

A FEW CHOICE TECHNICAL BOOKS. RECENTLY PUBLISHED.

Davis.—A Practical Treatise on the Manufacture of Bricks, Tiles, Terra-Cotta, Drain Pipes, Sewer Pipes, Fire Bricks, Fire Clays, Roofing, Flooring, and Art Tiles, &c., &c. Including full detailed descriptions of the most modern machines, tools, kilns, and kiln roofs used. Illustrated by 225 engravings and six plates. 8vo. 472 pages. \$5.00.

Dawidowsky-Brann.—A Practical Treatise on the Raw Materials and Fabrication of Glue, Gelatine, Gelatine Veneers and Foils, Isinglass, Cements, Pastes, Mucilages, etc. Including a description of the most recent American processes. 35 engravings. 12mo. \$2.50.

Wahl.—Galvanoplastic Vanishing. A Practical Guide for the Gold and Silver Electroplater. Comprising the Electro-Deposition of all Metals by means of the Battery and the Dynamo-Electric Machine, as well as the most approved processes of Deposition by simple immersion. Illustrated by 189 engravings. 656 pages. 8vo. \$7.50.

Andrews.—A Practical Treatise on the Fabrication of Varnishes and Fat Varnishes, Lacquers, Siccatives, and Sealing Waxes. Illustrated. 12mo. \$2.50.

Hoffer-Brann.—A Practical Treatise on Caoutchouc and Gutta-Percha, comprising the properties of the Raw Materials, and the Manner of Mixing and Working Them. Illustrated. 12mo. \$2.50.

Davis.—A Treatise on Earthy and other Minerals, and Mining. Illustrated by 76 engravings. 336 pages. 12mo. \$5.00.

Ross.—The Blowpipe in Chemistry, Mineralogy, and Geology, containing all known methods of Anhydrous Analysis, many Working Examples, and Instructions for Making Apparatus. With 120 Illustrations. 12mo. \$1.50.

Kerr.—The Assayer's Manual. An Abridged Treatise on the Domestic Examination of Ores and Furnace and other Artificial Products. Illustrated by 65 engravings. 8vo. \$3.00.

READY SHORTLY.

Davis.—The Manufacture of Leather. Being a Description of all the Processes for the Tanning, Curing, and Finishing of Leather, with special reference to the best American Practice. Illustrated by 302 engravings. 8vo. 800 pages. \$10.00.

Walton.—On Mining Described and Illustrated. 24 large and elaborate plates. Quarto. \$5.00.

The above or any of our books sent free of Postage, at the publication price, to any address in the world. We have our new and enlarged catalogue, 96 pages, 8vo., and our other catalogues, the whole covering every branch of science 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, Bookellers, and Importers,
810 WALNUT STREET, PHILADELPHIA, PA.

SIMPLE MECHANICS. How to Make and Mend; easy forms and plain directions for doing nearly

2,000 COMMON THINGS.
Active business men wanted to show samples and take orders. Write for description to **JOSEPH H. HOWARD & HULBERT**, 27 Park Place, New York.

JUST PUBLISHED, PRICE \$2.00 STEEL AND IRON

COMPRISING THE
PRACTICE AND THEORY OF THE SEVERAL
METHODS PURSUED IN THEIR MANUFACTURE AND OF THEIR TREATMENT
IN THE ROLLING MILLS, THE
FORGE, AND THE FOUNDRY.

BY
W. H. GREENWOOD,
F.C.S., ASSOC. M.I.C.E., M.I.M.E.,
ASSOCIATE OF THE ROYAL SCHOOL OF MINES.

WITH 97 DIAGRAMS FROM ORIGINAL WORKING
DRAWINGS.

1 vol. 12mo. Price, \$2.00.

"It is a thorough and exhaustive treatise, beginning with the ore, and bringing it up step by step in all the different directions and through all the different processes a one which and by means of which the pure metal is prepared for the different purposes of the special manufacture. The style is clear, correct, luminous, and the illustrations are what illustrations are not always—real helps to the understanding of the subject matter."—*N. Y. Herald.*

Sent by mail, prepaid, on receipt of price.

NOW READY Cassell & Company's Complete Descriptive Catalogue of Technical Publications, Illustrated and Fine Art Books, Juvenile and Educational Works, which will be forwarded free to any address on application.

Our Publications are For Sale by all Booksellers.

CASSELL & COMPANY, Limited,
739 & 741 Broadway, New York.

CARDS 20 Hidden Name 10 cts.
6 packs 50c. Your name hidden by hand holding flowers on each. 50 New Imported Embossed Chromes 15c
4 packs 50 cts. (not embossed edge as on t. overadvised for 10c. but each flower &c. completely embossed) New '85 Sample Book, illustrated premium list &c. sent FREE with each order. **CAPITOL CARD CO., Hartford, Conn.**

Shot Guns **Revolvers,**
Rifles, Etc.
Large Ill. Address
Catalogue free. Gun Works, Pittsburgh, Pa.

DROP FORGINGS

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.

NEW YORK BELTING & PACKING CO.,
Nos. 13 & 15 PARK ROW, Opp. ASTOR HOUSE, NEW YORK.
Branches: 308 Chestnut St., Philadelphia, Pa. 154 Madison St., Chicago, Ill.



A BOX OF FUN!

To any reader of this paper who will send 24 cents in stamps to pay postage, we will send FREE our New Agent's Sample Book of Cards with a list of a hundred styles and large premium list. We will also mail you a box of goods that would cost more than \$1.00. Just what this box contains: 1 pack Bustle cards, (comic) 1 pack Mind Your Business cards, 1 pack Caution cards, 1 pack Filtration cards, 1 pack Acquaintance cards, 1 pack Escort cards, the game of Kismet, 120 choice Quotations for Autograph Albums, the wonderful Age Tablet, \$500.00 in Confederate Money (facsimile), the Great Triple Prize Puzzle, the game of Fortune, (very laughable) 1 Fortune Telling Tablet, 11 games for parties, 1 Doef and Dumb Alphabet, 1 Morse Telegraph Alphabet, 1 sheet of Parlor Magic full of wonders and fun and mystery. Write at once. Send one cent stamps if you can.

C. S. CARD CO., CENTERBROOK, CONN.

Dyspepsia I CURED MYSELF FREE Dyspepsia

JOHN H. McALVIN, Lowell, Mass., 14 yrs Tax Collector



JUST OUT.

For 10 cts. I will send this Graceful Bracket Design, size 14x15 ins., over 30 new and beautiful miniature designs, and my new Illustrated Catalogue of Scroll Saws and Material, Athletic, and Theatrical Goods, Games, Novelties, Dog and Cat Collars, etc. Or I will send my complete Catalogue for two cent stamps. Best Premium Offers ever made by any dealer in these goods.

Address **E. H. MOODY,**
243 Main St., Hartford, Conn.

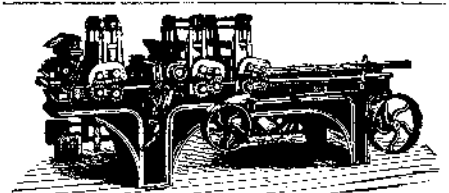
\$5 to \$20 per day at home. Samples worth \$5 free. Address **STINSON & CO., Portland, Maine.**

PAPERS UPON INDUSTRIAL CHEMISTRY.—By Dr. Albert R. Leeds. Soap Analysis.—What it is necessary to determine in the analysis of soap. Former methods of analysis. A new scheme proposed which has been found to give accurate and rapid results, which reduces the performance of the analysis to a few consecutive operations. Contained in **SCIENTIFIC AMERICAN SUPPLEMENT, No. 374.** Price 10 cents. To be had at this office and from all newsdealers.

The New Catalogue of Valuable Papers

contained in **SCIENTIFIC AMERICAN SUPPLEMENT**, sent free of charge to any address.
MUNN & CO., 361 Broadway, N. Y.

SHORTHAND Writing thoroughly taught. Situations procured all pupils when competent. Send for circular. **W. C. CHAFFEE, Oswego, N. Y.**



WITHERBY, RUGG & RICHARDSON Manufacturers of Patent Good Working Machinery of every description. Facilities unsurpassed. Shop formerly occupied by R. Ball & 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**

PATENTS.

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 thirty-eight 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, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business entrusted 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, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, 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,
361 Broadway, New York.

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

PATENTS NEGOTIATED ABROAD.

THE AMERICAN AND FOREIGN INDUSTRIAL ASSOCIATION of New York undertakes the sale of Patents in Europe. Is connected with the "Joint Stock Association" of London, and has Agents in Paris, Brussels, and Berlin. For further particulars, address **HENRY A. HERBERT**, President, 155 Temple Court, New York.

Holland Agency.—A Dutch firm, trading in technical manufactures with the Continent, are open to represent some further sedate articles, by preference specialties. Address, with particulars, **S. M. Y.**, care of Nijgh & Van Dijk's General Advertising Offices, Rotterdam.

LOVE COURTSHIP AND MARRIAGE.

Wonderful secrets, revelations and discoveries for married or single, securing health, wealth and happiness to all. This handsome book of 100 pages, mailed for only 10 cents by the Union Publishing Co., Newark, N. J.

Just Published.

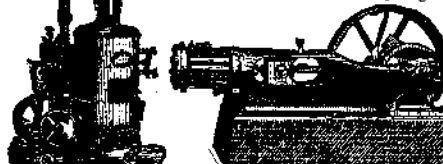
REVISED AND CHEAPER EDITION.
RULES, TABLES, AND DATA:
By **DANIEL KINNEAR CLARK.**

A MANUAL FOR MECHANICAL ENGINEERS.
Based on the most Recent Investigations.

Of constant use in calculations and estimates relating to Strength of Materials and of Elementary Constructions; Labor; Heat and its Applications; Steam and its Properties; Combustion and Fuels; Steam Boilers; Steam Engines; Hot Air Engines; Gas Engines; Flow of Air and of Water; Air Machines; Hydraulic Machines; Mill Gearing; Friction and Resistance of Machinery, etc.; Weights; Measures; Specific Gravity and the Weight of Bodies; Weight of Metals, etc. Third edition; 1,012 pages; 8vo, cloth. \$5.00.
Copies sent free, by mail, on receipt of price.
H. VAN NOSTRAND, Publisher,
23 Murray and 27 Warren Sts., New York.

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.
H. V. PAYNE & SONS,
P. O. Box 1207, Elmira, N. Y.

FARLEY'S REFERENCE-DIRECTORY OF THE

MACHINISTS

IRON, STEEL, AND METAL WORKING TRADES OF THE UNITED STATES.

A. O. FARLEY & CO., Publishers, Philadelphia.

WANTED.

A Business Man capable and willing to manage, and lay out the necessary money, to travel and advertise in a liberal way, and provide buildings for the largest, best, and most complete Museum and Panopticon in Europe, and which has been carried on profitably in one building in an Imperial Residence for the last eight years, and is arranged so that it can be moved in a few hours. The museum contains hundreds of Wax Figures in groups, representing different lectures and Scenes, Figures and Persons, a hundred Mechanical Automaton Figures and Animals, a large collection of Antique and Modern Guns, original Beheading Swords, Blocks, etc.; the Inquisition Horrors in wax and iron from the 13th till the 19th century; Mechanical Moving Wax groups and figures; Singing and Moving Birds on bouquets, in cages, and free; Mechanical Electrical Comic Wonders, and Illusion, etc., etc. To a responsible person half of the entire receipts will be given. Parties wishing can get catalogue and address of owner by addressing "Antique," P. O. Box 773, New York.

LE PAGE'S LIQUID GLUE.

UNEQUALLED FOR CEMENTING
WOOD, GLASS, CHINA, PAPER, LEATHER, &c.
AWARDED GOLD MEDAL LONDON, 1883.
Baker Bros. & Co., 100 N. 3rd St., Phila.
Palace Car Co., &c. Mfd. only by the **RUSSIA CEMENT CO., GLOUCESTER, MASS.** SOLD EVERYWHERE. Sample Tin Cans sent by Mail, 25c.



Syracuse Malleable Iron Works

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.

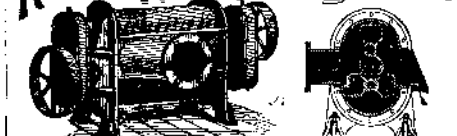


See illus. article in **SCIENTIFIC AMERICAN** Sept. 13, 1884.

WATCHMAKERS.

Before buying, see the Whitcomb Lathe and the Webster Foot Wheel, made by the **AMERICAN WATCH TOOL CO., Waltham, Mass.** CATALOGUES FREE.

ROOT'S NEW IRON BLOWER.



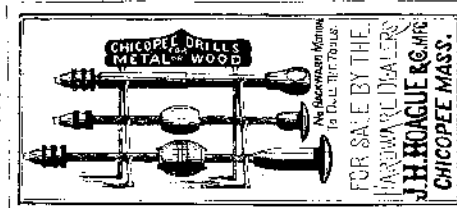
POSITIVE BLAST.

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

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

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

SEND FOR PRICED CATALOGUE.



APPARATUS FOR ELECTRICAL MEASUREMENTS.

Illustrations and description of the various interesting apparatus for measuring electricity that were shown at the Munich Exhibition, including Wiedemann's bifilar galvanometer; Wiedemann's galvanometer for strong currents; Zenger's differential photometer; Von Beetz's solenoid; apparatus for demonstrating the principle of the Gramme machine; Van Rysseberghe's thermomicrograph; Von Beetz's chronograph; and Harlach's apparatus for studying deep currents. Illustrated with seventeen engravings. Contained in **SCIENTIFIC AMERICAN SUPPLEMENT, No. 421.** Price 10 cents. To be had at this office and from all newsdealers.

For Men. Quick, sure, safe. Book free. Civilize Agency, 100 Fulton St., New York.

VIGOR OPIUM

ONLY \$1.00 BY MAIL, POSTPAID.



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 23 years is such as probably never before for 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. Illustrations sample 6 cents. Send now. Gold medal awarded the author by the National Medical Association, to the officers of which he refers.

Address the **Pathology Medical Institute**, or Dr. W. H. Parker, No. 4 Bulfinch Street, Boston, Mass., who may be consulted on all diseases requiring skill and experience. Chronic and obstinate diseases that have baffled the skill of all other physicians a specialty. Such treatment successful without any instance of failure. Consultation from 9 A. M. to 6 P. M. Sundays from 11 A. M. to 1 P. M. Be sure of the No. 4.

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.

OTHER COUNTRIES.—Patents are also obtained on very reasonable terms in France, Belgium, Germany, Austria, Russia, Italy, Spain (the latter includes Cuba and all the other Spanish Colonies), Brazil, British India, Australia, and the other British Colonies.

An experience of THIRTY-EIGHT years has enabled the publishers of **THE SCIENTIFIC AMERICAN** to establish competent and trustworthy agencies in all the principal foreign countries, and it has always been their aim to have the business of their clients promptly and properly done and their interests faithfully guarded.

A pamphlet containing a synopsis of the patent laws of all countries, including the cost for each, and other information useful to persons contemplating the procuring of patents abroad, may be had on application to this office.

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.