

IMPORTANT BOOKS

FOR SHEET METAL WORKERS.

The Sheet Metal Worker's Instructor for Zinc, Sheet Iron, Copper and Tin Plate Workers, and others; Geometrical Problems; Practical and Simple Rules for describing the various Patterns. By REUBEN H. WARN, Tin Plate Worker. With Boiler Making, Mensuration of Surfaces and Solids, Rules for Calculating the Weights of Different Figures of Iron and Steel, etc. Elaborately illustrated. 8vo. \$3.00

A Practical Workshop Companion for Tin, Sheet Iron, and Copper Plate Workers; containing Rules for Describing various kinds of Patterns used by Tin, Sheet Iron, and Copper Plate Workers; Practical Geometry; Mensuration of Surfaces and Solids; Tables of Areas and Circumferences of Circles; Japans, Varnishes, Lacers, Composites, etc. By LEROY J. BLINN, Master Mechanic. 100 illustrations. 12mo. \$2.50

Galvanized Iron Cornice-Worker's Manual, containing instructions in laying out the different Miter, and making Patterns for all kinds of plain and circular work. Also, Tables of Weights, Areas, and Circumferences of Circles. By CHAS. A. YALLIE. Illustrated by 21 plates. A new and revised edition. 4to. \$5.00

The above or any of our Books sent by mail, free of Postage, at the publication prices, to any address in the world. Our large Catalogue of Practical and Scientific Books, 96 pages, 8vo., and our other Catalogues and Circulars, the whole covering every branch of Science as applied to the Arts, sent free and free of Postage to any one in any part of the world who will furnish us with his address.

HENRY CAREY BAIRD & CO., INDUSTRIAL PUBLISHERS, BOOKSELLERS & IMPORTERS 810 Walnut Street, Philadelphia, Pa.

IMPROVED FOOT AND POWER LATHES, AND MACHINISTS TOOLS. CATALOGUES FREE. LATHES ON TRIAL. SEBASTIAN, MAY & CO. 157 W. PEARL ST. CINCINNATI, O.

Shepard's New \$30 Screw Cutting Foot Lathe. Foot and Power Lathes, Drill Presses, Scroll Saw Attachments, Chucks, Mandrels, Twist Drills, Chuck Chasers, etc. Lathes on trial. Lathes on payment. Send for catalogue of outfits for amateurs or artisans. Address H. L. SHEPARD, Agent, 134 E. Second St., Cincinnati, O.

A. A. GRIFFING IRON CO. STEAM HEATING Apparatus. SOLE MANUFACTURERS. BUNDY STEAM RADIATOR. 750 COMMUNIPAW AVE. JERSEY CITY, N. J.

WORK SHOPS WITHOUT STEAM POWER. BY USING OUTFITS OF Barnes' Patent Foot Power machinery can compete with steam power. Sold on trial. Metal and woodworkers send for prices. Illustrated catalogue free. W. F. & Jno. Barnes Co., Rockford, Ill. Address No. 1399 Main St.

DRAWING INSTRUMENTS. Illustrated catalogue sent on application to WM. T. COMSTOCK, 6 Astor Place, New York.

RAILWAY AND STEAM FITTERS' SUPPLIES. Rue's Little Giant Injector. SCREW JACKS, STURTEVANT BLOWERS, &c. JOHN S. URQUHART, 46 Cortlandt St., N. Y.

EVAPORATING FRUIT. Full treatise on improved methods, yields, and statistics. F. R. K. & Co. AMERICAN MAN'G CO. "BOX R," WAYNESBORO, PA.

ICE MACHINES. Of all sizes, from 10 lb. per Hour to 50 Tons per Day. Binary Absorption System. ECONOMICAL, SIMPLE, RELIABLE. Send for Circulars. Delamater Iron Works, 16 Cortlandt St., NEW YORK, U. S. A.

OUR STRONG and RELIABLE ROSES ARE FRAGRANT and BEAUTIFUL. 6 STRONG PLANTS for \$1.24, 10 for \$2.00, 25 for \$4.00, 50 for \$7.00. (Your own selection) for \$1.24, 10 for \$2.00, 25 for \$4.00, 50 for \$7.00. We mail our catalogue (beautifully illustrated) to all interested in Rose Culture, upon application, Free. R. SCOTT & SON, Rose Growers, Philadelphia.

WITHERBY, RUGG & RICHARDSON, Manufacturers of Patent Wood Working Machinery of every description. Facilities unsurpassed. Shop formerly occupied by E. Baile & Co., Worcester, Mass. Send for Catalogue.

PERFECT NEWSPAPER FILE. The Koch Patent File, for preserving newspapers, magazines and pamphlets, has been recently improved and price reduced. Subscribers to the SCIENTIFIC AMERICAN and SCIENTIFIC AMERICAN SUPPLEMENT can be supplied for the low price of \$1.50 by mail, or \$1.25 at the office of this paper. Heavy board sides; inscription "SCIENTIFIC AMERICAN" in gilt. Necessary for every one who wishes to preserve the paper. Address MUNN & CO., Publishers SCIENTIFIC AMERICAN

ECONOMIC MOTOR CO.'S GAS ENGINES. Best in principle, workmanship, and materials. An unequalled small Motor adapted to all uses. Simple, Safe, Economical, Durable. Four sizes: 1 H. P., 2 H. P., 1 man power, and a Sewing Machine Motor. Send for Circulars. ECONOMIC MOTOR CO., 12 CORTLANDT STREET, NEW YORK.

OTTO GAS ENGINE OVER 10,000 IN USE. WORKS WITHOUT ENGINEER OR BOILER. STEAM COAL OR ASH. STARTS AT ONCE AND IS FREE OF DANGER FIRE OR EXPLOSION. 1 to 25 HORSE POWER. SCHLEICHER SCHUMM & CO. 47 DEY ST. NEW YORK. 214 RANDOLPH ST. CHICAGO. 334 & WALNUT STS. PHILADELPHIA

MINING AND HOISTING Machinery; also, Stationary Engines, Boilers, and Ventilating Fans. Estimates made and contracts taken for constructing all kinds of Mining Machinery. I. A. FINCH & CO., SCRANTON, PA.

TRACTION ENGINE. Strongest, most durable, easiest to manage, and safest. Send for Catalogue. Address, A. B. FARQUHAR, YORK, PA.

BIBB'S Celebrated Original BALTIMORE FIRE-PLACE HEATERS. To warm upper and lower rooms. The handsomest, most economical. Cold Stoves in the World. R. C. BIBB & SON, 30 AND 32 LIGHT STREET, BALTIMORE, MD. MARBLED SLATE MANTELS. Send for Circulars.

VOLNEY W. MASON & CO., FRICTION PULLEYS CLUTCHES and ELEVATORS. PROVIDENCE, R. I.

THE HARDEN STAR HAND GRENADE FIRE EXTINGUISHER. Puts Out Fire Instantly. See editorial notice in SCIENTIFIC AMERICAN of November 23d, 1884. Send for circulars. Address Harden Hand Grenade Fire Extinguisher Co., 205 Wabash Ave., Chicago, 10 Oliver St., Boston, or 84 West Broadway, New York.

THE CAMERON STEAM PUMP. STANDARD OF EXCELLENCE. 30,000 IN USE. MANUFACTURED SOLELY BY THE A. S. CAMERON STEAM PUMP WORKS, Foot East 23d St., New York.

ROCK BREAKERS AND ORE CRUSHERS. We manufacture and supply at short notice and lowest rates, Stone and Ore Crushers containing the invention described in Letters Patent, issued to E. W. Blake, June 15th, 1856, together with NEW AND VALUABLE IMPROVEMENTS, for which Letters Patent were granted May 11th and July 20th, 1880, to Mr. S. L. Marsden. All Crushers supplied by us are constructed under the superintendence of Mr. Marsden, who, for the past fifteen years, has been connected with the manufacture of Blake Crushers in this country and England. FARREL FOUNDRY AND MACHINE CO., Manuf'rs., Ansonia, Conn. COPELAND & BACON, Agents, New York.

THE CAMERON STEAM PUMP. STANDARD OF EXCELLENCE. 30,000 IN USE. MANUFACTURED SOLELY BY THE A. S. CAMERON STEAM PUMP WORKS, Foot East 23d St., New York.

HOW TO BECOME "Quick at Figures." A collection of valuable Rules and Short-cuts for business calculations. It includes and fully explains the famous LIGHTNING METHOD OF ADDITION, and the Sliding Method of Multiplication, besides many other valuable contractions by which results are obtained rapidly and correctly. It commences where the text-book leaves off. Price \$1, postpaid. THE WOODBURY CO., (P. O. Box 3888), 105 Summer St., Boston, Mass.

THE PAYNE AUTOMATIC ENGINE. Gives more power from same amount of fuel and water than any engine made, and 50 per cent more power than rated at. All engines warranted. All sizes and styles, 2 to 250 horse power. Send for prices and catalogue A. 4. B. W. PAYNE & SONS, Elmira, N. Y. P. O. Box 1207. Or our General Sales Office, 83 Liberty St. & 149 B'way, N. Y.

HELP WANTED. We will pay \$5 per month and expenses to sell our goods to dealers, or \$40 a month to distribute circulars in your vicinity. All expenses advanced. Salary promptly paid. Samples free. No stamps required. No humbug. We mean what we say. Address MONARCH NOVELTY COMPANY, Arcade Building, Cincinnati, Ohio.

SHIPMAN STEAM ENGINE. A BOAT AND STATIONARY ENGINE. No skilled attendant required! Safe from fire and explosion! No expense when engine stops! Steam in FIVE minutes. Runs ten hours on less than 3 Gallons of Kerosene. See illustrated article in this paper, September 13. SHIPMAN ENGINE CO., 55 Franklin St., Boston

Wood-working Machinery, Williamsport Machine Co. (Ltd), 110 W. 3d St., Williamsport, Pa., U. S. A. A Full Line of Improved Machines. COMBINATION SAW & DADO MACHINE. SELF-FEED SAW TABLE.

INSURANCE @ HARTFORD CONN. CASH CAPITAL \$4,000,000. LOSSES PAID IN 66 YEARS. \$50,000,000. The Largest and Strongest Company. L. J. HENDEE, PRES'T. J. GOONOW, Sec'y. W. B. CLARK, Ass't Sec'y.

PHOTOGRAPHIC OUTFITS! MICROSCOPES, TELESCOPES, FIELD-GLASSES, MAGIC LANTERNS, BAROMETERS, THERMOMETERS. Drawing Instruments, Philosophical and Chemical Apparatus. List and Descriptions of our Ten Catalogues sent FREE on application. QUEEN & CO. 924 Chestnut St. Philadelphia.

KNOW THYSELF. A GREAT MEDICAL WORK ON MANHOOD. Exhausted Vitality, Nervous and Physical Debility, Premature Decline in Man, and the untold miseries flesh is heir to. A book for every man, young, middle-aged, and old. It contains 125 prescriptions for all acute and chronic diseases, each one of which is invaluable—so found by the author, whose experience for 28 years is such as probably never before fell to the lot of any physician. Three hundred pages, bound in beautiful French muslin, embossed covers, full gilt, guaranteed to be a finer work in every sense—mechanical, literary, and professional—than any other work sold in this country for \$2.50, or the money will be refunded in every instance. Price only \$1.00 by mail, postpaid. Illustrative sample, 6 cents. Send now. Gold medal awarded the author by the National Medical Association, to the officers of which he refers. Address the Leabody Medical Institute, or Dr. W. H. Parker, No. 4 Bulfinch Street, Boston, Mass., who may be consulted on all diseases requiring skill and experience.

Weak Nervous Men. Who suffer from Debility, Premature Decay and Exhausted Powers, certainly and permanently cured without STOMACH MEDICINES by the MARSTON BOLD; the new plan of treating Nervous Debility, Physical Decay, &c. Endorsed by thousands who have been restored to full and perfect manhood. Sealed treatise sent free. Varicocele cured without Surgery. Address MARSTON REMEDY CO., or DR. H. TRESKOW, 46 West 14th Street, New York.

FOREIGN PATENTS. Their Cost Reduced. The expenses attending the procuring of patents in most foreign countries having been considerably reduced the obstacle of cost is no longer in the way of a large proportion of our inventors patenting their inventions abroad. CANADA.—The cost of a patent in Canada is even less than the cost of a United States patent, and the former includes the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, British Columbia, and Manitoba. The number of our patentees who avail themselves of the cheap and easy method now offered for obtaining patents in Canada is very large, and is steadily increasing.

ENGLAND.—The new English law, which went into force on Jan. 1st, enables parties to secure patents in Great Britain on very moderate terms. A British patent includes England, Scotland, Wales, Ireland and the Channel Islands. Great Britain is the acknowledged financial and commercial center of the world, and her goods are sent to every quarter of the globe. A good invention is likely to realize as much for the patentee in England as his United States patent produces for him at home, and the small cost now renders it possible for almost every patentee in this country to secure a patent in Great Britain, where his rights are as well protected as in the United States.

MUNN & CO., Editors and Proprietors of THE SCIENTIFIC AMERICAN, cordially invite all persons desiring any information relative to patents, or the registry of trade-marks, in this country or abroad, to call at their offices, 361 Broadway. Examination of inventions, consultation, and advice free. Inquiries by mail promptly answered. Address, MUNN & CO., Publishers and Patent Solicitors, 361 Broadway, New York. Branch Office, cor. F and 7th Streets, opposite Patent Office Washington D. C.