

VALUABLE BOOKS ON PAINTING AND VARNISHING.

A Practical Treatise on the Manufacture of Colors for Painting:

Comprising the Origin, Definition, and Classification of Colors; the Treatment of the Raw Material; the best Formulae and the newest Processes for the Preparation of every description of Pigment, and the necessary Apparatus and Directions for its Use; Driers; the Testing, Applications, and Qualities of Paints, etc. etc. By M.M. Hiffault, Vergnaud, Toussaint, and M.F. Malpère. From the French by A. A. Fesquet. 80 engravings. 8vo. \$1.50.

A Practical Manual of House-Painting, Graining, Marbling, and Sign Writing. With nine colored illustrations of Woods and Marbles, etc. By E. A. Davidson. 2mo. \$3.

Painter, Gilder, and Varnisher's Companion. Containing rules and regulations in everything relating to the Arts of Painting, Graining, Varnishing, Glass Staining, Graining, Marbling, Sign Writing, Gliding on Glass, and Coach Painting and Varnishing; Tests for the Detection of Adulterations in Oils, Colors, etc. Sixteenth edition, revised, with an appendix. Containing Chevreul's Principles of Harmony and Contrast of Colors, etc. 12mo. 356 pages. \$1.50.

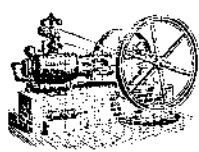
Sign Writing and Glass Embossing. A Complete, practical Illustrated Manual of the Art. By James Callingham. 12mo. \$1.50.

A Complete Guide for Coach Painters. Translated from the French of M. Arlot, Coach Painter. By A. A. Fesquet, Chemist and Engineer. 12mo. \$1.25.

The above or any of our Books, sent by mail, free of postage, to any part of the world, at the publication prices.

Our new and enlarged Catalogue of Practical and Scientific Books—26 pages, 8vo—and other Catalogues sent free to any one who will furnish his address.

HENRY CAREY BAIRD & CO., INDUSTRIAL PUBLISHERS AND BOOKSELLERS, 810 WALNUT STREET, PHILADELPHIA.

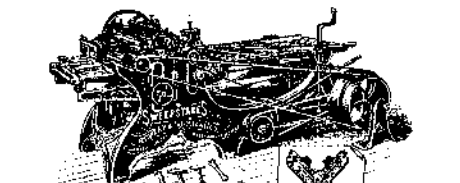


"RELIABLE"

Engines a complete success. Prices still 40 per cent. below those of other makers. Uniquely adapted for efficiency, simplicity, and durability. Prices from \$250 for 10 H. P., to \$400 for 30 H. P. All complete, with Governor, Pump, and Heater.

Address, for circular, HEALD, SISCO & CO., Baldwinville, N. Y.

JOHN R. WHITLEY & CO. European Representatives of American Houses, with First-class Agents in the principal industrial and agricultural centers and cities in Europe. London, 7 Poultry, E. C. Paris, 8 Place Vendôme. Terms on application. J. R. W. & Co. purchase Paris goods on commission at shippers' discounts.



SWEETSTAKES, WITH THE ELLIS Patent Journal Box. The best Planer and Matcher ever made. Planing 20 in. wide, 6 in. thick, weight 2,100 lbs., \$300; planing 24 in. wide, 8 in. thick, weight 2,500 lbs., \$350. Beading, Arbor, and Band, extra, \$20. Sash, Door, and Blind Machinery, a specialty. Send for descriptive catalogue to Rowley & Hermance, Williamsport, Pa.

An engine that works without Boiler. Always ready to be started and to give at once full power. SAFETY, ECONOMY, CONVENIENCE. Burns common Gas and Air. No steam, no coal, no ashes, no fires, no danger, no extra insurance. Almost no attendance.

THE NEW OTTO SILENT GAS ENGINE. Useful for all work of small stationary steam engine. Built in sizes of 2, 4, and 7 H. P. by SCHLEICHER, SCHUMM & CO., 3045 Chestnut Street, Phila., Pa. H. S. Manning & Co., 111 Liberty St., N. Y., Agents.

AIR COMPRESSORS. THE NORWALK IRON WORKS CO., SOUTH NORWALK, CONN.

Bookwalter Engine. Compact, Substantial, Economical, and easily managed; guaranteed to work well and give full power claimed. Engine and Boiler complete, including Governor, Pump, etc., at the low price of \$340 00 for 2 HORSE POWER, \$380 00 for 4 HORSE POWER, \$470 00 for 6 HORSE POWER. Put on cars at Springfield, O. JAMES LEFFEL & CO., Springfield, Ohio, or 110 Liberty St., New York.

THE DINGEE & CONARD CO'S BEAUTIFUL EVER-BLOOMING ROSES THE BEST IN THE WORLD.

Our Great Specialty is growing and distributing these Beautiful Roses. We deliver strong Pot Plants, suitable for immediate bloom, safely by mail at all post-offices. 5 Splendid Varieties, your choice, all labeled, for \$1; 12 for \$2; 19 for \$3; 26 for \$4; 35 for \$5; 75 for \$10; 100 for \$13. Send for our New Guide to Rose Culture—60 pages, elegantly illustrated—and choose from over Five Hundred Finest Sorts. Address THE DINGEE & CONARD CO., Rose Growers, West Grove, Chester Co., Pa.



The attention of Architects, Engineers, and Builders is called to the great decline in prices of wrought STRUCTURAL IRON. It is believed that, were owners fully aware of the small increase in cost which now exists between iron and wood, the former in many cases would be adopted, thereby saving insurance and avoiding all risk of interruption to business in consequence of fire. Book of detailed information furnished to Architects, Engineers, and Builders, on application.

RUBBER BACK SQUARE PACKING. BEST IN THE WORLD.

For Packing the Piston Rods and Valve Stems of Steam Engines and Pumps. B represents that part of the packing which, when in use, is in contact with the Piston Rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam-tight, and yet creates but little friction. This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square. JOHN H. CHEEVER, Treas. NEW YORK BELTING & PACKING CO., 37 & 38 Park Row, New York.

THE DRIVEN WELL.

Town and County privileges for making Driven Wells and selling Licenses under the established American Driven Well Patent, leased by the year to responsible parties, by WM. D. ANDREWS & BRO., 235 BROADWAY, NEW YORK.



WOOD-WORKING MACHINERY, Such as Woodworth Planing, Tonguing, and Grooving Machines, Daniel's Planers, Richardson's Patent Improved Trench Machines, Mortising, Moulding, and Re-Saw Machines, Eastman's Pat. Miter Machines, and Wood-Working Machinery generally. Manufactured by WITHERBY, RUGG & RICHARDSON, 26 Salisbury Street, Worcester, Mass. (Shop formerly occupied by R. BALL & CO.)

Lathes, Planers, Shapers Drills, Bolt and Gear Cutters, Milling Machines. Special Machinery. E. GOULD & EBERHARDT, Newark, N. J.

SHEPARD'S CELEBRATED \$50 Screw Cutting Foot Lathe. Foot and Power Lathes, Drill Presses, Scroll, Circular and Band Saws, Saw Attachments, Chucks, Mandrels, Twist Drills, Bore Calipers, etc. Send for catalogue of outfits for amateurs or artisans. H. L. SHEPARD & CO., 331, 333, 335, & 337 West Front Street, Cincinnati, Ohio.

ACME STEAM PUMPS, FOR EVERY DUTY. VALLEY MACHINE CO., EASTHAMPTON, MASS.

SPARE THE CROTON AND SAVE THE COST. Driven or Tube Wells furnished to large consumers of Croton and Ridgewood Water. WM. D. ANDREWS & BRO., 235 Broadway, N. Y., who control the patent for Green's American Driven Well.

WOOD WORKING MACHINERY. PLANING, MATCHING, MOLDING, TENONING, CARVING, MACHINES. BAND & SCROLL SAWS UNIVERSAL VARIETY WOOD WORKERS. J.A. FAY & CO. CINCINNATI, O., U.S.A.

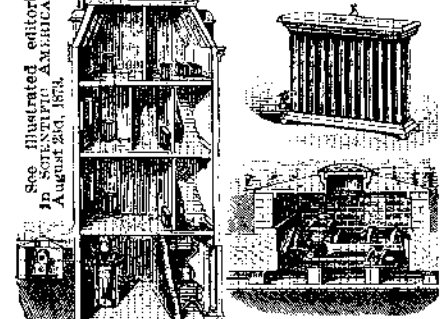
Pond's Tools, Engine Lathes, Planers, Drills, &c. DAVID W. POND, Worcester, Mass.

The George Place Machinery Agency Machinery of Every Description. 121 Chambers and 103 Reade Streets, New York.

'BLAKE'S CHALLENGE' ROCK BREAKER. Patented November 18, 1879. For Macadam Road making, Ballasting of Railroads, Crushing Ores, use of Iron Furnaces, etc. Rapidly superseding our older styles of Blake Crusher on account of its superior strength, efficiency, and simplicity. Adopted by important Railway and Mining Corporations, Cities, and Towns. First Class Medal of Superiority awarded by American Institute. BLAKE CRUSHER CO., Sole Makers, New Haven, Conn.

Delamater Steam Pumps, For every variety of work. WATERWORKS PUMPING ENGINES. DELAMATER IRON WORKS, Boiler Makers, Engine Builders, and Founders, Office, No. 10 CORTLANDT ST., Works, Foot of W. 13th St., North River, New York. ESTABLISHED 1841.

\$777 A YEAR and expenses to agents. Outfit Free. Address P. O. VICKERS, Augusta, Maine.



THE HOLLY SYSTEM FOR HEATING cities and villages, under the Holly Patents, is in practical operation in many places. For economy, comfort, and convenience, is superior to any other principle. Licenses granted to corporations for the use of this system. Holly Steam Combination Co., Ltd., Liverpool, N.Y.

AHEAD OF ALL COMPETITION! 1880.



LAWN MOWER. EIGHT SIZES FOR HAND USE. Weighing from 22 to 51 lbs. THREE SIZES FOR HORSE POWER. The very large increase in our sales last year prove that these machines fully sustain the awards "AS THE BEST" made to them at the great Centennial "hundred day trial," in Philadelphia, in 1876, and their complete victory at the Paris Exposition in 1878. We offer for 1880, Machines from entirely new patterns and greatly improved in a very respect. Examine our New Lawn Sweepers. Hand or Horse size GRAHAM, EMLEN & PASSMORE, Patentees and Manufacturers. 631 Market St., Philadelphia, Pa. Send for Descriptive Catalogue with prices.

THE Eclipse Engine. Furnishes steam power for all Agricultural purposes, Driving Saw Mills, and for every use where a first-class and economical Engine is required. Eleven first-class premiums awarded, including Centennial '76. Refer to No. 1, issue of '77, No. 14, issue of '78, of SCIENTIFIC AMERICAN, for Editorial illustrations. H. L. C. & CO., Waynesboro, Franklin Co., Pa. When you write please name this paper.

IMPLEMENTS, MACHINERY, ETC. Catalogues, prices, and Agency terms solicited. Unexceptional references. OSKAR NETZLER, Agent in Brisbane, Queensland, Australia.

THE FORSTER-FIRM GOLD AND SILVER AMALGAMATING COMPY of Norristown, Pa., will grant state rights or licenses on easy terms. This system works up to assay, and recovers the mercury rapidly. Apply as above.

Grain Speculation in large or small amounts. \$5 or \$25,000. Write W. T. SOULE & CO., Commission Merchants, 130 La Salle St., CHICAGO, ILL., for Circulars.

TELEPHONE Works 1 mile. Price \$3.50. Pat' Circulars free. HOLCOMB & Co., Mallet Creek, Ohio.

B. W. PAYNE & SONS, CORNING, N. Y. ESTABLISHED 1840. Patent Spark-Arresting Engines, mounted and on skids. Vertical Engines with wrought boilers. Eureka Safety powers with Sectional boilers—can't be exploded. All with Automatic Cut-Offs. From \$150 to \$2,000. Send for Circular. State where you saw this.

SEND STAMP FOR CATALOGUE. TAP & DIES, VISES, DRILLS, MACHINERY, FILES, LATHES, SHEET METAL, STAMPS. TALLMAN & MCFADDEN-PHILADELPHIA.

MACHINISTS' TOOLS. NEW AND IMPROVED PATTERNS. Send for new illustrated catalogue. Lathes, Planers, Drills, &c. NEW HAVEN MANUFACTURING CO., New Haven, Conn.

AGENTS Catalogue free. \$7 per day made easy. J. F. GAGE & CO., Boston, Mass.



To Electro-Platers. BATTERIES, CHEMICALS, AND MATERIALS, in sets or single, with Books of Instruction for Gold, Silver, or Nickel Plating. THOMAS HALL, Manufacturing Electrician, 19 Bloomfield Street, Boston, Mass. Illustrated Catalogue sent free.

STEAM PUMPS.

HENRY R. WORTHINGTON, 239 Broadway, N. Y., 83 Water St., Boston, 709 Market St., St. Louis, Mo. THE WORTHINGTON PUMPING ENGINES FOR WATER WORKS—Compound, Condensing or Non-Condensing. Used in over 100 Water-Works Stations. WORTHINGTON STEAM PUMPS of all sizes and for all purposes.

Prices below those of any other steam pump in the market. WATER METERS. OIL METERS.



No Sawdust! No Planing!

Thin lumber, 1-16 to 1/2 inch thick, cut and seasoned by our recently patented machines, equal if not superior to the sawed and planed wood, being smooth, flat, and in all cases perfectly seasoned. Used by the largest manufacturers in the country, and giving entire satisfaction. In addition to our specialty, our usual complete stock of sawed hardwood, Lumber, and Veneers, figured and plain, Burls, etc.

GEO. W. READ & CO., 186 to 200 Lewis Street, New York.



CAVEATS, COPYRIGHTS, LABEL REGISTRATION, ETC. Messrs. Munn & Co., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine Improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had OVER THIRTY YEARS' EXPERIENCE, and now have unequalled facilities for the Preparation of Patent Drawings, Specifications, and the Prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Registration of Labels, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very moderate terms.

We send free of charge, on application, a pamphlet containing further information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Hints on the Sale of Patents, etc.

Foreign Patents.—We also send, free of charge, a Synopsis of Foreign Patent Laws, showing the cost and method of securing patents in all the principal countries of the world. American inventors should bear in mind that, as a general rule, any invention that is valuable to the patentee in this country is worth equally as much in England and some other foreign countries. Five patents—embracing Canadian, English, German, French, and Belgian—will secure to an inventor the exclusive monopoly by his discovery among about ONE HUNDRED AND FIFTY MILLIONS of the most intelligent people in the world. The facilities of business and steam communication are such that patents can be obtained abroad by our citizens almost as easily as at home. The expense to apply for an English patent is \$75; German, \$100; French, \$100; Belgian, \$100; Canadian, \$50.

Copies of Patents.—Persons desiring any patent issued from 1836 to November 20, 1866, can be supplied with official copies at reasonable cost, the price depending upon the extent of drawings and length of specifications.

Any patent issued since November 20, 1866, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1.

A copy of the claims of any patent issued since 1836 will be furnished for \$1. When ordering copies, please to remit for the same as above, and state name of patentee, title of invention, and date of patent.

A pamphlet, containing full directions for obtaining United States patents sent free. A handsomely bound Reference Book, gilt edges, contains 140 pages and many engravings and tables important to every patentee and mechanic, and is a useful hand book of reference for everybody. Price 25 cents, mailed free.

Address MUNN & CO., Publishers SCIENTIFIC AMERICAN, 37 Park Row, New York. BRANCH OFFICE—Corner of F and 7th Streets, Washington, D. C.

ROOTS' NEW IRON BLOWER.



POSITIVE BLAST. IRON REVOLVERS, PERFECTLY BALANCED IS SIMPLER, AND HAS FEWER PARTS THAN ANY OTHER BLOWER. P. H. & F. M. ROOTS, Manuf'rs, CONNERSVILLE, IND.

S. S. TOWNSEND, Gen. Agt., { 6 Cortlandt St., } NEW YORK. WM. COOKE, Selling Agt., { 8 Dey Street, } JAS. BEGGS & CO., Selling Agts., { 8 Dey Street, }