## **OSBORN'S**

# Prospector's Field Book and Guide.

THIRD EDITION. JUST BEADY.

The Prospector's k'ield Book and Guide in the Search for and the Easy Determination of Ores and other Minerals. By Prof H. S. Osborn, LL.D. 58 engravings Third edition, revised and enlarged. 235 pages, 12mo. Price \$1.50 by mail, free of postage, to any addres in the world.

n one worm.

The A Descriptive Circular, illustrated, 4 pages, quarto, wing the full Table of Contents of thea bove volume, sent ree to any one in any part of the world who w ll. furnish is address.

his address.

To Sur New and Revised Catalogue of Practical and Scientific Books, Il pages, 800, 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., USTRIAL PUBLISHERS, BOOKSELLERS & IMPOR. 810 Walnut St., Philadelphia, Pa., U.S. A.

### Ready September 1st.

Stage Illusions and Scientific Diversions Including Trick Photography.

COMPILED AND EDITED BY

WITH AN INTRODUCTION BY HENRY RIDGELY EVANS.

Over 500 pages. Over 400 illustrations.

This is a new and unique work on magic art. It con tains exposés of the sleight-of-hand feats and illusions of the most famous conjurors of modern times. It is profusely illustrated with over 400 engravings. The subjects treated include interesting Biographies of Celebrated Conjurors, the Mysteries of Modern Magic, Ancient Magic, Science in the Theater, Automata, Curious Toys, and Photographic Diversions. The very latest developments in each line will be given. Thus, under photography the projection of moving pictures is taken up for the first time in book form.

An illustrated circular of this work is now ready, and will be mailed on request to any part of the world. The book will be sent, postpa d, on rece pt of \$2.50.

MUNN & CO., PUBLISHERS, 361 BROADWAY, NEW YORK CITY.



WHY PAY MONEY WHEN

## MODEL WORK

We are prepared to assist the trade and inventors in solving mechanical problems, also manufac-turing models and stock.

CENTURY MACHINE CO., 576 W. Broadway, New York omplete outfit of modern machinery and tools.



# **WOODEN TANKS.** For Railroads, Mills and Manufactories. Builders of Steel Towers and Tanks. La. Red Cypress Wood Tanks a specialty

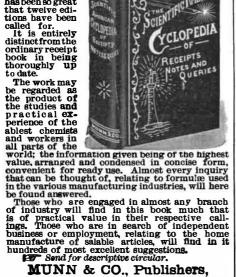
W. E. CALDWELL CO., 217 E. Main Street, Louisville, Ky.

Twelfth Edition Now Ready.

# THE SCIENTIFIC AMERICAN CYCLOPEDIA OF Receipts, Notes and Queries

12,500 RECEIPTS. 708 PAGES. Price, \$5.00 in Cloth; \$6.00 in Sheep; \$6.50 in Half Morocco, Postpaid.

THIS great
work has now
been on the market for nearly
six years, and
thedemandforit
has been so great
that twelve editions have been
called for.
It is entirely
distinct from the
ordinary receipt
book in being
thoroughly up
to date.
The work may



MUNN & CO., Publishers, 361 Broadway, New York. | instru

Switch, M. F. Finnerty.

Switchboard system, central office, W. S. & E. M.
Harrison.

Switch mechanism, automatic, J. E. Tryon.

Switch mechanism, automat Telegraphy, F. M. Short.

Telephone central station signaling circuit, G. K.

Thompson.

Telephone switchboard apparatus, C. E. Seribner.

ner.

Telephone switchboard signal, C. E. Scribner.

Ser, 445

Telephone switchboard signal, C. E. Scribner.

Ser, 445

Telephone switchboard signal, C. E. Scribner.

Ser, 445

Telephone system, automatic, M. Freudenberg.

Ser, 554

Telephone transmitter, O. Moran.

Ser, 654

Telephone transmitter, O. Moran.

Sanche.

Sanche.

Sanche.

Sanche.

Ser, 440

Thill coupling, A. C. Kane.

Ser, 440

Thill coupling, A. C. Kane.

Ser, 440

Thill support, J. C. Coffee.

Thread cutter and addressing device for spools,

W. H. White.

Titer, beycle, W. B. Mann.

Tire, elastic, B. H. Chameroy.

Ser, 452

Trop, E. A. Bondurant.

Trop, E. A. Bondurant.

Ser, 453

Trousers, P. G. Hercht.

Trunk, M. Lyons.

Trunk, M. Lyons.

Ser, 567, 567

Trunk, F. J. Palica.

Trunk, E. J. Palica.

Ser, 430

Trunk, M. Lyons.

Ser, 567, 567

Typewriter scale, Kitzmiller & Gillis.

Ser, 452

Trunk, E. J. Palica.

Ser, 453

Trunk, telescopic, F. J. Palica.

Ser, 567, 567

Typewriting machine, H. S. Dukes.

Ser, 567, 567

Valve, der olocomotive engines, overpass, C. J.

Mellin.

Ser, 622

Valve, M. Abt.

Ser, 623

Valve, M. Abt.

Ser, 623

Valve, Ser, 543

Valve, Ser, 544

Walve, Goodspeed.

Ser, 637

Valve, straightway, C. Jenkins.

Ser, 638

Venicited padal.

Venicited padal.

Perver.

Ser, 587, 587

Valve, straightway, C. Jenkins.

Ser, 638

Velocipede pedal.

Perver.

Ser, 587, 587

Valve, straightway, C. Jenkins.

Ser, 638

Velocipede pedal.

Perver.

Ser, 587, 587

Ser, 681

Velocipede pedal.

Perver.

Ser, 587, 587

Washing machine, J. D. Locke.

Ser, 681

Velocipede pedal.

Perver.

Ser, 587, 591

Wave and swell motor. H. Schomberg.

Ser, 587, 591

Wave and swell motor.

Ser, 587, 591

Wave and swell motor.

Ser, 587, 591

Wave and swell motor.

Ser, 587, 591

Wave and swell mo

DESIGNS.	
Badge, D. A. Reese.       27         Baking pan, G. W. Knapp.       27         Bath tub, W. P. Selbert.       27         Bath tub rim, D. D. Bulck.       27         Batteries, frame for ore stamp, W. G. Dodd.       27         Bedstead, M. Hall.       27         Bedsteads, metal mount for, F. W. Chesson.       27         Bicycle chains, side plate for, E. C. Fletcher.       27         Box or can, A. Cameron, Jr.       27         Carpet, W. B. Brown.       27	
Carpet, W. B. Brown       27         Carriage jack, P. Lanouette.       27         Check hook, H. H. Whitney.       27         Clevis, C. M. Ja vis.       27         Clock case or olumn, J. Wells.       27         Coin actuated machines, casing for, F. T. Parritt       27         Coin actuated wheels. casing for, J. C. Carter.       27         Communion cup, individual, H. G. Husted.       27         Communion cups, receptacle for, H. G. Husted.       27         Door fastener, J. D. Decelle.       27         Fuel, E. B. A. Zwoyer.       27,483         Glass vessel, J. D. Bergen.       27	
Glass vessel, G. H. West	4
Reamer drill, P. Feeney. 27 Rope tightener, L. E. Coale. 27 Scales, casing for weighing, W. N. Pelouze. 27 State, B. McConnellogue. 27 Spoons, etc., handle for, C. Silber. 27 Stay, dress, A. W. Lublin. 27 Tyre, F. B. Hopewell. 27 Trimming, S. Friedberger. 27 Wrindow fast ener socket, J. P. Smith. 27,467, 27 Wrench, F. L. Coes. 27 Wrench, F. L. Coes. 27 Wrench, S. T. Freas. 27	
Transa, or 21 21 outsite from the second sec	•

### TRADE MARKS.

Apparel, men's wearing, W. C. Loftus & Company 30,453
Bicycles, Penn Manufacturing Company. 30,476
Boots and shoes, C. M. Hapgood Shoe Company. 30,476
Butter, Eigin Creamery Company. 30,432
Gatsup, vinegar, preserves, felles, table sauces, pickles, chow chow, pepper sauce, olives, and extracts, Viaccus & Elliott Company. 30,462
Cereals, dried fruit, corn starch, spices and baking yowder, Mitchell, Fletcher & Company. 30,462
Chemical substances for sanitary purposes, Gas 1,462
Coffee compounds, Javarye Coffee Company. 30,462
Coffee compounds, Javarye Coffee Company. 30,462
Coffee ompounds, Javarye Coffee Company. 30,462

pany Insecticide for poultry, stock, and vegetation, L J. Ball. Lanterns, cycle, H. Riemann. Linjment for internal and external use, J. A. 30,482 Lee. 30,455
Mailing cases, Improved Mailing Case ompany. 30,474
Oats and oatmeal, rolled, Muscatine Oatmeal
Company. 30,471
Remedies for gout and rheumatism, E. J. Isenburg.

Company.

Remedies for gout and rheumatism, E. J. Isenburg.

Rubber packing, W. J. Gorham.

Salves, S. D. Harding.

Scales, weighing, Computing Scale Company.

Shoes, high cut men's or women's, Portsmouth Shoe Company.

Soap, H.O (Hornny's Oatmeal) Company.

Soap, H.O (Hornny's Oatmeal) Company.

Soap, Ho (Hornny's Catmeal) Company.

30,458

### PRINTS.

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1853, will be furnished from this office for 10 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York. Special rates will be given where a large number of copies are desired at one time.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$40 exc. If complicated the cost will be a little more. For full instructions address munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

KRAFTUBERTRAGUNGSWERKE RHEINFELDEN. Society for the Utilization of the Water 16,800 H. P. NOW AVAILABLE, TO BE INCREASED TO 30,640 H. P. The Company is in a position to let electric energy at exceptionally cheap rates and on the most favorable terms. They also offer to applicants wishing to establish themselves near the works, suitable land on either the German (Badish) or the Swiss side of the Rhine, in the vicinity of important railway lines. Cheap labor.

For further information please address The Manager, Kraftubertragungswerke, Rheinfelden, Switzerland.



CROOKES TUBES AND ROENTGEN'S Photography.—The new photography as performed by the use of Crookes tubes as a source of excitation. All about Crookes tubes. SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 181, 189, 233, 243, 244, 792, 795, 905, 980, 1050, 1054, 1055, 1056, 1057, also SCIENTIFIC AMERICAN, Nos. 7, S. 10 and 14, Vol. 74. These profusely illustrated SUPPLEMENTS contain a most exhaustive series of articles on Crookes tubes and the experiments performed with them. Among them will be found Prof. Crookes' early lectures, detailing very fully the experiments which so excited the world and which are now again exciting attention in connection with Roentgen's photography. Price 10 cents each. To be had at this office and from all newsdealers. CROOKES TUBES AND ROENTGEN'S



COPY LETTERS fifteen a minute, all legible, use my improved automatic copying ma hine.

Sond for illustrated circular.

JOHN H. ANDERSON, 910 Monadnock, CHICAGO.

LEHIGH PREPARATORY SCHOOL Best recommendations. Young men are prepared for Lehigh University, Yale, Harvard, Cornell, Princeton, etc. Over seven hundred pupils of this school have been admitted to Universities during the past eighteen years. For particulizing analytic

W. ULRICH, Ph.D., Bethlehem, Pa. DRY BATTERIES.—A PAPER BY L. K. Bohm, treating of open circuit batteries, historical dry batteries, modern dry batteries, Hellesen's battery. Bryan's battery, Koller's battery, and the efficiency of try cells. With three illustrations. Contained in Scientific American Supplement, No. 1001. Price D cents. To be had at this office and from all newsdealers.



# MICA WASHERS

For all mechanical uses. Perfect insulators. Samples and quotations furnished. A. O. SCHOONMAKER, 158 William Street, New York.

SAYED by sending for my 1897 Catalogue and Discounts on Architectural, Building, Mechanical, Electrical, Scientific and Technical Books, WM, T. COMSTOCK, 23 Warren St., New York

CAUSE OF LUMINOSITY IN THE Flanes of the Hydrocarbon Gases.—By Prof. Vivlan B. Lewes. An important paper in which the author endeavors to show that the luminosity of hydrocarbon flames is due to the localization of the heat of formation of acetylene in the carbon and hydrogen produced by its decomposition, and the cause of such localization. Contained in Scientific American Supplement. Nos. 1012 and 1013. Price 10 cents each. To be had at this office and from all newsdealers.

# Whitehall Cerminal

# **NEW ENTRANCE TO NEW YORK CITY** VIA B. & O.—Unequalled Facilities.

Whitehall Terminal, the new entrance into New York City, opened for business by the Baltimore and Ohio R.R. on Monday, July 19, is the most convenient station to and from all parts of New York City and Brooklyn-This terminal is at South Ferry, east of Battery, and from it, under the same roof, direct connections are made with trains of the Second, Third, Sixth and Ninth Avenue Elevated Roads; Broadway, Columbus and Lexington Avenue Cable Lines; East and West Side Belt Lines of horse cars; South Ferry, Staten Island Ferry, Hamiton Avenue and Thirty-ninth Street (Brooklyn) Ferry.

inconvenience.

### PROPOSALS.

U. S. ENGINEER OFFICE, ARMY BUILDING.
New York, July 25, 1897.—Sealed Proposals, in
Triplicate, for construction of riprap wall on eastern
beach of Sandy Hook, N. J., will be received here until 12
M., Aug. 25, 1897, and then publicly opened. Information furnished on application. WILLIAM LUDLOW,
Lieut. ol. Engineers.

Lieut. ol. Engineers.

PORT ELIZABETH MUNICIPALITY. TENDERS FOR ELECTRIC LIGHTING. The Town Council of Port Elizabeth, Cape Colony, are prepared to receive Tenders for Lighting the Streets and Municipal Buildings of Port Elizabeth by Electricity in consideration of the grant of a concession for the exclusive right of supplying electric current through the streets and roads of the town, to private houses, stores, etc., for terms of 6, 15, 20, 25 or 30 years respectively. The number of inhabitants of the town is about 30,000, of whom about 20,000 are Europeans. There are, approximately, about 50 miles of streets in the town as follows: Main thoroughfares, 5 miles 1,185 yards; principal streets, 16 miles, 1,433 yards; minor streets, 32 miles. The streets of the town are at present lighted by 330 gas lamps of reputed 16 candle power. The Municipal Buildings consist of Town Hall, Municipal Offices, Morning Market, Feather Market, Wool Market, and Museum. The main streets are to be lighted by Arc Lamps and the side streets and municipal buildings by Incandescent Lamps. The tenderers must state at what sum per annum they are prepared to adequately light the creeks and dunoto, if the propers of the price of the pric

WE BUY PATENTS, small novelties. Columbian Novelty Company, 766 Broad Street, Newark, N. J.

FILMS

For the Best Projecterscope or Kinetoscope Films, new list, F. L. WILLARD, 196 Lexington Avenue, Brooklyn, N. Y.

Experimental Pattern and Model Work, Optical, etc., instruments, bicycle sundries. EMPIRE NOVELTY WORKS, 402 E. 30th St., New York.

MACHINES, Corliss Engines, Brewers' and Bottlers' Machinery. THE VILITER MFG. CO., 859 Clinton Street, Milwaukee, Wis.

MODEL AND EXPERIMENTAL WORK Draughting, Pattern Work, Special Machinery, etc. S. P. Denison, 143 Center St., New York City

Experimental & Model Work Cirs. and ad vice free. Gardam & Son, 45-51 Rose St., N.Y.

STRONG CASTINGS, QUICK DELIVERY.
PATTERN WORK TO ORDER.
ACME MALLEABLE IRON WORKS.BUFFALO.N.Y.

WASHINGTON, D. C., Bliss Building.

Bliss School of Electricity The only institution teaching practical electrical engineering exclusively. Laboratory equipment excellent. Courses open October 1st. Catalogue on application.



Anyone sending a sketch and description may quickly ascertain, free, whether an invention is probably patentable. Communications strictly confidential. Oldest agency for securing patents in America. We have a Washington office. Patents taken through Munn & Co receive special notice in the

# SCIENTIFIC AMERICAN.

beautifully illustrated, largest circulation of any scientific journal, weekly terms \$5.00 a year; \$1.50 six months. Specimen copies and HAND BOOK ON PATENTS sent free Address

MUNN & CO., 361 Broadway. New York.

"HEAVEN AND HELL" From things heard and seen by EMAN-UEL SWEDENBORG. The grandest, most interesting. Ask for tickets to New York via B. & O. and save
noonvenience.

D. B. MARTIN,
Mgr. Pass. Traffic.

J. M. SCHRYVER,
Gen'l Pass. Agent.

MEL SWEDENBORG. The grandest, most interesting,
can be learned about genuine religion and the future
life than from whole libraries of other books. 452 pages.
Sent by mail on receipt of 62 cents. Address WM. H.
ALDEN, 2129 Chestnut St., Philadelphia, Pa.

# How to Build a Home



Those intending to build will find the very best practical suggestions and examples of Modern Architecture in the handsomest Architectural Magazine ever published . . .

### "The Scientific American **Building Edition.**"

Each number is illustrated with a Colored plate and numerous bandsome engravings made direct from photographs of buildings, together with interior views, floor plans, description, cost, location, owners' and architects' names and addresses. The illustrations include seashore, southern, colonial and city residences, churches, schools, public buildings, stables, carriage houses, etc.

All who contemplate building, or improving homes or structures of any kind, have in this handsome work an almost endless series of the latest and best examples from which to make selections, thus saving time and money.

Published Monthly. Subscriptions \$2.50 a Year. Single Copies 25 Cents. For sale at all news stands, or address MUNN & CO., Publishers, 361 Broadway, New York