

### THE HAMBURG-AMERICAN LINER "DEUTSCHLAND."

Of the six decades which cover the life of Transatlantic steam navigation, the latest is certainly the most remarkable. The period from 1889 to the present year may appropriately be called the "twin-screw period," for it was in the year of the last Paris Exposition that the Inman and International Line, predecessor of the American Line, placed in service those two magnificent ships, the "City of New York" and the "City of Paris," which were built on the Clyde from plans drawn by designer Biles. In several respects they marked a distinct departure from all previous vessels. They were the first to embody twin screws driven by separate engines placed in two distinct water-tight compartments. They marked, moreover, a great advance over previous ships in size, speed and accommodation; and from the very first they were a brilliant success, the "Paris" early in her career breaking the record for the Transatlantic trip and crossing from New York to Queenstown in considerably under six days, at an average speed of over 20 knots an hour. The following year the White Star Line placed in service the "Teutonic" and the "Majestic," sister ships of 13,800 tons displacement and 19½ knots speed. Although somewhat smaller than the "City of Paris," these vessels were 25 feet longer, their length over all being 585 feet.

Three years later the Cunard Company gained the leading position in respect to size, speed and accommodation by adding to their fleet the celebrated "Campania" and "Lucania." Throughout the history of the Transatlantic service there had been no instance of such a great increase over the dimensions of previous vessels as was marked by the advent of these handsome vessels. They were 625 feet long, or 65 feet longer than the "City of Paris," and 65 feet in beam, with a displacement of 19,000 tons, or 4,000 tons more than the last named ship. With an indicated horse power of 30,000, the "Lucania" has crossed the Atlantic from Sandy Hook to Queenstown in 5 days and 7 hours, at an average speed of 22.1 knots per hour.

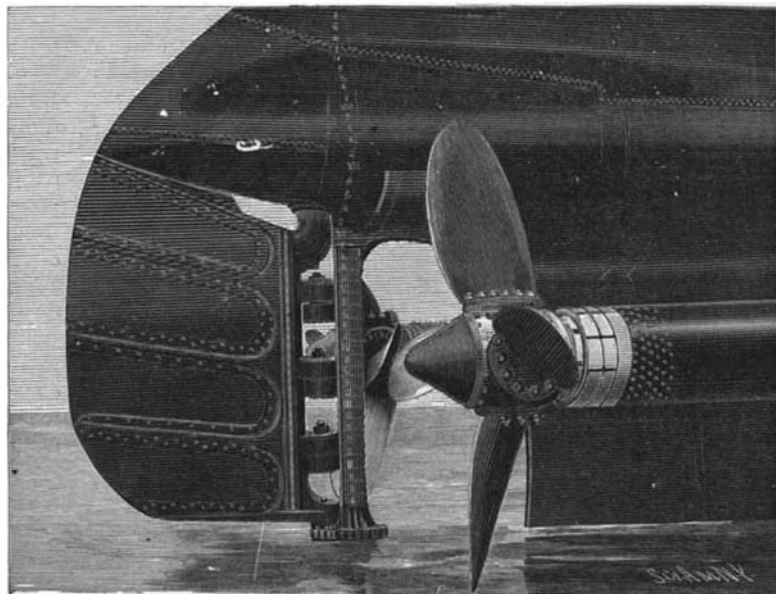
In 1895 the American Line, which under an Act of Congress had already purchased the "City of Paris" and the "City of New York," placed in service those two well-known vessels the "St. Paul" and the "St. Louis." Each may be described as an improved "City of Paris," retaining the best features of that vessel and embodying the many improvements in construction, motive power, and comfort for the passengers, which had marked the intervening six years since the launch of the latter vessel. They are 554 feet in length, 63 feet in beam, and have a displacement of 16,000 tons. The "St. Paul," whose engines indicate 20,000 horse power, has made the passage to Southampton at an average speed of 21 knots an hour. The four vessels of this line, it will be remembered, took an active part in the naval operations of the Spanish-American war and proved invaluable, both as scouts and in the transport service, for both of which duties the size, speed and coal endurance rendered them particularly well suited.

Two years later the North German Lloyd Company despatched on her maiden voyage to this city the "Kaiser Wilhelm der Grosse," a vessel which is naturally compared with the "Campania" and "Lucania." She is 24 feet longer than those vessels and possesses 1 foot more beam and 1,000 tons more displacement. From the very first she was a notable success, and up to the advent of the "Deutschland" she held all records for average sea speed and for distance traveled in 24 hours. Her fastest trip to Southampton was made at an average speed of 22.62 knots per hour, and she has covered the enormous distance of 580 knots in 24 hours.

After an interval of two years, the White Star Line added to their fleet a huge steamer that not only far exceeded in dimensions any existing liner, but both in length and displacement was greater than the "Great Eastern" itself. The "Oceanic" is 704 feet in length, 68 feet in beam, has a displacement of 28,500 tons, and with an indicated horse power of 28,000 has crossed the Atlantic at an average speed of 20.5 per hour.

In the latest Transatlantic liner, the "Deutschland," which forms the subject of the accompanying engravings, the Hamburg-American Company aimed to produce, if not the largest, at least the fastest, most powerful, and best appointed vessel, in the Atlantic service. She was built by the Vulcan Iron Works, of Stettin, Germany, who were the builders also of the "Kaiser Wilhelm der Grosse." She is not so long as

the "Oceanic" by 18 feet and she has one foot less beam and 5,500 tons less displacement. The "Oceanic," however, was not built for extremely high speed, but she was constructed with a view to carrying besides her passengers a large amount of cargo. The "Deutschland," on the other hand, is an ideal Atlantic racer. Her lines are exceedingly fine. Looking at her when she is in the dock, one is struck with the fact that the almost parallel lines amidships which exist in other fast steamships are wanting in the "Deutschland," for she begins to fine away toward the ends from amidships, remind-



THE BRONZE PROPELLERS OF THE "DEUTSCHLAND."  
Diameter, 23 feet; weight, 30 tons.

#### A DECADE IN THE DEVELOPMENT IN THE TRANS-ATLANTIC STEAMSHIP.

	Date.	Length. Feet.	Beam. Feet.	Displacement. Tons.	Horse Power.	Speed. Knots.
City of Paris .....	1889	560	63	15,000	20,000	20.25
Teutonic .....	1890	585	57½	13,800	18,000	19.50
Campania .....	1893	625	65	19,000	30,000	22.1
St. Paul .....	1895	554	63	16,000	20,000	21.0
Kaiser Wilhelm der Grosse .....	1897	649	66	20,000	28,000	22.62
Oceanic .....	1899	704	68	28,500	28,000	20.5
Deutschland .....	1900	686	67	23,000	35,640	23.0

ing one in the beauty of her lines of the model of a steam yacht. In the engine room, also, she greatly



"DEUTSCHLAND"—MAIN ENTRANCE TO SMOKING-ROOM.

exceeds the "Oceanic." She is driven by two sets of six-cylinder, quadruple expansion engines working on four cranks and balanced on the Yarrow-Schlick-Tweedy system, which is designed to, and very effectively does, reduce vibration. The hollow nickel-steel shafting for each engine is 130 feet in length and 2 feet in outside diameter, and the propellers, which are of bronze, are 23 feet in diameter. Steam is supplied by 16 Scotch boilers, 12 of which are of double-ended and the other four of the single-ended type. The working steam pressure is 220 pounds to the square inch. When

the boiler room is in full swing, the firemen have to feed coal continuously to no less than 112 separate furnaces. The vessel, it is almost needless to say, is constructed on the usual water-tight bulkhead principle, the hull being divided into 17 water-tight compartments by means of a longitudinal bulkhead and numerous transverse bulkheads. There is also the usual cellular bottom extending throughout the length of the ship and rounding well up into its sides.

It will be noted that the accommodation of the "Deutschland" is mainly restricted to first and second cabin passengers, provision being made for 467 first cabin, 300 second cabin and 300 third-class passengers. A novelty in the first cabin accommodation is a separate play-room for children and a gymnasium, while another innovation is a grill room, situated on the boat deck at an elevation of about 40 feet above the sea, where passengers may obtain a meal at any hour of the day. The general scheme of decoration may be gathered from the accompanying photographs, which we are enabled to present by the courtesy of Mr. Emil L. Boas, General Manager of the Hamburg-American Line. The dining saloon is a noble apartment reaching across the full width of the vessel and lighted by large port holes at the sides and through a large light-well, terminating in a dome covered with cathedral glass. One of our photographs, taken from the gallery of the deck above the dining saloon, shows three separate decks of the vessel; that on which the dining saloon is placed, the deck above, from which the photograph is taken, and above that the deck on which the ladies' parlor is located. This photograph is of particular interest as giving an impressive idea

of the true proportions of a modern Transatlantic liner. Two others of our photographs are taken in the first cabin smoking-room, which is located in the after part of the vessel. This room is of great height, not less than 20 feet to the roof of the dome, and the walls are decorated with paintings of New York harbor, the port of Hamburg, and other localities connected with the service of the ships of the line. Impressive evidence of the size of such a ship as this is afforded also by the fact that the promenade deck gives an unobstructed walk of 520 feet, or over 1,000 feet circuit.

In our last issue we gave some particulars of the maiden trip of the "Deutschland." On her return trip to Plymouth the vessel broke all previous records, covering a distance of 3,085 knots, at an average speed of exactly 23 knots an hour. The ship's log records that fog was experienced on two days of the run; and but for this the average speed would have been greater, a few hours being lost through slowing down. During the homeward trip the engines indicated 35,640 average horse power. One marked advantage of high speed in a vessel like the "Deutschland" is that she is enabled to make a round trip to Europe in three weeks, thus making a sailing from each port once in three weeks, instead of once in four or five weeks, as is common with slower vessels. Of course, this throws a much heavier strain on the ship and engines, and the vessel's life is likely to be of less duration; but it is considered by the company that in view of the rapid development in the size and speed that is ever taking place in Transatlantic steamships, such a vessel as the "Deutschland" will not begin to deteriorate until it is desirable to replace her with a more up-to-date ship.

#### Three Hundred and Fifty Thousand Dollars for a Patent.

The German government has just paid \$350,000 to the Strowger Automatic Telephone Exchange, of Chicago, for the patents and rights to manufacture and use that company's automatic switch. A trial of it was made in Berlin in the early part of the year, and the first payment of \$150,000 was made. The contract was for a 200-instrument exchange in the government service, to be used for six months, and if at the end of that time it proved satisfactory \$500,000 was to be paid. At the expiration of the second month the government asked for an extension of the terms of the contract in order to permit the installation of 200 more automatic instruments in private institutions, etc., in Berlin.

ACCORDING to M. H. Coupin, the alkaline herbs are poisonous in their influence on plants in proportion to the atomic weight of the metal, in the following order: calcium, strontium, barium, and strontium are poisonous. Most salts of barium especially so, as also are the chlorates of lime and potassium.