Founded by Mathew Carey, 1785

BAIRD'S BOOKS

FOR PRACTICAL MEN

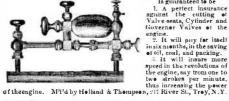
THE OUT NEW AND CHILDREN OF PRACTICAL AND SCIENTIFIC BOOKS, 96 pages, 8vo, Catalogue of Books on Steam and the Steam Engine, Mechanics, Machinery, and Dynamical Enginering, Catalogue of Books on Civil Enginering, Catalogue of Books on Civil Enginering, Catalogue of Books on Metal Minne, Metallurgy, Mineralogy, Assaying, and Chemical Analysis, etc., etc. Catalogue of Books on Dyenns, Calico Phinting, Weaving, Otton and Woolen Manufacture, 4to; Catalogue of Books on Dyens, Manufacture, 4to; Catalogue of A Miscellane, Manufacture, 4to; Catalogue of A Miscellane, Science, Political Economy, Banks, Population, Paulation, Pau

is address.

IBENRY CAREY BAIRD & CO.,
Industrial Publishers, Booksellers, and Importers,
810 WALNUT STIGET, PHILADELPHIA, PA., U. S. A.



THE HOLLAND LUBRICATOR, VISIBLE DROP



ls guaranteed to be
1. A perfect insurance
against the cutting of
Valve-seats, Cylinder and
Governor Valves of the



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



BARNES

Patent Foot and Steam Power Machi-nery. Complete out-tits for Actual Workshop Business. Lathes for Wood or Metal. Circular Saws, Scrool Saws, Formers, Mortisers. Tenoners,

etc., etc. Machines on trial if desired. Descriptive Catalogue and Price List Free. W. F. & JOHN BARNES. No. 1999 Main St., Rockford, Ill.

WANTED—By an American, Ph.D. of Zurich, chemist to a leading silk dyeing establishment in Switzerland, of several years experience, both in analytical and organic chemistry—a position as chemist, analytical or manufacturing in America, English, German, and French spoken. The best of references given. Address Dr. E. Keller, Seidengasse 14, Zurich, Switzerland.

CONSUMPTION.

RUPTURE

time and theil have them return again, I mean a radical eure. I have made the disease of FITS, EPILEPSY or FALLING SIGKNESS a life-long study. I warrant myremedy te cure the worst cases. Because others have failed is no reason for not now receiving a cure. Send at once for a treatise and a five bottle of my infallible remedy. Give Express and Fost Free Bottle of my infallible remedy. Give Express and Fost Office. It clost you nothing that right, and I will cure you. Address Dr. H. G. ROUT, 183 Fearl St., New York.



266th Edition. Price only \$1 BY MAIL, POSTPAID.



A Great Medical Work on Manhood,

Exhausted Vitality, Nervous and Physical Debility, Pre-mature Decline in man, Errors of Youth, and the untold miscries resulting from indiscretions or excesses. A book for every man, young, middle-aged, and old. It contains 25 prescriptions for all acute and chronic diseases, each one of which Isinvaluable. So found by the author, whose experience for 23 years is such as probably never before fell to the lot of any physician. 300 pages, bound in beau-tiful French muslin, embossed covers, full glit, guaran-ted to but thes western sections and chairs like. tiful 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.

This hook should be read by the young for instruction and by the afflicted for relief. It will benefit all.—Lendon Lancet.

There is no member of society to whom this book will not be useful, whether youth, parent, guardian, instructor, or clen yman.—Araonaut.

Addres the Peabosy Medical Institute, or Dr. W. H. Parker, No. 4 Bulfinch Street. Boston, Mass., who may be consulted on all diseases requiring skill and experience. Or nonic and obstinate diseases that HEAL as specialty. Such treated successfully THYSELF without an instance of failure.

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 $\frac{1}{4}$ to 2 inches square.

NEW YORK BELTING & PACKING CO.,

Nos. 13 & 15 Park Row, opp. Astor House, New York.



BLAKE'S CHALLENGE" ROCK BREAKER.



JOHN H. CHEEVER, Treas.

Patented November 18, 1879. For Macadam Road making, Ballasting of Railronds, Crushing Ores, use of Iron Furnaces, etc. Rapidly superseding our older styles of Blake Crusher en account of its superior strength, efficiency, and simplicity. Adopted by important Railway and Mining Corporations. Cities, and Towns. First Class Medals of Superiority awarded by American Institute, 1879 and 1880.

BLAKE CRUSHER CO., Sole Makers, New Haven, Conn.



AMERICAN OXIDE BRONZE CO
MAKES THE BEST AND CHEAPEST CAR BOX AND JOURNAL BEARING METAL
TENSILE STRENGTH, 39,292 Lbs TO THE SQUARE INCH ELASTICITY 9,718, FOR SALE TO
THETRADE IN INCOTS, THIS METAL CAN BE USED FOR ANY AND ALL PURPOSES. ADDRESS 402 WALNUT SE PHILADELPHIA PA

WATER.

Cities, Towns, and Manufactories Supplied by GREEN & SHAW

PATENT TUBE AND GANG WELL SYSTEM. Wm. D. Andrews & Bro., 233 Broadway, N. Y.

Infringers of above patents will be prosecuted.

VELOCITY OF ICE BOATS. A COLLEC-tion of interesting letters to the editor of the SCIENTIFIC AMERICAN on the question of the speed of ice boats, de-monstrating 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 SITPLEMENT, No. 214. P.ice 10 cents. To be had at this office and from all newsdealers.

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, M.E. Contained in SCIENTIFIC AMERICAN SCIPPLEMENT, 1. The same number also contains the rules and regulations for the formation of ice-boat clubs, the sailing and management of ice-boats. Price 10 cents.



GAS ENGINES,

Simple, Substantial, Safe, Economical, Half horse power will pump 500 gallons of water 100 feet high per hour with 25 feet of gas. POWER DETERMINED BY ACTUAL TEST.
Call and see them, or for circulars and prices address THE CONTINENTAL GAS ENGINE CO., No. 231 BROADWAY, NEW YORK

ICE-BOAT WHIFF, FULL WORKING drawings and description, with dimensions of the model ice-yacht Whift, the fastest yacht in the world. Exhibited at the Centennial, by Irving Grinnell. With fourteen illustrations. Supplement 63. Price 10 conts.

METAL WORKING ${f MACHINERY}$

LATEST IMPROVEMENTS. GOULD & EBERHARDT, NEWARK, N. J.

\$5 to \$20 per day at home. Samples worth \$5 free. Address STINSON & Co., Portland, Maine.



FOR SALE, CIRCULAR SAW MILL. All the Machinery, Irons, Saws, Rollers, three Sections of Carriage, to saw timber 45 ft. in leneth, also, Segments, Pullers with all the Gearing in perfect order for 3 Breast Wheel 20 feet in diameter, with 7 foot Buckets, Internal Gear. Will sell the above at low price, loaded on cars. A. M. PERKINS, West Winsted, Coun.

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 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



ROLLSTONE VARIETY LATHE.



Latest inproved. Rotary and Stationary Bed Planers and Buzz Planers; and Buzz Planers; and Buzz Planers; Band Saw; Wardwells Patent Saw Bench Dowel Machine; Chair Machinerry; Boiler Machines, etc. Also large Stock of Second hand Machinery always on hand Send for catalogue, and state just what you want, to Rollstone Machiner Co., 48 Water St., Fifchburg, Mass.

ICE-HOUSE AND REFRIGERATOR. Directions and Dimensions for construction, with one illustration of cold house for preserving fruit from season to season. The air is kept dry and pure throughout the year at a temperature of from 34° to 36°. Contained in SCIENTIFIC AMERICAN SUPPLEMENT NO. 116. Price 10 cents. To be had at this office and of all newsdealers.

COPYFOR) CROSSCUP & WEST.

SOUTHWARK FOUNDRY & MACHINE COMPANY, 430 Washington Avenue, Philadelphia.

Engineers & Machinists,
Blowing Engines and Hydraulic Machinery.
Sole makers of the

Porter-Allen Automatic Cut-Off Steam Engine.

ICE-HOUSE AND COLD ROOM.—BY R. G. Hatfield. With directions for construction. Four engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, 59. Trice 10 cents. To be lad at this office and of all newsdealers.

ROBERT WILHELM BUNSEN.



A PRACTICAL SUCCESS. VAN DUZEN'S PAT. LOOSE PULLEY OILER.

Thousands in satisfactory everyday use. Entire reliability and constancy demonstrated in a two years'
test by (would be) Eastern skeptics.
Thousands by the satisfactory everyever

RIG PAY to sell our Rubber Printing Stamps. Samples free. TAYLOR BROS. & Co., Cleveland, Ohio.

STEAM FITTERS' AND PLUMBERS' SUPPLIES. Rue's Little Giant Injector. SCREW JACKS OF EVERY DESCRIPTION.

JOHN S. URQUHART, 46 Cortlandt St., N. Y.

ON THE CALORIFIC POWER OF FUEL on Thomson's Calcormeter. An important puper by J. W. Thomas. F.C.S., F.I.C., in which the author points out the disadvantages of Thomson's calorimeter, and recommends a new and uniform method of procedure to ascertain the relative calorific power of differences in the results obtained by chemists may be overcome. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 288. Price 10 cents. To be had at this office and from all newsdealers.

ROOT'S NEW IRON BLOWER.

POSITIVE BLAST. IRON REVOLVERS, PERFECTLY BALANCED, Has Fewer Parts than any other Blower.

P. H. & F. M. ROOTS, Manufacturers, CONNERSVILLE, IND.

S. S. TOWNSEND, Gen. Agt., 22 Cortland St., 9 Dey St.
COOKE & CO., Selling Agts., 22 Cortland Street,
JAS. BEGGS & CO., Selling Agts. 9 Dey Street,
NEW YORK.

SEND FOR PRICED CATALOGUE.



Clark's Noiseless Rubber Wheels Absolutely prevent splintering and wearing Additions, caused by use of from Venels Adapted for Trucks, Bayes, Baskets, Tubles and work of every kind in Mils, Ware houses, Stores, etc. 'a stalogue free GEO. P. CLARK, Windsor Locks, Ct.

CE AND ICE HOUSES-HOW TO MAKE ice ponds; amount of ice required, etc., and full directions for building ice-house, with illustrated plan. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, NO. 53. Price 10 cents. To be had at this office and of all news-dealers.

CUTLER'S POCKET INHALER



Carbolate of Iodine INHALANT.

A curefor Catarrh, Bronchitis. Asthma. and all discusses of the Threat and tion—if taken in season, It will break up a Cold at Lungs—even Constitute once. It is the King of Cough Medicines. A few inhalations will correct the most Offensive Breath. It may be carried as handily as a penknife, and is guaranteed to accomplish all that is claimed for it.

Dr. George Hadley, late Professor of Chemistry and Pharmacy in the University of Buffalo, N. Y., concludes a carefully-considered report upon the merits of Cutler's Inhaler in these vords: "On the whole, this Inhaler seems to me to accomplish its purpose by novel, yet by the most simple and effectual means; to be philosophical in conception, and well carried out in the execution."

Patented through the surpose of the Surveyor.

Patented through the agency of the SCIENTIFIC AMERICAN in 1873, this Inhaler has since had a larger and more extensive sale than any Medical Instrument ever invented

ever invented.
It is approved by physicians of every school, and indorsed by the leading medical journals of the world.

orsed by the leading medical journals of the works.

Over 300.000 in use.

Sold by Druggists for \$1.00. By mail, \$1.25.

W. H. SMITH & CO. PROP'S.

410 Michigan St., Buffalo, N. Y.

THE DINGEE & CONARD CO'S BEAUTIFUL EVER-BLOOMING

The only establishment making a SPECIAL BUSINESS of ROSES, 60 LARCE HOUSES for ROSES alone. We CIVE AWAY, in Premiums and Extras, more ROSES than most establishments grow. Strong Pot Plants suitable for immediate bloom delivered safely, postpaid to any post-office, 6 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. Our NEW CUIDE, a complete Treatise on the laws, 70 pp. despandin ill ustrated FREE THE ONARD CO.

Rose Growers, West Grove, Chester Co., Pa



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. Furnishes steam power for all Agricultural purposes. Driving where a first-class and economical Engine is required. Eleven first-class premiums awarded, including Contennal, 76. Refer to No. 7, issue of '77, No. 14, issue of '78, of Scientific American, for Editorial illustrative, Frick & Co., Waynesboro, Franklin Co., Pa.



WANTED a man capable of superintending construc-tion of Portable and Stationery Engines. Rollers, and Saw Mills, and managing 300 employes; middle-aged man preferred, and must be thoroughly competent, and of soler habits; location in Pennsylvania, and position permanent and pay liberal. T. M. C., Box 73, N. Y.

AMERICAN MENT. Any desired back number of the Scientific AMERICAN SUPPLEMENT can be had at this office for 10 cents. Also to be had of newsdealers in all parts of the country.



PATENTS.

in SCIENTIFIC AMERICAN SUPPLEMENT, No. 289. Price lication 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 thirty-eight years' experience, and now have unequaled facilities for the preparation of Patent Drawings. Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Minm & Co. also attend to the preparation of Caveats, Convrights for Books, Labels, Reissnes, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very reasonable terms,

A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Convrights, Designs, Patents, Appeals, Reissues, Infringements, As signments, Rejected Cases, Hints on the Sale of Patents, etc.

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.

MUNN & CO., Solicitors of Patents,

261 Broadway, New York.

BRANCH OFFICE,-Corner of F and 7th Streets, Washington, D. C.