

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 monthly, 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 especially requested to notify the publishers in case of any failure delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, MARCH 25, 1893.

Contents.

(Illustrated articles are marked with an asterisk.)

Aeronautical congress, Chicago. 123
Armor plates, tempering. 126
Armor plate work, Brooklyn. 127
Navy Yard. 177
Armour Institute, the, Chicago. 178
Balloon line, a trolley. 179
Bicycle industry. 180
Bicycles, double rear wheels. 183
Book or copy holder, Gardiner's. 181
Books and publications, new. 187
Chemical notes. 186
Copper on prints. 185
Cotton seed, a testing. 184
Crank shapin' machine. 180
Cruiser Maine, progress of the. 185
Delfware. 184
Engine, traction, Stratton's. 185
Fire service, N. Y. City. 186
Fog signal, siren as a. 182
Inventions recently patented. 187
Lamp bracket, Watts'. 181
Mars, signaling. 183
Mechanical devices, recent. 187
Mine car, Durand'. 180

THE ARMOUR INSTITUTE, CHICAGO.

The Armour Institute in Chicago has added two departments of study that ought to be very popular and productive of excellent results. They are the mechanical and electrical engineering departments. There is a dearth of well trained, practical mechanics who can work with their hands as well as with their brains. Colleges and technical schools all over the country are turning out mentally trained mechanics, but the number of schools is very few that offer a thorough practical manual training—schools suited to educate the great body of working mechanics. In the electrical line there has been more or less of a reason for the lack of well trained men in the fact that the demand has been so great, and the industry so new, that only unskilled men have been obtainable. But this excuse no longer holds good. To-day the demand is as great as ever for educated, well trained men who have a practical knowledge of electrical matters. One of the difficulties in connection with isolated electric lighting plants is that of securing engineers who have the practical knowledge to run the steam plant with skill and economy and at the same time know how to operate and keep in good condition the electrical equipment. Mentally educated men are a drug on the market, while manually trained and educated men are in demand.

THE BELL TELEPHONE PATENTS.

We have received many letters from readers in various parts of the country asking if they are at liberty to make electrical telephones, now that Bell's original patent has expired. In answer we say no. Bell's original patent was granted for 17 years, dated March 7, 1876, and in the fifth clause he claims "The method of, and apparatus for, transmitting vocal and other sounds telegraphically, as herein described, by causing undulations, similar in form to the vibrations of the air accompanying the said vocal or other sound, substantially as set forth."

This claim was held by the Supreme Court to cover any kind of telephonic apparatus in which an undulatory electrical current was used. This patent expired March 7, 1893.

Bell's second patent, dated January 30, 1877, covers the construction of the well-known Bell instrument and the parts thereof. This patent runs for 17 years from its date and will expire January 30, 1894. Not until that date will the public be free to make use of Bell's invention.

Other important patents are held by the American Bell Telephone Company which have long terms to run; these are explained in the company's advertisement on another page, to which we call the special attention of readers.

THE WORLD'S CONGRESS AUXILIARY.

Modern civilization has brought into existence many great questions which are threatening in their tendencies because of a lack of understanding of their cause and remedy. These, like all great questions, require time for their solution. It is necessary to study and analyze them from all points of view and compare the results that have already been obtained, whether these results be good or indifferent, or failures.

A feature of the World's Columbian Exposition which attracts comparatively little attention, yet which has this particular work in view, is the holding of the several congresses under the auspices of the World's Congress Auxiliary.

Never before in the history of the world has there been such a well-planned and broadly conceived effort to call together eminent minds from all parts of the world, representing every progressive movement. Public attention is drawn each year more directly to the needs of the several movements—such as education, science, religion, reformation and the like; and a gathering at which the best thought of the age in each of these movements can be concentrated, the progress made to date be distinctly outlined, and the needs for better and more aggressive work in the future be discussed, cannot well fail to be productive of good results. The programme of each congress is so planned that single theories or one-sided views cannot well control the meetings, and ample time is assigned each congress for carrying on its work. The publications that will be issued by the Auxiliary, giving the results of each congress, will be valuable data from which to gather strength for concentrating greater energy in each line of effort.

THE VALUE OF A PATENT.

Speaking of the value of patents, a business man interested in such things asserts that a patent does not patent in this country. All that the Patent Office does is to give you a paper with some writing on it, and if another man steals your idea, and goes to manufacturing your invention, the Patent Office will not lift a finger to protect you or to stand by its own decision. The fact that you've got a patent is a point in your favor, but you've got to hire lawyers and fight the thief in the courts, and if he can stand it to hire lawyers longer than you, that settles you, and you might as well make him a present of your invention. There

are lots of men in the country getting rich on the discoveries of other people. All they had to do was to take 'em and fight the real discoverers into poverty. The Patent Office, to be respected and to be of any use, ought to have the power to cause the stealer of a patent to be sent to prison.—Railway Review.

[Concerning the above, we would say the function of the Patent Office is simply to assist and encourage inventors by granting patents for new and useful inventions and discoveries. To attack or to punish people is no part of the duties of the Patent Office.

Property in patents is held under much the same tenure as other property. If a man receives a deed of lands, he is liable to annoyance from infringers, squatters, and other claimants. If anybody invades his rights he has a remedy through the courts and is obliged to employ lawyers to defend his interests and defeat infringers. It is the same with patent property. The courts are always open to the inventor for his protection, and his patent, moreover, gives him certain special facilities in the prosecution of infringers which are not enjoyed by holders of real estate. The infringer of a patent, if he does not obey the mandate of the court and desist from infringement when so ordered, may be at once imprisoned.

Property in patents is just as secure, and the means for its defense just as ample, as for any other species of property. It is true there are occasional litigations concerning patents in which inventors are made to suffer at the hands of powerful and unfeeling corporations; but the same may be said, probably to a greater extent, of innocent holders of other species of property. We think it probable the rights of patentees are better respected and inventors less troubled with infringements than any other class of proprietors.

Every year there are granted some twenty-five thousand new patents; yet the number of lawsuits where deliberate infringement appears to have been attempted may almost be counted on the fingers' ends. Indeed, it must be admitted the number of patent suits of all descriptions is exceedingly small, when we consider the immense aggregate of patents issued, and the additional fact that in nearly nine-tenths of all our manufacturing industries patents, in some form or other, are made use of.—Ed. S. A.]

Steam Street Railways in New York and Brooklyn.

The elevated steam street railways of New York and Brooklyn are great conveniences for the public, but they are sources of dirt, din, and danger to many a passing victim in the streets below. Chunks of coal, bolts of iron, hot and cold water, fiery coals, these are only a part of the droppings that fall from the rattling trains. It is a curious fact, however, that many people love to live close to the lines of these roads.

The other day, in New York, a sober burgher was, to his amazement, suddenly knocked down by what he thought was a meteor from the heavens; but it proved to be only a man, who, by reason of a state of dizziness, fell from the elevated railway station to the street below. Both men were considerably hurt, but will recover.

In Brooklyn, Mrs. Hannah Reilly sat at the front window on the third floor of 37 Myrtle Avenue, rocking her infant to sleep. The structure of the Brooklyn Elevated Railroad is about level with the window. A train passed by on its way to the bridge, and at that moment a missile came through the window, partly tearing out the lower sash, and whizzed by Mrs. Reilly's head. She screamed, and, picking up the baby, ran to the dining room to her husband. Blood poured from three gashes in her face and two others in each hand. She fainted, and her husband sent for Dr. Corrigan, of Jay Street.

Mrs. Reilly was still unconscious when the physician arrived, and he had some difficulty in stopping the flow of blood and reviving her. He succeeded finally, and the woman was put to bed in a state of collapse.

A heavy iron bar was found beside the chair in which Mrs. Reilly sat. Broken glass was scattered all over the room. It is supposed the rod flew from the engine of the train which passed at the time.

Steam Engine Saws.

The Sonora Independent says: "The introduction of a new saw for lumber is to be noted—an upright implement, thin like a bandsaw, and having direct steam attachment. At each end of it is a steam cylinder, each of which has but a single steam port. The upper piston head draws the saw and the lower piston up, and the lower piston draws the saw and the upper piston down, each piston drawing the saw, but neither of them pushing it—this causing the saw at all times to be rigid, so that a very thin saw can be employed. Below the lower cylinder are a heavy pair of balance wheels, these giving a steady as well as uniform motion to the saw, and to these balance wheels are connected a pair of rods, the upper ends of which connect with a knuckle joint at the lower end of the saw, thus throwing the lower end of the saw out as it is going up and against the log as it is coming down. The log carriage is operated by the same engine that runs the saw."