

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.

Single copies of any desired number of the SUPPLEMENT sent to one address on receipt of 10 cents.

Remit by postal order. Address

MUNN & CO., 37 Park Row New York.

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. Many factors 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.

VOL. XLI., No. 17. [NEW SERIES.] Thirty-fifth Year.

NEW YORK, SATURDAY, OCTOBER 25, 1879.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Acids from electric lights', 'Agamemnon, launch of the', 'Amalgamator, new', etc., with corresponding page numbers.

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 199.

For the Week ending October 25, 1879.

Price 10 cents. For sale by all newsdealers.

Table listing sections I through VIII, including 'ENGINEERING AND MECHANICS', 'AGRICULTURE, ETC.', 'ELECTRICITY, MAGNETISM, ETC.', 'TECHNOLOGY', 'GEOGRAPHY', 'METEOROLOGY', 'NATURAL HISTORY', and 'MEDICINE AND HYGIENE, DENTISTRY, ETC.' with sub-articles and page numbers.

THE AMERICAN INSTITUTE FAIR.

There is probably but one department in which this year's exhibit will especially impress the visitor accustomed to these annual displays, and that is the section devoted to china-ware. The potteries of New Jersey and New York are abundantly represented, and their exhibits will be a surprise to many. The variety and excellence of the work done by our makers of china and stone ware are neither so well known nor so highly appreciated by the public generally as they deserve to be; and this exhibition will do much to convince all beholders that we may be, and in all probability soon will be, able to stand with the best in this department of industrial art.

In most other respects the fair is a counterpart of those which have gone before it, though quite unlike them in many respects. Agricultural machinery is not so abundantly represented as it has been, and there are fewer pumps, looms, printing presses, washing machines, and, not to speak disrespectfully of the foregoing, fewer catch-penny shows.

Rapid transit comes in for a good deal of attention. Col. Payne shows a large model of the apparatus to be employed in the traction of cars on the East River Bridge. The Winters Improvement Company have, in an obscure section of the machinery annex, a large display of tanks and apparatus for compressing and storing air for pneumatic motors. In another corner is shown the steam motor which the Third Avenue Horse Railroad Company have been trying as a substitute for horses. Mr. Louis Leyboldt offers a combination rail which promises to make no noise and seems likely to fulfill the promise through lack of opportunity. Mr. W. W. Riley exhibits a model of his safety center rail elevated road, which presents several ingenious features likely to make it useful where a cheap road of small capacity is needed.

The Tarbox automatic railway switch is worthy of critical examination. It is simple, strong, and direct in its action; and while placing the switch under the control of the engineer, it seems to obviate most of the current risks from misplaced switches by making the locomotive or car wheel mechanically set the switches ahead for the main track. The switch points move vertically instead of horizontally, and there appears to be nothing in the machinery which operates them that is likely to fail in working or to give any shock to a rapidly moving engine. The Greenway automatic switch, illustrated in a late number of this paper, is also shown in working model.

Among the notable engines in the exhibition, the Otto silent gas engine makes its first appearance at these fairs. Its smooth and quiet working attracts no little attention. It is exhibited by H. S. Manning & Co., 111 Liberty street. The engines supplying power in the annex are a Buckeye engine, with whose excellence our readers are all familiar; and a Whitehill engine, furnished by the Newburg Steam Engine Works. Joseph C. Todd, of Paterson and New York, exhibits several forms of the Baxter marine engine, and the Herreshoff Manufacturing Company, of Bristol, R. I., have an interesting display, including their patent safety coil boilers, and the new form of compound condensing engine which has proved so advantageous and economical for steam yachts, launches, and the like. In this connection may be mentioned also the fine display of Hancock inspirators, by H. S. Manning & Co. These inspirators may also be seen in use in connection with the exhibition boilers.

Close by the boilers will be seen the interesting exhibit of the Pierce Well Excavator Company, including the Pierce portable hand rock drill, and the company's improved artesian well drilling and mineral prospecting machine. Opposite are the well known Blake's challenge rock breaker, and the improved stone and ore crushers of the Farrel Foundry and Machine Company, of Ansonia, Conn. The latter are particularly prompt, powerful, and certain in their action. Adjoining will be seen a large variety of Tunatill's improved ice crushers, exhibited by the New York Plow Company. In the same vicinity are the Union Stove Company's exhibit of emery wheels and machinery, and a variety of celluloid emery wheels, grindstones, hones, sharpening rifles, and the like, made by the Celluloid Emery Wheel Company and shown by Mr. E. D. Bassford. The Empire State Brick Company have near by several of Gregg's improved brick machines, lately described and illustrated in this paper, and a fine display of pressed and ornamental bricks.

As usual the display of wood-working machinery, especially of the lighter sorts, is abundant. J. H. Blaisdell, New York, has an attractive assortment, including band saws, shaping machines, pony planers, spindle shapers, saw tables, and the like; also a novel sand papering machine with a traversing cylinder. Another good collection of wood-working machinery is shown by H. B. Smith & Co., of Smithville, N. J., who are also strongly represented by iron-working machinery. Another exhibitor of wood-working machinery is Mr. P. Prybil, of West 40th street.

Among the other exhibits worthy of attention may be mentioned the Keith dynamo-electric machine and the Fuller electric lamp, shown by the Fuller Electric Light Co., 20 Nassau street; the leather belting of J. B. Hoyt & Co., also of this city; Knight's perfection rudder for small craft; the foot, hand, and power presses of the Peerless Punch and Shear Co., 52 Dey street; Main's patent milling attachment for lathes, shown by Wm. Main, of Piermont, N. Y.; the Rhyston mangle, for ironing clothes without heat, described and illustrated a short time since in this paper; the pulsating pen of Ward & Drummond; the new economizer agricultural engine of the Porter Manufacturing Company; and an important exhibit by the American Vege-

table Fiber Company, of Philadelphia. The last includes De Landtsheer's improved machine for breaking and dressing flax, hemp, and other fiber plants, and a growing specimen of the abutilon—the newly discovered fiber plant of the Middle States—with samples of the fiber in its raw and manufactured states; also a great variety of products of this new American jute, bleached, dyed, spun, and woven.

As usual there is an interminable display of sewing machines and attachments, and other contrivances for saving (or increasing) domestic labor. There is also a good show of furniture; and the National Stove and Foundry Company display some fine castings in connection with their heaters and ranges.

A ZOOLOGICAL GARDEN FOR NEW YORK.

There is in preparation, at the upper end of New York island, a semi-educational pleasure resort that promises to add materially to the city's resources in that direction. The project is in the hands of a number of wealthy citizens, who have purchased 33 acres of ground lying between 155th and 159th streets, St. Nicholas avenue and Harlem River, to be laid out as a pleasure park, including botanical and zoological gardens, a large music hall, and other structures. The situation is admirably adapted for effective landscape gardening, and is accessible by water as well as by land.

The plans contemplate a grand arcade, 1,100 feet long, facing 8th avenue, and extending 450 feet on 155th street. The approaches to the arcade through the surrounding gardens will be by stairways, and from St. Nicholas avenue by paths descending to the upper section of the building. The arcade, to be devoted to shops (excluding barber shops, cigar stands, saloons, and the like), is to be of iron and glass throughout. It will be 40 feet high and 75 feet deep, and cost about \$275,000. Along its top, extending over 1,100 feet, will be a promenade overlooking the garden and the river.

The zoological garden will be back of the arcade, the cages to extend from the 157th street entrance to the foot of the bluff on 155th street. The monkey pavilion will stand between 155th and 156th streets, and the bird pavilion between 157th and 158th streets. In an artificial lake within the park will be an island carrying a large octagonal concert and dancing hall, two stories high. Back of the lake will be the bear pits, cut out of solid rock, 75 feet deep and 50 feet wide, visible from the lake side and also from the bluff above. Near by will be a house for antelopes and a bath for seals. Animals and birds that require darkness are to be sheltered in a deep ravine, to the north of the tower of the main building.

The main building, to stand near the corner of St. Nicholas avenue and 155th street, will contain a large concert hall and lecture room, seating 40,000; a botanical conservatory, 100 feet by 500 feet, with towers at the ends for birds and flowers. There will be besides a capacious restaurant, billiard rooms, bowling alleys, and the like. The grand tower will be used as an observatory. At the upper end of the park ten acres are reserved for out-door sports. A considerable amount of work has already been done upon the grounds, and the collecting of zoological and botanical specimens has been begun. One of the projectors (Mr. Crosby, of the law firm of Fullerton & Crosby) informs the Herald that they will soon have 500 men at work on the grounds, under the direction of Mr. Martinez, well known through his connection with the Philadelphia Zoological Gardens, and Mr. Hugo Kapka, engineer and landscape gardener. The company which has undertaken the enterprise is styled "The Universal Conservatory and Zoological Garden Company," with a capital of \$2,000,000, three-fourths of which have already been raised.

THE ORIGIN OF MACHINE-MADE PENS.

Joseph Gillott, the first to employ machinery in the manufacture of steel pens, was originally a maker of buckles and other "steel toys," working alone in a garret in a Birmingham "slum." At this time he was engaged to a young woman in his own rank in life, whose two brothers were working, in about the same style as himself, on hand-made pens. Gillott thought he could better the processes employed, and worked secretly in his garret until he had made a press and other appliances, by which he could make twenty times as many pens in a day, and better pens, than was possible under the old methods. He found ready sale for them, and soon the demand outgrew his power of production. At this juncture his sweetheart agreed to his proposal that they should marry and work together, little dreaming of the ultimate issue of their enterprise. In after years Mr. Gillott used to tell how, on the very morning of his marriage, he began and finished a gross of pens, and sold them for £7 4s., before going to church.

Ivy Poisoning.

Recently Chief Justice Noah Davis, of New York City, was badly poisoned by the creeping vine known as poison ivy, which infests every fence corner and waste place in this part of the country. He was gathering bright autumn leaves, while in the country about sixty miles up the Hudson, and did not know that poison ivy leaves were not to be safely handled. In view of the general prevalence and abundance of this vine, it is astonishing that any native of the country should be ignorant of its appearance and poisonous properties. The fact that Judge Davis did not know the plant is, however, only another evidence of the prevailing neglect, even among educated people, of attention to common objects in nature.