

however, the "Tarantula" turned the tables by beating the "Niagara IV." over a 40-knot course by 2 minutes 59 seconds official time, and 2 minutes 48 seconds actual time, both yachts being handicapped at the start. The "Tarantula," which is modeled on torpedo-boat lines, was built by Yarrow & Co., London. She is a steel vessel 152.7 feet in length, 15.3 feet in beam, with a draft of 4 feet. She is driven by Parsons turbines connected to three propeller shafts with a single propeller on each, and steam is supplied by two water-tube Mosher boilers. Her gross tonnage is 123.50. The "Niagara IV." is a much smaller vessel of 50 gross tons. She is 111 feet in length over all, 12.2 feet in beam, and draws 4.2 feet. She is a wooden vessel, built by the Gas Engine and Power Company, of Morris Heights, and she is driven by twin triple-expansion engines, steam being supplied by a water-tube boiler of the type made by the builders of the vessel.

The course of 20 nautical miles was laid out on Long Island Sound, and had to be covered twice. The yachts crossed the line at the start with "Tarantula" in the lead by 11 seconds, and she gradually began to increase her lead until, when the race had been under way for about 25 minutes, the "Tarantula" was 1-3 of a mile to the good. She rounded the outer stake five minutes ahead of the "Niagara IV.," having made the outward run of 20 miles at a speed of 25.12 statute miles an hour. On the return trip the "Niagara" did better work, but failed to cut down the lead of the "Tarantula," which finished with an advantage of 2 minutes and 59 seconds. If we disregard the handicap at the start, the speed of the "Tarantula" on the outward leg was 25.12 statute miles, and on the return trip 23.79 statute miles an hour.

The series of motor boat races was held upon the Hudson River over a triangular course, the apex of which was about opposite West 97th Street. There were two courses used. The longer one extended up the east side of the river to a point opposite Fort Washington Park, thence down the west shore to Weehawken, and back diagonally across the river to the starting point. It was 10 nautical miles in length. The shorter course, 6½ nautical miles in length, was within the longer one.

After several races for launches and cruisers, the chief race of the first day—that for 12-meter (39.37-foot) racers was started. This race was the first of three for an international trophy. Besides the "Dixie" and the "Shooting Star II.," which were the only boats to finish, two new boats to cross the starting line were Herreshoff's "Den" and the "Winton," a twelve-cylinder boat of 150 horse-power, whose hull was designed by B. B. Crowninshield and the motor of which was made up of three standard, four-cylinder automobile engines having 5¼ x 6-inch cylinders. Both of these boats quit almost at the start. The "Panhard II." had a close race with the "Shooting Star," which she distanced by about two boat-lengths. The "Dixie," steered by her owner, Mr. E. R. Thomas, passed both these boats at the first turn, and then the "Panhard II." withdrew after going only three-quarters of the distance around the course. The "Dixie" averaged in this race 19.6 nautical (22.59 statute) and the "Shooting Star" 18.09 nautical (20.85 statute) miles per hour.

The event of the second day was a long-distance race to Poughkeepsie and back, a distance of 134 miles. As the race was run as a handicap, and as the entries were numerous, it took three hours for all that were ready to be sent off. Those that started gradually dropped out from one cause or another, so that finally but two boats finished before sundown—the 30-horse-power "Simplex III.," in 7 hours, 27 minutes, 53 seconds, and the 30-horse-power "Wizard" in 7 hours, 58 minutes, 52 seconds. This figures out an average speed for the winner (which has a 4½ x 5½ four-cylinder S. & M. motor) of 17.95 miles per hour. The "Veritas," the highest-powered boat in the fleet, broke her clutch after the first day's racing, in which, however, she practically tied the "Dixie" for speed by making a circuit of the 10-nautical-mile course in 24 minutes, 52 seconds, or at the rate of 24.12 knots (27.81 statute miles per hour), as against the "Dixie's" best circuit in 24 minutes and 8 seconds, or 24.19 knots (27.82 statute miles an hour). The engine of the "Veritas" is a 7¾ x 9 eight-cylinder Craig. The only difference between this engine and that of the "Ontio" (which we illustrated in our March 4, 1905, issue) is that the "Veritas's" engine has auxiliary exhaust ports at the base of each cylinder. This huge engine speeds up as high as 825 R. P. M. and develops over 200 horse-power. The boat is 57 feet long over all; she has a 7-foot beam, and draws 18 inches of water.

One of the best races the first day was a handicap having four starters, and which was won by the "Durno," a small boat fitted with a 7-horse-power, two-cylinder, two-cycle Rochester motor. Given a handicap of over an hour, this boat beat the 30-horse-power "Simplex III." by 14 minutes, 53 seconds. She also won in the final for boats 33 feet long and under, and hence was awarded the Interstate trophy. This fine

showing is to be accounted for, doubtless, by the fact that her owner, Mr. J. H. Durno, is one of our best experts on the screw propeller.

The last day of the races saw the "Dixie" twice again a winner. In the morning, in a 30-nautical mile race, she finished in 1 hour, 18 minutes, 15 seconds, which is equivalent to an average speed of 23.003 knots, or 26.453 statute miles an hour. In the afternoon, although the time for the total distance was not so good, the "Dixie" made the last circuit in 24 minutes, 8 seconds, which equals a speed of 24.19 knots, or 27.82 statute miles an hour.

In view of the fine showing made by the "Dixie," it will be interesting to note that she has an eight-cylinder S. & M. Simplex motor, having cylinders with a 6½-inch bore and a 6¾-inch stroke. This engine is rated at 150 horse-power at 800 R. P. M. The engine of the "Shooting Star II.," which boat came in second to the "Dixie" in the race the first day, is a 4½ x 5½ eight-cylinder Lozier rated at 51 horse-power at 890 R. P. M.; while that of the "Wizard," the only other boat besides the "Simplex III." to finish the Poughkeepsie race, is a 6 x 7 four-cylinder Buffalo motor rated at 30 horse-power at 600 R. P. M. The "Dixie" is the boat which was to have represented America in the second international race for the Harmsworth trophy. This race took place on September 11 over a 30-nautical-mile course in Arcachon Bay on the north coast of France. The two "Brookes" (English) and one French boat, the "Mab," failed to finish. The two "Napiers"—the "II." and "I."—won the race in the order mentioned in 1 hour, 32 minutes, 26 seconds, and 1 hour, 33 minutes, 52 seconds. The speed of the winner was but 19.44 knots, or less than 22½ miles an hour; so had the "Dixie" competed and performed as well as she did in this instance, she would have stood a good chance of winning.

The "XPDNC," the same boat with which the late Frank Croker made records a year ago, is now propelled by a 75-horse-power four-cylinder Mercedes engine of 6½-inch bore and 5½-inch stroke, and which develops its power at 1,100 R. P. M. She won all three heats for the National trophy, her best time for the 30-nautical-mile course being 1:24:01, which is equivalent to 21.41 knots, or 24.68 statute miles an hour.

The races demonstrated once more the extreme fragility and liability to break-down of the high-powered motor boat. Like the racing auto, these freaks now serve no useful purpose, but are constructed merely for the sake of sport and the satisfying of the craze for speed at whatever cost.

180-TON SHEAR LEGS FOR THE BRITISH NAVAL DOCKYARD.

The resources of the British naval dockyard at Chatham for the handling of heavy material, such as the lifting of the largest types of guns upon battleships, have recently been augmented by the erection of large shear legs capable of dealing with a maximum load of 180 tons. These shears, which have been constructed by Messrs. Day, Summers & Co., of the Northam Ironworks, Southampton, are the largest in the world, and are of massive proportions.

The legs are constructed upon the hollow spindle principle, which was first introduced by this firm in their early types of steam traversing shear legs. As will be seen from the accompanying illustration, there are three legs—two front and a single back leg. The two front members each measure 160 feet in length, while the rear leg is 210 feet from end to end. They are all constructed with tapered ends, both top and bottom. In the case of the front legs, the greatest diameter in the center is 5 feet, with a taper to 3 feet at each end. The rear leg has a central diameter of 6 feet, the taper also being to 3 feet at each end. The total weight of the three members alone is 141 tons, of which the two front legs each represent 44 tons, while the rear leg is 53 tons in weight.

The in-and-out motion of the back leg is carried out by means of a large screw, 85 feet in length by 11½ inches in diameter, weighing over 11 tons, and operated by a set of steam engines. The hoisting equipment comprises three winches, each of which is driven by its own set of steam engines. Two of these winches each have a lifting capacity of 90 tons. There is also an inhaul winch, which is driven by a separate engine. The steam is supplied by two boilers.

The front page illustration shows the legs undergoing the official trial after erection at the dockyard. A dead weight representing 180 tons was lifted simultaneously by the two hoisting winches with complete ease, the rate of hoisting of each winch with 90 tons of weight being over 10 feet per minute. The full test load of 180 tons was lifted from the dock, run out to the maximum overhang of 64 feet from the perpendicular, and brought inboard again with complete ease. By the addition of this plant to the dockyard, the hauling equipment is appreciably decreased, since by its aid the heaviest guns and so forth of a battleship moored beneath can be lifted clear of the deck of the vessel, swung inboard, and deposited upon the ground

or onto transport wagons with the greatest facility in the minimum of time.

Messrs. Day, Summers & Co. were the original inventors of this type of handling plant, and their utility was conclusively demonstrated at Port Arthur during the present conflict between Russia and Japan. The equipment of the dockyard at Port Arthur included three sets of these shears, each with a lifting capacity of 60 tons. In this case the legs were employed for the purpose of facilitating temporary repairs to large battleships, which had suffered penetration of the hull from heavy guns, without necessitating drydocking operations. In these installations, below the shear poles the dock wall was covered by a staging similar to the lateral section of a graving dock. The battleship requiring overhauling was brought alongside this staging beneath the shear legs. The vessel was then heeled over by the plant until the damaged portions were exposed. The repairs were then quickly effected, the workmen having access to the defects in the hull from the staging. The Japanese turned one of these shears, which they captured uninjured, to excellent account for the salvaging and patching up of the vessels they secured more or less damaged in the harbor after its capitulation.

There are at the present time two sets of shears similar to those which we illustrate, only of 150 tons capacity, in course of construction for the British naval dockyard at Gibraltar by this firm. In this instance, however, the necessary motive power will be electricity instead of steam.

Death of Count di Brazza.

Count Pierre Savorgnan di Brazza died on September 14. To him France owes her African possessions in the Congo Free State.

Pierre Savorgnan di Brazza was born at Rio Janeiro in 1852, of a noble Italian family, the Counts di Brazza-Savorgnan, but was brought up in French schools, trained for the French navy, and his name, since he became famous, has usually been inverted into Pierre Savorgnan di Brazza.

Following immediately on Stanley's great journey down the Congo, Di Brazza between 1876 and 1878 explored the upper course of the River Ogowe, the chief stream of French Guinea, to its sources, and went beyond, following far streams that flowed into the Congo, and demonstrating that a practical route to that river existed along the line of his exploration.

In 1879 he succeeded in reaching the spot later called Brazzaville on Stanley Pool before Stanley worked his way up the Congo River. Di Brazza's appearance on the Congo hastened the agreement of the powers by which Africa was partitioned into "spheres of action."

In 1888, while still only a naval lieutenant, he was appointed commissary general of the French Congo and organized the whole administration of the colony. In 1891 he was again appointed and remained in charge till 1897, when he again resigned on account of ill health.

His explorations were made with a simplicity of equipment that provoked Stanley's contempt. He was the sole white man in the party that Stanley met at Stanley Pool, and he had only a few semi-civilized coast negroes with him. His explorations were of the thorough, unrecognized kind that mark the heroic age of Congo discovery.

Savorgnan di Brazza was 53 years old when he died. He was a naval ensign at 24 years of age, when he made his first Ogowe journey; became governor of the colony at 33, and was only 39 when he entered on his second term.

A New Motor Roadway.

A roadway or track for motor-propelled vehicles has been invented recently by Dr. T. A. Johnson, of Xenia, Ill., which promises a valuable means of transportation. It consists of two parallel tracks of concrete formed so as to present an outer flange, and a broad treadway with a strengthening rib running down into the ballast, which has been rolled firmly in the ditches previously excavated. This roadway is designed for motor vehicles, both passenger and freight, the cars having rubber tires. The track can be used as a toll line for automobiles. The inventor has also a device which can be attached to the steering lugs of the vehicle, preventing contact of tires with flanges, and obviating steering by motorman.

A Decoration for Arthur von Briesen.

Mr. Arthur von Briesen, one of the foremost members of the American patent bar and an old member of the SCIENTIFIC AMERICAN staff, has received from the government of France the cross of the Legion of Honor for his splendid work as president of the Legal Aid Society, in which capacity he has for years labored to protect the poor of French and other nationalities from the injustice which their poverty prevents them from combating.

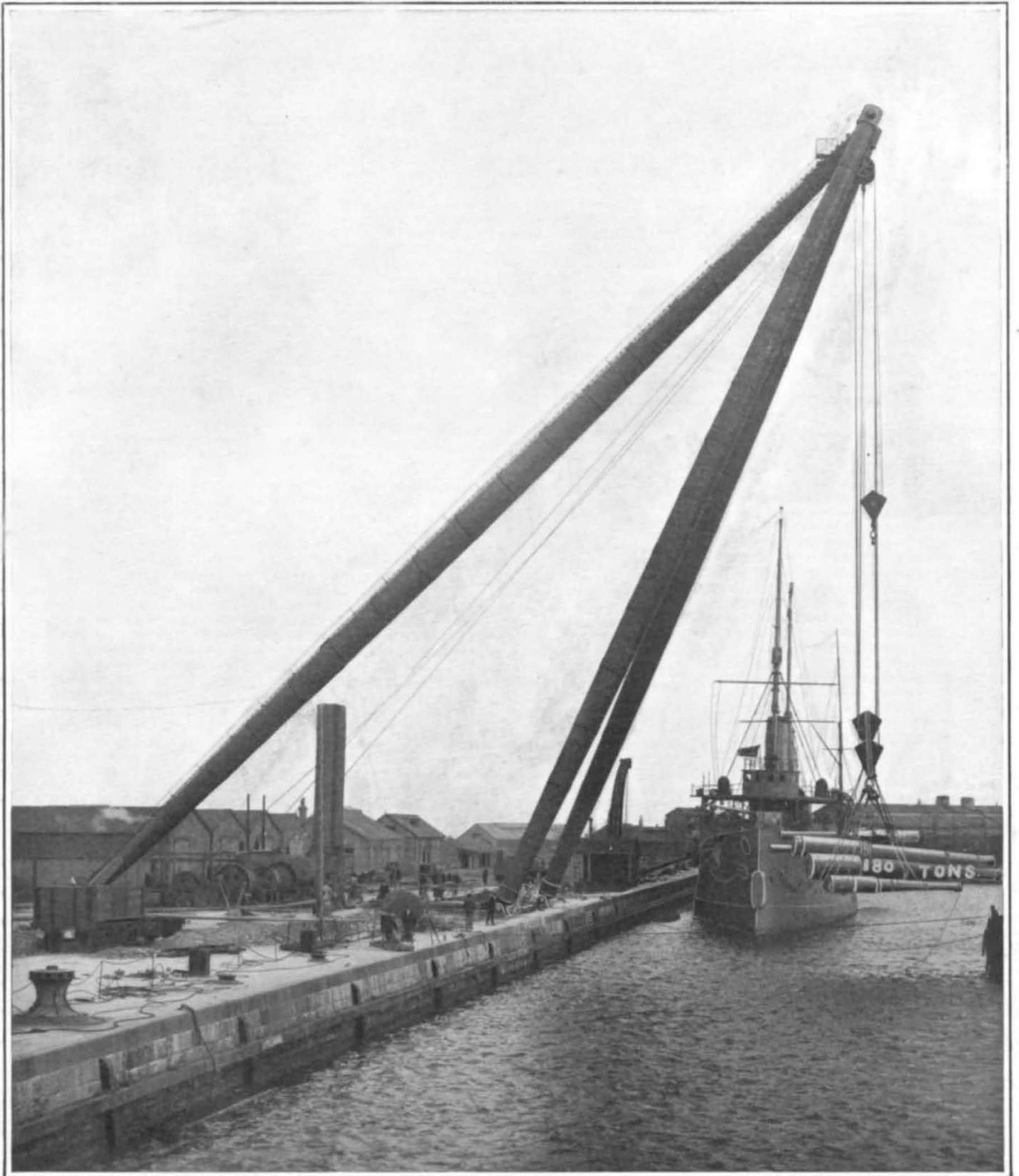
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THE 180-TON SHEAR LEGS FOR THE BRITISH GOVERNMENT DOCKYARD AT CHATHAM.—[See page 258.]