the undertakers, as such moderate principle of charging would bring the most traffic.

(To be continued.)

Great Britain Steamer.

By the politeness and favor of Mr. Guppy, the Engineer of the Company, we were permitted to inspect this celebrated vessel on Tuesday, the day previous to His Royal Highness Prince Albert's visit.

It is impossible for us, by any description we can give, to do justice to this great and noble ship. To form a true estimate of her, one must see her, go on board of her, and compare her with other vessels. Her upper deck, which is 308 feet long, and 50 wide, and flush throughout its entire length, appears to be a promenade, of which it would require some effort to march from one end to the other. From the figure-head to the taffrail is 322 feet.

Her grand saloon aft, is a noble room, 98 feet by 32, and near 8½ feet high. The fittings of this room are different from those of any other steamer we have yet seen. The style is extremely neat and chaste. About 8 feet from each side, and also in the centre line of the ship, are a row of pillars, some 10 or 12 feet apart, and opposite to each of these is a pilaster very tastefully ornamented, the intermediate spaces being panelled, so as to throw out the ornamented pilasters to the greatest advantage. At the ends and certain angles of the room, are placed mirrors, at such angles as to produce very pleasing illusions, and to have a fine effect.

Above this is the principal promenade saloon, which is decorated to correspond, and which also has a row of pillars down its centre. Ranged along its sides are seats for those who choose to lounge and sit, while the middle forms a light and spacious promenade in wet, or rough, weather.

In the fore part is another promenade cabin, or saloon, of less dimensions, being 67 by 21¾ feet, but intended, we hear, to be fitted up in a similar manner.

Beneath this, above the water-line, is the fore dining-room, which is 61 by 21¾ feet. There are 26 single bedded-rooms, and 113 double bedded.

For the accommodation of ladies there are large and commodious sitting-rooms communicating with their berths. These rooms, to the capacious size of which several berths are necessarily sacrificed, will be a great comfort to lady passengers, particularly in rough and foul weather.

We understand that the number of passengers' beds will be about 260. They might easily have made up a great many more, but have chosen to limit the number, rather than to encroach upon the comforts and pleasure of their customers, of which, indeed, they have been more prodigal than they might, with a just regard to their own profit.

The public has long been informed, that this vessel is to be driven by a propeller somewhat upon the principle of the screw. The plane

of this propeller is at right angles to its shaft, which is about 8 or 9 feet above, and parallel to the keel. To speak popularly, it consists of four segments of fans, (frustrums of the screw spiral of 22 feet pitch) not plain, but twisted, so as to produce the best effect upon the water, the general plane of each being inclined in an angle to the plane of the propeller. The form, inclination, or pitch, and dimensions of the fans, we understand have been the result of long and careful experiment, made for the especial purpose of finding out the best form.

The diameter of the propeller is 16 feet, and its top will be under the water line when the vessel is loaded.

By dividing the propeller into four parts, it is calculated that the motion of the vessel will be easier, and that the water will not be so much sliced, as if there were a greater number of fans, and will hence be capable of offering more resistance.

The shaft of the propeller, which is of solid wrought-iron, 16 inches diameter, passes through a stuffing-box in the stern of the vessel, and terminates in a wheel, which is to be driven, as we understand, by a pitch chain passing over this and the great drum. This wheel is 6 feet, and the drum attached to the crank shaft of the engine is 18 feet diameter. The propeller, therefore, makes three revolutions for every revolution of the drum, or every double stroke of the engine.

The length of the stroke is 72 inches, and the diameter of each cylinder 88.

There are four cylinders, two placed on each side of the vessel, opposite, or nearly so, to each other, the opposite pairs converging towards the top in an angle of about 68 degrees. The connecting rods of each pair are attached to the same crank, and, therefore, drive the crank as one cylinder.

This plan simplifies the machinery much, and obviates a difficulty which had been conceived by some eminent steam navigation gentlemen, with regard to the simultaneous working of the cylinders in a rough sea. As designed, the four work as one pair.

It is intended to work the cylinders expansively, with an apparatus for cutting off the steam at any part of the stroke within certain limits. The intention is to cut off at one-fourth, and expand the other three-fourths. The computation is, that when the cut off is at half stroke, each cylinder will do the duty of 250 horses, the steam in the boiler being 6 lbs. above the atmosphere. The engines are, therefore, collectively, of 1000 horse-power.

The boiler is 34 ft. long, 32 ft. broad, and 22 ft. high, and is divided into three nearly equal compartments, each compartment forming a separate boiler, and may be all three used separately, or together These compartments add much to its strength. The steam-pipes from each compartment unite behind the boiler, and the steam-ways, 24 inches diameter, turn round the sides to the cylinders.

The boiler is heated by 24 fires, and its plates are 7-16th inch thick. The flues recurve within the boiler, and give it something of the property of a tubular boiler.

At present merely the boiler and cylinders are put in the vessel The framing and truss-work for the shaft, &c., are of Demerara

Green Heart wood, and very thick wrought-iron, and present the appearance of great strength.

The rudder is 7 ft. wide, and works upon a pivot, of course, behind the propeller, two-thirds behind it and one-third before. It will, therefore, be very easily worked, and as the propeller will force the water back upon it with considerable force, it will possess great command over her motions, even at comparatively slow velocities. This is one great advantage the screw and all aft propellers have over paddles; the vessels are always more manageable with them.

At 6 lbs. per horse-power per hour, the *Great Britain* will consume 2.67 tons of coal per hour, or near 64 tons per day. To steam, therefore, for 20 days, she must carry 1,280 tons of coals. Her bunkers will contain 1,200 tons, or provision for about 19 days.

With regard to the vessel herself, she is, on all hands, allowed to possess the finest proportion, and most beautiful lines. Her neat entrance, clean run, and gracefully swelling sides, strike the eye as exceedingly well calculated for speed, steadiness of motion, and sitting well upon the water. From her great length, and apparently narrow beam, it might be expected she would be disposed to roll, but as her water line is below the swell of her sides, that will be a great check, and the probability is, that she will ride with greater safety, and be less liable to ship seas. She is calculated to average 12 knots an hour at the least, by steam, and with a good fair wind, 13 through the water. At this rate she will reach New York in 10 days.

It is intended to carry only one class of passengers, for which, as we said, every comfort and convenience are secured.

As our readers know, she is made of iron. Her plates and angle-irons, or those which would be called her ribs, are ⅝ths of an inch thick. These are trussed with immense stringing timbers at every deck and division, and strengthened by struts from the iron joists supporting the decks. The lower decks themselves consist of narrow planks stretching from side to side, of 5 inches thick. These are again strengthened by cross-iron stays, screwed to them in all possible directions beneath. In fact, every care appears to have been exhausted to ensure ample strength and stability to this magnificent vessel.

The displacement of the *Great Britain* is about 3,200 tons. Her power, therefore, is one horse to 3.2 tons, which is a high proportion, especially for a vessel of her tonnage. Taking, consequently, into account her tonnage and power, they are warranted in calculating upon an unusually high speed.

Her engines and machinery weigh about 600 tons, and the total quantity of iron used in her, is 1,500 tons. The greatest care has been used to have none but materials, whether iron, or wood, of the very best quality.

She has 6 masts, 4 of which carry fore and aft sails only, and the main-mast, which is 75 feet high above the deck, will have an immense spread of square and studding sails.

She has 5 water-tight bulkheads, all reaching above the water-line, but some of them much higher. Her funnel is 39 ft. high, and 8 ft. diameter.

The estimate was for £75,000, but it is expected she will cost about £100,000. The weight of the main-iron shaft is 16 tons, the largest ever constructed. It was manufactured at the Mersey Iron Works. Her boiler will contain about 200 tons of water; and her pumps, worked by machinery, will be able to throw off 7,000 gallons of water a minute.

At the time we were at Bristol, we had an opportunity of going over the Company's work-shops, and were both surprised and pleased to observe the unusually fine manner in which they turn out their work—it is a credit to Bristol.

Railway Magazine.

The Steam Excavating Machine.

We have already had the pleasure of introducing this important machine to the public, and we now avail ourselves of the opportunity of giving some further account of it. As is well known, it is of American invention: and this individual machine was imported from the United States, after having been employed on a railway there for the purpose of testing its capabilities in this country. It is now at work on the Eastern Counties Railway, about 20 mile from London, and is exciting much attention. In its present state, the machine is rather complicated, but it is susceptible of great improvement; and we have no doubt that any machines manufactured in this country will be much simplified. For this purpose it cannot be in better hands, the management of the patent being entrusted to Mr. John Braithwaite, the engineer, whose mechanical attainments are well known to the public, and who is well qualified to turn a machine of this kind to the best account.

The accompanying engraving* is a perspective view of the machine when at work, and it will be seen by it, that one man, the engine-tender, stands behind, to regulate the performance of the engine, and another man in front, to regulate the motion of the scoops, and to turn the jib, or crane, to the right or left, as may be required. By the aid of this jib, the scoop is enabled to take a sweep of 30 feet, and clear away obstructions before it to the height of about 14 feet.

The cubic content of the scoop is 1½ yard, and it lifts about 1¼ cubic yard, two of which is about a wagon load of 2½ cubic yards. If the wagons were brought up as fast as the machine could supply them, it would fill 30 per hour. During the day we inspected the machine, it loaded 26 wagons of 2½ cubic yards each within the hour; and at another performance, it filled 103 cars in 5½ hours. By these trials, the duty of the machine appeared to be, upon an average, 20 wagons, or 50 yards, per hour, or 500 yards per day. This quantity does not appear to be more than half the duty of the machine, as detailed in a report before us, emanating from a committee of managers of the American Institute, New York, especially appointed to examine the machine. The committee state—

* See engraving in this Journal, page 324, vol. v.