

A New and Important Book on Metallic Alloys, Solders, etc.

RECENTLY PUBLISHED.

# THE METALLIC ALLOYS

A Practical Guide for the Manufacture of all Kinds of Alloys, Amalgams, and Solders used by Metal Workers, together with their Chemical and Physical Properties and their Application in the Arts and the Industries, with an Appendix on the Coloring of Alloys. Translated and edited, chiefly from the German of A. Krupp and Andreas Wildberger, with extensive additions, by Wm. T. Brant, one of the editors of "The Techno-Chemical Receipt Book," etc. Illustrated by 16 engravings. 12mo., 428 pages. Price, \$2.50.

By mail, free of postage, to any address in the world. A descriptive circular giving the full table of contents of the above book, together with a list of Important Books on Electro-Metallurgy, Moulding, Founding, Pattern Making, and Metal Working, sent free to any one who will apply.

Send this New and Revised Catalogue of Practical and Scientific Books, 37 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 his address.

**HENRY CAREY BAIRD & CO.,**  
INDUSTRIAL PUBLISHERS, BOOKSELLERS & IMPORTERS  
510 Walnut St., Philadelphia, Pa., U. S. A.

"Improvement of the order of the age."

# THE SMITH PREMIER TYPEWRITER



Important Improvements. All the Essential Features greatly perfected. The Most Durable in Alignment. Easiest Running and Most Silent. All type cleaned in 10 seconds without soiling the hands. The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A. Send for Catalogue.

**TIGHT & SLACK BARREL MACHINERY**  
A SPECIALTY OF  
**JOHN GREENWOOD & CO.**  
ROCHESTER, N. Y.

**ELECTRO MOTOR. SIMPLE. HOW TO MAKE.** By G. M. Hopkins.—Description of a small electro motor devised and constructed with a view to assisting amateurs to make a motor which might be driven with advantage by a current derived from a battery, and which would have sufficient power to operate a foot lathe or any machine requiring not over one man power. With 11 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 641. Price 10 cents. To be had at this office and from all newsdealers.

**S and 16 Light Dynamos,**  
Sewing Machine and Fan Motors,  
Complete Machines or Castings,  
and parts and instructions.  
**Electro Plating Dynamos**  
School Demonstrating Dynamos,  
Plunge Batteries, Electrical Supplies.  
Send stamp for catalogue.  
**PALMER BROS.,**  
Mianus, Conn.

**HOW TO MAKE DYNAMO-ELECTRIC MACHINES.**—By Geo. M. Hopkins. With drawings to scale and full directions for constructing dynamos of different sizes. The small machine is intended for experimental purposes. With heat from 4 to 6 inches of platinum wire, produce the electric light, decompose water rapidly, magnetize steel, ring a large gong, give powerful shocks, operate induction coils, and will, for temporary use, replace 8 or 10 Bunsen cells. Contained in SUPPLEMENTS 161 and 399. Price 10 cents each. The larger machine produces eight 16-candle lights or one powerful arc light. Can be arranged as a series, shunt, or compound wound machine. Can be run for a short time by two or four men. Requires one horse power for continued running. Best engravings of dynamo ever produced. Details of every part shown. Winding of armature and field magnet fully explained. Any intelligent person with the aid of these drawings and instructions may make useful, durable, and effective machines. Contained in SUPPLEMENT 600. Price 10 cents. MUNN & CO., PUBLISHERS. 361 Broadway, New York.

**EXCELSIOR STEREOPTICONS**  
FOR SCHOOLS & PUBLIC ENTERTAINMENTS—  
LANTERN SLIDES COLORED & UNCOLORED  
SEND FOR CATALOGUE  
**QUEEN & CO.**  
PHILA. PA.

**GYMNASTICS FOR GIRLS.**—AN INTERESTING account of the course of instruction given at the Berkeley Athletic Club for Ladies. With 18 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 733. Price 10 cents. To be had at this office and from all newsdealers.

# 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 forty-one 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 OFFICES.—No. 622 and 624 F Street, Pacific Building, near 7th Street, Washington, D. C.

**DEAFNESS & HEAD NOISES CURED**  
by Peck's Invaluable Tubular Ear Cautions. Whispers heard. Successful when all remedies fail. Sold only by F. H. H. 553 Broadway, N. Y. Write for book of proofs FREE

**MOSS ENGRAVING COMPANY**  
335 PEARL ST. COR. ELN. NEW YORK  
OUR PROCESSES PHOTO ENGRAVING ZINC ETCHING WE DO FINE PRESS WORK  
Engravings direct from photographs and other copy. Our circular "N" shows specimens. Fine printing a specialty.

# THE DAIMLER MOTOR

**THE DAIMLER MOTOR CO.**  
is prepared to furnish 1, 2, and 4 Horse Power GAS or PETROLEUM MOTORS for all Industrial Purposes. Fully illustrated catalogue and price list on application. Motors in operation at Works, Steinway, Long Island City.  
Office, 111 East 14th Street, New York City.

# STRONGHOLD BELT CLASP

(Patented Sept. 21, 1886.)  
For Round Belts. Cheapest, Strongest, Lightest, and most Secure Coupling made. The only perfect Coupling for Round Belts in the market. All sizes from 1/2 to 3/4 in. in stock and for sale by all dealers in Leather Belting. Apply to  
**W. T. MESSEREAU & CO.**  
34 Union Square, near 17th Street, NEW YORK CITY.

# JAMES LEFFEL WATER WHEELS

**ENGINES, and BOILERS.**  
**JAMES LEFFEL & CO.**  
FARLO ST., SPRINGFIELD, OHIO.  
110a Liberty Street New York City.

**THE EAGLE**  
THE EASIEST RUNNING BICYCLE IN THE WORLD.  
Speed, Comfort and Safety.  
AGENTS WANTED.  
Large Illustrated Catalogue sent Free to any Address.  
**THE EAGLE BICYCLE MFG. CO.,**  
STAMFORD, CONN.

EXCELLENT BLACK COPIES, only equalled by Lithography, of anything written or drawn with any Pen by the Patent Specimens  
**AUTOCOPYIST**  
free.  
Ten Eyck & Parker, 66 Pine Street, New York

**WORKING LOCOMOTIVES WITH**  
Petroleum Fuel.—By Thomas Urquhart. An interesting account of the recent results of the author's experience in the use of petroleum refuse as fuel on an unprecedented scale upon the Graz & Tauris Railway, South-east Russia. With 52 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT Nos. 769 and 770. Price ten cents each. To be had at this office and from all newsdealers.

**IDE AUTOMATIC ENGINES. TRACTION AND PORTABLE ENGINES.**  
**STEAM ROAD ROLLERS.**  
**WEITMYER PATENT FURNACE.** BOILERS OF EVERY DESCRIPTION.  
Manufactured by FOUNDRY & MACHINE DEPARTMENT, Harrisburg, Pa., U. S. A.

**HARRISON CONVEYOR!**  
For Handling Grain, Coal, Sand, Clay, Tan Bark, Cinders, Ores, Seeds, &c.  
Send for Circular. **BORDEN, SELLECK & CO.,** Sole Manufacturers, Chicago, Ill.

**ICE and REFRIGERATING MACHINES**  
The Pictet Artificial Ice Company (Limited), Room 6, Coal & Iron Exchange, New York.

**Burnham's New Improved Standard Turbine**  
Vertical or Horizontal. Yields a greater percentage of water used, either with full or part gate drawn, and is the simplest constructed and best finished wheel in the market. Can fill your order promptly. **BURNHAM BROS.,** YORK, PA.

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

**ON THE ELECTRO-DEPOSITION OF PLATINUM.**—By William H. Wahl. Description of a practical method of depositing platinum by electrolysis, a result never before accomplished satisfactorily. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 777. Price 10 cents. To be had at this office and from all newsdealers.

**BICYCLES** ON EASY PAYMENTS  
All makes new or 2d hand. Lowest prices guaranteed. Send for catalogue and save money. **Rouse, Hazard & Co.,** 16 G St. Peoria, Ill.

# A LIBRARY FOR \$1.00

Five books in one. Worth its weight in gold to every mechanic. The very latest information for 20 different trades. This wonderful book contains 575 pages absolutely teeming with rules, tables, secret processes, and new information that cannot be had elsewhere for less than \$25.00. The Modern Steam Engine—How to Read an Indicator—The Westinghouse Air Brake—Blacksmith's and Machinist's Tools—Practical Mathematics Simplified—Tin and Sheet Iron Worker's Manual—Carpenter's Manual—Points for Painters—Magnetism and Electricity—How to Get a Patent—A Mechanical Dictionary. Everything fully explained in one handsome volume and guaranteed to be absolutely correct. Send \$1.00 for a copy bound in silk cloth, or \$1.50 for Morocco binding. With each copy of the book we give free a complete working chart for setting gear teeth. The regular price of this chart is \$1.50. **AGENTS WANTED.** Write for terms. **LATROD & LEE, Publishers, 263 Wash Avenue, Chicago, Ill.**

**WHAT** Uncle Sam and Aunt Columbia think, etc., of **WASHINGTON and SEATTLE.** Send stamp to **Kahelman, Llewellyn & Co.,** Seattle, W.

# FIRE FELT.

It is to be superior to Hair Felt in Non-Conducting qualities. Made into sectional form for pipes and into sheets and rolls for large surfaces. Send for Samples.  
**Asbestos Boiler Coverings, Steam Packings, Asbestos Cloth, Asbestos Building Paper, etc.**  
**THE CHALMERS-SPENCE CO.,** 59 and 61 Liberty St., New York.  
BRANCHES—Philadelphia, Chicago, Pittsburgh, Boston.

# STAMPED CORRUGATED SHEETS

Insure Perfect Joints in Your Buildings. And when your joints are perfect, your buildings are Fire, Wind, and Water Proof.  
**THE CINCINNATI CORRUGATING CO.**  
Send for Catalogue B. Piqua, Ohio.

**MORE FLEXIBLE 9-TIMES STRONGER**  
RUBBER COVERED WIRE BELTS  
THAN LEATHER. NOT AFFECTED BY WET DRY OR HEAT. SEND YOUR FULL NAME AND ADDRESS FOR PRICE LIST AND ILLUSTRATIONS TO THE MIDGLEY WIRE BELT CO., BEAVER FALLS, PENNA. U.S.A. GOOD AGENTS WANTED. NAME THIS PAPER.

**THE PENNA. DIAMOND DRILL & MFG. CO.**  
BIRDSBORO, PA., Builders of High Class Steam Engines, Diamond Drilling and General Machinery. Flour Mill Rolls Ground and Grooved.

**EVERY USER OF MACHINERY SHOULD LEARN**  
**How to Use Loose Pulleys.**  
Useful information on this subject is given in our "Catalogue No. 56." Sent free to any address.  
**VAN DUZEN & TIT, Cincinnati, Ohio.**  
MENTION THIS PAPER.

**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.

**Caligraph.**  
LIFESHORT-WRITE THE WAY  
Address: The American Writing Machine Co., Hartford, Conn.; New York Office, 237 Broadway.

**STEEL TYPE FOR TYPEWRITERS**  
Stencils, Steel Stamps, Rubber and Metal Type Wheels, Dies, etc.  
Model and Experimental Work  
Small Machinery, Novelties, etc., manufactured by special contract.  
New York Stencil Works, 100 Nassau St., N.Y.

**BLUE PRINT** Paper, Superior Quality. Photographic Supplies. Send for catalogue.  
**T. H. MCCOLLIN & CO.,** 109 Arch Street, Philadelphia.

**PATENTED NOVELTIES** of merit sold by inventor, **H. B. HARFORD & SON,** Office Rooms, 9 & 10 Exchange Bldg., 134 Van Buren St. Chicago.

**CHUCK AND MICROMETER STOP** for Amateurs.—By C. D. Parkhurst. Description of a simple and easily constructed chuck for use with a dividing machine, and the micrometer stop that is used to regulate the depth of the cut in the graduation of circles, etc. With 9 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 772. Price 10 cents. To be had at this office and from all newsdealers.

**STEEL TYPE FOR TYPEWRITERS**  
Stencils, Steel Stamps, Rubber and Metal Type Wheels, Dies, etc.  
Model and Experimental Work  
Small Machinery, Novelties, etc., manufactured by special contract.  
New York Stencil Works, 100 Nassau St., N.Y.

**BLUE PRINT** Paper, Superior Quality. Photographic Supplies. Send for catalogue.  
**T. H. MCCOLLIN & CO.,** 109 Arch Street, Philadelphia.

**PATENTED NOVELTIES** of merit sold by inventor, **H. B. HARFORD & SON,** Office Rooms, 9 & 10 Exchange Bldg., 134 Van Buren St. Chicago.

**IDEAL MUSICAL BOX**  
Is the Latest Invention in Swiss Musical Boxes. It is the Sweetest and Most Perfect Instrument for the Parlor. Any number of tunes can be obtained for it. The Largest Stock of Musical Boxes in America. Send 4 cent stamp for Illustrated Catalogue.  
**JACOT & SON, 800 BROADWAY, NEW YORK.**

# TYPEWRITERS.

Lar est like establishment in the world. First-class Second-hand Instruments at half new prices. Unprejudiced advice given on all makes. Machines sold on monthly payments. Any Instrument manufactured shipped, privilege to examine. EXCHANGING A SPECIALTY. Wholesale prices to dealers. Illustrated Catalogues Free.  
**TYPEWRITER** } 70 Broadway, New York.  
**HEADQUARTERS,** } 144 La Salle St., Chicago.

**\$10.00 to \$50.00** per night. A light and profitable business. Magic Lanterns and Views of popular subjects. Catalogues on application. Part 1 Optical, 2 Mathematical, 3 Meteorological, 4 Magic Lanterns, etc.  
**L. MANASSE, 88 Madison Street, Chicago, Ill.**

**AGENTS** make 100 per cent. profit on my Corsets, Belts, Brushes, Curlers, and novelties. Samples free. Write now. **Dr. Bridgman, 373 B'way, N.Y.**

**BEATTY'S ORGANS, PIANOS \$35 UP.**  
Write for Catalogue. Address **Dan'l F. Beatty, Washington, N.J.**

**THE NEW NON-CONDUCTING MATERIAL**  
is a Flexible Felt Made of Pure Asbestos, in a finely divided fibrous state, indestructible by heat and unexcelled as a Non-Conductor. U. S. Navy tests show for pipes and into sheets and rolls for large surfaces. Send for Samples.  
**Asbestos Boiler Coverings, Steam Packings, Asbestos Cloth, Asbestos Building Paper, etc.**  
**THE CHALMERS-SPENCE CO.,** 59 and 61 Liberty St., New York.  
BRANCHES—Philadelphia, Chicago, Pittsburgh, Boston.

# PROPOSALS.

**Proposals for Jetty Construction at Entrance to Galveston Harbor, Texas.**—UNITED STATES ENGINEER OFFICE, Galveston, Texas, February 28, 1891. Sealed proposals, in duplicate, will be received at this office until 12 o'clock, noon, 30th meridian time, March 30, 1891, and then opened, for delivery of about 1,000,000 tons of stone and concrete blocks in place, for improving the Entrance to Galveston Harbor, Texas. Preference will be given to materials of domestic production or manufacture, conditions of quality and price (import duties included) being equal. The attention of bidders is invited to the Acts of Congress approved February 26, 1885, and February 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, U. S. Statutes at Large. For blank forms for proposals, and all necessary information, apply to **CHARLES J. ALLEN, Major, Corps of Engineers.**

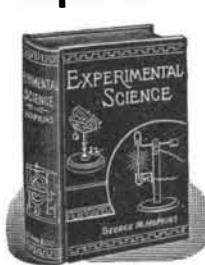
# PROPOSALS FOR IMPROVEMENTS IN MAIL-BAGS, MAIL-CATCHERS AND MAIL-BAG LABEL HOLDERS.

POST OFFICE DEPARTMENT, WASHINGTON, D. C., February 28, 1891.—Sealed proposals from patentees or their assignees for granting the use of patented improvements in the mode of opening and closing mail-bags of any kind, and in the construction of mail-bags, mail-catchers, and devices for labeling mail-bags, will be received at this Department until noon, on Wednesday, the second day of September, 1891. All proposals must be in accordance with the specifications, which can be obtained from the Second Assistant Postmaster General, Mail Equipment Division.  
**JOHN WANAMAKER, Postmaster General.**

# PROPOSALS FOR MAIL-BAG CORD-FASTENERS AND FOR IRON AND STEEL, &c., FOR POST OFFICE DEPARTMENT.

POST OFFICE DEPARTMENT, WASHINGTON, D. C., February 28, 1891.—Sealed proposals will be received at this Department until noon, on Wednesday, the sixth day of May, 1891, for furnishing, according to contract, Mail-bag Cord-fasteners, Iron, Steel, Brass, Oils, and Waste. All proposals must be in accordance with the specifications, which can be obtained from the Second Assistant Postmaster General, Mail Equipment Division.  
**JOHN WANAMAKER, Postmaster General.**

# Experimental Science



BY **Geo. M. Hopkins.**  
Interesting Experiments in Every Branch of Physics. Descriptions of Simple and Efficient Apparatus, much of which may be Made at Home. Among Subjects treated are Electricity in all its Branches, Magnetism, Heat, Light, Photography, Microscopy, Optical Illusions, Mechanics, etc. A world of Valuable Information. A Source of Rational Amusement. A superb work for Young and Old.

Illustrated Circular and Table of Contents sent free. 740 PAGES. 680 ILLUSTRATIONS.  
PRICE, by mail, postpaid, - - - \$4.00.  
**MUNN & CO., Publishers,**  
Office of THE SCIENTIFIC AMERICAN,  
361 Broadway, New York.

**AUCTION NOTICE.** Henry B. Herts' Son, Auctioneer, will sell on Monday, March 30, at 11 o'clock, at the private mansion, No. 149 Second Ave., near 10th St., N. Y. City, the celebrated Barrow Collection of Electrical and Scientific Apparatus, being a large and valuable assortment of galvanometers, resistors, tubes, air pumps, Holtz Machine, Electro Magnets, Fine Microscope with numerous Lenses, collected by the late John Wylie Barrow, founder and first President of the Franklin Scientific Association.  
The goods will be on exhibition Saturday, March 28th.

**CUSHMAN CHUCKS**  
Complete line for all uses shown in new illustrated catalogue. Free to all.  
**Cushman Chuck Co.,** Hartford, Conn.

**STENCILS, STEEL NAME STAMPS, STEEL** Figures, Alphabets, Burning Brands, and Log Hammers, Printing Dies, Brass Signs, Door Pulls, and Seals.  
**BELLOWS & KONIGSLOW,**  
314 Seneca St., Cleveland, O.

**FAMILY ICE MACHINE** Ice, etc., in a few minutes. \$10 & up. L. Dermigny, 125 W. 25th St., N. Y. State Rights for sale.

**THE COPYING PAD.**—HOW TO MAKE and how to use; with an engraving. Practical directions how to prepare the gelatine pad, and also the aniline ink by which the copies are made; how to apply the written letter to the pad; how to take off copies of the letter. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 438. Price 10 cents. For sale at this office and by all newsdealers in all parts of the country.

A young man who understands the manufacture of  
**Perforated Tin Plates**  
seeks a position. Please address offers to D. 4947, care Rudolf Mosse, Coln, a. R. Germany.

**FOR SALE, LEASE, OR RENT.**  
Valuable Property for Manufacturing and Summer Resorts. Large factory, with steam power and heat and other modern conveniences, water power, etc., and ten acres of valuable building sites on Lake George, close to railroad depot and post office, Caldwell, N. Y. Factory is suitable for large variety of manufacturing. For particulars, address **John E. Alder, Glens Falls, N. Y.**

**FOR SALE CHEAP.** One Horizontal Slide Valve Engine, 8 inch cylinder, 16 inch stroke, with pulley, with assortment shafting, pulleys, steam pump, 10x5x4. Address **H. T. Bartlett, 200 Lewis Street, New York.**

**FOR SALE AT A Bargain.**—A small Stove and Job Foundry in complete running order. Address **W. T. B., care SCIENTIFIC AMERICAN, N.Y.**

# The Scientific American PUBLICATIONS FOR 1891.

The prices of the different publications in the United States, Canada, and Mexico are as follows:

RATES BY MAIL.	
The Scientific American (weekly) one year	\$3.00
The Scientific American Supplement (weekly), one year	5.00
The Scientific American, Spanish Edition (monthly) one year	3.00
The Scientific American, Architects and Builders Edition (monthly), one year	2.50
COMBINED RATES.	
The Scientific American and Supplement	\$7.00
The Scientific American and Architects and Builders Edition	5.00
The Scientific American, Supplement, and Architects and Builders Edition	9.00

Proportionate Rates for Six Months.  
This includes postage, which we pay. Remit by postal or express money order, or draft to order of  
**MUNN & CO., 361 Broadway, New York.**

WORKING MODELS & LIGHT MACHINERY. INVENTIONS DEVELOPED. Send for Model Circular. Jones Bros. E. Co., Cin'ti. O.