STEERING TORPEDOES BY MEANS OF WIRELESS TELEGRAPHY.

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The great destructive power of the torpedo is limited by its range and the difficulty of steering it with certainty, except for moderate distances. If a Whitehead torpedo after traveling 800 yards, strikes the target, it is doing exceptionally good work, and under the conditions of an engagement, when the distance and speed of the ship to be attacked are only approximately known, the difficulties of making a successful hit increases in proportion.

The Sims-Edison and the Brennan torpedoes were the outcome of attempts to control the movements of these weapons over areas far greater than can be covered by the Whitehead, the Howell, or other torpedoes of the automobile type. In each case a cable connection was maintained with the operator on shore, and the steering was performed electrically by means of electro-magnets acting directly upon the helm. Obviously the efficiency of these craft is somewhat impaired by the very connecting wires which increase their radius of action; for the drag of the wires, if they are unwound on shore, or their weight, if they are unwound within the torpedo itself, cuts down the speed, placing a limit upon the range.

It was natural that the successful results obtained with Marconi wireless telegraphy should have suggested its use for the steering from a distance of floating and submerged vessels. Residents of New York will remember the proposition of last year, on the part of a well-known electrical expert, to control the fleets of America in distant seas by the single will of an operator snugly ensconced in his Sandy Hook office. Now, although that scheme called for a somewhat vigorous exercise of the imagination, the principles upon which it was to be worked were so far sound, that the steering of vessels by wireless telegraphy has been recently accomplished in a bona fide, if on a somewhat diminutive test, recently carried out in the south of England for the British government.

Mr. Varicas, the inventor of the system, first commenced his experiments in the early part of 1898. No serious trials of the apparatus were attempted, however, until two or three weeks ago, when a private test was carried out before some representatives of the naval department of the British government, and the results were so satisfactory that further trials are to be conducted in the English Channel.

The torpedo boat, with which the experiments were conducted at this private test, was only a model about four feet in length, and in order that the invention should be given a fair trial the experiments were carried out in the public swimming bath at Yeovil, instead of in the sea at Weymouth, near by. At one end of the bath a transmitting apparatus similar to that employed by Marconi in his wireless telegraphy was set up by Mr. Varicas. At the farther end of the pool, which is about 100 yards in length, the small launch was placed in the water. The little vessel is capable of traveling at four knots an hour, the screws being driven by an electric motor, fed by a storage battery. A primitive receiver capable of working the conventional Morse writer at a distance of several hundred yards is ordinarily placed in the launch, but in this particular test this writer was replaced by a rudder-turning contrivance which was normally held hard-a-starboard by a spring. The launch was also equipped with a mast, from which a short wire projected.

Mr. Varicas and Commander Colwell, who was carrying out the test for the government, stood by the transmitting apparatus, while an assistant attended to the launch at the other end of the bath. When all was ready, the assistant started the motor in the launch and the little vessel answering its helm naturally turned to port. Commander Colwell uttered an order, Mr. Varicas turned the controlling wheel of the transmitter, and the little boat immediately altered her course to the desired direction. Then followed further orders from the commander, and the launch quickly performed all the necessary evolutions, as though a quartermaster were aboard and shifted her helm according to the various commands, "Hard-a-port," "starboard," "forward," or "reverse,"—the little craft promptly responded. One of the most difficult experiments was when Commander Colwell threw a short stick into the water and commanded the inventor to bring his craft from the extreme end of the bath and make it collide with the obstacle, a maneuver which was performed with equal ease. The vessel has also been tried on one or two occasions in the open sea at Weymouth, and although the strain has been very severe upon the diminutive craft, since she is scarcely of sufficient size to withstand the buffetings of the waves, yet she has performed the same maneuvers with perfect satisfaction.

A VESSEL of the Orient line will be navigated so as to bring the ship upon the central line of totality off the coast of Portugal at the time of the eclipse on May 28. The journey will be from London or Plymouth to Gibraltar or Marseilles. The passenger can make the complete journey in about fifteen days.

PARIS EXPOSITION NOTES.

The American Forestry Building has been sent from Chicago in sections to Paris. It is probably the first time that an American building for exhibition purposes has been shipped across the Atlantic.

A foot bridge in the Champ de Mars which connected the Exposition with the Globe Celeste collapsed on April 29, killing several and injuring many. The Globe is an outside attraction and was not in the grounds, therefore, the managers of the Exposition were not to blame. The bridge had been condemned in the morning and no one was allowed to walk over it.

The Exposition is now finally assuming shape and order is being brought out of chaos. The galleries are gradually filling with exhibits and they are being installed as rapidly as possible. So far there have been two fires in the exhibition grounds which have shown how great is the danger of a conflagration, the facilities for fighting fire being very meager. Special measures are now being taken to remedy the situation. When the fountains are playing, it will undoubtedly be a difficult matter to secure water, for during the burning of the Comédie Française, notwithstanding the great lack of water, the fountains were not turned off.

The different parts of the Exposition will be connected by a small electric railway, which follows for the most part the same route as the elevated moving platform, passing along the side of the Champ de Mars, the Quai d'Orsay, the Esplanade des Invalides and the Avenue de la Motte Picquet. Along certain parts of the route it has been placed under the structure of the moving platform, and in other cases it follows it at one side upon a lower level. Along the Avenue de la Motte Picquet, it is supported upon an elevated structure by a series of iron arches placed over the sidewalk, the moving platform occupying a similar position on the other side of the street. At the entrance to the Invalides Bridge it crosses over a viaduct and passes underground by the Pont de l'Alma. It contains in its course several grades of 4 per cent, and curves of small radius. The track is of one meter gage and the total length of the route is about 3½ kilometers. A number of elevated stations have been established, to which access is given by staircases or by inclined elevators consisting of a continuous, flexible web passing over a series of drums. The train is made up of one motor car and two trailers, having a total capacity of 210 places. The motor cars have a two-wheeled truck at each end, carrying Westinghouse motors of 25 horse power. The current is taken from a railroad rail laid along the ties outside of the main track; it rests upon insulating blocks placed at intervals. At the time of heaviest traffic the trains follow each other at intervals of 90 seconds, making about 40 trains per hour, or 8,400 passengers.

The United States building has a prominent place among the buildings of the other nations represented at the Exposition. These have been constructed upon a long platform extending along the Seine from the Invalides Bridge. It is at a considerable height above the water-level, and is upheld by a sub-structure of iron work. The series of national buildings presents an imposing effect, each being built in a characteristic architectural style, some of white staff, others richly decorated, imitating stone and other materials; others, such as the Swedish Pavilion, are entirely of wood. The Italian building is very large, and is in the style of the fifteenth century; its construction resembles that of a cathedral, and it is richly decorated with exterior frescoes and surmounted by three gilded domes. The Turkish building is almost entirely of white staff, with characteristic pointed arches; it is relieved by an exterior border in which blue predominates. The United States building comes next to that of Turkey, and is followed by that of Austria. The buildings are separated by a considerable space, and at the front of the platform passes a pavement running along the entire length of the series. The United States building has a main body of octagonal form with four long and four short sides, and is surmounted by a high dome. In front is a portico which spans the pavement by an arch on each side, and a third arch overlooks the river. Under the latter is an equestrian statue of George Washington of colossal size in white staff, mounted upon a square base about ten feet high. The hemispherical ceiling of the portico has a fresco by Robert Reid of pleasing effect; it represents the Goddess of Liberty seated upon the clouds and holding a shield, with the American eagle to the left in the rear. The main door of the building is at the back of a niche, and is reached by a flight of half a dozen steps. Over the door is a fresco representing the genius of the nation and the various arts and products; it has a fine effect when seen from the pavement. Surmounting the portico is a large group in white staff representing the Goddess of Liberty drawn in a quadriga. The main dome is of white staff, like the rest of the building, but is ornamented with gilded palm branches at the four corners, with a smaller leaf ornamentation between. At the top is a globe carrying a gilded eagle with outspread wings, and at the base of the dome, on four sides, is a shield surmounted by an eagle in white staff. A handsome frieze surrounds the building, representing arms and trophies in relief. On each side of the portico, next the river, is a high flagstaff with an ornamental base, carrying a large flag. The interior rotunda is surrounded by the balconies of the different floors. At each side of the entrance door is an electric elevator, and in the corners of the building are staircases leading to the upper stories. On one side is a model American post-office, and arrangements have been made by which letters mailed here will be shipped direct to New York. The different floors will be mainly occupied by the offices of the Commission; on the lower floor will be the reception rooms and on the second floor a lunch room. Against each of the columns of the lower floor is a handsome bronze fixture containing five incandescent lamps. The United States building has been favorably commented upon, and it is the only one of this series which is ornamented with sculpture groups of any importance. As seen from the other side of the river it presents a very handsome appearance, and adds greatly to the effect of the series.

AUTOMOBILE NEWS.

The Italian government has purchased some steam motor vehicles of large size capable of carrying four tons and hauling another vehicle carrying eight tons.

On account of the Paris Exposition, the automobile races in France this year will be especially numerous and interesting. Up to the middle of April four important events have taken place, the Course du Catalogue, the Coupe des Voiturettes, and the races at Pau and at Nice. The two former events were carried out upon a new system of classifying the vehicles, these being grouped according to the catalogue price of the truck and motor, not taking into account the carriage-body. This system has proved satisfactory and affords a precise method of classification, which is otherwise somewhat difficult. Class A, with a price below 3,000 francs, includes light vehicles whose weight is below 250 kilogrammes; class B, 3,000 to 6,000 francs, includes a somewhat heavier type. In class C are included the touring vehicles, with prices from 6,000 to 9,000 francs, having motors of 6 to 8 horse-power. The other classes, whose vehicles cost from 9,000 to 15,000 francs and over, include heavy vehicles whose motors range from 8 to 16 horse power, such as the Panhard & Levassor, Bolide, George Richards and other makes. The results given by the latter vehicles were better than those of the other classes, without, however, being greatly in excess. The best result was that obtained by Girardot, with an average speed of 50 kilometers per hour. The vehicles of class B, made a good showing, and M. de la Roëre, with a Hurtu machine, covered the route with a mean speed of 32 kilometers. The races held at Pau, which included different events, were a decided success for the Panhard & Levassor automobiles, which were obliged to compete with several prominent makes such as Mors, Bollée, etc. M. René de Knyff, mounted upon a 16-horse power machine of the Panhard type, covered the distance at the high speed of 70 kilometers per hour, which he held for five hours. The races known as the Coupe des Voiturettes, organized by the Journal des Sports, were reserved for light automobiles weighing below 500 kilogrammes, these being divided into two groups, the lighter, below 250 kilogrammes, and the heavier from 250 to 500. These groups were subdivided according to the type of refrigerating apparatus used, namely, air or water cooling devices. The races took place on March 11, over the route from St. Germain to Rouen, returning by a different road, and covering 218 kilometers. Of the lighter vehicles, with water refrigeration, there were four entries, only one of which was classed, the distance being made by Camus with a vehicle of the Esculape pattern, in 7 hours 37 minutes, with a mean rate of 28 kilometers per hour. The lighter vehicles, with water refrigeration, had 10 entries, of which 8 were classed; these included the De Dion, Phébus, George Richard and other types. The best time was made by Tart with a De Dion vehicle, an average speed of 38 kilometers per hour. The best speed with the heavier vehicles, with water refrigeration, was made by Théry upon a Decauville machine, being 45 kilometers per hour; there were 14 entries in all, of which 12 were classed, nearly all making speeds from 40 to 30 kilometers. For those with air refrigeration there were 6 entries, but only one classed, the route being covered by Lefèvre, with a Bollée machine, in 8 hours 9 minutes, or 26·7 kilometers per hour. These results indicate that the lighter vehicles with water refrigeration have given the best showing, both in the proportion of the competitors classed and as to speed; seven of the ten first arrivals being of this type. The races at Nice took place in exceptionally bad weather and the results are not very instructive, as the greater part of the vehicles could not run, and most of those who ventured met with a series of accidents. An extraordinary speed was made in a short race by Beconnais, mounted upon a gasoline tricycle: he reached the speed of 90 kilometers per hour, making the kilometer in 39⅕ seconds, the race lasting for 1 minute 18 seconds.