

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, postage included \$3 20

One copy, six months, postage included 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

To Advertisers.—The regular circulation of the SCIENTIFIC AMERICAN is now Fifty Thousand Copies weekly. For 1880 the publishers anticipate a still larger circulation.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, with handsome cover, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, postage paid, to subscribers. Single copies 10 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of seven dollars. Both papers to one address or different addresses, as desired.

The safest way to remit is by draft, postal order, or registered letter

Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost. The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

NEW YORK, SATURDAY, DECEMBER 6, 1879.

Contents.

(Illustrated articles are marked with an asterisk.)

Academy of Sciences, New York, 353
American industries, 357
American institute of architects, 353
Anasconda, crushed by an, 354
Astronomical notes, 356
Commercial enterprise, 357
Dairy fair, international, 356
Dead, preservative of the, 359
Electrical generator, Edison's, 359
Fire losses, 352
Fish, cross-breeding among, 350
Gas well and carbon factory, 352
Gelatine, purifying, 351
Glass tubing, 351
Haymaking, artificial, 358
Hughes micro and Blake trans, 350
Ibex, the, 359
Industries, American, 357
Inflammable goods, a ban on, 353
Inventions, agricultural, 351
Inventions, mechanical, 353
Inventions, miscellaneous, 357
Letters patent, 352
Linen Company, Williamite, 351
Masters and apprentices, 356
Mining tunnel, Colorado, 352
Motor, tramway, new, 354
National public health assoc'n., 353
Natural history notes, 359
Near-sightedness, 351
Notes and queries, 353, 354
Projectile, military, new, 350
Reading room, British museum, 351
Red Sea, where Israelites crossed, 354
River, Manchester and Liverpool, 354
Screw driver, improved, 358
Lag boiler covering, 351
Steamer, Cunard, new, 358
Steam fitter, young, hints to, 355
Telegraphic system of the world, 352
Telegraphy in France, 352
Towboat, Western, 352
Towing, steam, on the Erie canal, 350
Trade mark decision, a, 352
Tribute, handsome, a, 353
Volcanic products of the Pacific, 359
Wagon hardware trade, 353

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 205.

For the Week ending December 6, 1879.

Price 10 cents. For sale by all newsdealers.

I. ENGINEERING AND MECHANICS.—Shafting, Couplings, and Hangers. 9 figures.
Machinery from an Insurance Point of View. By A. J. BATES. (Continued from No. 204)
How to Prevent the Rapid Spread of Fire. Architectural remedies for the rapid spread of fire through buildings.
Principles of Horseshoeing. Valuable advice by Dr. GEORGE FLEMING, V. S., London.
Shingle Manufacture.
Advantages of Cumberland, Maryland, as a Manufacturing Center.
II. MINING AND METALLURGY.—The Lexington Oil Belt, Santa Clara County, California. Recent developments. Promising wells.
The Sutro Tunnel. An address before the Bullion Club, by ADOLPH SUTRO.
III. TECHNOLOGY AND CHEMISTRY.—Bracewell's Improved Bleaching Kier. 2 figures.
Wood Stains.
On Gelatino-Bromide of Silver. By D. VAN MONCKHOVEN.
Heliotype Printing Plates. How prepared.
A New Quantitative Analytical Method of Extensive Applicability. Prof. A. Claassen's process.
Turkey Red Oil. By G. STEIN.
Determining Sulphur. By ALBERT COLSON.
Compound Nature of Phosphorus. By N. LOCKYER.
Spongy Silver.
Fast Scarlet without Cochineal.
IV. ELECTRICITY, LIGHT, ETC.—Carre's Di-electric Machine. 2 figures.
1. The friction machine. 2. The di-electric induction apparatus.
The Most Powerful Telescope in Existence. By E. NEISON.
V. MEDICINE AND HYGIENE.—Curious Case of Loss of Personal Identity.
The Eucalyptus and the Pine Considered in Relation to their Sanitary Properties. By C. T. KINGZETT.
Neuralgia Cured by Nerve Stretching.
Anti-fat.
VI. NATURAL HISTORY.—The Orang-Outang of the Garden of Acclimatization, Paris. 1 full page illustration.
South African Baboons. Notes by H. N. MOSELEY.
The Orang-Outang. 11 figures. The orangsin Paris.—Orang-outangs in Borneo.—The orang's fighting propensities.—The orang and evolution.
The Homing Instinct in Pigeons.
Phylloxera.
Hedge Hog and Viper.
VII.—ARCHEOLOGY.—New Explorations of the Ruins at Palenque, Mexico. By M. F. MALER. 2 figures.

THE TRADE MARK DECISION.

The three cases of the United States against Emil Steffens, Adolph Witterman, and W. W. Johnson—all prosecutions for violations of the trade mark laws embodied in sections 4,937 to 4,947 of the Revised Statutes—were decided by Justice Miller in the United States Supreme Court, at Washington, November 17. The lower courts had been divided in opinion as to the constitutional power of Congress to legislate on this subject. It was maintained by counsel who sought an affirmative answer to the question that two clauses in the Federal Constitution furnish sufficient warrant for the legislation in dispute, namely, the 8th clause of section 8, article 1, which provides that Congress shall have power to pass laws to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their inventions and discoveries; and the third clause of the same section, empowering Congress to regulate commerce between the States and with foreign nations. The court declared the attempt to identify trade marks with works of authorship and invention to be surrounded by insurmountable difficulties. If the symbol, however plain, simple, old, or well-known, had been first applied by a claimant as his distinctive trade mark, he could by registrations secure the right to its exclusive use. While such legislation might be a judicious aid to common law on the subject of trade marks, and within the competency of legislatures whose general owners embraced that class of subjects, the court was unable to find any such power in the constitutional provision concerning authors and inventors.

With regard to the argument that a trade mark is used to identify a particular class or quality of goods, and that as so used it is a valuable aid or instrument of commerce, and comes within the scope of the constitutional provision cited, the court held that the clause quoted does not bring within the control of Congress every species of property which is the subject of commerce, or which is used in commerce (Wallace vs. Louisiana, 8 How. 73; Paul vs. Virginia, 8 Wall. 168), and that the legislation in question did not limit the use of trade marks to inter-state or international commerce, as it should do if based on the constitution or provision quoted in its support. If it referred to all trade and to commerce between all points, it was obviously an exercise of power not conferred upon Congress. That this was the purpose of the legislation in question seemed, in the opinion of the court, to be evident. It contemplated the establishment of a universal system of trade mark registration for the benefit of all who had already used a trade mark, or who wished to adopt one without regard to the character of the trade to which it was to be applied or to the locality of owner. Such legislation was, in the opinion of the court, in the excess of Congressional power. It had been urged that if Congress had power to regulate trade marks used in commerce with other nations and among the several States, its legislation, so far as it related to that class of cases, should be held valid; but to this the court held two objections: First, that there was nothing to show that the trade marks in the three causes under consideration were used in that kind of commerce; and, second, that it was not within judicial province to give the words used by Congress a narrower meaning than they were manifestly intended to bear. To do so would be virtually to make a law which would be only partial in its operation, and which would complicate rights which parties would hold in some instances under acts of Congress and in others under State law. The question of the treaty-making power of the General Government over trade marks, and the duty of Congress to pass any laws necessary to carry such treaties into effect, was left untouched. The only question in the three cases under review was whether the statutes of 1870 and 1876 could be upheld in whole or in part as valid and constitutional, and that the court answered in the negative.

From this decision many have hastily inferred that no protection remains for the property rights of merchants and manufacturers in trade marks, and no means of preventing the markets from being flooded with spurious wares bearing well-known and respected labels. But such is not the case. Those who have been using trade marks have acquired a common law right to them; and in case they are counterfeited their owners can at once bring suit at equity to restrain and to recover damages in the courts of any and every State where the infringement occurs; or in the United States courts in case the litigants are citizens of different States.

The advantages of the laws which have been declared unconstitutional lay simply in their enabling all suits for infringements of trade marks to be brought in United States courts, and in providing for a formal registration of trade marks by the Patent Office, the certificate of which was accepted in all the courts of the country as prima facie evidence of ownership. Another advantage of such registration arose from the facility it afforded for determining whether a desired trade mark had been previously adopted by another, thus preventing unintentional infringements. It is proper to add that this decision does not in any way affect the protection of trade labels by copyright.

The Patent Office will continue to register trade marks as heretofore, notwithstanding the unconstitutionality of the laws upon which such registration has been based, trusting, doubtless, to prompt action on the part of Congress to furnish the necessary legislation for the permanent continuance of the work. Should this fail, Congress will no doubt provide by appropriate legislation the means for returning

the fees received for the 8,000 or more trade marks thus far registered.

A WESTERN TOW-BOAT.

The Pittsburg coal firm of W. H. Brown & Co. have just completed and added to their fleet of tow-boats the Harry Brown, a typical Western river tow-boat, being the most powerful and complete high pressure craft of its kind afloat. The peculiar and hazardous conditions which attend the safe delivery at New Orleans of a "tow" (from 200,000 to 500,000 bushels) of Pittsburg coal cannot be fully shown here, nor are they likely to be clearly comprehended by any but river men. The first 500 miles below Pittsburg comprises a succession of tortuous windings, of shoals and "riffles," and bars and counter-currents. To successfully run this gauntlet with a cumbersome, deeply laden tow, containing tens of thousands of tons of coal, boats of the Harry Brown type are required, with light draught and enormous steering as well as propelling power. Their pilots must have absolute control over a rigid mass that often takes up all the available water in the channel, both as to width and depth. To render this possible the Western river man places his boat behind his fleet of coal-laden boats and barges, and by means of great hawsers binds the whole mass of a score of craft into a solid "tow."

On the Ohio and Mississippi rivers the Hudson River or canal system of towage would be utterly useless. Hence in the Harry Brown's construction features unintelligible to Eastern boatmen may be noted. Her dimensions are as follows: Length on deck, 210 feet; beam, 42 feet, over all, 52 feet; hold, 5 1/2 feet. Engines, one pair, high pressure, 26 and 1/2 diameter of cylinders, 10 feet stroke. Seven steel boilers, 40 inches diameter and 28 feet long, furnish the necessary steam, at 170 pounds pressure, test pressure of boilers being 260 pounds hydraulic. An auxiliary or "nigger" boiler, 38 inches by 10 feet, supplies steam for engines operating capstans, etc. The wheel, located at the stern of the boat, is 26 feet 4 inches in diameter, length of buckets, 32 feet, each bucket or paddle being 32 inches in width. The wheel shaft, upon which the greatest strain is brought to bear, and upon which the safety of boat and tow depends, is a special feature of the Harry Brown, being the first wrought steel shaft ever imported and used upon a river tow-boat. It is of crucible steel, from the works of Krupp, at Essen, and weighs alone 20,600 pounds; with flanges, etc., 40,000 pounds; and cost 13 cents per pound delivered in New York. Its dimensions are: Length, 36 feet 7 inches; diameter at journals, 13 inches; in center, 15 inches. Rudders, four in number: one pair, balanced, 25 feet long; one pair, wing, 14 1/2 feet long; actuated by steering wheel, 12 1/2 feet in diameter, with 16 inch barrel.

Ready for business the Brown draws only 3 feet 4 inches forward and 3 feet aft, a great desideratum, enabling her to return to port during a season of low water. In service, and to maintain steam at 170 pounds, the boilers will evaporate 5,000 gallons of water per hour, and the engines evolve 1,750 horse power. This boat, with a favorable stage of water—9 to 12 feet at Pittsburg—is expected to take to New Orleans and other Southern ports from 28 to 30 loaded coal boats, say 600,000 bushels, or the total output of 6 acres of a 4 1/2 foot vein of Pittsburg coal. Such a tow measures 850 by 200 feet, and reduced to tons of 2,000 pounds, contains 22,800 tons. A loaded coal boat draws from 7 1/2 to 8 feet, a barge from 6 to 7 feet. The former's load is 23,000 to 25,000 bushels, the latter 12,000 to 13,000 bushels.

In the Harry Brown is embodied every feature that long experience could suggest or money procure to make her the model of her class. At present prices for iron, etc., she could scarcely be built for \$60,000, though her actual cost was \$50,000.

THE GREAT GAS WELL AND CARBON FACTORY AT MURRAYSVILLE, PA.

About a year ago, in boring for oil at Murrysville, near Pittsburg, Pa., the boring tools tapped an extraordinary vein of natural gas. The flow was estimated at about 50,000 cubic feet per hour. Recent measurements show that instead of decreasing, the present flow is fully 10,000 feet per hour greater than the first estimate, while the pressure at the mouth of the well is 90 pounds per square inch. This enormous quantity of natural fuel has, up to this time, been mostly wasted, but will soon be utilized for the manufacture of carbon black, or "lamp" black, as it is more commonly called.

A Pittsburg firm, Messrs. Sherriff & Hazely, are at work upon a contract for the machinery and fittings of what will probably be the largest carbon black factory in the world. The appliances for collecting the soot from the Murrysville gas are the following: Near the well is erected a frame building, 300 by 175 feet, and into it the gas is led in four parallel lengths of 250 feet each, of 2 inch gas pipe. Along the sides of these are fitted short branches of 1/2 gas pipe, terminating in a slight upward curve and tipped with ordinary gas burners of 6 foot per hour capacity. Above these burners, at a distance of 10 inches, are placed a series of cast iron plates, contiguous and forming a smooth surface whereon the carbon black is deposited. A small car traveling on rails laid between burners and plates, and furnished with a scraping device, plies forward and back every ten minutes during the twenty-four hours. This carriage is propelled by steam