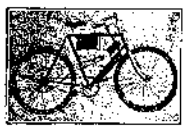
All makes of Cameras and Lenses at Bargain Prices.
Get our latest lists—we save you money.
Films developed.
Bromide Enlargements.
Photo work of all kinds at lowest prices.
We buy and exchange.
We carry the famous Lumiere Plates—try them.

NATIONAL COMPANY,
49 West 28th Street, New York City.



Convert your Bicycle into a Motor-Cycle or your Boat into a Launch by using one of the **Steffey Motors.** Also a complete line of Motors and Castings for Auto or Stationary. Lowest prices. Send stamp for catalog
STEFFEY MFG. CO.
2720 Brown St., Phila., Pa.

Micro Scopes

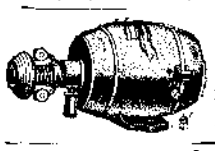
Our Microscopes, Microtomes, Laboratory Glassware, Chemical Apparatus, Chemicals, Photo Lenses and Shutters, Field Glasses, Projection Apparatus, Photo-Micro Cameras are used by the leading Laboratories and Government Departments Round the World.
Catalogs free.
BAUSCH & LOMB OPT. CO.
ROCHESTER, N.Y.

GOOD STANDARD SCALES
For Farm Use
Send for Catalogue S
OSGOOD SCALE CO. Binghamton, N. Y.

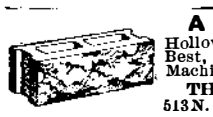
To Gas Engine Operators
Dynamo Ignition.
Motsinger Auto-Sparker
No battery to start or run. The original speed-controlled friction-drive Dynamo. Driven parallel with engine shaft. No belts. No beveled pulleys nor beveled fly wheel necessary. For make and break and jump-spark system. Water and dust proof. Fully Guaranteed.
MOTSINGER DEVICE MFG. CO.,
14 Main Street, Pendleton, Ind., U.S.A.
Write for 32-page catalog. Free.

Bashlin Telephone Disinfector
One of the greatest sanitary inventions of the age. Endorsed by forty Health Boards throughout the United States.
Prevents Moisture, Dust, Micro-organisms, in fact all foreign matter from entering the mouthpiece.
Frees the telephone of all obnoxious odors. Prevents inoculation. Improves transmission.
Price 50 cents. Postpaid.
Tatem Manufacturing Company
BUFFALO, N. Y., U. S. A.
AGENTS WANTED.

łæŋgwidʒiz
TRANSLATORS of pamphlets, catalogs, letters, labels. Printers, Booksellers, Newsdealers, in Many Languages.
LANGUAGES PRINTING COMPANY
Languages Building, 15 West 18th St., New York



Every Gas Engine User
should learn about the **Apple Automatic Sparker.** Easily attached. No more belt, battery or commutator troubles. Increases power and speeds For any kind of ignition apparatus write
The Dayton Electrical Mfg. Co.
98 Beaver Bldg. Dayton, Ohio.



A MONEY MAKER
Hollow Concrete Building Blocks, Best, Fastest. Simplest, Cheapest Machine. Fully guaranteed.
THE PETTYJOHN CO.
513 N. 9th Street, Terre Haute, Ind

THE Nulite Vapor GAS Lamps
For Home, Store and Street
We also manufacture Table Lamps, Wall Lamps, Chandeliers, Street Lamps, Etc. 100 Candle Power seven hours ONE CENT. No Wicks. No Smoke. No Odor. Absolutely safe. THEY SELL AT SIGHT. Exclusive territory to good agents. Write for catalogue and prices.
Chicago Solar Light Co. Dept. G, Chicago

50 Years' Experience
PATENTS
Trade Marks, Designs, Copyrights, Etc.
Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. Handbook on Patents sent free. Oldest agency for securing patents.
Patents taken through MUNN & Co. receive *Special Notice*, without charge, in the
Scientific American
A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, $3 a year; four months, $1. Sold by all newsdealers.
MUNN & CO. 361 Broadway, **NEW YORK**
Branch Office 625 F St. Washington, D. C.

Telegraphic signaling key, J. A. Fleming... 792,015
Telegraphy, electric, I. Kitsee..... 792,052
Telegraphy, transmitting apparatus for wireless, J. A. Fleming 792,014
Telegraphy, wireless, G. Marconi..... 792,528
Tension plate, S. W. Wardwell..... 792,093
Testing machine, J. E. Hitch..... 792,037
Theater chair, Wiersching & Bergstrom.... 792,566
Theatrical device, V. Wald 792,481
Thill coupling, J. D. Tam..... 792,086
Timber preservative, R. P. Reynolds..... 792,458
Time wheel mechanism, Deeley & Quinlan. 792,572
Tire casings to clincher rims, tool for applying clincher, E. N. Downs..... 792,009
Tire, pneumatic, P. E. Doolittle 792,008
Tire, pneumatic, C. S. Sears..... 792,290
Tire, vehicle, J. C. Raymond..... 792,075
Tobacco cutting machine, E. Quester..... 792,453
Toilet article, R. R. Debacher..... 792,251
Tool, combination, J. D. Wages 792,480
Tool, pneumatic, H. Leineweber 792,333
Toothpick, J. L. Smith 792,471
Toy, P. Heftler 792,130
Track, H. L. Ferris 792,254
Transformer lead, J. J. Frank..... 792,016
Traveling bag, G. Tiderman 792,183
Tread, elastic, P. W. Pratt..... 792,555
Tree cancer, remedy for, E. Homann..... 792,518
Trolley head, power driven, W. J. Sumner 792,176, 792,177
Trousers, F. G. White 792,097
Truck, car, J. C. Wands..... 792,482
Trunk, Andrews & Wyman 792,246
Truss, F. King 792,424
Truss, hernial, F. B. Allshouse..... 792,305
Tube, pipe, or cylinder coating machine, A. W. Buchanan 792,394
Tubes with veneers, covering metal, L. Coburn 792,005
Tubing, manufacture of, P. Patterson..... 792,446
Turbine, elastic fluid, M. Matthews..... 792,143
Turbines, rotary packing for elastic fluid, F. Hodgkinson 792,131
Turpentine box, A. C. McLeod..... 792,542
Turpentine cup, White & Gardner..... 792,483
Twyer iron, C. O. Swenson..... 792,179
Type casting machine centering mechanism, Bancroft & Indahl 792,247
Typographical blocks, manufacturing, G. H. Calmels 792,313
Umbrella, G. Ericson 792,408
Umbrella holder, M. E. Freund..... 792,126
Unicycle, C. G. Crosse 792,403
Valise attachment, L. L. Downing..... 792,204
Valve, F. Schreidt 792,353
Valve apparatus, F. Grinnell 792,258
Valve, cylinder relief, M. R. Zehnder..... 792,378
Valve, distributing, J. Trapp 792,090
Valve, engineer's air brake, J. F. McElroy. 792,152
Valve for compressed air brakes, expansion and triple, W. R. Smith..... 792,558
Valve gear, engine, J. L. Wheeler..... 792,372
Vapor burner, H. C. Hornish..... 792,519
Vapor burner, E. Thomson 792,562
Vapor burner thermoregulator, E. Thomson. 792,087
Vault, burial, R. F. Folk..... 792,510
Vault, metallic grave, D. B. Hiser..... 792,036
Vegetable cutter, J. N. Buell..... 792,396
Vehicle brake block, M. Potter..... 792,564
Vehicle controlling device, motor, T. L. & T. J. Sturtevant 792,241
Vehicle gear, F. E. Wilcox..... 792,484
Vehicle, motor, J. F. Duryea..... 792,573
Vehicle wheel, Cochran & Gilmore..... 792,199
Vehicle wheel, S. S. Scott..... 792,468
Vending machine, G. B. Townsend..... 792,296
Voting machine, W. J. Wilkinson..... 792,373
Vulcanizing mold, H. Z. Cobb..... 792,198
Wagon loader, W. Anderson 792,488
Walls, erecting, E. Press 792,451
Washing machine, G. W. Ray..... 792,456
Washing or churning apparatus, C. R. Gustavson 792,415
Watch stem winding and setting mechanism, A. Guggisberg 792,414
Watchmaker's instrument, C. M. Thomsen. 792,367
Water, apparatus for producing purified, G. Knodler 792,426
Water elevator, current operated, T. H. Dolling, et al..... 792,505
Water forcing apparatus, M. A. Libbey.... 792,429
Water heater, G. R. Burt..... 792,496
Wave motor, G. M. Lynch 792,224
Weaner muzzle, calf, W. A. Abbett..... 792,187
Weather strip, window, W. Peace..... 792,286
Wedge bolt, W. Thissen 792,181
Weeder, M. McEachern 792,541
Weighing and delivering apparatus, beet, J. S. Eash 792,406
Weir, H. Herzig 792,517
Well drill, oil, J. E. Downer..... 792,322
Well piston or plunger, deep, C. M. Ray.. 792,349
Welts into stitched seams, guide for introducing corded, O. E. Brown..... 792,116
Wheel. See Car wheel.
Wheel, H. T. Hansen..... 792,026
Winding machine, S. W. Wardwell..... 792,545
Wire, film coated, J. G. Callan..... 792,001
Wire, making ingots for seamless gold plated, H. M. Williams.....792,098, 792,099
Wires or bars to pieces of metal, plug or bush for connecting, E. A. Richardson, reissue 12,359
Wrench, S. B. House 792,213
Wrench, J. W. Woodard 792,487
Wrench, W. H. F. Tenny..... 792,560
Yoke, harness, W. G. Parker..... 792,069

DESIGNS.

Badge, C. J. Dieges 37,461
Chair frame, W. H. Redmond 37,462

LABELS.

"Banzai," for a tonic, S. Hochstadter..... 12,207
"Cauffman's," for ginger brandy, E. Cauffman & Co. 12,206
"Dixie Flake," for a confection, Robert A. Johnston Co. 12,196
"Linfa," for cigars, Cole Lithographing Co.. 12,197
"Lowry's Red Cordial," for a medicine, J. I. Lowry 12,199
"Lyric Record," for talking machine records, International Record Co..... 12,209
"M C Split," for mineral water, Ponce de Leon Mineral Water Co..... 12,200
"Mme. Wilbur's Eureka Face Cream," for a cosmetic, E. W. Prather..... 12,195
"Mozart Record," for talking machine records, International Record Co..... 12,208
"Nica Pana," for cigars, Schmidt & Co..... 12,198
"Our Home Comfort," for coffee, Vogel Bros. & Co. 12,201
"Selby Blue and Gold Brand," for white lead, Selby Smelting and Lead Co..... 12,210
"Trimble," for whisky, White, Hentz & Co. .....12,202 to 12,205

PRINTS.

"A Nice Hand to Hold. Congress Cards Make Players Happy. Initial, Pictorial & Club Backs," for playing cards, United States Playing Card Co..... 1,349
"Circus Dolls No. 1," for patterns for paper dolls, Gray Lithograph Co..... 1,347
"For Purity," for beer, Cream City Brewing Co. 1,344
"Gordon Suspender Girl," for suspenders, Gordon Manufacturing Co..... 1,346
"Muslin Underwear," for underwear, Ferguson-McKinney Dry Goods Co..... 1,345
"Selby Blue and Gold Brand," for white lead, Selby Smelting and Lead Co..... 1,350
"Still Alarm and Summer Backs, Congress Playing Cards," for playing cards, United States Playing Card Co..... 1,348

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, provided the name and number of the patent desired and the date be given. Address Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.

Clean House With Air
Over 55 companies operating Thurman Patents in America, and as many more in Canada, England, and Europe.
FREE CATALOGUE.
General Compressed Air House Cleaning Co.
ST. LOUIS, U. S. A.
Manufacturers of the Celebrated Thurman direct-connected Gasolene Driven Air Compressors for Mines, Pneumatic Tools, Etc.

SPECIAL MANUFACTURING.
DIES AND STAMPINGS TO ORDER.
SPEC'L MACHINERY-MODELS-EXPERIMENTAL WORK.
DROP FORGING DIES AND DROP FORGINGS.
HARDWARE SPECIALTIES ETC. MANFD. TO ORDER. SEND SAMPLES OR DRAWINGS FOR ESTIMATES. WRITE FOR OUR BOOKLET.
THE GLOBE MACHINE & STAMPING CO.
970 HAMILTON ST., CLEVELAND, OHIO.

ICE MACHINES. Corliss Engines, Brewers' and Bottlers' Machinery. THE VILTER MFG. CO., 899 Clinton St., Milwaukee, Wis

MODELS & EXPERIMENTAL WORK. Inventions developed. Special Machinery.
E. V. BILLAARD, 24 Frankfort Street, New York.

Dies, Tools, Models and Special Machinery. Metal Specialties and Stampings Manufactured.
HOEFT & MOORE, Chicago, U. S. A.
OFFICE, 565 FIFTH AVENUE. WORKS: INDIANA & FRANKLIN STREETS

BALLOONS Aeronaut L. Stevens, Box 181 Madison Sq., N. Y.

DRYING MACHINES. S. E. WORRELL Hannibal, Mo.

MODELS & GEARS INVENTIONS PERFECTED UNION MODEL WORKS 193 So. CLARK ST. CHICAGO.

RUBBER Exper' Manufacturers Fine Jobbing Work
PARKER, STEARNS & SUTTON, 228-229 South St., New York

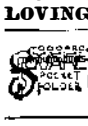
MODELS CHICAGO MODEL WORKS ESTABLISHED 1867 179 E. MADISON ST. CHICAGO, ILL. WRITE FOR CATALOGUE OF MODEL SUPPLIES.

The OPTICAL INSTRUMENT MONTHLY
Just started. Send for sample copy.
E. P. BUFFET, 108 Fulton Street, New York

INVENTORS' AND MACHINISTS' Machines and Tools designed. Inventions perfected. Accurate drafting. C. H. M'Glehan & Co., 110 W. 34th St., N. Y.

MODEL AND EXPERIMENTAL WORK.
Electrical and Mechanical Instruments. Small Mach'y
EDWARD KLEINSCHMIDT, 82 W. Broadway, New York

MODELS, DIES AND TOOLS
Repairing of machinery. Brass novelties and metal articles made under contract or on royalty.
LOVINGTON MFG. CO., Lovington, Ill.



Just Out! Shows how to cut all kinds of Rafters, gives Degrees, Pitches, Polygons, Ovals, Ellipses, etc. Introductory price, 10c.
Dwight L. Stoddard, Author of Steel Square Pocket Book, 3-8 W. Raymond St., Indianapolis, Ind.

We Make and Market Patented Articles
Experimental Work and Models. Metal Stamping and Die Work and General Machine Shop.
Anglo-American Corporation, 124 Baxter St., New York

PLUMBING SCHOOLS
WANTED—Men and boys to learn plumbing trade We cannot supply demand for graduates. $4.50 to $5.00 per day. Eight weeks completes course. Earn while learning. Address for catalogue COYNE BROS. Co., Plumbing Schools, Cincinnati, O., St. Louis, Mo. Employment guaranteed or money refunded.

LEARN WATCHMAKING
Refined, profitable labor. Competent men always in demand. We teach it thoroughly in as many months as it formerly took years. Does away with tedious apprenticeship. Money earned while studying. Positions secured. Easy terms. Send for catalog.
ST. LOUIS WATCHMAKING SCHOOL, St. Louis, Mo.

INVENTORS We manufacture METAL SPECIALTIES of all kinds, to order; largest equipment; lowest prices. Send sample or model for low estimate and best expert advice **FREE**
THE EAGLE TOOL CO., Dept. A, Cincinnati, O.

NAME PLATES—STEEL STAMPS
EMPLOYEE CHECKS, KEY TAGS & BADGES.
J. ROBBINS MFG. CO. 58 KNEELAND ST.
SEND FOR CATALOGUE BOSTON, MASS.

Are you interested in Patents, Model or Experimental work? Our booklet entitled
WHAT WE DO—HOW WE DO IT
will be sent to you on request.
KNICKERBOCKER MACHINE WORKS, Inc.,
8-10-12 Jones Street, New York.

If not to be had of your dealer write us, stating preference and enclosing amount, and we will supply you by return mail or express, sending prepaid. *Write for Free Catalog.*
HARRINGTON & RICHARDSON ARMS CO. 328 PARK AVE. WORCESTER, MASS.

FOR SALE One almost new Hydraulic Flanging and Drawing Press. Five 12-in. plungers with 5-in. stroke exerting pressure of 400 tons at 2,000 lbs. The Platen is 5 ft. x 7 ft. 6 in. Distance from head to table of press, 8 ft. 6 in. Massive Head and Lifting Table, each cast in a single piece of steel. The four 8-in. columns supporting press are forged steel turned true. Four overhead jackarms 4½-in. cylinders 48-in. stroke for clamping work to lifting table. One almost new five-cylinder 60-gal. Hydraulic Pump with automatic alleviating valve for operating above. Also one second-hand 20-gal. Hydraulic Pump. Special low figures quoted on one or all of above. Address
PHILLIPS PRESSED STEEL CO., Joliet, Ill.

AUTO STORAGE BATTERIES ALL KINDS
THE WILLARD STORAGE BATTERY CO. CLEVELAND O.

AGENTS WANTED
in every railway shop to solicit subscriptions for the
RAILWAY MASTER MECHANIC
ONE DOLLAR A YEAR
LIBERAL COMMISSION TO AGENTS
Address **RAILWAY MASTER MECHANIC**
305 Bearborn St., Chicago

NOW READY

Bound Volume
OF THE
SCIENTIFIC AMERICAN BUILDING MONTHLY
VOLUME XXXIX
January to June, 1905
277 Illustrations 6 Covers in Tint
132 Pages
PRICE OF SEMI-ANNUAL VOLUME $2.00, POSTAGE PAID

SPECIAL FEATURES
Notable American Houses.
By Barr Ferree.

Mrs. A. Cass Canfield's House, Roslyn, L. I., N. Y.
The House of Ogden Mills, Esq., Staatsburg, N. Y.
"Bellefontaine," the Estate of Giraud Foster, Esq., Lenox, Mass.
The House of Lloyd Bryce, Esq., Roslyn, L. I., N. Y.
"Martin Hall," the House of James E. Martin, Esq., Great Neck, L. I., N. Y.
"Talbot House," the Estate of **Talbot** J. Taylor, Esq., Cedarhurst, L. I., N. Y.

Helps to Home Building. What the House Builder should know. Difficulties to Overcome. The Plan. The Structure. Designing the House. The Rooms and Their Uses.

Departments. Roads. Landscape Architecture. Ventilation. New Building Patents. Publishers' Department. The Automobile. The Plumber. Exhibitions. Correspondence. Fire Protection. Civic Betterment. Unknown Buildings. The House. Monthly Comment. The Household. The Garden. Fifty Suggestions for the House. The House Interior. New Books. Sanitation.

The Building Monthly aims to help its readers to better building. The illustrations reproduce homes and other structures of the highest grade and of varying costs. It seeks to interest the architect, the house owner, the real estate promoter, the home maker, and the builder. It stands for the good and the true and the beautiful in the art. Its series on "Notable American Houses" describes and illustrates with great wealth of illustrations the more important of the best large houses recently built in the United States and brings its readers in immediate touch with the most important work of the leading architects of the day. Its descriptions of houses are brief but compact with information. Its departments constitute a "review of reviews," summary of current comment, suggestion and help in all matters relating to the construction of the home, its decoration, equipment, and use.

Volume XXXIX. January to June, 1905, price $2.00. Six covers in tint and three hundred and eight illustrations. A rich conspectus of interesting notable houses. Many fine estates are treated with ample fullness. The discussions of current architectural themes are of permanent value and of unusual interest.

FOR SALE BY
MUNN & COMPANY
No. 361 Broadway, New York City
AND ALL NEWSDEALERS