ENGINEERING.

It is gratifying to learn that the application of block signaling on the railroads of the United States is increasing; although we could wish that the rate of progress were more rapid. The last report of the Interstate Commerce Commission shows that the total length of road operated under the block system at the beginning of the year was 59,548 miles, a net increase over the previous year of 879. The comparatively small increase is attributed to the financial depression.

The special commission appointed by the Canadian government to prepare plans for a new Quebec bridge is having made an extensive series of tests of the strength of riveted joints in nickel-steel plate. The tests, which are to be made at the Engineering Experiment Station of the University of Illinois, require the testing to failure of about one hundred joints, in which any movement of the joints will be measured to one-ten-thousandth of an inch.

That the speed of battleship construction is liable to be delayed by the failure of the government to deliver material as fast as it is called for, is shown by the case of the "North Dakota." On May 1st, when the ship was 81.5 per cent completed, the builders were still lacking armor for three turrets, and eighteen plates of the upper casemate armor which had been rejected by the government and which will have to be remade. It had been hoped to complete the trials of this battleship during the present year.

The trees which are used in the government work of reforestation are grown at eight government nurseries in the Western Forest Reserves. The preliminary stage of forest planting has been passed, and the eight stations now contain some 9,000,000 trees from one to three years old. Several planting stations have produced, already, trees of sufficient growth for planting on the permanent sites, and about 700,000 of these were planted during the winter and spring of 1907.

The advisability of making the overhead trolley line of specially strong construction, on such stretches of electrified road as are used jointly by steam locomotive and electric trains, was illustrated last week on the Long Island Railroad at Far Rockaway, when a wire from the overhead trolley broke from its fastening and struck the engine. The shock threw the engineer from his seat, and the broken wires, coming in contact with the gas piping, ignited the gas tanks beneath the cars and started a conflagration.

According to a dispatch from Berlin, the Krupp firm has contributed $2,500 per year to enable Prof. Weichert of Goettingen to prosecute his experiments with an aerial or "flying" torpedo, for which extraordinary speeds are claimed. The object of Prof. Weichert's present investigation is to work out a system of wireless control. Although such details as have been made public are so confusing as to scarcely warrant repetition, there can be little doubt that experimental work of this character is being seriously undertaken.

The Public Service Commission is to be credited with inaugurating a most valuable improvement in rapid-transit travel in New York city, by securing the introduction of the center-door type of car on the New York Subway. This is the type of car preferred by the operating company, which has built an experimental train that has given good results. To prevent passengers on the train from blocking these new doorways, the entrance space is bisected by a railing, which extends from the door sill nearly to the middle of the aisle. With the space thus divided, an obstructing passenger would be swept into or out of the car by the rush of traffic.

The United States Reclamation Service announces the completion on May 1st, 1909, of the Pathfinder dam, which has been built on the North Platte River, Wyoming. It consists of a vertical, concrete-rubble arch, 215 feet in height, which closes the river where it flows through a narrow gorge. The length of the dam on its crest is only 500 feet, yet the storage capacity is 1,025,000 acre-feet or 358,000,000,000 gallons. Its great capacity is shown by a comparison with the largest reservoirs in the East, of which the Wachusett dam has a capacity of 192,000 acre-feet, the new Croton dam of 92,000 acre-feet, and the Ashokan dam now under construction of 368,000 acre-feet.

That the British government places great value on the maintenance of friendly relations with the private ship-building establishments is shown by the following statement of the First Lord of the Admiralty at the recent launch of one of the "Dreadnoughts," when he said: "I am glad to have the opportunity of saying how much we prize the good feeling that exists between the Admiralty and the great firms which supply us. Unless we could rely on these firms, and know that in any emergency they would be ready to put everything within their resources at our disposal, we never could answer to Parliament and the country for the necessary supplies to maintain the supremacy of the fleet. I regard the existence of the firm which built this ship as a great national asset."

AERONAUTICS.

The first meet and flight exhibition of the Aeronautic Society at Morris Park has been postponed to Saturday, June 5th. An additional prize of $150 has been offered for the machine having the best points of design and construction.

Announcement has just been made of the formation at Berlin of the Wright Flying Machine Company, Ltd. This company has a capital of $125,000 and is backed by the Krupps, the Allgemeine Elektricitaets Gesellschaft and the Ludwig Loewe Company. It is to purchase the exclusive rights for the Wright aeroplane for the German empire, its colonies and protectorates, as well as for Sweden, Norway, Denmark, and Turkey. The arrangement will extend over a period of fifteen years, the company to be entitled to all improvements made by the Wrights during this time. The brothers have also made arrangements with the Italian government, while in England they are building a half dozen machines for private sale. No less than forty Wright aeroplanes are said to be under construction in France at the present time.

The first national balloon race of the Aero Club of America will start from Indianapolis in the afternoon of June 5th. Six balloons are entered in this event, most of them being new ones constructed for this race. Mr. A. H. Forbes, the acting president of the A. C. A., and Mr. Charles Walsh will be the only representatives of an Eastern club. Particular interest attaches to Mr. Forbes's new balloon "New York," constructed by Capt. Baldwin, since the envelope has no less than 20 films of rubber laid upon and vulcanized to two layers of cotton fabric, whereas eight films of rubber is the greatest number that has heretofore been used. Mr. Walsh will go up in the balloon "Hoosier."

President Taft is eager to witness an aeroplane flight by Orville or Wilbur Wright, and if possible arrangements will be made for one or the other of the brothers to make an exhibition flight at Washington on June 10th, when the President will present them with the medals of the Aero Club of America at the White House. A special train will convey the members of the Aero Club to Washington, and it is expected that fully 100 will make the trip especially to witness the presentation. On May 20th M. Paul Tissandier, one of Wilbur Wright's French pupils, made at Pau a flight lasting one hour and ten minutes.

On the 18th instant Wilbur R. Kimball, the secretary of the Aeronautic Society, tried his new aeroplane at Morris Park. This machine has eight 4-foot propellers arranged in line between the two planes. The propellers are driven from a 50-horse-power 4-cylinder, 2-cycle motor by means of a small wire cable. The test was successful as far as the propellers were concerned, as they operated satisfactorily and developed sufficient thrust to send the machine along at good speed. Unfortunately it could not be steered when on the ground, and it ran off the track and damaged the horizontal rudder.

Prof. Henry H. Clayton, who for sixteen years has occupied the position of meteorologist at the Blue Hill Observatory, expects to cross the Atlantic in the near future in a balloon. He believes there are upper air currents flowing constantly eastward, which would make it possible to do this in three or four days. He expects to use a very large balloon, of about 230,000 cubic feet capacity. He is at present in San Francisco, from which point he intends to make a preliminary test flight across the continent. Prof. Clayton's project is similar to that proposed lately by Joseph Bruckner, who expects to perform the same feat in an airship by making use of trade winds which blow to the eastward during a certain part of the year.

A. Gaston Dauville, asserts that aviators make a mistake by practising soaring flight in a horizontal plane. This method makes use of air resistance to overcome weight and in this way excludes all development of progress. He adds that the proper course would be an undulating flight, which would first use air resistance to overcome weight and then use weight to overcome air resistance. In support of this view he cites the experiments of Capazza and Lilienthal. According to this view, in undulating flight gravity would furnish a motor destitute of weight, using no fuel, and of unlimited power, the only motor able to produce speed comparable to that of birds and to overcome the action of the strongest winds. M. Dauville criticises aeroplanes hitherto constructed in that their construction is too light to resist sudden gusts.

Chinese ink is made by carbonizing a mixture of colza or sesame oil, varnish, and lard, and mixing the product with gum water and a little camphor and musk. The paste thus obtained is beaten with steel hammers on a block of wood. A metallic luster is given to the ink by adding from 25 to 140 leaves of gold to each pound. The ink is then pressed and dried in wooden molds.

SCIENCE.

For several years past the sheepmen of the Southwest have suffered serious losses from a disease known among the Mexican herders as "pingué." "Pingué" is popularly supposed to be caused by eating either the leaves or roots of a plant which has in the last few years been quite prominent in the public eye as the rubber plant or rubber weed. Hot water and salt is an efficacious remedy.

The value of X-rays in superficial carcinomata is well established. But their value in deep-seated malignant diseases is doubtful. Dr. G. F. Phaler has published an important paper based on the treatment of 35 sarcomata and 304 deep-seated carcinomata. The results are encouraging, considering the hopeless character of the cases. In over fifty per cent of carcinomata he obtained recoveries.

A tribe of Brazilian Indians, living on the island of Pacoval at the mouth of the Amazon River, clothe themselves in nothing more nor less than a piece of pottery. The "tanga," as this piece of earthenware clothing or more properly apron is called in Portuguese, is simply a curved piece of earthenware triangular in contour, the convex surface of which is elaborately ornamented. It is surmised that the first tangas were simply pieces of broken earthenware.

A large plot of ground in New York city has been given by Mrs. C. P. Huntington to the American Geographical Society, on the condition that the society raises money for the erection of a building on the site. The society has accepted the condition. It may be of interest to note that the society is the oldest in the United States, having been founded in 1852, when there were but twelve similar associations in the world.

The carbon dioxide recorder is a welcome addition to the modern boiler house equipment. It is the function of the recorder to take samples of the flue gases at intervals of two to four minutes, to analyze them for the percentage of carbon dioxide which they contain, and to record the results on a clock-driven chart. The record shows whether proper conditions for maintaining complete combustion have been preserved, and enable the fireman to stoke properly.

The very special subject of heredity of hair color has been exhaustively considered by Gertrude and Charles Davenport. From their investigations it follows that there are probably two main types of pigment in human hair—one a reddish yellow and the other a sepia-brown—and that "two parents with clear blue eyes and yellow or flaxen straight hair can have children only of the same type, no matter what the grandparental characteristics were; that dark-eyed and dark-haired, curly-haired parents may have children like themselves, but also of the less developed condition."

What is known as the Greenland Society, of Copenhagen, has been formed for the purpose of developing the natural resources of Greenland. The annual report states that interesting results have been obtained from the explorations made for a large Danish syndicate during the years 1903-1907 in Greenland, by Norwegian and German engineers. Up to the present about the only products known were cryolite, which deposits are now extensively worked, and coal deposits. The recent explorations show that there is to be found graphite of a very good quality, besides asbestos, mica, and copper. It appears that copper is abundant in Greenland. At present it is already taken out at the Alangossak mines.

In Brussels an investigation has been made of the effect of ventilating fans in restaurants and other public places. Some of the ventilators simply agitated the air, while others were connected with openings in the wall. The experiments were made by determining the number of bacteria in a cubic meter of air before the ventilator had been started and after it had been running an hour or two hours. The results may be summarized as follows: In a number of cafés and restaurants the number of bacteria in a cubic meter of air, in the morning before the ventilators were started, ranged from 10,000 to 22,000. After an hour's running the number ranged from 17,000 to 48,000; after two hours' running the number ranged from 27,500 to 85,000. Another experiment was made in a laboratory where remedies for tuberculosis were prepared. Here the number of bacteria rose from 8,500 before the ventilator was started to 45,000 after one hour's running and to 75,000 after two hours' running. Another experiment was made in a private parlor. The number of bacteria per cubic meter, 650 before the starting of the ventilator, rose to 2,500 in one hour and to 4,000 in two hours. The ventilator was then stopped. Two hours later the number of bacteria per cubic meter had fallen to 700. These figures are so eloquent, that no further discussion is needed to show that the ventilators used in all these cases did far more harm than good, by creating a lively current of air which stirred up and carried with it dust containing bacteria.