

Advertisements.

ORDINARY RATES.

Inside Page, each insertion - - 75 cents a line
Back Page, each insertion - - - \$1.00 a line

For some classes of Advertisements, Special and Higher rates are required.

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WOOD OF METAL WORKERS
without steam power can save time and money by using our Foot and Hand Power Machinery
SEND FOR CATALOGUE—
A—Wood-working Machinery.
B—Lathes, etc.
SENECA FALLS MFG. COMPANY,
685 Water St., Seneca Falls, N. Y.

AMERICAN PATENTS.—AN INTERESTING and valuable table showing the number of patents granted for the various subjects upon which petitions have been filed from the beginning down to December 31, 1894. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

POWER & FOOT LATHES. SHAPERS, PLANERS, DRILLS, MACHINE SHOP OUTFITS, TOOLS, CUTTING-OFF MACHINES, ETC.
SEBASTIAN LATHE CO., 120 CULBERT ST., CINCINNATI, O.

IDEAS DEVELOPED. Absolute secrecy. Send for particulars. Advice and suggestions free. Correspondence and sample orders solicited. 2 years in business. Gardani & Son, 8 John St., New York.

The Philosophy of Science
Popular Scientific Lectures by Ernst Mach. Send for circular No. 10, for full particulars and sample copies of periodicals. **OPEN COURT PUB. CO., Chicago.**

The Curtis Steam Pressure Regulator
A steam saving appliance of established value. May be used wherever necessary to control or reduce steam pressure. Its employment means a great saving in operating expenses.
Send for circular S. A.
D'ESTE & SEELEY CO.,
29-33 Haverhill St., Boston.

VELOCITY OF ICE BOATS. A collection of interesting letters to the editor of the SCIENTIFIC AMERICAN on the question of the speed of ice boats, demonstrating how and why it is that these craft sail faster than the wind which propels them. Illustrated with 10 explanatory diagrams. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 214. Price 10 cents. To be had at this office and from all newsdealers.

PERFORATED METAL
OF EVERY DESCRIPTION FOR ALL USES
THE HARRINGTON & KING PERFORATING CO.,
CHICAGO, ILL. U.S.A. AND 284 PEARL ST. NEW YORK

Starrett's Universal Surface Gauge
This gauge has joint at base allowing spindle and scriber to be moved back and forth and placed in any position from upright to horizontal to reach over, back of, and underneath.
Price, No. 1, 9 inch.....\$2.50. No. 2, 12 inch.....\$3.00
No. 3, with two spindles, 12 and 18 inches.....\$5.00
Illustrated Catalogue Free
The L. S. Starrett Co., Manufacturer of Fine Tools,
P. O. Box 13, ATHOL, MASS.

\$26.50. An 8 Light 16 C.P. 110 Volt Dynamo
Not a toy, but a high grade, substantial machine, which we guarantee to do all we claim for it. We place this machine on the market at above low price in order to introduce our Dynamos and Motors of larger sizes.
Send for circular No. 26.
ROTH BROS. & CO.,
30 to 34 Market St.,
Chicago, Ill., U.S.A.

ARMSTRONG'S PIPE THREADING AND CUTTING-OFF MACHINES
Both Hand and Power. Sizes 1 to 6 inches. Water, Gas, and Steam Fitters' Tools, Hinged Pipe Vises, Pipe Cutters. Stocks and Dies universally acknowledged to be the best. See our catalog.
THE ARMSTRONG MFG. CO.,
Bridgeport, Conn.

SCIENTIFIC AMERICAN DYNAMO.
Description of a plain shunt-wound dynamo of simple construction, capable of supplying a current of from 60 to 75 110-volt incandescent lamps or of being used as a 5 h. p. motor. This machine was constructed especially for the benefit of the readers of the Scientific American, by Mr. W. S. Bishop, of New Haven, Conn. It is designed to meet the wants of mechanics and amateurs who desire to construct a simple dynamo for their own use, but who do not care to enter into the subject scientifically. With 24 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 865. Price 10 cents. To be had at this office and from all newsdealers.

VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid. Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

HYPNOTISM My original method \$2. 100 pp. pamphlet 10c. One on Personal Magnetism 10c. Dr. Anderson, 8 A 1, Masonic Temple, Chicago.

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Bottle, C. K. Sherwood..... 25,048
Clamp base, metal, G. Stab..... 25,051
Game board, H. Cochrane..... 25,053
Glove, P. Chablain..... 25,049
Knife, M. G. Collins..... 25,047
Stove, gas, Kennedy & King..... 25,854
Tile, crest, J. R. Bryant..... 25,052

TRADE MARKS.

Aluminum and aluminum alloys, Pittsburg Reduction Company..... 27,664
Asbestos or other material for covering pipes, T. R. McKim..... 27,638
Baking powder, Universal Baking Powder Company..... 27,648
Beer, lager, Lone Star Brewing Company..... 27,642
Bicycles, G. L. Crandal et al..... 27,636
Bicycles, G. H. Foley et al..... 27,637
Bicycles, tricycles, and other light vehicles of similar character, and their accessories, S. D. Wardell..... 27,668
Billiard and pool table cushions, F. Rosatto..... 27,633
Boots and shoes, A. W. Tedcastle & Company..... 27,634
Candle holders, Farg & Sons..... 27,631
Cards, playing, E. Conley..... 27,632
Clam extracts, Cape Fear Canning and Sea Food Company..... 27,645
Cosmetics and preparations for rendering the skin soft and smooth, U. G. Beck..... 27,641
Elastic fabrics known as Korin, Glendale Elastic Fabrics Company..... 27,637
Foods and beverages, certain, J. F. Humphreys & Company..... 27,644
Hams, Fowler Brothers..... 27,649
Lemons and oranges, Haight Fruit Company..... 27,647
Mills, pulverizing, Bradley Pulverizer Company..... 27,660
Paint and colors, Patterson-Sargent Company..... 27,640
Pie cure, liquid, Le Fevre & Sawyer..... 27,653
Pipes, conduits, and roofing and paving, compositions for sewer, Asphaltina Company of America..... 27,639
Raisins, Boston Raisin Company..... 27,646
Remedies, certain named, S. B. Ryckman Medicine Company..... 27,651
Remedy for certain named diseases, A. Rivera & Company..... 27,650
Remedy for headache and neuralgia, J. P. Steadman..... 27,652
Sad Irons, Cleveland Foundry Company..... 27,655
Suspensories, A. L. Ware..... 27,636
Thread, Merriek Thread Company..... 27,635
Watches and portable clocks, W. C. Ball..... 27,630
Wines, native, A. B. Perneti..... 27,643

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$40 each. If complicated they cost a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

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STORAGE BATTERIES for All Purposes.
Best Battery for Gas or Gasoline Engines. Thousands in use. Solid rolled lead plate. Immense strength. Large surface. Electrochemical formation of active material. Greatest durability and efficiency. All sizes.
American Battery Co., 42 West Quincy Street, CHICAGO, ILL.
Highest Award, World's Columbian Exposition, Chicago.

EMPIRE BOILER CLEANER
COMPOUND
We Don't Offer Gratuities, but our Circular will give you the information that will enable you to save Time, Trouble and Money. Tried, approved, and being used by the Largest Railways and Factories in the East.
OFFICE:
Kemble Bldg., 19 Whitehall St., N. Y.

ICE-BOATS—THEIR CONSTRUCTION and Management. With working drawings, details, and directions in full. Four engravings, showing mode of construction. Views of the two fastest ice-sailing boats used on the Hudson river in winter. By H. A. Horsfall, U.S. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

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Save money! Make money printing for others! Type-setting easy. Printed rules. Write for catalogue, presses, type, cards, etc., to factory.
KELSEY & CO.,
Meriden, Conn.

FIRE BRICK FOR ALL PURPOSES.
Send for Prices and Catalogue.
BROOKLYN FIRE BRICK WORKS,
88 Van Dyke Street, BROOKLYN, N. Y.

FOOT POWER LATHES
For Electrical and Experimental Work.
For Gunsmiths & Tool Makers. For General Machine Shop Work.
High Grade Tools; elegant in design, superior in construction. The best foot power lathes made, and quality considered, the cheapest. Send for catalogue and prices.
W.F. & JOHN BARNES CO., 1399 Ruby St., Rockford, Ill.

ELECTRO MOTOR. SIMPLE. HOW TO make. By G. M. Hopkins.—Description of a small electro motor devised and constructed with a view to assisting amateurs to make a motor which might be driven with advantage by a current derived from a battery, and which would have sufficient power to operate a foot lathe or any machine requiring not over one man power. With 11 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 641. Price 10 cents. To be had at this office and from all newsdealers.

AT A TEST
of Steam Pipe Coverings thought in open market by the State College of Pennsylvania, for the purpose of conducting a CONDENSATION TEST, our Covering gave
2% better results than - John's Asbestos Sponge.
2% better results than - Magnesia Sectional Covering.
2% better results than - Carey's So-called Asbestos.
5% better results than - Manville Wool Felt Covering.
We offer it at prices to suit the times.
Agents Wanted. Mention this paper.
New York Fire Proof Covering Co., 121 Liberty St., N. Y.

Gearhart's Family Knitter.
Knits a stocking heel and toe in ten minutes. Knits everything required in the household from homespun or factory, wool or cotton yarns. Most practical knitter on the market. A child can operate it. Strong, Durable, Simple, Rapid. Satisfaction guaranteed.
Agents Wanted. For particulars and sample work, address
J. B. GEARHART,
4 Stone Street, Clearfield, Pa.

MANUFACTURE OF BICYCLES.—A very comprehensive article giving the details of construction of every part of these vehicles. With 15 engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 908. Price 10 cents. To be had at this office and from all newsdealers.

Pyrometers, Barometers, Thermometers, Hydrometers,
for every purpose. In stock and made to order. Patentee and Sole Mfr. Stand. U. S. Govt. Hydrometers for Distillers, Instruments for Coal Oil, Brewers, etc. Genuine Scotch Gauge Glass, all lengths and diameters, cut to order. Write for this. **GIUSEPPE TAGLIAPIETRA, 302 Pearl St., NEW YORK.** Original House Established 1834.

THE MODERN ICE YACHT.—BY Geo. W. Polk. A new and valuable paper, containing full, practical directions and specifications for the construction of the fastest and best kinds of Ice Yachts of the latest, most approved forms. Illustrated with engravings drawn to scale, showing the form, position, and arrangement of all the parts. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 624. Price 10 cents. To be had at this office and from all newsdealers.

CRITERION STEREOPTICONS, MAGIC LANTERNS & ACCESSORIES.
PERFECT APPARATUS FOR VISUAL TEACHING
SCIENTIFIC PROJECTIONS & PRIVATE USE.
ELECTRIC FOCUSING LAMPS
For Photo-Engravers, Stage Lighting, Etc.
J.B. COIT & CO.
115-117 NASSAU ST. NEW YORK

ELECTRICITY
Mechanics, Steam Engineering, Mechanical Drawing, Architecture, R. R. and Bridge Engineering, Plumbing, Heating, Mining, English Branches. Send for free circular, stating subject wish to study or your trade. Correspondence School of Industrial Sciences, SCRANTON, PA.

MANUFACTURE OF STARCH FROM Maize.—By J. Krieger. Full details of the process. With one illustration. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1012. Price 10 cents. To be had at this office and from all newsdealers.

GATES ROCK AND ORE BREAKERS
OVER 3000 IN USE THROUGHOUT THE WORLD
GREATER CAPACITY USING LESS POWER THAN ANY OTHER ON EARTH
MODERN MINING MACHINERY OF EVERY DESCRIPTION
GATES IRON WORKS DEPT. 1
650 ELSTON AVE. CHICAGO

BUY TELEPHONES
That are good—not "cheap things." The difference in cost is little. We guarantee our apparatus and guarantee our customers against loss by patent suits. Our guarantee and instruments are BOTH GOOD.
WESTERN TELEPHONE CONSTRUCTION CO.,
440 Monadnock Block, CHICAGO.
Largest Manufacturers of Telephones in the United States

MAGNETO BELLS
ALL KINDS OF PARTS
PRICES OF PARTS
TELEPHONES
ELECTRICAL SUPPLIES
SEND STAMP TO MIANUS ELECTRIC CO., 57 FOR CATALOGUE.
MIANUS ELECTRIC CO.,
MANSFIELD, CONN.

Mason-Maxwell Telephone Mfg. Co.
Makers of Local and Long Distance Telephones, Switch-Boards, etc.
Send \$5.00 for a sample of our House Telephone with battery, receiver and transmitter complete, guaranteed to work perfectly on lines up to 500 ft.
Factory and Offices, RICHMOND, VA.

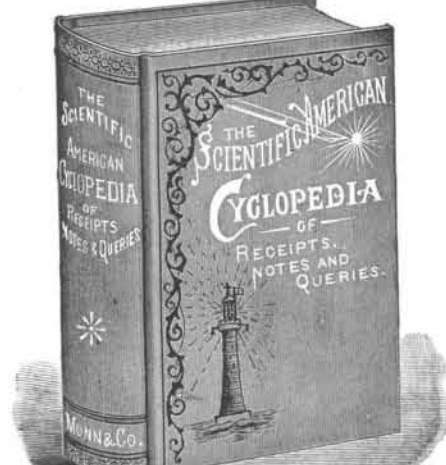
HELLO, CENTRAL!
Do you use telephones? If so, we can give you just what you want. Our specialty is Blake Transmitters. There is a "best" in everything and ours are the best. We supply complete telephones or all or any of the parts to construct a telephone. Write for illustrated catalogue.
PHENIX INTERIOR TELEPHONE CO.,
131 Liberty St., NEW YORK.

EDGE TOOLS
are often nearly ruined by using a grindstone not adapted to the work. Our quarries produce a large variety of grits suitable for grinding any tool.
May we send you our Catalogue, which will give you some information?
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No. 80 River Street, GRAFTON, OHIO.

ICE HOUSE AND COLD ROOM.—BY R. G. Hatfield. With directions for construction. Four engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 391. Price 10 cents. To be had at this office and from all newsdealers.

USE GRINDSTONES?
If so, we can supply you. All sizes mounted and unmounted. Always kept in stock. Remember, we make a specialty of selecting stones for all special purposes. Ask for catalogue.
The CLEVELAND STONE CO.,
2d Floor, Wilshire, Cleveland, O.

A Valuable Book



12,500 Receipts. 708 Pages. Price \$5.
Bound in Sheep, \$6. Half-Morocco, \$6.50.

This splendid work contains a careful compilation of the most useful Receipts and Replies given in the Notes and Queries of correspondents as published in the Scientific American during the past fifty years; together with many valuable and important additions.
Over Twelve Thousand selected Receipts are here collected; nearly every branch of the useful arts being represented. It is by far the most comprehensive volume of the kind ever placed before the public.
The work may be regarded as the product of the studies and practical experience of the ablest chemists and workers in all parts of the world; the information given being of the highest value, arranged and condensed in concise form convenient for ready use.
Almost every inquiry that can be thought of, relating to formulae used in the various manufacturing industries, will here be found answered.
Instructions for working many different processes in the arts are given.
Those who are engaged in any branch of industry probably will find in this book much that is of practical value in their respective callings.
Those who are in search of independent business or employment, relating to the home manufacture of sample articles, will find in it hundreds of most excellent suggestions.
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361 Broadway, New York.