Scientissic American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 87 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

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

s a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT s issued weekly. Every number contains 16 octavo pages, with handsome cover uniform in sizewith 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 ParkRow, 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. (27) Manufacturers and others who desire to secure foreign trade may have large, and handsom ely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large ugranted 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.)

Acids from electric lights* 261	Lacquer, brown [26]
Agamemnon, launch of the 260	Memphis, parification of 260
Amalgamator, new* 262	Nordenskjold's discoveries 258
American Institute fair 256	Notes and queries 267
American trade revival 264	Palissy plate* 263
Baptismal font* 265	Paper, albumenized 261
Barometer tube, to fill [1] 267 Building in New York 264	Papier mache [11]
Building in New York 264	Pens, machine made, origin of 256
Candle, electric, improved 265	L'hoto-collographs, printing 260
Candle novel* 263	Photo-decoration of metals 262
Cape of Good Hope 264	Photo-printing process, new 261
Cave, remarkable discovery of 293	Photography in natural colors 260
Copying ink, black [23] 207	Photography of flashing signals. 259
Cotton factories for the South 266	Pine cones for fire kindling 260
Dominion exhibition, the 265	Pin factory, visit to a 261
Electric light, division of 260 Electric light, heat of the 263	l'owder-post insects* 261
Electric light, heat of the 262	Progress, recent, in Soudan 266
Elevated railways, progress of* 255	Rativay signals (15]
England again invaded 266	Ratiway signals [15] 267 Screws to nick [2] 267
Erratum 265	Sealing wax (25)
Expansion metal [19]	Berrents eggs [28] 267
Fences, metallic	Chearing & riveting machinery*. 259
Fires, great, record of 264	Epeeds, fast
Fluorescent body, new 261	Stains, nitrate of silver 260
Guns, powerful 265	Stores, American in England 260
(7un, magazine, Hotchkiss 259	Stove pipes, improvement in* 262
Heat [9]	St. Paul as a milling center 260
Hydraulic ram, new	Btring telephone [3]
International park at Niagara 257	Temper vs. health
Invention, the basis of 266	Therapeutic agent, new 272
Inventions, agricultural 260	Torpedo experiments, new* 257
Inventions, engineering 263	Valve travel of [16]
Inventions, mechanical 259	Valve, travel of [16]
Inventions, miscellaneous 263	What to teach
Tvv palsoning 256	Wire resistance of IRI 267
Towolry electric*	Wire, resistance of [8] 267 Zoological garden for New York, 256
Demont, Cooking the second	DOUGHOUS BUT GOT TOT THEN THE , AND

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.

L ENGINEERING AND MECHANICS.—American Engineering. Part V. (Continued from No. 193.) Internal navigation. The United States the pioneer in steam navigation. Fitch. Fulton, and Collins. American river steamers, etc.

The Agamemnon. Description of the second (new) British central citadel, iron clad war steamer.

The Temperature of Escaping Steam. 1fg. Showing apparatus employed in testing safety valves. Steam acting on safety valves to be treated n t as an elastic fluid, but as a stream of projectiles.

Berthon's Collapsible Boat for Pontoon Bridge Equipment, recently adopted by the British Government. 4figs.

Machine for Sharpening Straight and Circular Saws. 1 fig. Steam elowing Engine. 1 fig. An improved 10 horse steam blowing engine, English.

engine, English.

II. AGRICULTURE, ETC. — Australian Sheep. 1 figure.
Preparing Bees for Winter. Plan of G. M. Doolittle, Borodino, N. Y.
East Indian Wheat. India as a wheat-producing country.
The P turi Plant. The Australian stimulant.
The Newer Grapes. Discussion at the meeting of the American Pomological Society. Cultivation and diseases of grapes. The exhibition at Rochester
Ex ort of American Food Products to England. A statistical statement of our export trade in food stuffs, prepared by Mr. Victor Drummond. British Secretary of Legation at Washington.

III. ELECTRICITY, MAGNETISM, ETC.—De Meriten's New Magneto-Electric Machine. 3 figs. Mr. Jamieson's Lectures on Electricity and the Submarine Telegraph. First examination paper.

TECHNOLOGY.—Methods and Rules of China Painting. General preliminaries, requisites etc. Confectionary at Home. By CATHERINE OWEN. How to make French candies at home and without expensive apparatus. Fondants. Panache Fondant.etc.

Gas and Gas Making. 111. By L. I. Grand Form No. 192.) The process of gas making, continued. Patterson's theory.

Blast Furnace Slag, its New Uses. The utilization of a nuisance. Slag shingle. Slag brick. Slag stone etc.

Mineral Deposits The Comstock Lode. Lecture by Professor W. F. STEWART, of Virginia City, Nevada.

V. GEOGRAPHY.—The Objects and Aims of Geographers. Opening address of Clements R. Markham, President Section E, British Association.

VI. METEOROLOGY.—The Scint llation of the Stars and Meteorological Phenomena. 4 figs. M. Montigny's scintillometer.

Dust Showers. Observations of Professor Orazio Silvestri, the Rallan microscopist. One il 'ustration, with many figures, showing material of a dust shower in Sicily. (Magnified 500 diameters).

VI. NATURAL HISTORY.—On Nocturnal Animals. By JAMES MURIE. M.D., LL.D., F.L.S. Conditions of nocturnal activity. Nocturnal protozoa meduses, apneloids, mollusca, spiders, scorpions, fish, reptiles, tirds, curious examples, etc.

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 sur prise 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 con vince all beholders that we may be, and in all probability 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 Leypoldt 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 wellknown 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 shown by Mr. E. D. Bassford, The Empire State Brick a fine display of pressed and ornamental bricks.

N. J., who are also strongly represented by iron working sold them for £7 4s., before going to church. machinery. Another exhibitor of wood-working machinery roguant etc.
192.) The process of gas making, continued. Patterson's

Mr. P. Pryibil, of West 40th street.
192.) The process of gas making, continued. Patterson's

Among the other exhibits worthy of attention may be WIII. MEDICINE AND HYGIENE. DENTISTRY, ETC.—Digestion and Dyspepsia. Effects of acids and alkalies in the stomach. Replanting, and a new process of ingrafting porcelain crowns on natural roots. By George W. Wild, D.B.S.

paper; the pulsating pen of Ward & Drummond; the new the plant is, nowever, or economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economizer agricultural engine of the Porter Manufacturing neglect, even among economiz

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 soon will be, able to stand with the best in this department 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 zoologicalgardens, 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

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 manuice crushers, exhibited by the New York Plow Company. facture of steel pens, was originally a maker of buckles and In the same vicinity are the Union Stove Company's exhibit other "steel toys," working alone in a garret in a Birmingof emery wheels and machinery, and a variety of celluloid ham "slum." At this time he was engaged to a young emery wheels, grindstones, hones, sharpening rifles, and the woman in his own rank in life, whose two brothers were like, made by the Celluloid Emery Wheel Company and working, in about the same style as himself, on hand-made pens. Gillott thought he could better the processes em-Company have near by several of Gregg's improved brick ployed, and worked secretly in his garret until he had made machines, lately described and illustrated in this paper, and a press and other appliances, by which he could make twenty times as many pens in a day, and better pens, than As usual the display of wood working machinery, especial was possible under the old methods. He found ready sale ly of the lighter sorts, is abundant. J. H. Blaisdell, New York, for them, and soon the demand outgrew his power of prohas an attractive assortment, including band saws, shap duction. At this juncture his sweetheart agreed to his proing machines, pony planers, spindle shapers, saw tables, and posal that they should marry and work together, little the like; also a novel sand papering machine with a travers-dreaming of the ultimate issue of their enterprise. In after ing cylinder. Another good collection of wood-working years Mr. Gillott used to tell how, on the very morning of machinery is shown by H. B. Smith & Co, of Smithville, his marriage, he began and finished a gross of pens, and

Ivy Poisoning.

Recently Chief Justice Noah Davis, of New York City, mentioned the Keith dynamo-electric machine and the Fuller was badly poisoned by the creeping vine known as poison electric lamp, shown by the Fuller Electric Light Co., ivy, which infests every fence corner and waste place in 20 Nassau street; the leather belting of J. B. Hoyt & this part of the country. He was gathering bright autumn Co., also of this city; Knight's perfection rudder for leaves, while in the country about sixty miles up the Hudsmall craft; the foot, hand, and power presses of the son, and did not know that poison ivy leaves were not to be Peerless Punch and Shear Co., 52 Dey street; Main's patent safely handled. In view of the general prevalence and milling attachment for lathes, shown by Wm. Main, of Pier- abundance of this vine, it is astonishing that any native of mont, N. Y.; the Rhyston mangle, for ironing clothes with- the country should be ignorant of its appearance and poisonout heat, described and illustrated a short time since in this ous properties. The fact that Judge Davis did not know paper; the pulsating pen of Ward & Drummond; the new the plant is, however, only another evidence of the prevailing economizer agricultural engine of the Porter Manufacturing neglect, even among educated people, of attention to com-