THE FRENCH WAR SHIP AMIRAL BAUDIN.

The armor-plated ship Formidable, built at Lorient, left that port, at the beginning of the year, for Toulon, where the final tests of her were made, and she is shortly to be put in service. This vessel is the mate of the Amiral Baudin, which forms part of our squadron, so that the picture of the last named, given herewith, portrays at the same time the new armorclad which is to increase the power of our fleet.

These two ships are the largest of the vessels that we have afloat, and may be compared with those that rank as first class in other navies. The following are their principal dimensions: Maximum length, 343 feet; extreme breadth, 69½ feet; depth, 40½ feet; mean draught, 26 feet; displacement, 11,400 tons.

The steel hull is partially armor-plated, the armor covering a region which extends over the float water line from stem to stern. A cuirass protects three turrets, in which are placed the large pieces of artillery, and covers, up to the ironclad deck, the passageway for the projectiles designed for these guns. Finally, for the commander, there is an ironclad place of shelter, proof against the fire of musketry and light guns.

Scientific Uses of the Eiffel Tower.

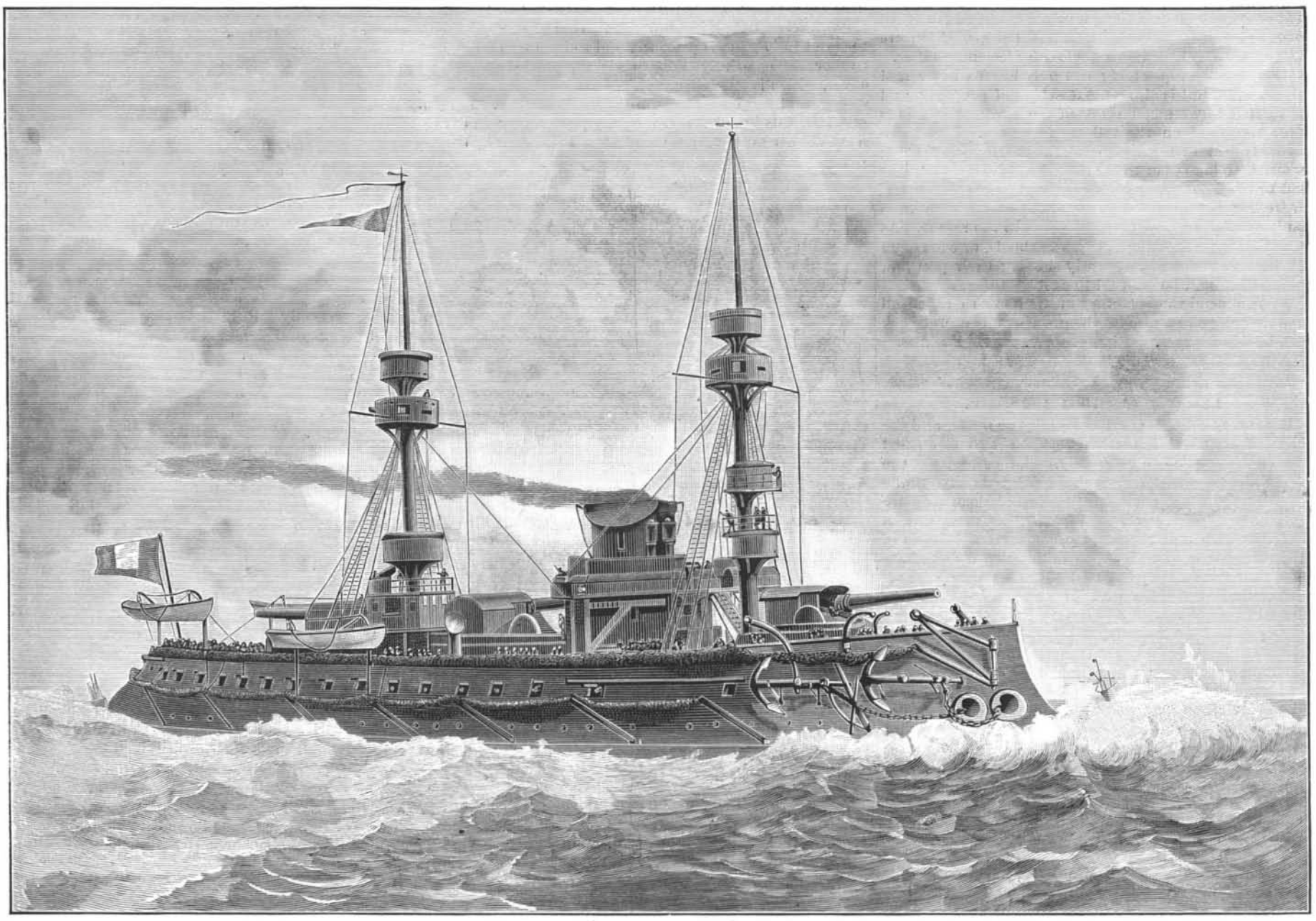
M. Janssen, of the Institut France, is of opinion that the Eiffel tower will have many scientific uses. One of the greatest difficulties of meteorological observations is the disturbing influences of the station of observation itself. How, for example, can a true deviation of the wind be observed if a purely local obstacle causes it to deviate? And how can a true temperature of the air be determined by a thermometer influenced by radiation from surrounding objects? Thus the meteorological elements of great centers of habitation have to be taken outside those centers, and at a certain height above the soil. The tower, since it rises to a great height, and, from the nature of its construction, does not modify in any way the meteorological elements to be observed, will get over this difficulty. A height of 300 yards is in itself not a negligible quantity from the point of view of rainfall, temperature, and pressure, but these circumstances give all the more interest to the institution of comparative experiments on variations due to altitude. The electrical interchanges between the soil and the atmosphere can also be studied to advantage. Special arrangements can be made for avoiding accidents, and results of great interest should be obtained.

He recommends also the institution of a service of meteorological photography. A good series of photographs would give forms, movements, modifications, which the clouds and atmospheric conditions undergo from sunrise to sunset. Thus a history of the skies would be written on a radius not hitherto dealt with. In physical astronomy various other observations might be taken, especially in relation to the study of telluric spectrum. M. Eiffel announces that three laboratories have already been arranged on the tower. One will be devoted to astronomy, and the second will contain registering apparatus from the central bureau of meteorology, and will be devoted to physics and meteorology. MM. Mascart and Cornu expect to draw great advantages from its use in the study of the atmosphere. The second is reserved for biology and micrographic study of the air, to be organized by M. Henocque. M. Cailletet is arranging a great mercurial manometer, with which he expects to obtain pressures as high as 400 atmospheres

M. De Fonvielle has made very curious electrical experiments at the summit of the Eiffel tower. Some, it is considered, will lead to important considerations of a scientific character, which will be continued; others are of a more practical character. The atmosphere round the tower at this elevation is free from all influence of the soil, as would be the case at the top of a mountain, and the air is in an extraordinary active state of electricity. The tower will, it is said, be the most perfect conductor of electricity during a storm, and all within it will be in a state of entire immunity against all danger from lightning.

A New Channel Steamer.

The new Calais mail steamer which has been built for the London, Chatham, and Dover company, has been named the Calais-Douvres, the name having been taken after the popular twin ship, which is now to be finally withdrawn from the service. The new vessel is built entirely of steel, and to insure additional safety in case of collision has been divided into nine different watertight compartments. The dimensions of the vessel are as follows: Length between perpendiculars, 325 feet; breadth, 36 feet; depth, 21 feet 6 inches. It is calculated that she will be the fastest cross Channel steamer afloat, and will make the passage between the English and French coasts easily in an hour. The vessel is being luxuriously fitted throughout, and, in addition to a fine deckhouse and state saloon, has a large number of private cabins. The steamer has been constructed with a view to combine steadiness with speed, and has all the latest improvements in machinery and fittings. She will be lighted by incandescent electric lamps, and has been provided with embarkation arc lights.



THE FRENCH WAR SHIP AMIRAL BAUDIN.

The motive apparatus consists of two distinct engines, separated by a tight median bulkhead, and each actuating a screw, so that, in case of accident to one of them, the ship may not be brought to a standstill.

The artillery comprises three 14½ inch guns in the turrets, twelve 5½ inch guns in the battery, and a multitude of revolving and rapid-fire guns distributed over the quarter deck and among the tops.

Neither of the vessels has any canvas. The masts shown in the engraving are such as are called "military" ones, that is to say, they are designed exclusively for carrying revolving guns that permit of directing a plunging fire against torpedo boats.

Since the putting of these new vessels in service has led us to speak of our armorclads, we ought to add that our engineers were better inspired than the English engineers when they conceived the plans of them. The report just published by the English Admiralty upon the maneuvers of 1886 points out, in fact, that the English armorclads, not high enough above water in front, are in a condition of sensible inferiority as regard sailing qualities. Thus, for example, the Trafalgar stands but eleven feet out of water, while, with a nearly similar draught, the height of the Amiral Baudin above water is nineteen feet. The result is that, with equal power, and provided the sea was rough, the French armorclads would have the advantage.—*L'Illustration.*

WHEN a man presents himself to the United States inspectors as an applicant for marine engineer's license, he must have his application signed by two or three persons who can speak knowingly of his character and capabilities; and it is reasonable to think that no one can judge of his ability as well as the engineer with whom he has been employed—for every applicant for engineer's license must have had at least one year's experience aboard a vessel—although in strict adherence to the law, it is not necessary to have an engineer's name signed to an application. While the inspector can test his qualifications as an engineer by examination, he cannot judge of his character as to sobriety and integrity by the same process. Hence any man who signs a man's application for license has a certain responsibility resting upon him, for no man should be licensed as a steamboat officer of any grade who does not stand fairly before the world.—*The Am. Engineer.*