Aldvertisements.

Inside Page, each insertion - - - 75 cents a line. Back Page, each insertion - - - \$1,00 a line.

The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

USE ADAMANT WALL PLASTER 1891



It is Hard, Denne, and Adhesive. Does not check or crack.
It is impervious to wind, water, and disease germs. It dries in a few hours. It can be applied in any kind of weather. It is in kenderal use. Licenses granted for the mixing using, and selling.

Address ADAMANT MFG. CO. 309 E. Genesee St., Syrncuse, N. Y.

STEREOTYPING; THE PLASTER AND Paper Processes.—Composition and preparation of the mould, the best alloys of metal and proper degree of heat, frimming and mending the plate, etc. A minute description of both processes, with numerous illustrations. A paper of great interest to every printer. By Thomas Bolas, F.C.S. F.I.C. SCIENTIFIC AMERICAN SUPPLEMENTS, 773 and 774. 10 cents each.



The Sebastian-May Co. Improved Screw Cutting

Foot&LATHES Power LATHES Drill Presses, Chucks, Drills, Dogs, and Machinists' and Amateurs' Outfits. Lathes on trial. Catalogues mailed on application. to 167 Highland Ave., SIDNEY, OHIO.

ADVERTISING SPECIALTIES! Inventors can sell us outright or have manufactured on royalty, inventions of novelty or utility that can be used for advertising. Correspondence invited. The Tuscarora Advertising Co., Coshocton, O.

GATES ROCK & ORE BREAKER



Capacity up to 200 tons per hour. Has produced more ballast, road metal, and broken more ore than all other Breakers combined. Builders of High Grade Mining Machinery.

CATES IRON WORKS, 50 CSo. Clinton St., Chicago 215 Franklin St., Boston, Mass.

ROCK DRILL

MINING AND QUARRYING MACHINERY Ingersoll-Sergeant Drill Co. NATIONAL

No. 10 PARK PLACE, NEW YORK. for Complete Priced Catalogue.

RUCK DRILLS (S) AIR COMPRESSORS & CENERAL MACHINERY FOR MINING, TUNNELING. RRY & RAILROAD WORK. RAND DRILLEO 23 PARK PLACE NEW YORK

The value of the SCIENTIFIC AMERICAN as an advertising medium cannot be overestimated. Its circulation is many times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. This he has when he advertises in the SCIENTIFIC AMERICAN. And do not let the advertising agent influence you to substitute some other paper for the SCIENTIFIC AMERICAN. when selecting a list of publications in which you decide it is for your interest to advertise. This is frequently done for the reason toat the agent gets a larger commission



ON GAS ENGINES. - A VALUABLE paper by E. Delimare-beboutteville, touching upon the history of gas moi ors in general, and describing in detail the "Simplex" engine invented by the author and Mr Malandin. With 23 figures. Contained in SCIENTIFIC AM RICAN SUPPLEMENT, Nos. 715 and 716. Price 0 cents each. To be had at this office and from all newsdealers.

THE DAIMLER MOTOR

THE DAIMLER MOTOR CO. ed to furnish 1, 2, and 4 Horse Power is prepared to furnish 1, 2, and 4 Horse I GAS or PETROLEUM MOTORS for all Industrial Purposes. Fully illustrated catalogue and price list on application. Motors in operation at Works, Steinway, Long Island City.

Office, 111 East 14th Street, New York City.



Barrel, Keg, Hogshead STAVE MACHINERY. E. & B. HOLMES,

BUFFALO. N. Y.
Also a full line of Wood
Working Machinery.

1891 GREGORYS SEED

ATALOGUE

THE PUBLIC WANT their seed fresh and true. Would they not be most likely to obtain such by buying directly from the grower? I can buy seed at half what it costs me to raise it, but could not sleep sound should I warrant seed of this class. For the same reason I make special effort to procure seed stock directly from their originators. You will find in my new seed catalogue for 1891(sent free) the usual extensive collection (with the prices of

some kinds lower than last season). and the really new vegeta-bles of good promise. You should be able to get from me, their introducer, good seed of Cory Corn, Miller Melon, Hubbard Squash, all Seasons and Deep Head Cabbages, and many other valuable

JAMES J. H. GREGORY, Marblehead, Mass

\$3 PRINTING PRESS. Do all your own printing. Save logue for two stamps. Kelsey & Co., Meriden, Com.

BARNES
PAT. FOUT POWER MACHINERY
I feel so highly pleased with your Velocipede Foot Power with seat, that I wish to add my testimony to its superiority. I did not expect to like it, but having used the Velocipede Power, I would have nothing else It so greatly lessens the fatigue of using foot power, in fact, it may be said to be almost without ratigue, and is a steadier motion. I only wish I had known of it sooner. Send for catalogue. W. F. & J. BARNES CO., 269 Ruby St., Rockford, Ill.

INVENTIONS WORKED OUT, Drawings and

THE SMITH PREMIER TYPEWRITER



Important Improvements.
All the Essential Features greatly perfected. The Most Durable in Alignment. Essiest Running and Most Silent.
All typecleaned in 10 seconds without solling the hands.

The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A. Send for Catalogue.

MANAGEMENT OF SILK WORMS IN China.—A valuable and comprehensive paper translated from the Chinese of Tsou Tsu T'ang, by Robert Kliene. The Muberry tree; hints on the cultivation of it. Silkworm rearing. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 775. Price 10 cents. To be had at this office and from all newsdealers.

CATALDOJES FREE TO ANY ADDRESS

ACE-HOUSE AND REFRIGERATOR. Directions and Dimensions for construction, with one illustration of coid house for preserving fruit from season to season. The air is kept dry and pure throughout the year at a temperature of from 3t to 3t. Contained in SCIENTIFIC AMERICAN SUPPLEMENT NO. 116. Price 10 cents. To be had at this office and of all newsdealers. ICE-HOUSE AND REFRIGERATOR.

STEVENS PATENT SPRING SCREW THREAD CALIPERS Ideal, No. 64. Price, by mail, postpaid.

3 inch......\$1.00 | 5 inch......\$1.25 Ideal and Leader Spring Dividers, and Calipers, Ideal Surface Gauges, Depth Gauges, and Fine Machinists' Tools.

Illustrated catalogue free to all. J. STEVENS ARMS & TOOL CO., P. O. Box 230, Chicopee Falls, Mass.

PATENTED NOVELTIES of merit sold facturer or inventor, H. B. HARPORD & SON, Office Rooms, 9 & 10 Exchange Bldg, 134 Van Buren St. Chicago.

■HE PENNA. DIAMOND DRILL & MFG. CO. BIRDSBORO, PA., Builders of High Class Steam Engines, Diamond Drilling and General Machinery. Flour Mill Rolls Ground and Grooved.

Steam! Steam!

Quality Higher, Price Lower. For Strictly Cash, Complete Fixtures except Stack

2-Horse Eureka Boiler and Engine, - \$145 66 66 Other sizes at low prices. Before you buy get our prices

B. W. PAYNE & SONS,

ELMIRA, N. Y. Drawer 56.



BIT Bores SMOOTH ROUND, OVAL, and SQUARE HOLES. Mortising Core Boxes, etc. Invaluable to Carpenters, Cabinet and Pattern Makers. Highest Award, Send \$8.00 for set (% to 01-8), in neat case, or 50c, for sample Bit, mailed free with Illustrated List. BRIDGEPORT GUN IMPLEMENT CO., 17 Maiden Lane, New York.

STEEL TUBE CLEANER



RANKS THE HIGHEST Endorsed by the best Engineers, CHALMERS - SPENCE CO. Office, 59 Liberty St., New York.

NEW CATALOGUE

Slast Furnaces, with special reference to large Yields.

Blast Furnaces, with special reference to large Yields.

By James Gayley. A description of seme of the principal blast furnaces in design and practice by means of which extraordinarily large yields have been obtained in the last decade. With 8 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, NO. 776. Price 10 cents. To be had at this office and from all newsdealers. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, sent

MUNN & CO., 361 Brondway, New York.



HOW TO MAKE DYNAMO ELECTRIC Machines.—By Geo. M. Hopkins. With drawings to scale more than to see his advertisement in a printed newspaper. He wants circulation. This he has when he advertises in the Scientific American. And on not let the advertising agent influence you to substitute some other paper for the Scientific American. And on other paper for the Scientific American. And edid directic light, decompose water rapidly, solecting a list of publications in which you decide it is for your interest to advertise. This is frequently done, for the reason that the agent in stream of the scientific and the paper having a small circulation than is allowed on the Scientific American.

For rates see top of first column of this page, or address MUNN & CO. Publishers, 361 Broadway. New York.

The stream of the scientific American. The larger machine the papers having a small circulation than is allowed on the Scientific American.

Solution of this column of this page, or address MUNN & CO. Publishers, 361 Broadway. New York.

The stream of the scientific American. The larger machine is intended to experimental sizes. The small full directions for the sizes. The small full directions for which full full full directions for color full full HOW TO MAKE DYNAMO ELECTRIC



NEW YORK TRADE SCHOOLS-DE STEAN LOCKS I WALDE. SUPPLIES — DE-scription of the New York Trade Schools which were established frine years ago for the purpose of giving in-structions to young time in eartain trades, and to enoble young men already in such trades to improve themselves. With a dilustrations. Contained in Schiff First Americ CAN Stupplemans. No. 781. Price 11 dents. To be had at this office and from all newsdealers.

For Threshing Machines, Hay Presses, Corn Shellers, Pile Drivers, Well Diggers, &c., our newest and latest Engine a little wonder and a giant to work. Send for prices. Mention this paper. Van Duzen Gas & Gasoline Engine Co. CINCINNATI, OHIO.

GYMNASTICS FOR GIRLS. teresting account of the course of Instruction given at the Berkeley Athletic Club for Ladies. With 18 illus-trations. Contained in SCIENTIFIC AMERICAN SUPPLE-MENT, No. 733. Price 10 cents. To be had at this office and from all newsdealers.



RAILWAY & STEAM FITTERS SUPPLIES

Rue's Little Giant Injector. SCREW JACKS, STURTEVANT BLOWERS, &c. JOHN S. ERQEHART, 46 Cortlandt St., N. Y.

"FISHKILL" CORLISS ENGINE COMBINING A MAXIMUM OF ECONOMY, EFFICIENCY, AND DURABILITY Fishkill Landing Machine Co., Fishkill-on-Hudson, N. Y.

EW & SECOND HAND-BOUGHT, SOLD AND HOED FA ALSO RENTED TO SOME

ELECTRICAL!

Just out. Finely finished and Effective Desk Fan Metor. Continuous High Speed with Primary Battery. Motor and Battery, \$10,00. NOVELTY ELECTRIC CO., 54 North 4th St., Phila., Pa.



THE PHELPS BURGLAR ALARM
Size 6% by 2% inches.
Portable, Mechanical, Durable,

Size 64 by 226 inches.
Portable, Mechanical, Durable, and Cheap, Applicable to doors and windows. Sells at sight. The patent is for sale or on royalty. For particulars, address PHELPS P. B. ALARM CO., SALEM, MASS.

STEREOTYPING.—A VALUABLE series of lectures by Thomas Bolas, discussing the most recent methods in this branch of typography. With 23 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 773 and 774. Price 10 cents each. To be had at this office and from all newsdealers.



OIL WELL SUPPLY CO. Ltd.



HYDRAULIC OR JET-PROPELLED Steam Lifeboat. Description of a naval lifeboat propelled by a jet of water, with full details and account of the main features of construction and of the trials made of it for maneuvering power. With a illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, NO. 770. Price 10 cents. To be had at this office and from all newsdealers.



Wells, Oil and Gas Wells, drilled by contract to any depth, from 6t to 3000 feet. We also manufacture and furnish everything required to drill and complete same. Port-able Horse Power and Mounted Steam Drilling Machines for 100 to 600 ft. Send 6 cents for illustrated

Complete line for all uses shown in new illustrated catalogue. free to all.
Cushman Chuck Co., Hartford, Conn.

A BOON TO THE DEAF!

weeks' trial if not found satisfactory. OSGOOD BROS., Cor. 7th St. & Broadway, Oakland, Cal.



HUNTER'S SIFTER & MIXER The best in use for Sifting and Mixing Ba king Powder, Flour, Drugs. Plasters, Fertilizers, and all kinds of Powders. Ten sizes; lupounds to 10 barrels.

Send for catalogue of all kinds of Mixing machinery.

J. H. DAY & CO., Cincin nati, Ohio. Branch Office, 35 Murray St., New York.

KOCH'S DISCOVERIES.—A FULL ACcount of Dr. Koch's remedy for tuberculosis, the method of using it, etc. With 9 illustrations. Contained in Scientific American Supplement, No. 78:2. Price 10 cents To be had at this office and from all newsdeelers.

award by Franklin Institute as a legitimate Art Pod. Invalorable to crayon and water color portrait artists and draughtsmen. Saves time, gives finest technical effects.

AIR BRUSH MFG. Co., 67 Nassau St., Rockford, Ill.

The Best Mechanical Help An inventor, investigator or experimenter can have is a great machine shop, whose business is (first) to do regular work, and (second) to help develop ideas. We have that shop, and have put what we have to say in a primer—will send it.

THE JONES BROTHERS ELECTRIC Co. CIN'TI, O. STEEL ALPHABETS.



Manufacturers, Agriculturists, Chemists, Engineers, Mechanics, Builders, men of leisure, and professional men, of all classes, need good books in the line of their respective callings. Our post office department permits the transmission of books through the mails at very small cost. A comprehensive catalogue of useful books by different authors, on more than fifty different subjects, has recently been published for free circulation at the office of this paper. Subjects a copy, have only to ask for it, and it will be mailed Address

MUNN & CO., 361 Brondway, New York.