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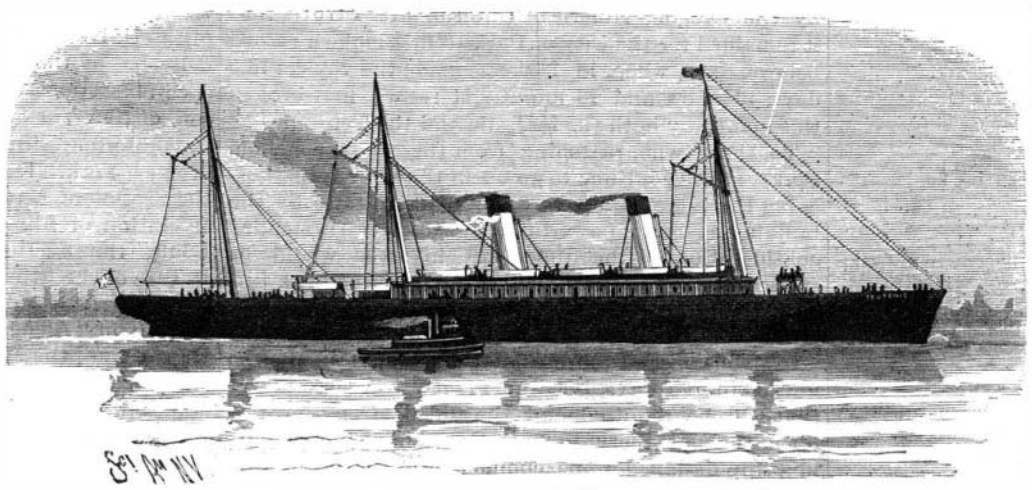
WHITE STAR STEAMER TEUTONIC.

Two weeks ago we recorded the fact that the steamer Majestic, in a voyage ending August 5, had broken all previous records of quick voyages across the Atlantic, making the run in 5 days 18 hours and 8 minutes. Now the Majestic herself has been beaten by a sister ship of the same line, the Teutonic, which completed the voyage on August 19 in 5 days 16 hours and 31 minutes, thus beating the time of the Majestic by 1 hour and 37 minutes. The time in each case is taken from Daunt's Rock light, outside of Queenstown Harbor, to the Sandy Hook lightship, at the entrance to New York Harbor. The Teutonic also made in this voyage the longest single day's run ever recorded, 517 knots. Her average speed for the voyage was 20·357 knots per hour. The engines developed, during the best runs, about 19,900 horse power, her screws making almost 81 turns a minute, while the average for the voyage was a little under 80 turns a minute, on a coal consumption said to be about 310 tons per day.

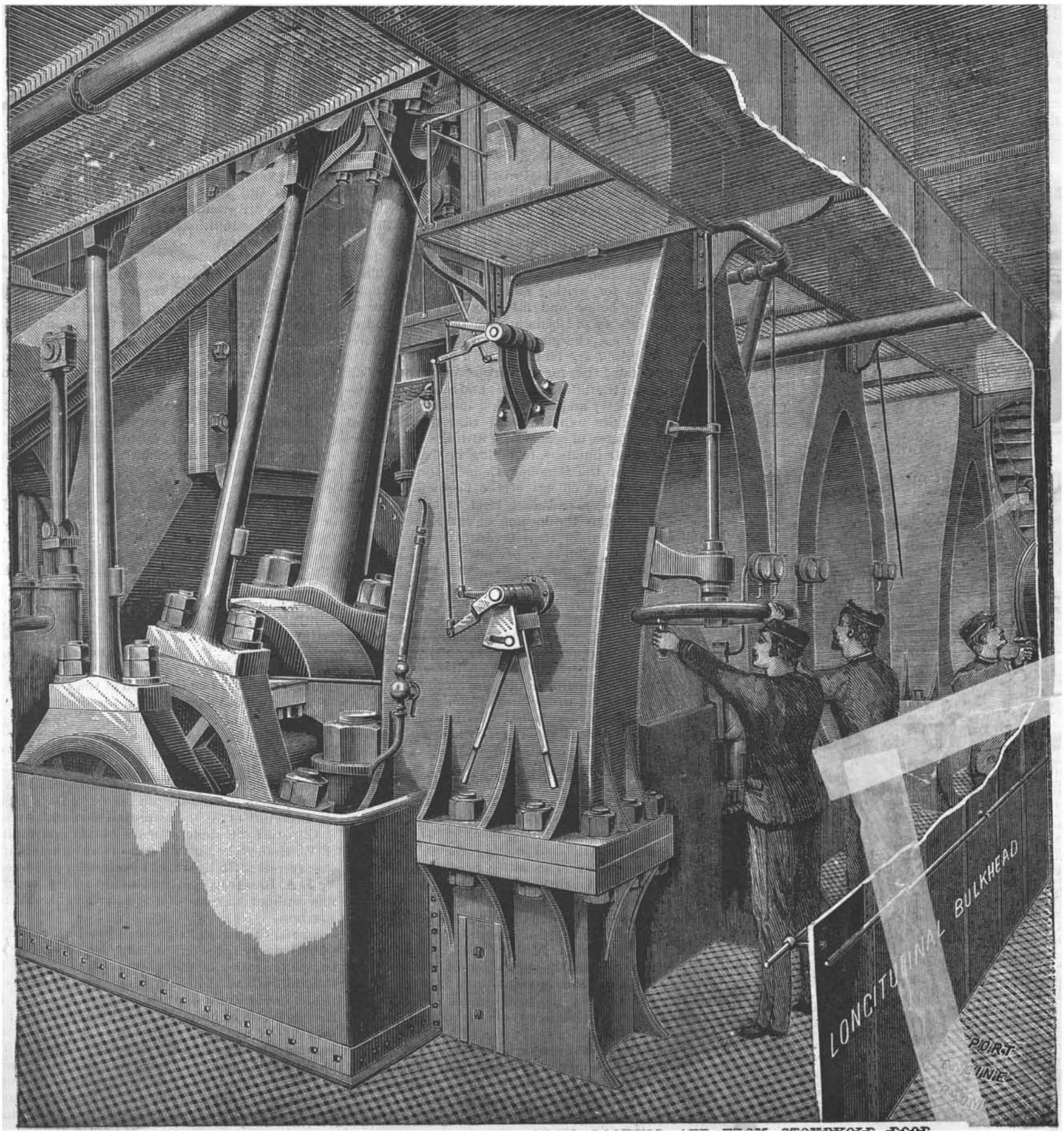


THE WHITE STAR LINER TEUTONIC.

The records of the daily runs for the three fastest voyages thus far made are as follows:

	Teutonic.	Majestic.	City of Paris.
First day....	460	470	462
Second day..	496	501	493
Third day....	505	497	502
Fourth day...	510	501	506
Fifth day....	517	491	509
Sixth day....	290	317	316
Total...	2,778	2,777	2,788

(*Continued on page* 134.)



STEAMSHIP TEUTONIC—STARBOARD ENGINE ROOM, LOOKING AFT FROM STOKEHOLD DOOR.

WHITE STAR STEAMER TEUTONIC.

(*Continued from first page.*)

The White Star steamers Teutonic and Majestic are similar throughout. They have a gross tonnage of 10,000 tons each, and their displacement, when fully loaded, is about 16,000 tons each, the indicated horse power of each being 17,000, which can be run up, as has been seen, to nearly 20,000. They were both built by Messrs. Harland & Wolff, of Belfast. The Teutonic was launched in January, 1889, her keel having been laid in March, 1887, and the Majestic was launched in June, 1889. Both vessels are specially constructed for service as mercantile armed cruisers, according to arrangements made with the British Admiralty, so that the British government could at any time add them to its naval force in case of war with another country. They are built of Siemens-Martin steel, and propelled by two independent sets of triple expansion engines driving twin propellers with manganese bronze blades. In addition to being minutely subdivided by athwartship bulkheads, they are constructed with a longitudinal bulkhead running fore and aft throughout the greater portion of their length, which gives additional rigidity to their structure and greatly increases their security in the event of accident. They can each carry 855 fore cabin passengers, 175 second class, and 300 in the saloon. When fully loaded, each will have on board about 3,000 tons of coal and nearly 4,000 tons of cargo.

In the engine and boiler rooms each carries twenty-five engineers. Mr. T. Sewell, in the Majestic, and Mr. Currie, in the Teutonic, hold the extremely responsible positions of engineers-in-chief. There are sixty firemen and forty-eight coal trimmers; electricians, ice machine men, etc., bring up the engine room staff of each to one hundred and sixty-eight. They carry crews of about forty sailors, twenty-five cooks, and sixty stewards.

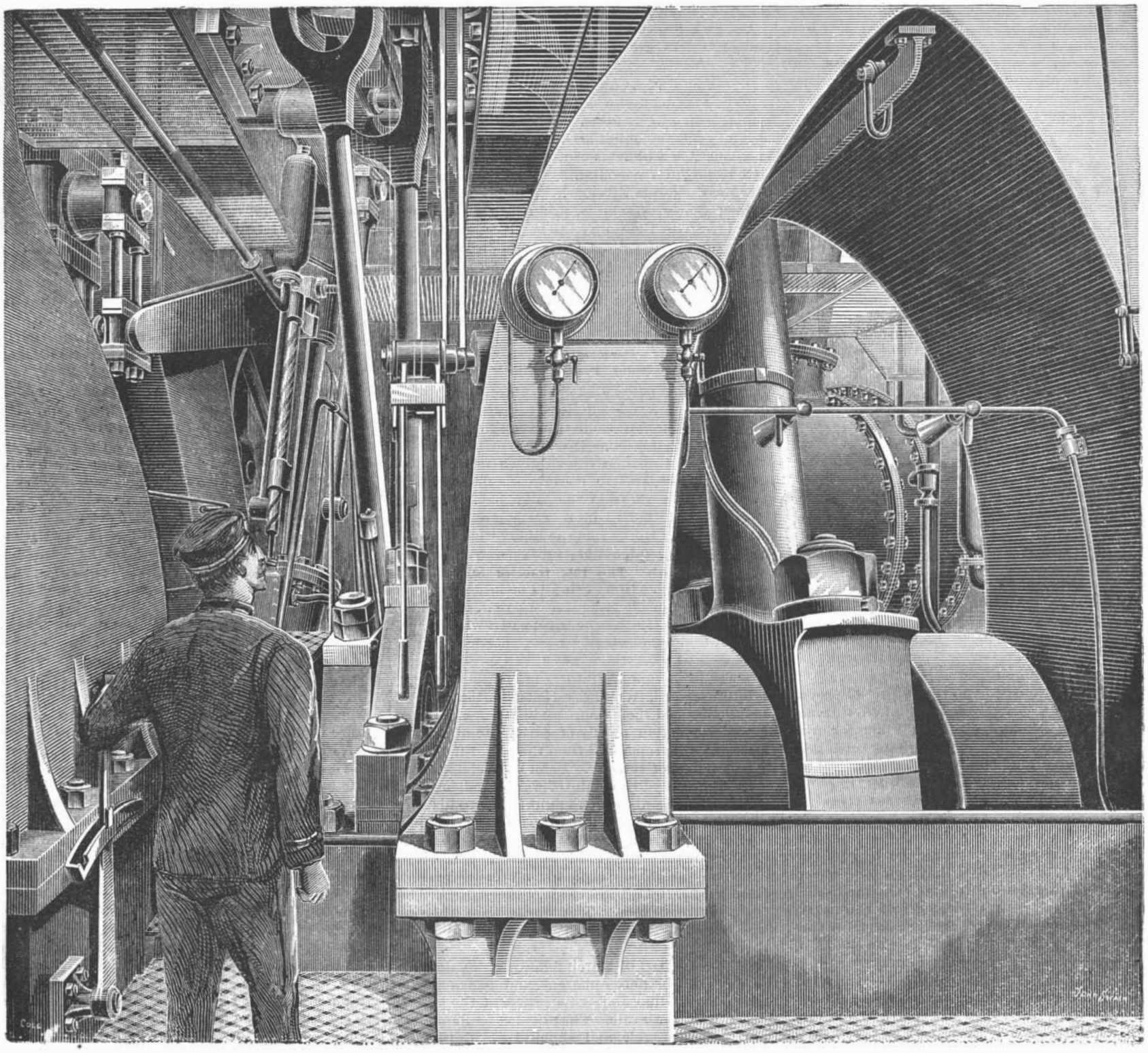
The cylinders of the triple expansion engines are 43 inches, 68 inches, and 110 inches in diameter, respectively, the stroke, common, being 60 inches, and, according to the London *Engineer*, from which we copy the illustrations and condense this description, each cylinder is carried on cast steel frames. In front is an A frame, and at the back a single frame, so that the cylinders are carried each on three points of support, and the "three-legged stool" principle is called in to give stability, which it does in the fullest degree. The high pressure cylinders stand next the boiler rooms. The engine rooms are over 50 feet long. All the cylinders have piston valves, two each to the intermediate and low pressure cylinders, and one to the high pressure cylinder. The cylinders are not steam jacketed, but all are fitted with liners and are air jacketed. The intermediate and low pressure pistons have tail rods, but the high pressure pistons have not. All the pistons are coned to impart stiffness, and have been made as light as is consistent with strength.

The condenser is quite separate from the engine. It is cylindrical, of brass, some 20 ft. long, and 7 ft. in diameter. The tubes are of brass, ⅝ in. diameter. The aggregate length of all the condenser tubes is about twenty miles. The water passes through the tubes three times. The boilers are fed by Weir's vertical pumps, but Worthington pumps are also provided. The engines are separated by the longitudinal bulkhead, which rises a few feet above the water line to a point about level with the cylinder covers. The whole of the upper part of the engine room is common to both engines. As the propellers overlap, the engines can be placed much closer together than is possible when the usual system is adopted.

The valve gear is of the ordinary Stephenson shifting link type. The rods of the two sets of piston valves on the intermediate and low pressure cylinders are keyed into a crosshead working in guides, and to the center of the crosshead. The link die is coupled so that one link serves for both valves. We give a view taken on the middle platform. The cylinder bottoms are seen overhead. The construction of the valve gear will be readily understood. The hand wheel and screw on the weigh shaft is for fine adjustment for expansion.

We also give two views showing the enormous dimensions of the crank shaft and connecting rods. The crank shafts, each weighing 41 tons, are of Whitworth steel, the crank pins being 22 in. by 22 in.

The screw shafts are placed so close together that the screws overlap 5 ft. 6 in., and the starboard propeller is astern of the other by 6 ft. The propellers revolve "outboard." A large opening is made in the dead wood to allow of this system of construction. There are no stern brackets, the hull being worked out round the screw shaft, and fitted with a strong spectacle casting in steel, which carries the stern bearings. There is no screw alley in the ordinary sense of the word. Each screw shaft—one 199 ft. and the other 205 ft. long, weighing 76 tons—runs along a species of chamber which, well aft, is really outside the hull. One of our engravings shows a view taken in this chamber. At the other side is the longitudinal bulkhead, and in the space between this and the shaft are placed ice-making machines—ammonia—and the cold air storage holds are supplied with cold air by fans from this department. Everything is duplicated, so that the machinery at both sides of the bulkhead is the same.



STEAMSHIP TEUTONIC—STARBOARD ENGINES, STARTING PLATFORM.

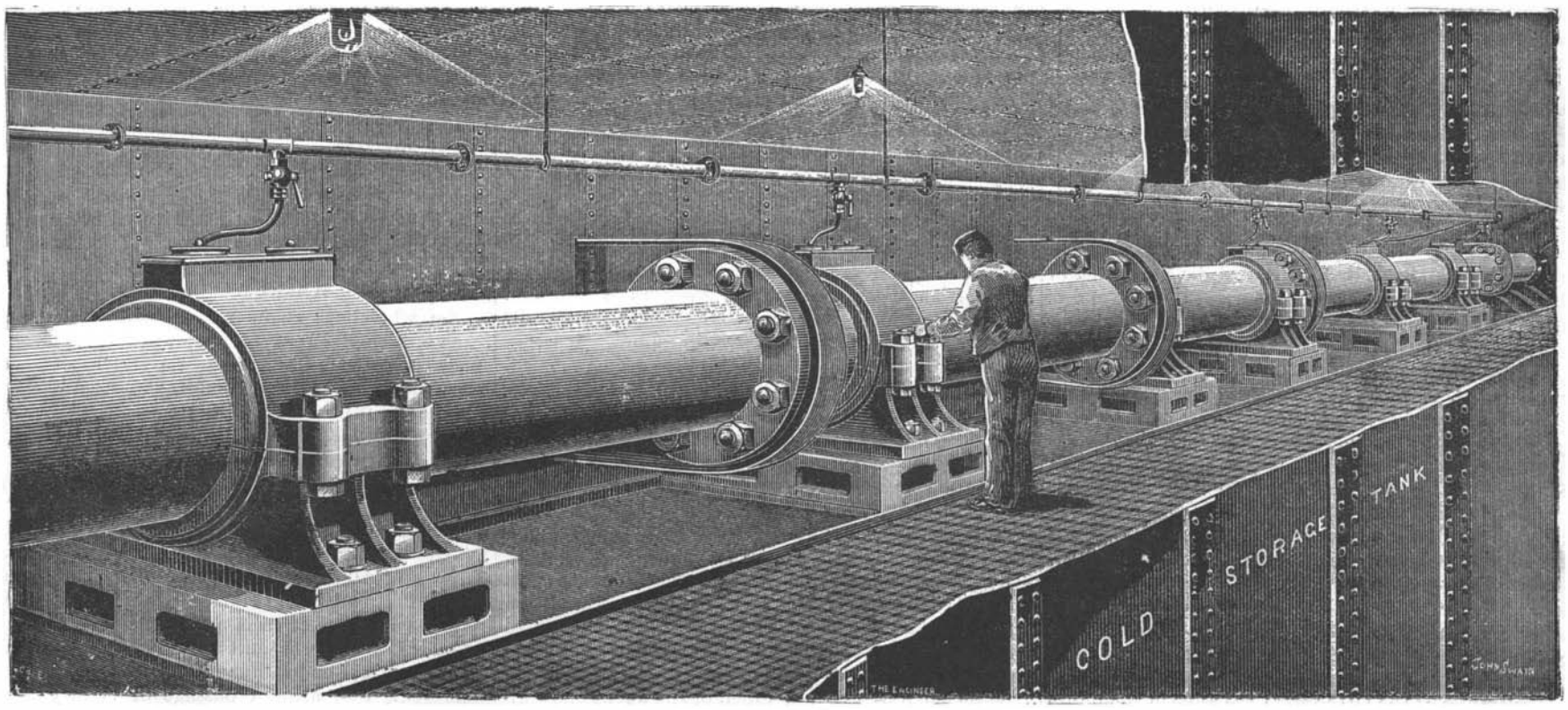
The screw propellers are 19 ft. 6 in. diameter and 28 ft. 6 in. pitch, four bladed, modified Griffiths true screws, with a surface of 108 square feet each. The propeller blades were cast of Parsons manganese bronze from ingots supplied by the Manganese Bronze and Brass Co., Deptford, by Messrs. Harland & Wolff, Belfast, who have for some time past adopted this metal for the propellers of all their fast passenger steamships.

Steam is supplied by twelve double-ended and four single-ended boilers, containing eighty-four furnaces. The pressure is 180 lb. They are worked with forced, or rather assisted, draught, on a modification of Howden's system. On the bridge decks, at each side of the funnels, there are four double fans driven by compound engines, to drive air into the stokeholds, supplementing the supply drawn through the fiddley

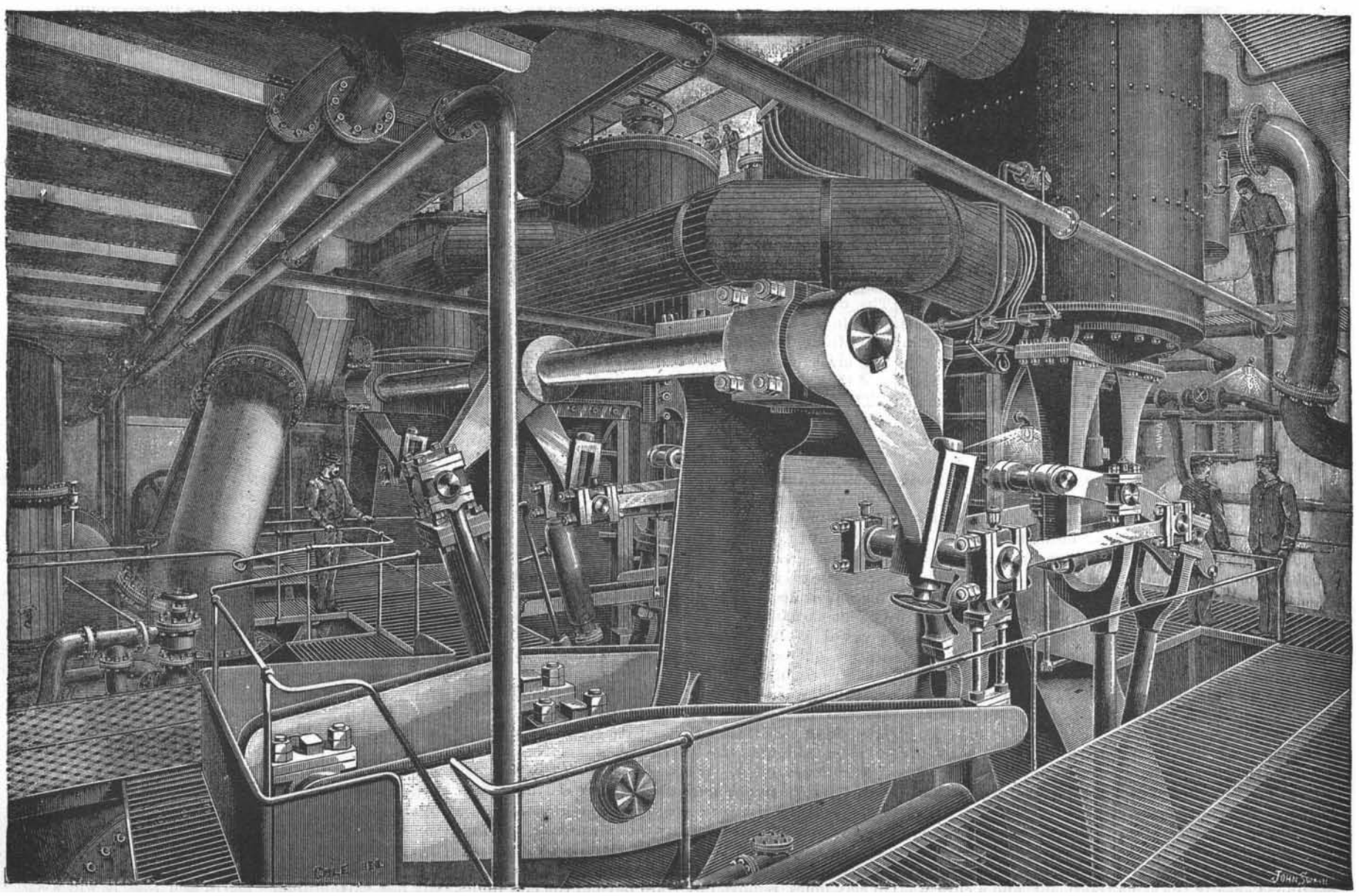
gratings. Below these are fourteen fans, driven by Chandler engines, to draw the air from the hottest places in the stokeholds and force it into chambers in the uptakes at the bases of the chimneys. There are fifty vertical tubes in each chamber, and through these tubes the products of combustion pass, while the air from the fans circulates round them, and passing down the sides of the smoke boxes is finally delivered into the closed ash pits at a comparatively high temperature. About one-fourth of the whole air supply is admitted over the fires. The combustion is very perfect, and it is only under exceptional circumstances before the fires are fairly away that much smoke is given off. The chimneys, two in number, are oval, each 14 ft. on the major axis by 11 ft. 6 in. wide. In addition to the eighteen fans, there are three others, two for keeping the dynamo rooms cool and one for ventilating the firemen's quarters.

In running the engines of the Teutonic at their indicated 17,000 horse power, it is computed that the boilers will have to produce about 120 tons of steam per hour, with an absolute pressure of 195 lb., the safety valve load being 180 lb. on the square inch. Of course the feed pumps have to deliver 120 tons of water into the boilers against this pressure every hour. The feed water required for one hour would fill a cubical tank nearly 16½ ft. long, broad, and deep; for at 36 ft. to the ton, 120 tons means 4,320 cubic feet. The energy expended in putting this great body of water into the boilers is over 57 horse power, allowing nothing for friction in pipes or losses of any kind. The feed pumps really absorb about 120 indicated horse power. The total feed water for one day of twenty-four hours amounts to 103,680 cubic feet, or an ample daily supply for a town of 26,000 inhabitants, giving every person twenty-five gallons per day. To convert this water into steam about 13·5 tons of coal are burned every hour, or in round numbers 320 tons a day. These figures are not official, but they are not far from the truth. The 13½ tons of coal need for their combustion not less than 270 tons of air. Assuming that this air before it enters the fans has a temperature of about 80°, it will weigh, omitting fractions, 7 lb. per 100 cubic feet. The 270 tons represent, then, 8,640,000 cubic feet. To raise this air from 80° to 180° as is done represents about 5,800 theoretical horse power, and a large portion of this may be regarded as clear gain, being obtained for nothing. In other words, if the air were delivered cold to the furnaces instead of hot, some 20 tons of coal extra would be required per day.

The centrifugal circulating engines must run constantly when the main engines are moving; they must be started before the main engines, and must be kept running during all temporary stoppages, in order that the great condensers may be kept cool and ready to deal with the immense volumes of steam which are discharged from the low pressure cylinders of the main engines. The weight of steam to be condensed is taken roughly at 120 tons per hour, a quantity which gives some idea of the important part which surface condensation has played in the progress of steam navigation. About 26,000 gallons of water are made into steam at a pressure of 180 lb. per square inch, and reconverted into water every hour. To effect this condensation about 4,000 tons of sea water are passed



STEAMSHIP TEUTONIC—STARBOARD TUNNEL.



STEAMSHIP TEUTONIC—STARBOARD ENGINES, MIDDLE PLATFORM, FROM FORWARD STARBOARD CORNER.

through the tubes of the surface condensers every hour. This duty is effected by circulating pumps, and it may be interesting to state that the amount of water dealt with on the round trip between New York and Liverpool is over 1,000,000 tons—enough to fill a reservoir about a mile long, a quarter of a mile wide, and six feet deep.

The London Insectary.

The insect house in the Zoological Society's gardens is now in excellent order, and well deserves a visit. In addition to the silk moths that are usually present during the warm weather, the Papilioninae, or swallow-tail butterflies, afford at the present time the chief display. The perfect insects of several species of the genus Papilio have appeared—*P. cresphontes*, *ajax*, and *asterias* from North America, *P. alexanor* from the Mediterranean shores, and the handsome *P. maackii* from Japan. The last named has been seen for the first time in the house this year, and offers a striking contrast to the other species of the genus that have previously been exhibited in the gardens, it being of black and golden-green colors instead of the yellows and blacks that we are accustomed to in our European swallow-tails.

P. cresphontes has appeared in large numbers in the house, but no varieties have been obtained. This, also, is the first season for two other beautiful Papilioninae, viz., *Doritis apollina* from Asia Minor and the Japanese *Sericina telamon*. The latter shows considerable difference in the markings of the sexes. The North American *Limenitis disippus* can be at present seen in all its stages, and is well worthy of attention, the caterpillar moving along the leafstalks with a peculiar interrupted gait. Of the sphinx moths, the south European *Deilephila alecto* has already appeared, and *D. nicae* is expected. These insects are, however, not seen to advantage in confinement, as their superb powers of flight cannot be displayed in a small compartment. Two examples of the Orthoptera are alive in the house —*Diapheromera femorata*, one of the stick or twig insects from North America, and *Empusa egena* from southern Europe. The former has been reared from eggs laid in the insect house, but these progeny are not so healthy as those obtained from freshly imported eggs. The Empusa is of a most bizarre form, and belongs to the family Mantidae, the species of which feed only on living creatures. The public is indebted to Mr. S. H. Carver for the opportunity of seeing living scorpions. He has sent examples of two species of this group from Egypt, both of which, unfortunately, are unidentified, there being obvious difficulties in the way of carrying about live scorpions and comparing them with dried specimens. There is a third scorpion, from south Europe, living with its Egyptian congeners. It has a small delicate tail, and is altogether a less frightful creature, though assuming a menacing attitude with equal readiness.

A spider, *Lycosa portosantana*, from Madeira, is healthy, and is a fine creature, though insignificant by the side of its neighbor, a huge Mygale from South America. The latter, as well as the scorpions, is fed with mice, which are given to it dead, though in its native haunts a Mygale has been known to prey on living individuals of these small mammals.—*Nature.*

A New Treatment for Baldness.

The form of alopecia for which M. Moty suggests a new plan of treatment is that which proves at times so obstinate, in spite of all applications, commonly known as alopecia areata. At a recent meeting of the French society of Dermatologie et Syphilographie, he presented a number of patients who had been subjected to intradermic injections of corrosive sublimate in strength of two to five hundred, and claimed that the treatment had proved very satisfactory, in that the growth of hair over the bald spots had been more rapid than after other modes of treatment. A variety of vehicles had been experimented with, until it was found that an aqueous solution was the best. Several injections of not more than five or six drops are made around each patch.

Modern investigations tend to show that there is at least one variety of alopecia, occurring in rounded plaques, which is due to the invasion of a microorganism, and the observations of Von Scholen, Thin, Robinson, and others in this field have rendered it scarcely justifiable for an author at the present day to attribute the affection to neurotic causes in all cases. If, as Robinson maintains, the organisms are situated deeply in the tissues of the scalp or other hairy portions of the skin, then the plan of treatment here suggested is eminently rational, and ought to be as successful as it is claimed.

It must always be remembered, however, that the disease is of a most erratic nature, and while at times it resists all our efforts, at others it shows a tendency to rapid and spontaneous recovery.

Besnier relates an instance in point, where a patient was treated in his service continually for two years without success. He was then sent to a colleague who continued exactly the same treatment, and a cure was promptly effected.—*Med. Record.*

Disposal of Refuse in American Cities.

The disposal of the refuse in cities, while it has been a problem in the sanitation of our larger towns, is yet to be solved. There is probably not a city of any size in the United States where the disposal of wastes is satisfactory or conducted in such a manner as to meet the demands of cleanliness and hygiene. If there is a perfect plan adopted, there are to be found defects in its execution which render ineffective the methods used. The report of Mr. Walter V. Hayt, General Sanitary Officer of the Chicago Board of Health, recently published, gives a summary of different cities as to their methods of "collection and disposal of garbage and refuse." From this we learn that in New York the garbage is collected by the city teams, loaded upon flat boats, removed to sea and dumped. The garbage is removed from Philadelphia by small contractors in a very unsatisfactory manner; some feed to hogs, others sell to farmers, and at times it is buried or accumulated on the ground awaiting slow decomposition. Cremation is recommended. In Brooklyn refuse is moved to the sea. Collections are made daily from hotels, from dwellings twice a week in winter and three times a week in summer. St. Louis collects its garbage and discharges it at certain dumps. It is not satisfactory, and cremation is also here recommended. The following is said regarding the disposal of garbage in Boston:

"There are now about three hundred and fifty thousand loads of garbage, ashes, street sweepings, and other miscellaneous *debris* gathered up by the city teams annually, and carted away to different places and for different uses. The annual cost to the city in hauling this large amount of material is about $500,000, about $100,000 of which is spent in collecting garbage. With the growth of the city and the gradually increased distance to which such matter must be carried for disposal comes a corresponding increase in the expense. The question occurs to us, cannot this growing expense be lessened, and much of the offense now attending the necessary storing of garbage in the houses and yards, and the hauling and carting of it in the streets, be avoided? It is found that with trifling cost in arranging the kitchen stove, each family can easily burn all its refuse as it is made, and before it becomes offensive, and thus save all subsequent expenses and nuisance incidental to its being kept on the premises for several days and then carried through the streets by the city teams."

Baltimore says that "the mode of disposing of the garbage, night soil, and street dirt of the city, as at present carried on, though far from perfect, is, with our present facilities, the best our circumstances will allow. The offal and filth of cities *must* be deposited *somewhere* when gathered from every house and locality, and is from the very nature of things a nuisance to those who reside in the neighborhood of the dumps. Much, however, could be done in mitigation of this evil by more stringent regulations in the manner of removing both garbage, ashes, and night soil. The garbage carts are very poorly adapted, in their present construction, for the transportation of garbage and ashes through the streets of the city, and are a source of constant complaint by citizens whose olfactories are greeted throughout the summer months by the odor of decaying vegetable and animal matter, and at all seasons saluted by a shower of dust from uncovered ash carts."

In 1883 Cincinnati contracted with a private company for two years to remove, for the sum of $2,500 annually, all "vegetable garbage, dead animals, and slaughter house offal within the limits of the city." The company must remove all animal matters from dwellings and hotels at least three times a week, and daily from all slaughter houses. Ashes and other refuse must not be mixed with vegetable garbage. It is said that the city has the best end of the contract.

The Cleveland method is as follows, as taken from the report: "*Something Necessary?*" "A long delayed sanitary necessity remains unprovided in this city, to wit: A satisfactory gathering of house garbage. No city of this size can be considered well taken care of which makes no public provision for this purpose. Private methods are entirely inadequate and mainly inefficient for the prompt and cleanly removal of such material. It is an old topic in these reports, but must continue to be urged until some relief is obtained. Whatever disposition is finally made of garbage, a systematic gathering should be inaugurated as speedily as possible. At present we are without funds for such service, but could money be better employed for the real welfare of our citizens?"

From the report it is gathered that the total cost of the scavenger service in Chicago for the year 1889 was $253,140.72. The area covered aggregated 174 square miles, including in this 2,047 miles of streets and about 3,000 miles of alleys. It is admitted that this service is only "fair." In one ward only is there a daily service. Outside of this it was tri-weekly. About 225 teams have been regularly employed by the contractor to whom this collecting is let, and by the city, and an average of 2,000 cubic yards per day is removed and deposited in clay holes, removed by train beyond the city limits, or from February 19 to October 15, 1890, burned by the Chicago Garbage Reduction Company. This company burned 7,208 tons of garbage in this period. For the year 1890 a total of 325 teams was demanded, and Mr. Hayt recommends radical improvements in the contract system of collecting, "if that is to be continued." These recommendations cover the employment of a minimum number of teams, a wagon box of standard size, with a proper canvas cover, wagons to be plainly marked with ward and number.

In all the cities cited the methods of disposal are not satisfactory in one. The method adopted or the service rendered is at fault. The lack of funds is responsible in some instances for the deficient work in the disposal of garbage. In the first place there is too much garbage produced, and in the next that which must necessarily be produced is not properly cared for, and the problem how best to dispose of the refuse of cities is still unsolved. The fact is some garbage must be produced, and we do not believe that any method which does not look to the destruction of this garbage will be a success.—*Sanitary News.*

Whaleback Steamers.

The whaleback steamer Charles H. Wetmore, Capt. Saunders, arrived at Liverpool on July 21, having made the passage from Montreal in about sixteen days. She arrived in New York from Liverpool Aug. 14, making the trip in fifteen days. She is the first lake steamer that ever crossed the Atlantic, and her safe voyages mark a new departure in the steam tonnage of these waters. Several Clyde-built steamers have been sent across, and after being cut in two sections they were locked through the St. Lawrence system of canals and joined together again at Buffalo. The Campana, Athabasca, and Alberta, built to the order of the Canadian Pacific Railroad Co., are instances of importations, and they have ever since remained in the lake trade. The steamer Rosedale was built at Sunderland, England, in 1888; she left London bound to Chicago on May 25 of that year, and after a passage of twenty days she reached the lakes and proceeded on to Chicago, where she arrived all well. Last year she was lengthened at the shipyard in Owen Sound, and she has since been a fortunate and profitable steamer on the lakes. Quite a number of lake schooners have crossed the Atlantic, and at one time it was thought that a lucrative trade might be built up between Cleveland, Ohio, and the old country. Steam, however, had so superseded sail that canal schooners were found to be too small to compete in the Atlantic carrying trade, and the large lake tonnage was prohibited on account of the limited size of the St. Lawrence system of canals. The Wetmore shot the rapids where the canals would not admit of her locking through, so that unless she is cut in two she can never reach the lakes again. After demonstrating the seagoing qualities of this type of vessel, they will be sent *via* the Straits of Magellan to Puget Sound, to enter upon the coal trade between Sound ports and San Francisco. It is now considered that the ultimate success of these vessels is assured.—*Marine Record.*

Quick Eyes and a Clear Head Needed.

When a railroad company, says the *Philadelphia Record*, handles as many million tons of coal annually as the Reading does, the question of weighing it becomes a matter of some importance. Skill and long experience have solved the problem, however, and the bulk of the vast coal tonnage of the leading coal-carrying road in the country is weighed on four scales, and then they are not crowded.

The weight of the empty car is marked in chalk on the outside. As the car approaches, a clerk takes the number of the car and its weight, the weigher calls out the gross weight, and the difference is the weight of the coal. The cars run as fast as ten miles an hour across the scale, and it is very seldom that one has to be stopped and brought back for reweighing, although that is done when the weigher is at all uncertain about his figures.

The men at the scales can generally tell within a hundred pounds or so what a car contains. As soon as they see the class of car coming, they know the number of tons it contains, and have the scale so prepared that only the hundredweights need be adjusted while the car is moving over it. Expert officials of the company can tell at a glance what each class of cars should contain, and if, in looking over the weight sheet, any car appears either too heavy or too light, it is brought back and reweighed.

Phenocoll Hydrochlorate.

Phenocoll hydrochlorate, the new antipyretic which is distinguished because of its ready solubility in water, is now at last commercially obtainable, and is receiving the attention which, from its expected therapeutical superiority, it merits. It claims for itself an antipyretic, anti-rheumatic, and anti-nervine action. From the evident interest of qualified observers and leading therapeutists in Germany, France, England, and America, it is reasonable to deduct that the new remedy has extraordinary merit, and that it will assume prominent rank in a very little while.