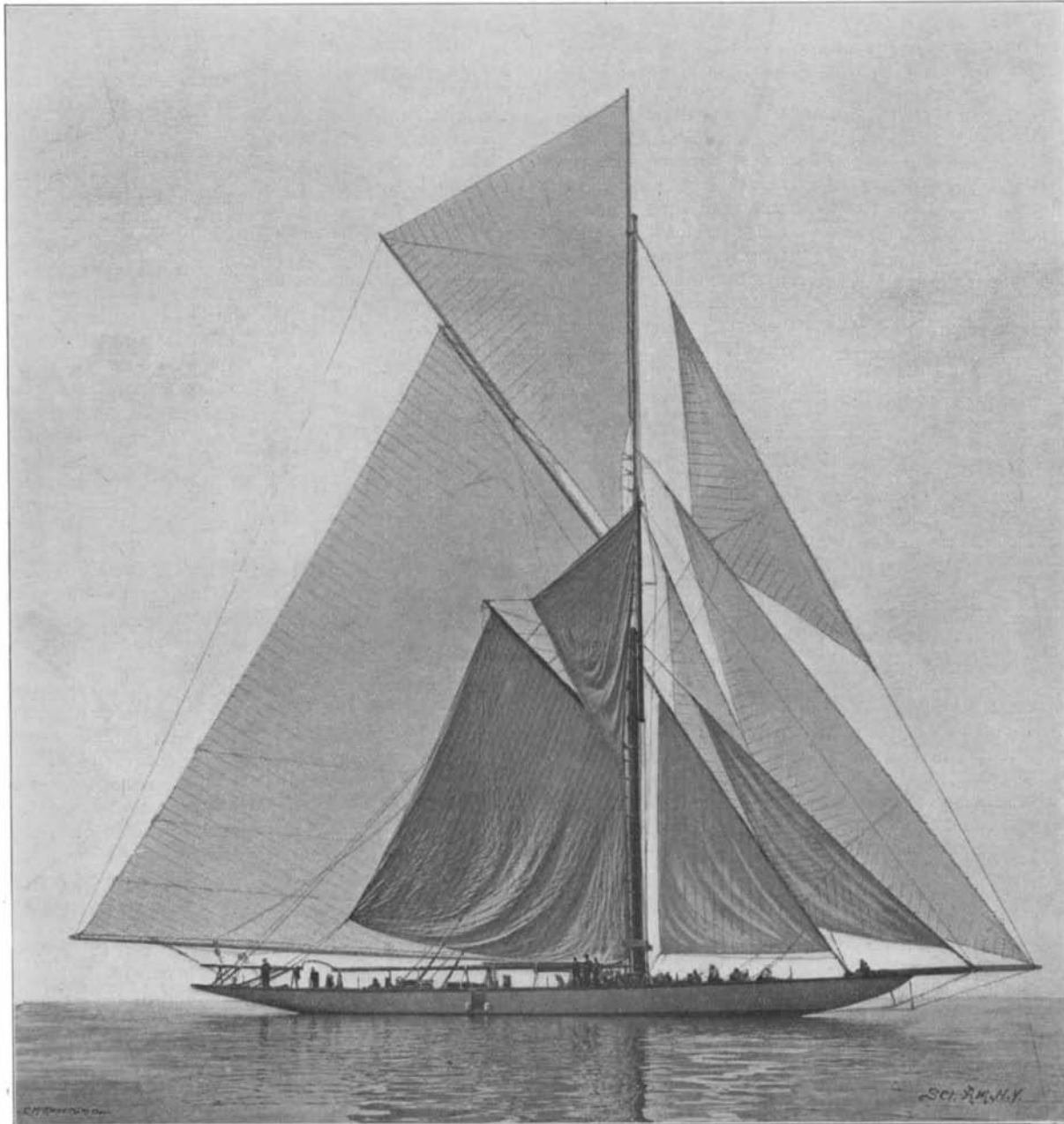
the tapering front and offer but little resistance to the air. These cars were especially remarked for their handsome lines. They have a stable and solid appearance, mainly due to the wide spacing of the wheels and the low position of the body, which rests near the ground. Among the conductors of the Mors cars were Fournier, Gabriel, Augieres, W. K. Vanderbilt, Jr., and others, some of whom are of the first class and have made many records, while the remainder are very close to them in skill and *sang froid*. Vanderbilt and his white car attracted a great deal of attention, as he was one of the few Americans to enter the race. The Panhard & Levassor cars were also among the most prominent. They have not changed much in form since last year, but have been considerably improved; the motor is of the same size as that used in the Paris-Vienna race, but can now furnish 70 horse power. The cylinders are of steel, surrounded by copper water jackets. The inlet valves are now operated mechanically, and another improvement is a new type of carbureter, besides a larger flywheel on the motor. The chassis is built of pressed steel. This year's type is remarkable for the unusual position of the motor, which is inclined toward the front at a considerable angle. This has been

done in order to lower the center of gravity as much as possible and at the same time use a flywheel of large diameter, to give greater weight. So it was decided to tilt the motor toward the front, thus lowering one end while the rear end carrying the flywheel is higher up. The seats are placed near the middle. The crank case, of square form and sloping toward the front, is terminated by the radiator, which has a ventilating fan placed behind it. The Panhard cars were mounted by a number of first-class conductors, René de Knyff, Henri and Maurice Farman, and Baron de Crawhez, who have distinguished themselves in preceding years, besides Heath, Rolls, Teste, and others not far behind them.

The two favorites among the French racing cars were closely rivaled in interest by the German Mercedes car, and the Daimler Company made a special effort this year to construct a machine of great power and high speed. Although the Mercedes machines have a high reputation in general, it is only this year that a racing car properly so-called has made its appearance. Last year although not so powerful as their competitors, some of these machines were much more solidly built, and owing to the breakdown of their competitors came

very near winning the Paris-Vienna race with Zborowski and De Forest at the wheel.

Great attention was therefore attracted by the new 60 and 90 horse power Mercedes cars which arrived from Canstatt a few days before the race. These two types are the same in size, differing only in the motor. The 90-horse power cars are among the most powerful machines yet built. They have a somewhat square appearance and the seat is far in the rear, just over the axle. The four-cylinder motor represents all the newest ideas, and among other points has a double inlet valve which is mechanically operated. The motor is protected by the long box front, which is terminated by the honeycomb radiator. That this firm were the first to introduce, with its air-fan behind it. The body lies very low, and the wheels have a remarkable spread. The Mercedes cars were mounted by Werner, Baron de Caters, Degrais, Jenatzy, Warden, Foxhall Keene, Mr. Terry, the well-known American chauffeur, and others. After the favorites comes the De Dietrich racer, which was remarked for its pointed shape. These machines are among the newest in the field, but they have already made a good record. The four-cylinder motor gives 45 horse power, which can be pushed to 60. The radiator is mounted just beyond the pointed front



"SHAMROCK III." IN HER OCEAN AND RACING RIGS.

an automobile race, and it is estimated that at least two million persons were ranged along the route at different points between Paris and Bordeaux. The event is also remarkable for the high power and great speed of the new machines, some of which undoubtedly reached 80 miles an hour. The race led off in the most brilliant manner, having no less than 228 starters, but after the finish of the Bordeaux stage, which occupied the first day, the news came of a number of serious accidents, including the death of Marcel Renault, and the race was not allowed to proceed further. As it is, however, it has been a great event and one which will long be remembered.

The Mors machines have the form of an upturned boat, or a torpedo shape with sharply pointed front, which gives them a handsome appearance. The wheels are spread wide apart, and the radiator is placed between the front wheels and underneath the body of the car. The four-cylinder motor gives 80 or 90 horse power, with mechanically operated valves and magneto ignition. The Mors racers have a transmission which allows four speeds, with direct driving at the high speed. The rear wheels are driven by chain gearing. The driver's seat is placed far in the rear, and the chauffeurs are thus almost entirely concealed behind