

Political Economy, the Tariff and the Currency JUST READY.

A Catalogue of Books and Pamphlets on Social Science, Political Economy, the Tariff, the Currency, the Finances, Population, Pauperism, Charity, the Land Question, etc. 32 pages, 8vo, sent free to any one in any part of the world who will furnish his address.

HENRY CAREY BAIRD & CO. INDUSTRIAL PUBLISHERS, BOOKSELLERS & IMPORTERS 810 Walnut St., Philadelphia, Pa., U. S. A.

TELESCOPE... OPTICAL CO. ROCHESTER, N.Y. A FIRST CLASS... FOR 45... ALSO SUITS AT HIGHER COST... BEST QUALITY AT LOWEST COST.

EXCURSIONS TO THE NATIONAL CAPITOL.

The Royal Blue Line has arranged a series of personally conducted three day tours from New York, Newark, Elizabeth, Trenton and Philadelphia to Washington, under the supervision of Thos. Cook & Son, the famous Tourist Agents.

The tickets will be valid for the return journey on any Royal Blue Line train within three days, including day of sale, thus affording tourists an opportunity to visit the public buildings and places of interest in and about the Capitol.

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 VANDUZEN & TIFT CO., 102 to 108 E. Second St., Cincinnati, O.

FOR SALE, CHEAP.

One pair of Greene Cut-off Engines, 260 H. P. (125 H. P. each), 18 x 48 in., 14 ft. x 30 in. fly wheel; all in good condition. Have been running up to date. Address: WINCHESTER REPEATING ARMS CO., New Haven, Conn.

MALLEABLE AND FINE GRAY IRON ALSO STEEL CASTINGS FROM SPECIAL PATTERNS. THOMAS DEVLIN & CO. LEHIGH AVE. & AMERICAN ST. PHILA.

CALIFORNIA EXCURSIONS.

The well known Phillips Excursion Company have arranged to run weekly excursions to all principal California and other Pacific Coast cities from all points on the Baltimore & Ohio R. R.

KNITTING MACHINERY.

Knitted underwear is in vogue. The best machinery for its manufacture, such as SHIRT MACHINES, SLEEVERS, BAR STITCH MACHINES, etc., are made by SCOTT & WILLIAMS, 2077 E. Cumberland Street, Philadelphia, Pa., U. S. A.

DEAFNESS

and HEAD NOISES relieved by using Wilson's Common Sense Ear Drums. New scientific invention, entirely different in construction from all other devices. Assist the deaf when all other devices fail, and where medical skill has given no relief.

GRAPHITE PAINT

for Bridges, Roofs, Structural Iron and all exposed metal or wood surfaces. Guaranteed not affected by heat, cold, smoke, or chemicals. DETROIT GRAPHITE MFG. CO., Detroit, Mich.

BARNES' New Friction Disk Drill.

FOR LIGHT WORK. Has these Great Advantages: The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue. W. F. & JNO. BARNES CO., 1999 Ruby St., Rockford, Ill.

Scientific Book Catalogue

RECENTLY PUBLISHED. Our new catalogue containing over 100 pages, including works on more than fifty different subjects. Will be mailed free to any address on application. MUNN & CO., Publishers Scientific American, 361 Broadway, New York.

STRUCTURAL & ORNAMENTAL

IRON STEEL WORK FOR BUILDINGS, LAWYER'S OFFICES, STABLES, STAIRS, ETC. STAINLESS STEEL, WIRE ROPE, RIVETS, BOLTS, NUTS, WASHERS, ETC. SNEAD & BIBB, 711-14th St. LOUISVILLE, KY.

RIFE'S AUTOMATIC HYDRAULIC ENGINE OR RAM

SUPPLYING WATER FOR Irrigation, Small Towns, Railroad Tanks, Factories, Steam Mills, Dairies, Country Residences, Stock Yards, etc. Efficient, Durable, and Inexpensive. Send for fully illustrated notice in Sci. Am., p. 5, July 5, '90. Rife's Hydraulic Engine Mfg. Co., Roanoke, Va.

The Remington Typewriter.

As Perfect in Design and Construction as Original Ingenuity, Long Experience, and Constant Improvement can make a Writing Machine. It is Simple, Well Made, Practical, Durable, Easy to Learn and to Operate.

Wyckoff, Seamans & Benedict, 327 Broadway, New York.

SCIENTIFIC AMERICAN DYNAMO.

Description of a plain, shunt-wound dynamo of simple construction, capable of supplying a current of from 30 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.

CASTINGS and PARTS

for 641, 865, and other Dynamos and Motors described in Sci. Am. Supplements. Engine Castings 1/2 to 6 h. p. TELEPHONE Materials. ELECTRICAL SUPPLIES. Send stamp for catalogue. PALMER BROS., Mianus, Conn.

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.

ABOUT MAGIC LANTERNS. WE MAKE THEM. J. B. COLT & CO. 16 BEEKMAN ST. 189 LA SALLE ST. NEW YORK CHICAGO, Ill.

Rubber Rolls and Wheels.

Power Wringing Machines, Drying and Ventilating Fans. All styles of Trucks made to order. Catalogues free. GEORGE P. CLARK, Box 1, Windsor Locks, Conn.

THE GRIFFIN MILL

A perfect pulverizer of all refractory substances by either the wet or dry process. It works better and at less expense than any other Mill, and is conceded to be the only perfect pulverizing Mill manufactured.

For FREE illustrated Pamphlet address BRADLEY FERTILIZER CO., 92 STATE ST, BOSTON.

PATENTS. CLAIMS, TRADE MARKS, COPYRIGHTS. CAN I OBTAIN A PATENT? For a prompt answer and an honest opinion, write to MUNN & CO., who have had nearly fifty years' experience in the patent business.

STEREOPTICONS. MAGIC LANTERNS AND ACCESSORIES. SEND FOR CATALOGUE TO CHAS BESLER, MAKER 218 CENTRE ST. NEW YORK.

HOTTENTOTS OF SOUTH AFRICA.

By Nicolas Pike. An interesting account of this very singular race of people. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 924. Price 10 cents. To be had at this office and from all newsdealers.

MY WIFE CANNOT SEE HOW YOU DO IT AND PAY FREIGHT.

For the Oxford Improved HINGER Sewing Machine, with a complete set of attachments and guaranteed for 10 years. Shipped anywhere on 30 days' trial. No money required in advance. 25.00 now in use. Write for catalogue. Buy from factory, save dealers' and agents' profit. Write today for our LARGE FREE CATALOGUE. Oxford Mfg. Co., 342 Wabash Ave., Chicago, Ill.

HATCH CHICKENS BY STEAM

With the Improved Excelsior Incubator. Simple, Perfect, Self-Regulating. Thousands in successful operation. Guaranteed to hatch a larger percentage of fertile eggs at less cost than any other Hatcher. Lowest priced first-class Hatcher made. Circulars free. Send for Price Catalogue. GEO. H. STAHL, Quincy, Ill.

AN IDEAL STUB PEN—Esterbrook's Jackson Stub, No 442

A specially EASY WRITER, a GOOD INK HOLDER and a DELIGHT to those who use a STUB PEN. ASK YOUR STATIONER FOR THEM. Price, \$1.00 per gross. THE ESTERBROOK STEEL PEN CO., 26 John St., New York.

THE DENSMORE

Did you ever consider that in typewriting the real work is performed at the keyboard—and the lessening of fatigue resulting from machine with light touch? This is one of several essential features in which the Densmore demonstrably excels every competitor. Recently awarded contract to supply machines to the U. S. War Dep't. Now ready, the 1894 Model with strong new features, pronounced by Pres. Frisbee, Wells College, "a fine study," and by many others, "The World's Greatest 'Typewriter' indeed." Represented in every large city. Pamphlets free. Densmore Typewriter Co. 202 Broadway, New York

PROPOSALS.

PROPOSALS FOR IRON GUN CARRIAGES. Office of the Chickamauga and Chattanooga National Military Park, Room 524, War Department, Washington, D. C., December 26, 1893. Sealed proposals for furnishing and delivering at Lytle, Walker County, Georgia, seventy or more Cast and Wrought Iron Gun Carriages, made in accordance with patterns in use in 1861-64, will be received at this office until 12 m., Wednesday, January 24, 1894, and opened immediately thereafter in presence of bidders. Specifications, working drawing, general instructions to bidders, and blank forms of proposal will be furnished on application to this office. J. S. FULLERTON, Chairman of Commission.

MILLER & VAN WINKLE STEEL WIRE AND STEEL SPRINGS. TEMPERED STEEL WIRE. TEMPERED COMPRESSION & EXTENSION SPRINGS. A SPECIALTY. OFFICE & WORKS 10 to 24 BRIDGE ST. BROOKLYN, N.Y.

AMATEUR PHOTOGRAPHERS.

Finish your own photos on Celerite Paper. Requires no experience, long washings or expensive solutions. Entirely new process. Samples and full particulars free. CELERITE PAPER CO., cor. 23rd and State Streets, Gerald Building, Chicago, Ill.

SINTZ GAS ENGINE CO.

GRAND RAPIDS, MICH., U. S. A. Manufacturers of the Sintz Stationary and Marine Gas and Gasoline Engines. Especially adapted for Boats and Electric Lighting. Runs with manufactured or natural gas—Boats and launches. Prices within the reach of all. Send for Catalogue. Mention this paper.

FOR SALE.

Patent No. 539,672, on Ship's Hulls, for sale. For terms, etc., apply to P. O'BRIEN, Dequary St. Patrick's St. John's, Newfoundland. See page 37.

STEAM COOKER.—Patented.

Cooks in one third the time. Retains all flavor and substance. Safe and reliable. Decided success. Partner wanted to establish factory. Write for particulars. Address C. T. OWENS, McKinney, Texas.

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. Send for Catalogues. GATES IRON WORKS, 50 C So. Clinton St., Chicago 136 C Liberty Street, New York 237 C Franklin St., Boston, Mass

THE PEARY EXPEDITION: AN INTERESTING NARRATIVE.

With 8 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 882. Price 10 cents. To be had at this office and from all newsdealers.

ALANSON CARY SPRINGS. MANUFACTURER OF STEEL OF EVERY DESCRIPTION. 240 & 242 W 29th ST. NEW-YORK

Graduated Beam Calipers, suit Trade and Scientific purposes; warranted accurate. E. G. Smith, Columbia, Pa

DO YOU 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.

MAGIC LANTERNS WANTED AND FOR SALE

HARBACH & CO. 809 Filbert St. Phila. Pa.

HOPKINS' BUILDING DESIGNS.

SEND 2-cent stamp for a Book of 12 DESIGNS, with help, how to BUILD, and NEW IDEAS. D. HOPKINS, Arch't, Grand Rapids, Mich.

"ECONOMY IS WEALTH."

Canvassers wanted to sell the Improved Kelly Typewriter. Writes all languages. Price, \$30. Great inducements to agents. Send for catalogue and terms. Address N. TYPEWRITER CO., 611 Washington Street, Boston, Mass. Mention Scientific American.

LIGHTNING CONDUCTORS.—A

valuable and exhaustive paper giving Reynolds' instructions for erecting and testing lightning rods. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 906. Price 10 cents. To be had at this office and from all newsdealers.

TELESCOPES. SEND FOR CATALOGUE. W. & O. MOGEY. BAYONNE CITY, N.J.

The Scientific American

PUBLICATIONS FOR 1894.

The prices of the different publications in the United States, Canada, and Mexico are as follows:

Table with 2 columns: Publication Name and Price. Includes Scientific American (weekly), Scientific American Supplement (weekly), Scientific American Spanish Edition (monthly), Scientific American Architects and Builders Edition (monthly), and combined rates for multiple subscriptions.