

THE ENGLISH CHANNEL STEAMERS.

We have already alluded to the oscillating saloon steamer, and some time ago we gave an illustration of her peculiar saloon, designed by Mr. Henry Bessemer to overcome the seasickness so prevalent in crossing the English Channel. She is now nearly ready for service, and is 350 feet long by 610 broad. She is fitted with two sets of paddle wheels, 106 feet apart, and is double ended. The saloon, suspended on pivots and controlled by hydraulic gear, is 70 feet long by 35 feet wide. Twenty miles an hour is expected of her but it is doubtful if she attains it. We hope to publish a view of the entire ship in a few weeks.

Mr. Bessemer's experimental vessel will, however, be tested by competition with a formidable rival, the *Castalia*, built on the largest scale and at great expense for the same traffic. This is a twin ship, propelled by paddle wheels placed between the connecting girders; and she is especially designed to sail without pitching or rolling in any sea, however rough. The engraving, reproduced from the *London Graphic*, gives the reader a clear idea of her appearance on the water and the extent of her accommodations. She is 296 feet long and 60 feet wide over all, each hull having a width of 17 feet; she is also double-ended, to avoid the necessity of turning in entering or leaving a harbor. Her cabins and saloons are handsomely appointed; and she was much commended as a successful sea boat in her preliminary voyage from the Thames, where she was built, to Dover, her intended point of departure for the continent. Thirteen knots an hour is to be her speed, according to the expectation of her designer (Captain Dicey) and the builders and engineers. By the latest advices she was waiting at Dover for a heavy sea to thoroughly test her capabilities. We shall shortly know the result of her further trial, and hear, we hope, of her success.

Launch of the Bessemer.

The Bessemer saloon steamer was recently launched from the yard of Earle's Shipbuilding and Engineering Company, Hull. According to the *London Times*, she has very much the appearance of a breastwork turret ship. She is shaped alike at bow and stern, and for 48 feet from each end she has a freeboard of about 3 feet only. Her total length at the water line is 350 feet, and the raised central portion, rising 8 feet above the low bow and stern, is 254 feet long, and extends the whole width of the vessel, 60 feet over all. The swinging saloon, 70 feet long, is in the center, and the engines and boilers which drive the two pair of paddlewheels are stowed in the hold at either end of the raised portion of the vessel.

The whole of the machinery is on board, and the after pair of engines is completely fitted. The nominal horse power is 750, working up to 4,600, sufficient, it is estimated, to drive the vessel 18 or 20 miles an hour. The

two pairs of paddlewheels are placed 106 feet apart, and each wheel is 27 feet, 10 inches in diameter, and fitted with 12 feathering floats. The saloon is entered from two staircases leading to a landing, connected with the saloon by a flexible flooring. The saloon itself is upheld on its axis by four steel supports, one at each end, and two close together in the middle. The aftermost of the two central supports is hollow, and serves as a part of the powerful hydraulic machinery which will regulate the motions of the saloon. Without entering into a long technical explanation, it is enough to say that Mr. Bessemer has constructed some machinery which will cause the valves, the opening and shutting of which will adjust the saloon, to work automatically. The interior of the swinging saloon measures 70 feet long, 35 feet wide, and 20 feet high.

As to the question of the double set of paddlewheels and their effect upon the speed as compared with a single pair of wheels, Mr. Reed's view is as follows: When a ship is being propelled at a uniform speed by the exertion of a given constant power of engine, all that the engine does is to prevent the speed from decreasing, as it would do if the propelling power were removed. Were that power removed, the ship would not suddenly stop, but be gradually and slowly brought to rest by the resistances opposed by the water to her progress through it. In point of fact, therefore, in the case of a paddlewheel steamer at full speed, the ship herself carries the wheels rapidly past the surrounding water; and before the wheels can begin to propel at all, the engine must cause them to revolve with a corresponding velocity. If, for example, we take the case of a steamer going at a uniform speed of 14 knots an hour, with 36 revolutions of her engines, we may assume that 30 of those revolutions were required for enabling the wheels to overtake the ship, and that the remaining six only are useful for propulsion. These six revolutions no doubt impart a sternward velocity or race to the water of corresponding amount; and if another wheel has now to be brought into action in order to apply increased power, and has to be set to work in this race, it is obvious that it will require to be turned 36 times before it will begin to propel, and the few revolutions necessary for propulsion must be added to this number. The difference between the two wheels will therefore simply be that the sternward wheel will require to revolve a few revolutions more than the other before it begins to propel, but after that the two will be upon equal terms, excepting as regards any losses from friction, etc., due to the extra speed of revolution. This is Mr. Reed's view, and, if he be correct, the speed realized by the Bessemer will probably prove at least equal to that of the fastest paddle steamers in the world; although, at the same time, the designer considers the very light draft and great beam of the ship, and the extra weights which have been found necessary in connection with the saloon and its

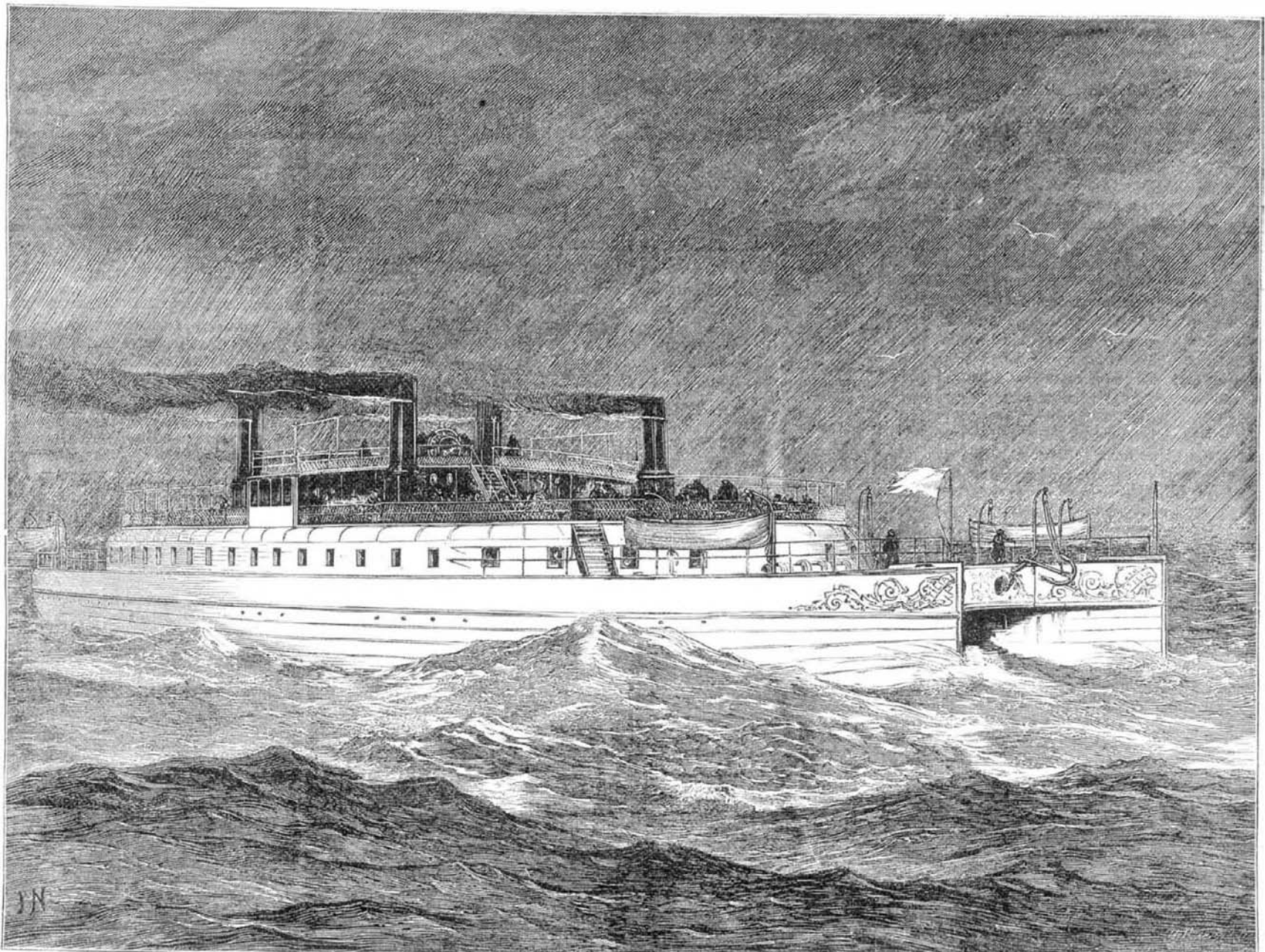
machine beyond what he was called upon to design for will in some degree detract from the speed which has been predicted by the admirers of the vessel.

THE EARLY HISTORY OF WHEELED VEHICLES AND RAILWAYS.

NUMBER 2.

"Men of genius have a hard time, I perceive; and must expect contradictions next to unendurable—the plurality of blockheads being so extreme!"—CARLYLE

The struggle, however, between the friends and enemies of improvement was by no means over. One hundred and fifty years after John Crasset wrote his "reasons," a new motive power, which was to produce an unprecedented revolution in human affairs, to enable immense navies to advance in the face of wind and tide, and vast armies to traverse under lofty mountains and across deep rivers at a pace which far outstrips the fleetest race horse, made its appearance, and the conflict was again renewed with increased vigor. In truth, the opposition made to the railroad in its early years stands peculiarly alone. On the one side was a little band of merchants and manufacturers headed by George Stephenson the self-educated "Killingworth brakesman." On the other hand were the rich monopolies whose interests were about to be affected by the railway: the coach companies now about to be ruined, the canal companies about to avenge on the railroad the opposition they had experienced in time past; the nobility, the preservers of game, the celebrated engineers and famous doctors, the landed gentry, the small farmers, the public press "backed by the opinion of the nation," every profession from the clergy to the engineer, every trade, every rank of society from the peer to the Northumbrian miner, was bitterly hostile to the steam railway. Against this array of public-spirited obstructives ready to choke the new invention at its birth on the ground of the public good, it struggled hard to gain a footing, scarcely daring to lift itself into notice for fear of ridicule. The civil engineers to a man rejected the idea of a "locomotive railway." The idea of traveling at a rate of speed double that of a stage coach was too preposterous for any engineer to risk his reputation by supporting it. Such a thing, they said, "did not fall within their general experience." Mr. Nicholas Wood, C. E., of London, in 1825, speaking of the powers of the locomotive, remarks: "It is not my wish to promulgate to the world that the ridiculous expectations, or rather professions, of the enthusiastic speculator will be realized, and that we shall see engines traveling at the rate of twelve, sixteen, eighteen, or twenty miles an hour. Nothing could do more harm towards their general adoption and improvement than the promulgation of such nonsense." "What," says a writer in the *Quarterly Review* for March 1825, "can be more palpably absurd and ridi-



CAPTAIN DICEY'S TWIN STEAMER CASTALIA