

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. Terms of subscription for SUPPLEMENT, \$5.00 a year, for the U. S., Canada or Mexico. \$6.00 a year to foreign countries belonging to the Postal Union. Single copies, 10 cents. Sold by all newsdealers throughout the country. See prospectus, last page.

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. Each number is illustrated with beautiful plates, showing desirable dwellings, public buildings and architectural work in great variety. To builders and all who contemplate building this work is invaluable. Has the largest circulation of any architectural publication in the world.

Spanish Edition of the Scientific American.

LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published in uniform in size and typography with the SCIENTIFIC AMERICAN. Every number of La America is profusely illustrated. It is the finest scientific, industrial trade paper printed in the Spanish language. It circulates throughout Cuba, the West Indies, Mexico Central and South America, Spain and Spanish possessions—wherever the Spanish language is spoken. \$3.00 a year, post paid to any part of the world. Single copies 25 cents. See prospectus.

MUNN & CO., Publishers, 361 Broadway, New York.

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. Readers are specially requested to notify the publishers in case of any failure delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, AUGUST 12, 1893.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Agricultural Improvements, Aluminum alloys, Aurora, Bicycle gear, Blanking for sheet iron, Books and publications, Cat and hen, friendship of a, Coal conveyor, Congressional Library building, Eclipse of the sun, Rags of python, Eggs, notes on, Electricity from water power, Electroplated gauze work, Exposition, Columbian, Babcock & Wilcox steam boiler, Exposition, Columbian, chemical and pharmaceutical products, Exposition, Columbian, impressions of, Exposition, Columbian, photographing at, Exposition, Columbian, welded and bent tubes, German, Exposition notes, Gas lighter or extinguisher, Geissler's, Inventions recently patented, Javanese at the Fair.

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 919.

For the Week Ending August 12, 1893.

Price 10 cents. For sale by all newsdealers.

Table listing detailed contents of the supplement, including I. ARCHITECTURE, II. BIOLOGY, III. CHEMISTRY, IV. COLUMBIAN EXPOSITION, V. ELECTRICITY, VI. MEDICINE, VII. MINING ENGINEERING, VIII. MISCELLANEOUS, IX. NAVAL TACTICS, X. PHYSICS, XI. PHYSIOLOGY, XII. TECHNOLOGY.

NEW INVENTIONS FOR STREET CLEANING WANTED IN NEW YORK CITY.

It is really sickening to see how lazy and dishonest men become as soon as they are employed on public works in New York City. If it is street sweeping, they make a pretense by moving their brooms, without pressing hard enough to lift the dirt. If it is raking leaves on the grass, the men give one pull at the rake, then stop to rest and talk for a few minutes. If it is the laying of cross walks, five men will spend three days in adjusting six stones, and so on. The sense of honor and honesty in doing work seems to have left the men.

This is the main reason why New York City has suffered so long from dirty streets. Hundreds of men are employed to do the work, but they cheat the city. They pocket their wages, but evade the labor. They require to have overseers who will stand by to watch and whip them up to duty. These overseers the city does not furnish. If they did, the men would rebel at the polls.

Mr. W. S. Andrews, recently appointed in New York City as commissioner of street cleaning, expresses the opinion that the streets will not be thoroughly, properly and economically cleaned until some machine is adopted which will sweep the streets and at the same time take up the sweepings and carry them away to the place of final deposit, so as to avoid a second handling. He objects to any system which involves shoveling or dumping the sweepings from one cart to another, as it is impossible in doing that to avoid dust and a certain amount of scattering. He might have added it is impossible to make the shovelers do honest work.

The only hope of success in New York street cleaning is through the invention of new machinery for doing the work, and the elimination of manual labor. It would seem as if there were here a chance for inventors. Mr. Andrews is an enterprising man and will doubtless be glad to avail himself of any practical plans that may be brought to his notice. Steam rollers are now quite generally employed on city pavings and there is no good reason why steam street sweepers and dumpers might not be introduced.

THE NEW CONGRESSIONAL LIBRARY BUILDING.

The Fiftieth Congress made a liberal appropriation for a new Congressional library building, at Washington, and a square, consisting of ten and a half acres of ground, situated about 1,000 feet east of the Capitol, was purchased at a cost of \$585,000 for a site. Here a magnificent structure is now quite rapidly assuming shape. The work has been going on for the past four years, at times greatly delayed because the stone could not be furnished as fast as wanted.

The building is of Italian renaissance architecture, and will be 365 by 470 feet in size, with cellar, basement, and two stories. The material of the outer wall consists of granite, more or less beautifully carved and ornamented. A prominent feature will be a gilded dome, 100 feet in diameter, surmounted by a tolos or lantern. A balustrade will surround the base of both the dome and the lantern. The base of the latter will be about as high as the top of the vertical portion of the dome of the Capitol.

This great building, with a larger area than that of the Capitol itself, gives promise of being one of the handsomest of the many fine structures in Washington.

The reading room will be 100 feet in diameter and 90 feet in height, inclosed on the top with great skylights admitting a flood of light. Radiating book repositories, nine galleries high, and capable of holding over 8,000,000 volumes, will communicate with the reading room. The present Congressional library, for years greatly overcrowded, contains 650,000 volumes and 250,000 pamphlets. Only about one-fourth of the new building will be occupied by the library.

The cellar of the building is completed, and the heating apparatus all in place. The dome will be finished some time during the summer, and the walls of the building by next fall. The interior work, consisting of marble, woodwork, decorating, etc., will occupy several years more. The building will be especially well lighted, for, besides the great skylights, there will be about 1,500 windows.

With its snow-white walls and conspicuous gilded dome—the latter forming a pleasing contrast to that of the Capitol—its beautiful grounds, walks and driveways, the new Congressional Library will be a fitting companion for its grand and stately neighbor across the way.

Wave Power Pumps.

Two wave motor pumps have been in operation some time out near the Cliff House, not far from San Francisco, that have raised 1,000,000 gallons per day into a reservoir at an elevation of 100 feet. The Pacific Lumberman says: This appears to be the best result that we know as having been obtained from the various wave motors that have been tried during the past six or seven years.

John Stephenson.

John Stephenson, the inventor of the street car and one of the fathers of transportation, died at his home, in New Rochelle, on July 31. Mr. Stephenson was born in 1809, of English and Scotch parentage, at Armagh, Ireland, and was apprenticed to a New York coachmaker at the age of seventeen. In 1831 he began business for himself, and he designed the first vehicle known in New York as an "omnibus." Mr. Stephenson secured a patent for the first street car in 1832, the new cars being run on the New York and Harlem Railroad. The first car was named John Mason, after the president of the road. This car is now regarded as a historical curiosity. The first trip of the John Mason was made with the mayor and common council as passengers from Prince Street to Fourteenth Street. Other orders poured in, and he soon had a very flourishing business. In 1843 the Stephenson Works were built in Twenty-seventh Street, near Fourth Avenue, where they still turn out magnificent specimens of the car builders' art. It is curious to note that the original patent was signed by Andrew Jackson and members of his cabinet.

Street railroads are essentially American, and the fame of the car builder was carried into all civilized countries. New York must have always remained within certain limits if some means of transit had not been devised which should be cheap and at the same time fairly rapid. The street car filled the want for a long time, and a period of over forty years elapsed before they were obliged to give place, in New York, to the elevated railroad, and it is only within the last two years that cable and trolley cars have begun to displace the street car propelled by horses. At the present time the majority of the cars in New York are horse cars. The street car systems of New York appear to be particularly identified with Mr. Stephenson, and many hundreds of them still bear the words "John Stephenson's patents."

The perfection of the overhead trolley system has done a great deal to advance rapid transit and render it possible for people with small means to live in the cheap and generally attractive suburbs. Already the trolley lines, which are cheaply built and cheaply run, are successfully bidding for traffic with the elevated and other steam railroads, and in Brooklyn the elevated railroads have asked for a reduction in their assessment for taxation on the ground of loss of business caused by the number of passengers carried on the trolley roads. It is only a question of a few years when the whole State of New Jersey will be gridironed with trolley roads. The growth of street railways in the last five years has been phenomenal, and John Stephenson has borne an important part in this development, as he did back in the thirties, when the odd-looking little cars toiled painfully up Murray Hill. In some countries the memory of John Stephenson would be honored by a public funeral.

Electroplated Gauze Work.

Any one who has had experience with the thin glass globes used for covering delicate objects and instruments will be aware of the many accidents that are liable to befall them in the workshop. By covering them, however, with wire gauze, they may be in a measure protected.

Much ornamental gauze work is now being made by a large firm of electroplaters in the following manner: Instead of wire gauze being used directly, ordinary mosquito netting or fine lace is employed as the base, afterward electroplated.

To prepare a covering for the glass globes, it is but necessary to fit a lace or netting bag over the outside and remove it to coat it with a varnish to receive the conducting material. Almost any medium slow-drying varnish may be used, or plain shellac in alcohol, if nothing better is available. The lace cap must, as soon as the varnish is perfectly dry, be slipped over the glass globe, and fitted carefully around it. This precaution is taken so that when the plumbago is dusted on none will adhere to the glass and thus give a deposit where it is not wanted. As soon as it is well in place some of the solvent used must be sprayed upon it. This will soften the shellac or whatever material is employed upon the threads, preventing it from spreading to the glass. The graphite may now be safely dusted on from a fine-meshed stocking, being careful afterward to obtain a close-grained contact surface by rubbing with a soft brush well immersed in the conducting powder. Three or four wires should now be attached at different places and the whole immersed in the copper plating solution. A cyanide is preferable, as the deposit thus obtained is even and fine grained. The slower the deposit the better will it prove as a resisting material, and the finer will be the surface resulting.

To finish the outside of the meshes and give it a neat appearance, it is advisable to dip it in or brush it with a dilute solution of nitric acid, afterward exposing it to the fumes of ammonium sulphide to give it a dense black coating. It is best to lacquer the gauze, which will now be found to present a resisting surface to many of the strains and jars that the globe or shade is liable to have while in the laboratory.—Elec. Review.