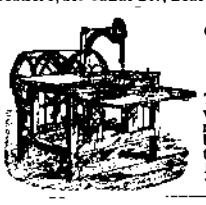
BAIRD'S BOOKS FOR PRACTICAL MEN.

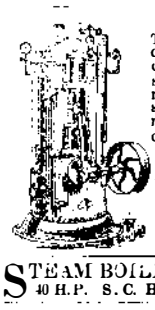
My new, revised and enlarged Catalogue of PRACTICAL AND SCIENTIFIC BOOKS—96 pages, 8vo.—will be sent, free of postage, to any one who will favor me with his address.

HENRY CAREY BAIRD,
INDUSTRIAL PUBLISHER,
406 WALNUT STREET, Philadelphia.

THE CHAMPION SILVER-STEEL SPRING MATTRESS, now greatly improved, has been before the public for several years, and continues to occupy its unrivalled position in the trade, as the BEST BED ever produced. It presents the rich and elegant appearance of silver, and is the softest, easiest, cheapest, and most durable Spring Bed in market. Wholly composed of tenacious tempered steel springs, so united that the pressure is equally distributed. Easily lifted, turned, or rolled up. Both sides alike. No frame, no wooden slats, no tow stuffing, no straps. May be used on floor without bedstead. No under bed required. Needs only half the thickness of hair mattress. More springs for your money in this bed than in any other. Unequalled for hotels. Any sizes made to order. Send for pictorial circular. Retail price of double bed, $13. Shipped, by single bed or quantity, to all parts of the world. Liberal discount to the trade. Sold by leading dealers in all parts of the country. Refer to Phelps, Doremus & Corbett, J. T. Allen & Co., New York, Gould & Co., Philadelphia, Pa., Gilbert & Sons, Norwich, Conn, Bowditch & Co., New Haven, Conn., and many others. CHAMPION SPRING MATTRESS CO., Makers, 246 Canal St., near Broadway, New York.



WEAVER'S *COMBINED CIRCULAR & SCROLL SAWING, BORING, PLANING AND SURFACE MOULDING MACHINES.* They can be driven by hand, when other motive power is not available. Hundreds are being operated so. Manufactured at the "GREENWICH MACHINE WORKS." Greenwich, Washington Co., N. Y.



BOOKWALTER ENGINE. The lowest-priced good Engine ever constructed; Boiler and Engine made of the best Charcoal Iron, Compact, substantial, economical, and easily managed; Boiler, Governor, Pump, and all Trimmings complete for running at low price of (boxing excepted):

3 Horse Power . . . $250 00
4½ " " . . . 300 00

☞ Delivered on Cars at Shops.

JANES & FOOS,
109 LIBERTY STREET, NEW YORK

STEAM BOILERS for sale cheap—15, 20, 30 40 H.P. S. C. HILLS, 51 Courtlandt St., New York.

$2400 Yearly to Agents. 54 new articles and the best Family Paper in America, with two $5 Chromos. Family Journal, 300 Br'way, N. Y.

$180 EACH WEEK to active AGENTS. Something new and reliable. Write at once. COWGILL & CO., Kalamazoo, Michigan

Last Chance

FOR

AN EASY FORTUNE!

Fifth and Last Gift Concert

IN AID OF THE

Public Library of Kentucky.

JULY 31st, 1874.

LIST OF GIFTS.

One Grand Cash Gift		$250,000
One Grand Cash Gift		100,000
One Grand Cash Gift		75,000
One Grand Cash Gift		50,000
One Grand Cash Gift		25,000
5 Cash Gifts,	$20,000 each,	100,000
10 Cash Gifts,	14.000 each	140,000
15 Cash Gifts,	10,000 each	150,000
20 Cash Gifts,	5,000 each	100,000
25 Cash Gifts,	4,000 each	100,000
30 Cash Gifts,	3,000 each	90,000
50 Cash Gifts,	2,000 each	100,000
100 Cash Gifts,	1,000 each	100,000
240 Cash Gifts,	500 each	120.000
500 Cash Gifts,	100 each	50,000
19,000 Cash Gifts,	50 each	950.000
Grand Total, 20,000 Gifts, all cash,		2,500,000

PRICE OF TICKETS.

Whole Tickets	$50 00
Halves	25 00
Tenths, or each Coupon	5 00
11 Whole Tickets for	50 000
22 1-2 Tickets for	1,000 00

For Tickets or information, Address

THO. E. BRAMLETTE,
Agent and Manager.
Public Library Building, Louisville Ky.

BANKRUPT SALE OF STEAM ENGINES.

1—18 in. by 36 in. Plain Slide Valve Engine.
1—12 " " 24 " " "
1—10 " " 20 " " "
1—16 " " 32 " Rider Cut off Engine.
1—13 " " 36 " " "
1—12 " " 24 " " "
6—4 " " 6 " Yale Vertical "
6—6 " " 8 " " "
5—10 " " 13 " " "
1—12 " " 14 " " "
Also 4—5 ft. Planers.
2—8 " Engine Lathes.
4—6 " Drill "

The above are all new, and will be sold cheap for cash.
H B BIGELOW, Assignee. New Haven, Conn.

The Toll-Gate! Prize Picture sent free! An ingenious game! 50 objects to find! Address, with stamp, E C. ABBEY, Buffalo, N.Y.

PATENTS

The publishers of the SCIENTIFIC AMERICAN have acted as solicitors of patents in the United States and foreign countries for more than a quarter of a century. More than FIFTY THOUSAND inventors have availed themselves of their services. All patents secured through this agency receive a special notice in the SCIENTIFIC AMERICAN, which frequently attracts purchasers for the patent.

Inventions examined, and advice as to patentability free

Patents obtained in the best manner, and with as little delay as possible.

Caveats prepared from either model or drawings, and filed in the Patent Office at short notice.

Special examinations as to the patentability of inventions made, at the Patent Office, on receipt of model or drawing and description; cost for this search and report, $5.

Trade Marks.—The necessary papers for securing protection to manufacturers and merchants in this country and abroad are prepared at this office.

Design Patents, for protecting artists and designers of any new ornamental work, are quickly and cheaply obtained through this office.

Copyrights obtained.

Foreign Patents are solicited in all countries where patent laws exist. Pamphlets, containing the cost and full particulars, mailed on application.

Canada Patents.—Canada is one of the best countries for patents. The cost depends upon the length of time for which a patent is desired. Full particulars by mail on application.

We shall be happy to confer with inventors, examine their models and drawings, and advise with them as to obtaining patents without consultation fee. Every kind of information pertaining to patents, at home or abroad cheerfully given.

Send for pamphlet, 110 pages, containing laws and directions for obtaining patents. Address

MUNN & CO.,
Publishers SCIENTIFIC AMERICAN,
37 Park Row, N. Y.

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

PATENT
COLD ROLLED SHAFTING.

The fact that this shafting has 75 per cent greater strength, a finer finish, and is truer to gage, than any other in use, renders it undoubtedly the most economical. We are also the sole manufacturers of the CELEBRATED COLLINS PAT. COUPLING, and finish Pulleys, Hangers, etc., of the most approved styles. Price lists mailed on application to

JONES & LAUGHLINS,
Try street, 24 and 3d avenues, Pittsburgh, Pa.
190 S. Canal st., Chicago.

☞ Stocks of this Shafting in store and for sale by FULLER, DANA & FITZ, Boston, Mass.
GEO. PLACE & CO., 121 Chambers street, N. Y.
PIERCE & WHALING, Milwaukee, Wis.

OTIS' SAFETY HOISTING Machinery.

OTIS, BROS. & CO.,
NO. 348 BROADWAY NEW YORK.

GLASS MOULDS for Fruit Jars, Lamps, Bottles, Ink Stands, etc., made by H. BROOKE, 15 years COR. WHITE AND CENTER STS., N. Y. For any thing new in glass you will require a mould (o die).

☞ PARTICULAR ATTENTION paid to MOULDS for INVENTORS. Send model or drawing; inclose stamp.

BLAKE'S PATENT
Stone and Ore Breaker

Crushes all hard and brittle substances to any required size. Also, any kind of STONE for ROADS and for CONCRETE, &c. Address BLAKE CRUSHER CO., New Haven, Conn.

NEXT JULY, A WELL KNOWN FIRM of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground-floor Warehouse, having windows fronting Queen Victoria Street and Cannon Street, City, London, England. The firm is prepared to accept the agency for special machinery, tools, etc., and to exhibit a choice selection of these and of working models. Advertizers' travelers canvass Great Britain and the whole of Europe. For terms, apply to W. P., Box 773 New York City.

PAGE'S Water Flame Coal Lime Kiln, with coal or wood. No 1 Soft White Lime or Cement with use of water. C. D. PAGE, Patentee. Rochester, N.Y

MACHINERY.

WOOD AND IRON WORKING,
Specialties from new and improved Patterns.
Planing and Matching Machines. Rotary Bed, Panel Buzz and Daniels Planers. Saw Benches, Band Saws.
BUSS & BRADLEY, 59 Sudbury St., Boston. Mass.

GREAT BARGAIN.

The property of the Yale Iron Works, consisting of one machine shop 66x150 ft., Basement, two floors and attic, with new engine and boiler, Shafting, Tools, etc. all in running order, suitable for manufacturing Engines, Tools, &c. Also one Foundry Building 52½ ft. x 150 ft., with two Cupolas, crane, flasks, scales, and everything complete for doing a large iron foundry business. The buildings are Brick situated on the corners of Chapel St., the business Street of the city. The buildings will be sold separate or together, with or without the machinery. Also, large assortment of engines and tools ready for delivery. All things considered, this is a chance of a lifetime for a most profitable investment.
New Haven, Conn. H. B. BIGELOW, Assignee.

R. BALL & CO.,

WOOD WORKING MACHINERY.

For Planing Mills, Car Shops, Sash, Blind and Door Makers, &c., &c. Send for Illustrated Catalogue and price list. Factory, at Worcester, Mass. Salesroom, at 121 Chambers & 108 Reade Sts., New York.

MANUFACTURERS and Capitalists will find it to their interest to investigate a new invention of permanent and increasing value, an article needed in every family. Address M. G., care J. H GATES, Cleveland, O.

Buy the "*Greenfield*" Planes, the "*Diamond*" Irons, the "*Hammered*" Plow Bits, the Patent "*Concave*" Ox Shoes. The *best* and *cheapest*. Address, for Catalogue, GREENFIELD TOOL CO., Greenfield, Mass.

SHINGLE AND BARREL MACHINERY.—Improved Law's Patent Shingle and Heading Machine, simplest and best in use. Also, Shingle Heading and Stave Jointers, Stave Equalizers, Heading Planers, Turners, &c. Address TREVOR & Co. Lockport, N. Y.

PORTABLE STEAM ENGINES, COMBINING the maximum of efficiency, durability and economy, with the minimum of weight and price. They are widely and favorably known, more than 1,800 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address
THE J. C. HOADLEY CO. Lawrence. Mass.

IRON BRIDGES—CLARKE, REEVES & Co., PHŒNIXVILLE BRIDGE WORKS. Office, 410 Walnut Street, Philadelphia, Pa.
Specialties—Accurate Workmanship—Phœnix columns—Use of double refined iron. No welds. All work done on the premises, from ore to finished bridges. Illustrated Album mailed on receipt of 75 cents.

Machinery,

Wood and Iron Working of every kind. Leather and Rubber Belting, Emery Wheels, Babbitt Metal, &c.

Sturtevant Blowers.

Of every size and description constantly on hand.

Cold Rolled Shafting.

Best and most perfect Shafting ever made, constantly on hand in large quantities, furnished in any lengths up to 24 ft. Also, Pat. Coupling and Self-oiling adjustable Hangers, pulleys, etc. GEORGE PLACE & CO.,
121 Chambers Street. & 108 Reade Street, New York.

Niagara Steam Pump.

CHAS. B. HARDICK,
28 Adams st., Brooklyn, N. Y.

HAND SAW MILL—SELF-FEEDING.—1 man do work of 3 men guaranteed. Slit 3-inch timber with ease. Send for Circular,
L. B. COXE & CO., 197 Water St., N. Y

THE JOHN HARDICK
Niagara Steam Pump.

HUBBARD & ALLER, Brooklyn, N.Y.

PUNCHING AND DROP PRESSES. For the Best and Cheapest Address THE STILES & PARKER PRESS CO. MIDDLETOWN, CONN.

WOOD-WORKING MACHINERY GENERALLY. Specialties, Woodworth Planers and Richardson's Patent Improved Tenon Machines.
Central, corner Union st., Worcester, Mass.
WETHERBY RUGG & RICHARDSON.

FOR SALE—Four Engine Lathes, 36 inches swing, geared in face plate—one, 17½ feet between centers, with cross feed and gearing for screw cutting, made by Wood, Light & Co., Worcester, Mass.—three, 19 feet between centers, made by Hewes & Phillips, Newark, N. J. Counter shafts and steady rests complete with all the lathes. Used about eight months turning steel tubes of Illinois and St. Louis Bridge, and in first class condition. Weight about 7,000 lbs. each.
Also, the superior Testing Machine of the Illinois and St. Louis Bridge Co.; a very accurate and reliable machine, adapted to all forms of tests, and of 100 tons capacity. All sold for want of further use. Apply to JOHN A. NICHOLS, Keystone Bridge Company, Pittsburgh, Pa.

STENCIL DIES For cutting business Stencils, all sizes. Also complete OUTFITS for Clothing Stencils and Key Checks, with which young men are making from $5 to $20 a day. Send for catalogue and samples to S. M. SPENCER, 117 Hanover St., Boston Mass.

WHALEN TURBINE. No risks to purchaser. Pamphlet sent free. SETH WHALEN, Ballston Spa, N. Y.

Milling Machines.

Of all styles and sizes, from 600 to 10,000 lbs. Universal, Plain, Index. Gear and Cam Cutting. Mill Grinders. Mills made to order. Index Plates drilled. BRAINARD MILLING MACHINE CO., 131 Milk St., Boston. Works at Hyde Park, Mass.

$72 EACH WEEK. Agents wanted; particular free. J. WORTH & CO. St. Louis, Mo

WROUGHT IRON BEAMS & GIRDERS

THE Union Iron Mills, Pittsburgh, Pa. The attention of Engineers and Architects is called to our improved Wrought-Iron Beams and Girders (patented), in which the compound welds between the stem and flanges, which have proved so objectionable in the old mode of manufacturing, are entirely avoided, we are prepared to furnish all sizes at terms as favorable as can be obtained elsewhere. For descriptive lithograph address Carnegie, Kloman & Co, Union Iron Mills, Pittsburgh, Pa.

Small Tools of all kinds; also GEAR WHEELS, parts of MODELS, and materials of all kinds. Castings of Small Lathes, Engines, Slide Rests, &c. Catalogues free. GOODNOW & WIGHTMAN, 28 Cornhill, Boston, Mass.

BOYD & CHASE, N.Y. City, the largest factory in the world for preparing Arkansas & Washita Oil Stone for Mechanical purposes. Send for Circular.

5,000 AGENTS WANTED. Samples sent free by mail. Two new articles, saleable as flour. Address N. H. WHITE, Newark, N. J.

ADVERTISERS! Send twenty-five cents to GEO. P ROWELL & CO., 4 Park Row, New York, for their *Pamphlet of one hundred pages*, containing lists of 3,000 newspapers, and estimates showing cost of advertising.

MAGNETS—Permanent Steel Magnets of any form or size, made to order by F. C. BEACH & CO., 263 Broadway, New York. Makers of the celebrated Tom Thumb and Miniature Telegraph Instruments.

PATENT
Planing and Matching

and Molding Machines, Gray & Wood's Planers, Self-oiling Saw Arbors, and other wood working machinery.
S. A. WOODS MACHINE CO., 91 Liberty st., N. Y.;
Send for Circulars, etc. 67 Sudbury st., Boston.

E. M. MAYO'S PAT. BOLT CUTTER.
☞ Send for Illustrated Circular, Cincinnati, Ohio.

RICHARDSON, MERIAM & CO. Manufacturers of the latest improved Patent Daniels and Woodworth Planing Machines, Matching, Sash and molding, Tenoning, Mortising, Boring, Shaping, Vertical, and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip-saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse 107 Liberty st. New York. 17

VALUABLE PROPERTY AND WATER Power for Manufacturing Purposes for Sale. The Belvidere Manufacturing Co. will offer at public sale, on Friday, June 12, next, their property at Belvidere, Warren Co., New Jersey. The buildings are almost new and in good repair. Water power abundant and reliable. Advantages for manufacturing are very great. For particulars, address THE ELVIDERE MANUFACTURING CO., Belvidere

P. BLAISDELL & CO.,

Worcester, Mass.,

Manufacturers of the Blaisdell Patent Upright Drills and other first-class Machinists' Tools.

NEW & IMPROVED PATTERNS.—MACHINISTS' TOOLS—all sizes—at low prices. E. GOULD, 97 to 113 N. J. R. R. Ave., Newark, N. J.

Andrew's Patents.

Noiseless, Friction Grooved, or Geared Hoisters, suited to every want.
Safety Store Elevators. Prevent Accident, if Rope, Belt, and Engine break.
Smoke-Burning Safety Boilers.
Oscillating Engines, Double and Single, 1-2 100-Horse power.
Centrifugal Pumps, 100 to 100,000 Gallons per Minute, Best Pumps in the World, pass Mud, Sand, Gravel, Coal, Grain, etc., without injury.
All Light, Simple, Durable, and Economical. Send for Circulars.
WM. D. ANDREWS & BRO.,
414 Water Street, New York.

THE PRATT & WHITNEY CO., Hartford, Conn., are prepared to furnish, from their factory direct, or through their agencies at 25 Park Place, New York, 186 W. 2d St., Cincinnati, O., and 253 So. Canal St., Chicago, Ill., Iron Working Machinery for machine and railway shops, sewing machine and gun factories, and for special purposes, including drop and trip hammers, blacksmith shears and iron shop cranes of thorough construction, with full equipment of the best modern attachments. Enquiries for description and prices are solicited.

☞ JUST PUBLISHED. ☜
Riddell's Mechanic's Geometry. For the use of Workmen in Wood, Stone, and Metals. Illustrated by fifty large plates, including several explanatory cardboard models that can be readily put together, showing the principles of construction in a new and novel manner. By Robert Riddell, author of "Hand Railing Simplified," "The Carpenter and Joiner," etc. 1 volume, quarto, cloth. Price $5.

☞ For sale by booksellers generally, or sent upon receipt of the price.

CLAXTON, REMSEN & HAFFELFINGER
PUBLISHERS, PHILADELPHIA, PA.

MACHINERY, NEW and 2d-HAND. Send for Circular. CHAS. PLACE & CO. 60 Vesey st., New York.

1832. SCHENCK'S PATENT. 1871
WOODWORTH PLANERS

And Re-Sawing Machines, Wood and Iron Working Machinery, Engines, Boilers, etc. JOHN B. SCHENCK'S SONS, Matteawan, N. Y. and 118 Liberty St., New York.

ALL KINDS OF IRON AND STEEL DROP FORGINGS made to order. NEW ENGLAND MOTOR AND MOWER CO., Danbury, Conn

A Set of 12 Steel Lathe Dogs,

From ⅛ to 4 inch.....$17.30
" " " to 2 " .....$ 8.00
Iron, from ⅛ to 2 inch.....$ 6.50
" " " to 4 " $15.00
1 Set of Steel Clamps.....$12.50
" " Iron " $10.00
Expanding Mandrels taking anything from ⅛ to 4 inches, &c.
Send to C. W. LE COUNT, South Norwalk, Conn. for Circular.

THE "PHILADELPHIA"
HYDRAULIC JACK.

PISTON guided from both ends; all working parts guarded from dust; single or double pumps, cylinders, shafts, rocker arms, pistons, etc., entirely steel.
No. 14 N. 5th st., Philadelphia. } PHILIP S. JUSTICE.
No. 42 Cliff st., New York. }

HUSSEY'S NATIONAL
Cottage Architecture.

New and Original Designs. Working Scale Drawings, and Details for all Styles of low-priced Houses, with Specifications and Cost. *Just Published.* Royal quarto. Post-paid, $6.

WOODWARD'S NATIONAL ARCHITECT } 1,000 WORKING DRAWINGS Plans, Details, Specifications & Estimates TWELVE DOLLARS, post-paid.
MONCKTON'S NATIONAL STAIR-BUILDER. } Six Dollars, post paid.
MONCKTON'S NATIONAL CARPENTER & JOINER. } Six Dollars, post paid.
ORANGE JUDD CO., 245 Broadway, N.Y

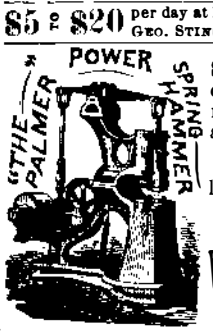
MASON'S PAT'T FRICTION CLUTCHES are manufactured by Volney W. Mason & Co., Providence, R. I. Agents, L. B. BROOKS, 60 Cliff street, New York; TAPLIN, RICE & CO., Akron, Ohio.

RIGBY'S RESPLENDENT GAS-BURNER
Patented June 17, 1873.
Gives increased light with 25 to 30 per cent less gas, as proved by actual test. Sample mailed for 50c. Agents Wanted. Address
RESPLENDENT BURNER CO.,
176 West Fourth Street, Cincinnati.

1874. and 1875 *Catalogues Free.*

Machinists', Blacksmiths,' Model Makers', Pattern Makers', Organ Builders', Piano Makers', and Tools and Supplies for all classes of Mechanics.
A. J. WILKINSON & CO., Boston Mass

$5 to $20 per day at home. Terms Free. Address GEO. STINSON & Co., Portland, Maine.



Superior to any modification of the trip hammer. Simple, Efficient, and Cheap.

☞ Send for Circulars and price.

Address

W. L. Chase & Co.,
95 & 97 Liberty St.,
New York

© 1874 SCIENTIFIC AMERICAN, INC.