

THE WARSOP AERO-STEAM ENGINE.

The London *Times* publishes a long and favourable notice of the engine patented by Messrs. Eaton and Warsop, of Nottingham. It says an iron screw steamer with a Warsop engine has been built at Middlesbrough-upon-Tees, and is at present carrying cargo. She is named the Fox, and is intended for coasting purposes. She is schooner rigged, carries 230 tons of dead weight, and was built by Messrs. Bickhouse and Dixon, of Middlesbrough, for her owners, Messrs. Williams and Purvis. Her engines are by Messrs. Joy and Co. of Middlesbrough, and have a high pressure boiler weighted to 60lb., and two cylinders of 15½ inches diameter and 13 inches stroke. The boiler is vertical and cylindrical, with cylindrical furnace inside, and cross tubes from side to side, the uptake passing through the steam as superheater. The air-pump is placed vertically above one of the cylinders, and its piston is 11 inches in diameter, with eight inches stroke. The first trial trip of the Fox was made on the 13th of December, 1869. She left Middlesbrough at 11.41 a.m., and went down the Tees under steam only, with a strong land wind blowing. She had neither ballast nor cargo, and rolled very much. She crossed the bar about 12.20, and got out to sea. The steam pressure was let down to 28lb., with only two inches of water in the gauge-glass, and a thin fire. At 12.40 the air was turned on, with the engine feed-pump at full work pumping through the feed-heater, and the donkey running slowly, pumping cold water into the boiler. At 12.58 the boiler pressure had gone up to 55lb., and from the continued feed the water in the glass stood at ten inches. The engines were allowed full steam both at the stop valve and at the expansion lever. At 1.30 and thenceforward, the engine still working full speed, the boiler pressure stood at 60lb., and there was no priming. As an experiment, with this pressure and the screw making 112 revolutions, the air was shut off. Within two minutes water began to pass into the cylinders, and in three minutes the revolutions had fallen to 100. The air was again turned on, and in three minutes all priming had ceased, and the screw was again making 112 revolutions. From the heavy wind and the lightness of the vessel she was scarcely manageable, and the trip was brought to a premature close, having shown only that the engines worked well, and that the Warsop system prevented priming. A few days later she was taking cargo from Middlesbrough to Berwick, when, between Hartlepool and Shields, with the Warsop system in full operation, a pressure of 60lb., and the screw making 126 revolutions, the nut of a valve broke and disabled the air-pump for a time. It was immediately necessary to reduce the pressure on account of priming, and nothing above 30lb., and 60 revolutions of the screws could be maintained for the rest of the trip. The captain calculated that the stoppage of the air supply lost three hours time in a passage that occupied eleven. The next trip of the Fox was to Aberdeen, and on this, after five hours steaming on the Warsop system the air was turned off, and she was kept for five hours under steam alone. In the five hours under steam and air she ran by log 32½ miles, averaging 87½ revolutions per minute, and with an average boiler pressure of 50lb., and no priming. In the five hours under steam alone she ran by log 24½ miles, averaging only 71 revolution per minute, with an average pressure of 35lb., and primed whenever the pressure reached 39. Under steam alone the consumption of coal was

345lb., per hour, and under steam and air it was 270., per hour, showing a saving of 27 3 per cent of fuel, besides the increase in the rate of speed. It will be observed that the speed was never high, but the engines of the Fox are only of 35 horse-power, and are not calculated to lift her cargo at any rapid rate. The representative of the patentees had considerable difficulty in persuading the captain and engineer to complete the five hours under steam alone. They said that they had evidence enough, and they wanted to get on. We have said enough to show that the invention of Mr. Warsop possesses no small claim to the attention of engineers, and of all employers of steam power. Its value has still to be tested by careful and sufficiently prolonged experiments, conducted by skilled impartial observers. But for these we shall not have long to wait. Stationary engines of the kind are already in full operation at various places. There is one at the engineering works of Messrs. Robert Daglish and Co., at St. Helens; and another at the shipbuilding yard of Messrs. Wigham, Richardson and Co., on the Tyne. A third is in use at the doubling mill of Messrs. Thackeray, of Nottingham. Others are in course of being erected at the works of Messrs. Backhouse and Dixon, of Middlesbrough; Messrs. Kitson, of Leeds; Blair, of Stockton; and Robey, of Lincoln; licensees have been applied for from San Francisco for the use of the patent for portable and traction engines; and it is also about to be applied, on engines of 600 horse power, at the New York public waterworks. At the works of Messrs. Eaton and Amos, Southwark, a Warsop of the highest finish is being built, and will shortly be open to the inspection of any who may desire to see it. The system has as yet only been made profitably applicable to high-pressure boilers, but the inventor feels assured that he will shortly overcome certain difficulties of detail which have hitherto diminished the economy of its application to condensing engines also. The history of inventions is one of trials, of discouragements; often, also, of ultimate and brilliant success. The Warsop engine may yet be found to have drawbacks that will militate against its usefulness; but, so far as an experience extending over nearly twelve months teaches, such drawbacks are not preceptible. If it should be found to fulfil only half its present promise, it will effect an annual saving the amount of which it would be almost impossible to calculate, and its use would become, a matter of necessity wherever the profits of manufacture are curtailed by the influence of competition. No merchant steamer could dispense with it, and, by enabling ships of war to keep the sea, it would become of equal importance to the statesman.

The New York *Sun* says:—France is complaining of the decay of her shipping, just as this country is. The transatlantic line of steamers, which receives 2,000,000 francs a year from the Government, is just able, with the aid of that subsidy, to pay expenses, and unless it is increased will have soon to go into liquidation. In 1869, of 152 departures from Havre for New York, only 26 were of French vessels. Of 60 departures in the same year from Havre and St. Nazaire for the West Indies, only 24 were French. Under a law passed in 1866, foreign vessels compete so successfully with French vessels that they bring to France nearly all the incoming freight, and take a large part of that going out. The French Legislature has ordered special inquiry into the subject,

THE DECLINE OF GREAT BRITAIN.

(From the Cincinnati Enquirer.)

The New York *Tribune*, in an article upon Great Britain, says "that she has passed her highest point of strength and influence." It may be patriotic in an American journalist to entertain or express this belief, but an Englishman might, if he chose, give some good reasons to the contrary. He would claim that his country was never more progressive than now. In no ten years of her history did she ever make such strides toward commercial eminence as from 1860 to 1870. The amount of her shipping, which was but little more than that of the United States in 1860, is now more than double ours, and every year appears to be increasing her superiority. Commerce has ever been one of the greatest elements of her strength, and she is constantly increasing it. In manufactures, it was not long ago that the *Tribune* asserted that under the French reciprocity treaty she was underselling and ruining important branches of French industry, and extending her influence on the continent. Never was our contemporary more urgent for the very highest tariff in the United States, to protect our manufacturers from British competition, than he is at the present time. Her colonies all appear to be satisfied with her rule. She has withdrawn her troops from Canada, and preserves her supremacy there by the regard of the people for the connection. Her other great colonies are also satisfied. The population of the three Islands has doubled within the last half century, and a steady increase is still going on. At the same time she is making great political reforms, and approximating her institutions more and more to a republican standard. Is this calculated to diminish her strength and influence? The Island of Great Britain is a small country, and in time will arrive at a point from which an advance is not possible, but that apparently is yet remote. The Anglo-Saxon race, much as it is advancing in the United States, is not declining, nor likely to decline, for a century in the old country. This is the reply a Briton would make to the *Tribune*.

THE COLONIES.

The remarks printed below are most pleasing. The great conservative body of English politicians is sound in reference to the United Empire, and we believe that their sentiment will yet pervade the generality of statesmen in Britain of all shades in politics. At the Conservative banquet in London on the evening of March 9th, Mr. Gathorne Hardy, while referring to the Colonial question, said:

"As to the Colonies; I want to know whether the Conservatives of England want to be separated from the Colonies [No, no, and cheers.] I believe Conservative principles in regard to the Colonies are that we should maintain with them the most cordial relations, and never show them the cold shoulder; never meet them with civil sneers [hear, hear] or lukewarm civility; but to let them see that so long as they display loyalty to the mother country and to the crown of England, so long will the mother country hold that the crown of England is one and indivisible." [Cheers.]

The Canadian Papal Zouaves, whose term of service has expired, arrived in Montreal on Thursday morning at eleven o'clock, and were escorted by the college boys and some volunteers to the French church, where a service was performed.