

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S., Canada or Mexico. \$3 00
One copy, six months, for the U. S., Canada or Mexico. 1 50
One copy, one year, to any foreign country belonging to Postal Union. 4 00

The Scientific American Supplement is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN.

Building Edition.

THE ARCHITECTS AND BUILDERS EDITION OF THE SCIENTIFIC AMERICAN is a large and splendid illustrated periodical, issued monthly, containing floor plans, perspective views, and sheets of constructive details, pertaining to modern architecture.

Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, \$2.50 a year. To foreign Postal Union countries, \$3.00 a year.

Spanish Edition of the Scientific American.

LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published monthly, uniform in size and typography with the SCIENTIFIC AMERICAN.

The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN & CO.

NEW YORK, SATURDAY, MARCH 24, 1894.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Air and life', 'Aluminum yachts', 'Ants, Texas', 'Artist's canvas, preparing', etc., with corresponding page numbers.

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 951.

For the Week Ending March 24, 1894.

Price 10 cents. For sale by all newsdealers

Table listing contents of the supplement by subject, including 'I. ASTRONOMY', 'II. BIOLOGY', 'III. GEOGRAPHY', etc., with page numbers.

REMARKABLE BOAT SPEED—32 1/4 MILES PER HOUR.

The breath of brag in which some of our boat builders have indulged concerning certain American vessels is cut short by the performances of some of the new torpedo boats recently constructed for the British navy.

This vessel is 180 feet long and 18 1/2 feet wide, has eight boilers, and four funnels. Displacement, 220 tons; greatest draught, 7 feet 6 inches; estimated horse power, 6,248.

The Havock made a speed of 27.56 knots. Some forty of these boats are being built in England. Remarkable as is the speed of the Hornet, a boat which is expected to go still faster is now being constructed in France.

The following are particulars of the sea-going torpedo boat Forban, which is now being built at Havre by MM. Augustin Normand & Co., and which is designed to attain the extraordinary speed of 30 knots or 34 1/2 statute miles an hour.

In view of these new advances in naval construction, it is to be hoped Congress will wake up to the necessity of ordering a few vessels of equal speeds to the foregoing.

THE IMPERFECTIONS OF THE OVERHEAD TROLLEY SYSTEM.

At the recent convention of the National Electric Light Association, some very suggestive topics were treated in the papers read before the assembly. One which has attracted most attention was written by Mr. J. H. Vail on the trolley system, with reference to the harm incident to the present system of construction of the return or ground circuit.

The earth treated as a conductor has long been taken as of no resistance. But like many other things in electricity, this appears better in statement than it proves in realization.

The essence of economy in a parallel arc system, such as the electric railroad, is the approximate uniformity of potential at all parts of the line; if a railroad, the potential should not drop greatly, even when the cars are running.

of course, brings about the necessity for a larger generating plant than would be otherwise necessary.

This is not the most striking part of the subject, however. The return circuit through the rails and parallel wire being in contact with the earth, branch currents go off in all directions, and neighboring water and gas pipes take up a share of the work of the return conductors.

Some very remarkable results were cited by Mr. Vail. In one case a pipe was quite destroyed. This goes to show that the trolley system as at present installed not only menaces life, but also property.

The remedy, as suggested by the writer of the paper referred to, is to use one or more low resistance metal insulated return wires, laid in parallel with the rails and connected at frequent intervals thereto.

The saving of copper on an electric supply line is very poor economy. It is obvious that the improvement suggested by Mr. Vail would cost a good deal; but the ultimate saving in running expenses would justify the improvement in many cases.

The paper is a very suggestive one, and emphasizes the lesson which experience has so slowly taught electric engineers—the importance of good installation. The trolley system has gone through years of tribulation because it was, in its early examples, too cheaply erected.

The California Midwinter Fair.

The success of the Fair is now assured. The first week's attendance was 124,282; second week, 60,459; third week, 61,192; and the fourth week, 122,743. A feature of the Fair is special days. On February 23 was children's day, when 55,871 persons passed the turnstiles, the second largest single day attendance since the Fair opened.

Draining of Lake Copais.

The draining of Lake Copais has led to discoveries far beyond what was at first anticipated. Not only has an elaborate system of aqueducts been laid bare, of which we hope later to give full particulars, but in the bed of the lake traces of an ancient settlement have been found, and according to the Berliner Philologische Wochenschrift the ground plan of a palace has been made out, which in main outline corresponds to that of Tiryns.

The Congress of American Physicians and Surgeons.

This congress is to meet in Washington on May 29, 30, and 31, and on June 1 next, under the presidency of Dr. Alfred L. Loomis, of New York. The congress is a conjoint triennial meeting at Washington of certain national medical societies, so arranged that while each society preserves its autonomy and has its own meetings, papers, and discussions, the members of all the societies meet together at stated hours to carry out the objects of the congress.