

per hour at sea. Of course, the quadruple expansion engines of these twin screw vessels will be the most interesting feature, on account of the great power they are expected to develop.

This is the first time an effort has been made to use quadruple expansion in engines of over 4,000 I. H. P., and in only one or two instances has it been applied to engines of that power. In speaking of the vessels, Mr. Charles H. Cramp, in a paper read before the American Society of Naval Architects and Marine Engineers, said: "I will not venture prediction as to their probable performance, but I will guarantee them to be perfectly safe, comfortable and economical ships. They are to be closely followed by other ships, which I will not now describe, except to say that they will not shrink from comparison or competition. The St. Louis and St. Paul have been especially arranged so as to be readily and quickly convertible into armed cruisers, carrying eight 6 inch 100 pound rapid-fire guns, and the conditions of the mail contract between the United States government and the International Navigation Company place at the disposal of the American navy these great ships, almost instantly convertible into commerce destroyers, averaging greater performance than the Columbia, which, with the three others that are about to follow as quickly as the plans can be completed, will practically re-enforce the United States navy by \$21,000,000 worth of ships, and that not only without cost of building, but also without the expense of maintenance and commission in time of peace. In conclusion, allow me to say that these ships will be American from truck to keelson. No foreign materials enter into their construction. They are of American model and design, of American material, and are being built by American skill and muscle."

Effect of the Earthquake Shock in Constantinople.

Mr. W. S. McGregor, the engineer of the Imperial Ottoman Gas Work at Dolma-Baghtche, sends the following to the Journal of Gas Lighting:

"A very severe shock of earthquake was experienced in Constantinople on the 10th of July, at 20 minutes past 12 P. M. The first shock lasted about 40 seconds; and a second shock, less severe, was felt about 5 minutes afterward. Considerable damage was done to property, and a number of houses were thrown down; while fires of a serious character broke out in different parts of the city. But comparatively little loss of life took place. At the Imperial Gas Works, at Dolma-Baghtche, the water in the gasholder tanks suddenly overflowed; while in No. 1 holder (a two-lift telescopic holder of 320,000 cubic feet capacity) the water rose suddenly and overflowed the tank, and as suddenly subsided. As the holder was cupped scarcely a sheet in the second lift, it uncupped and cupped again with startling rapidity; the girders and tie rods meanwhile shaking violently, and appearing as if they would be wrenched away from the columns. The chimney stalk of the old works was badly cracked, and a portion of the top thrown down; but beyond this, and the flooding of the inlet and outlet pipes of the different gas holders, no serious damage was done. Various ugly cracks about the buildings testify to the serious nature of the shock; and altogether, if possible, it is not an experience that one would care to undergo a second time."

Electric Mail Cars in Brooklyn, N. Y.

The Atlantic Avenue Railway Company has recently completed at its shops, Twenty-fourth Street near Fifth Avenue, an electric postal car designed by the company officials, assisted by the postal authorities of Brooklyn, patterned after the standard type of postal car used on steam railroad lines.

Only half of the car will be used for postal purposes, the other half being a smoking compartment. There are pigeonholes for distributing the mails, and hooks for holding the mail pouches open. Drop letter boxes are provided at each corner of this compartment.

The exterior of the car presents a very handsome appearance. It is painted white, like the United States mail cars which are run on steam routes, the smoking compartment being lettered "Smoking Car." The windows are covered with wire screens. The car is mounted on a Brownell truck.

Two of these cars will go into service immediately.

An Improved Alloy.

Fifty parts of copper, forty parts of zinc, and aluminum in the proportion of two and a half per cent of the whole are taken. This is one example, but others may be obtained by varying the amounts of copper and zinc to the same proportion of aluminum.

The mode of preparation of the alloy varies: For a hard metal, the copper and aluminum are first mixed to form a copper alloy and the zinc added in small pieces during continuous agitation of the molten mass.

This gives a reddish alloy that takes a high polish. For a ductile metal the zinc and aluminum are first mixed and the copper then added. This gives an alloy resembling brass. In both cases the metal is claimed to be non-oxidizable, proof against sea water, and, to a large extent, against acids.—D. W. Sugg, London.

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Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Alloy, improved, Patents granted, Peach ratafia, Arctic expedition, etc., with corresponding page numbers.

TABLE OF CONTENTS OF

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Table listing contents of the supplement with page numbers, including sections like I. AERONAUTICS, II. BOTANY, III. CIVIL ENGINEERING, etc.

THE BROOKLYN MEETING OF THE AMERICAN ASSOCIATION.

As an especial degree of interest belongs to the buildings in whose halls the American Association for the Advancement of Science is to meet next week, a brief description of them may interest the public. The opening general session and the opening sessions of the sections will be held in the Polytechnic Institute of Brooklyn, located on Livingston Street. The building is very ample and of modern construction, fully equipped for the scientific instruction of the thousand or more undergraduates who are pursuing the several courses required for the degrees of Bachelor of Science, Bachelor of Arts, or Civil Engineer, Electrical Engineer. Alongside this main building is the Preparatory Department, which has about eight hundred pupils in attendance. This institute, indeed, was originally founded, in 1854, as an academy; but its curriculum has been steadily enlarged and extended to meet the increasing demands of a growing city, and larger buildings were required for the accommodation of the increasing number of students. Accordingly, in 1889-90, the Regents of the New York University granted an absolute charter for the Polytechnic Institute, as it now exists, with a munificent endowment and a superior faculty ready for all the higher educational work found in similar institutions elsewhere. While mathematics, the ancient and modern languages, history, philosophy, etc., receive due attention, especial facilities are afforded for the study of chemistry, electricity, engineering, architecture, the steam engine, and the natural sciences in general. The Spicer Library contains 3,000 volumes classified for special investigation and research. The gymnasium is remarkably well equipped, and the laboratories, observatory, art studio and museum of natural sciences are equal to the needs of this admirable institution. And all these rooms and their contents are for the time at the disposal of the A. A. S. by the generosity of the corporation.

The Packer Institute is located on the corner of Livingston and Joralemon Streets, in ample grounds, with spacious lecture rooms, fine laboratories, libraries and scientific collections. This college is for young ladies, of whom nearly 1,000 are in attendance during term time. Its graduates enter the senior year of such colleges as Smith and Vassar. The building being near that of the Polytechnic Institute, some of the sections will be assigned to rooms here. The evening addresses, receptions and closing session will be held in the Academy of Music and Art building, Montague Street. All these buildings are near each other and are within a block of the City Hall Square.

THE WASTE OF COAL MINES AS A SOURCE OF POWER.

The readers of our columns have been kept informed of the work in progress at Niagara Falls for the utilization of some of the power now running to waste over the great precipice. Recently the project has been attacked by our contemporary, Electricity, and the assertion has been made that there is little chance of its paying for some time to come, and that it has a dangerous rival in the culm heaps of the Pennsylvania coal regions. Every coal mine in the anthracite region produces enormous quantities of coal dust, known as culm, which keeps on accumulating, as it has accumulated for many years, about the mines and coal breakers. This culm has good, calorific value, and recently manufacturers have begun to use it under their boilers. It can be bought for twenty-five cents a ton. Mr. D. B. Atherton, the secretary of the Scranton Board of Trade, has given figures to show that with culm firing a horse power per annum will cost but \$3.93. At Niagara Falls a horse power will cost, it is said, \$15 per annum. It is evident that the culm bank is the cheaper.

Of course this apparent difference is offset by other considerations. No account is taken of the capitalization of the steam and electric plants required to utilize culm, but the difference in the quotations given is so great as to certainly give the economic advantage to culm as a source of energy. In utilizing culm we are disposing of a waste product and of an accumulation of man's operations. In burning coal we are disposing of the accumulation of Nature's riches. Natural gas is already on the wane, and sooner or later coal will become exhausted. Then will be the time for Niagara Falls and similar natural sources of power to do their part in the work of the world. But to day there is at least a suspicion that the heavy capitalization of the Niagara Falls works will restrict greatly its domain of usefulness.

Another point made is that the anthracite regions are more favorably situated for the distribution of power than are Niagara Falls. On the whole, a very strong plea has been made for the culm bank as opposed to the great cataract.

Repeatedly in modern industries the question of capitalization has determined the success or failure of enterprises. At Niagara Falls the power primarily costs nothing; the capitalization and harnessing of the force of the cataract constitute the elements of cost.