

| | |
|--|---------------------------|
| Glass, drawing, Speer & Harvey..... | 841,193 |
| Glass from their baths, separating sheets of, Speer & Harvey..... | 841,594 |
| Glass furnace, H. M. Brookfield..... | 841,112 |
| Glassware manufacturing apparatus, hollow, F. A. Grosse..... | 841,511 |
| Governor, S. C. Foster..... | 841,318 |
| Governor, J. A. Hoak..... | 841,521 |
| Grain drill, M. E. Wilson..... | 841,295 |
| Grain transferring device, B. B. Stauffer..... | 841,465 |
| Grate bar, protected, J. C. Fitzsimmons..... | 841,498 |
| Grinding device, A. H. Kramer..... | 841,541 |
| Gun cleaning rod, S. A. North..... | 841,336 |
| Hair drying apparatus, P. Schwidewski..... | 841,584 |
| Half tapers, backing lumber for, Brown & Hande, R. A. Watson..... | 841,115 |
| Harrow tooth and weeder, combined, P. S. Gunning..... | 841,512 |
| Harvester reels, cam for, J. T. Brett..... | 841,110 |
| Heater. See Air heater..... | |
| Heating apparatus, J. H. Blakeway..... | 841,107 |
| Heating system, steam, F. C. Gaff..... | 841,389 |
| Hinge, P. J. Madden..... | 841,333 |
| Hinge, Stevens & Manders..... | 841,596 |
| Hobby horse, G. S. Axford..... | 841,569 |
| Hoisting machine, G. L. Trebb..... | 841,198 |
| Hook and link, L. D. Mattassi..... | 841,164 |
| Hooks and eyes, implement for driving screw, W. H. Vanderberchen..... | 841,472 |
| Horse-power, J. Mallon..... | 841,412 |
| Horseshoe, J. F. Robinson..... | 841,448 |
| Hose supporter, E. Pearl..... | 841,430 |
| Hothouse, grape, and greenhouse, combined, Bender & Taylor..... | 841,306 |
| Hydraulic press, Hoberg & Hudson..... | 841,150 |
| Ice cream dipper, Aiken & Harmon..... | 841,097 |
| Ignition device, combined dynamo-magneto, J. A. Struthers..... | 841,599 |
| Incandescent mantles, means for protecting and applying, O. Wiederhold..... | 841,204 |
| Ink and making same, printing, E. Klein..... | 841,156 |
| Ink well, G. J. Sengbusch..... | 841,345 |
| Insect trap, C. R. Jones..... | 841,531 |
| Insulating handle connection, J. H. Gault..... | 841,138 |
| Iron shaping machine, C. E. & O. M. Knutsen..... | 841,327 |
| Iron shaping machine, wrought, C. E. Knutsen..... | 841,326 |
| Irening table, C. P. Carlson..... | 841,120 |
| Kneading and molding machine, bread, C. & E. Kruse..... | 841,408 |
| Knobs to bolts, device for fastening, D. W. Tower..... | 841,284 |
| Label, G. E. Howard..... | 841,321 |
| Lace holder, shoe, H. F. Molkenbur..... | 841,419 |
| Lamp, P. N. Milsted..... | 841,559 |
| Lamp bracket, H. Bryarly..... | 841,308 |
| Lamp, gas, A. H. Humphrey..... | 841,323 |
| Lamp, incandescent gas, O. Wiederhold..... | 841,203 |
| Lamp, stormproof, G. Stueben..... | 841,630 |
| Lantern, J. H. Hill..... | 841,648 |
| Level, G. J. Stricker..... | 841,598 |
| Level, plumb, L. B. Nelson..... | 841,562 |
| Lever mechanism, A. R. & F. S. Welch..... | 841,362 |
| Life-preserving steamer chair, A. L. Richardson..... | 841,343 |
| Line holder, J. Simon..... | 841,589 |
| Liquid containing and dispensing device, J. H. Bromley..... | 841,111 |
| Liquids with gases, apparatus for treating, A. Pagniez..... | 841,298 |
| Lock, W. B. Wyke..... | 841,208 |
| Lock casing, H. M. Small..... | 841,592 |
| Lock mechanism, E. A. Baldwin..... | 841,579 |
| Locomotive cushioning appliance, W. Dahl..... | 841,519 |
| Logging device, G. Moore..... | 841,420 |
| Loom, C. F. Perham..... | 841,432 |
| Looms, mechanism for changing shutters in, E. J. Entwistle..... | 841,492 |
| Lubricator, H. H. Cramer..... | 841,632 |
| Machine brake, F. B. Rae..... | 841,441 |
| Mail box, C. A. Wellman..... | 841,201 |
| Mandrel, corrugating, E. R. Stasch..... | 841,277 |
| Marine electric wharfage, G. G. Schroeder..... | 841,583 |
| Massage apparatus, pneumatic, S. Hasbrouck..... | 841,146 |
| Match delivering receptacle, C. W. Redman..... | 841,181 |
| Matress wire-winding machine, F. J. Crouch..... | 841,634 |
| Measure, tape, R. J. Read..... | 841,272 |
| Mechanical movement, F. H. Richards..... | 841,342, 841,443, 841,444 |
| Merry-go-round, G. B. McKinney..... | 841,424 |
| Metal coating composition, M. Tech..... | 841,603 |
| Metal plate, ornamental, A. Du Montier..... | 841,490 |
| Metal working, scraper for, C. Lehnert..... | 841,332 |
| Metals, mixing, Prince & Rodgers..... | 841,178 |
| Metallic ground post, driven, J. H. Downs..... | 841,645 |
| Metallic hook, J. J. Leonard..... | 841,550 |
| Micrometer, J. Rau..... | 841,271 |
| Milk desiccating apparatus, J. A. Just..... | 841,153 |
| Mine shaft, J. Mika..... | 841,416 |
| Mining machine, W. B. Chapman..... | 841,625 |
| Models, cards, etc., adjustable support for, H. Buschmann..... | 841,372 |
| Mold-making apparatus, pattern guide for, E. H. Mumford..... | 841,167 |
| Motion converting device, F. H. Richards..... | 841,445 |
| Motor control, alternating current, M. C. A. Latour..... | 841,257 |
| Motor winding, E. F. W. Alexanderson..... | 841,609 |
| Mowing machine tedder attachment, J. Moore..... | 841,166 |
| Music player, pneumatic, F. W. Winter..... | 841,205, 841,206 |
| Music sheet guiding device, E. Thomson..... | 841,356 |
| Musical instrument modulating attachment, T. P. Brown..... | 841,113 |
| Musical instruments, automatic playing mechanism for, C. B. Dunnett..... | 841,383 |
| Musical instruments, key locking mechanism for automatic, T. P. Brown..... | 841,114 |
| Needles in temporary holders or books, machine for inserting combing, T. Townsend..... | 841,358 |
| Needle cutter, G. A. Jelley..... | 841,152 |
| Nezzle, exhaust, P. B. Houghton..... | 841,492 |
| Nut lock, J. W. Kreitzburg..... | 841,542 |
| Oil, apparatus for the purification of waste, N. W. Smith..... | 841,347 |
| Oil burner, W. S. Stewart..... | 841,597 |
| Oil shell, C. A. Glover..... | 841,508 |
| Operating mechanism, T. J. Winans..... | 841,606 |
| Optical instrument, S. Lake..... | 841,409 |
| Ordnance, breech-loading, Dawson & Buckham..... | 841,637 |
| Ore chlorination, W. V. Lander..... | 841,328 |
| Ore cyaniding, W. V. Lander..... | 841,330 |
| Ores, treating, Baker & Burwell..... | 841,102, 841,103 |
| Overhoe holder, W. H. Tillson..... | 841,282 |
| Pan. See Dust pan..... | |
| Pan supporting rack, Buergermeister & Flicke..... | 841,116 |
| Paper tube blank, J. C. Kimsey..... | 841,539 |
| Paper weight, inclosed, C. L. Craver..... | 841,124 |
| Pastry horns or cups for containing ice cream, etc., machine for making, J. Abraham..... | 841,211 |
| Pavement, E. Heylyn..... | 841,647 |
| Pen, self-filling fountain, P. E. Wirt..... | 841,475 |
| Ponstock, W. G. Fargo..... | 841,495, 841,496 |
| Pencil holder, J. H. Williams..... | 841,365 |
| Pencil sharpener, P. Makin..... | 841,555 |
| Pencil sharpener, J. W. Cover..... | 841,631 |
| Phenylglycin, making, R. Schmidlin..... | 841,456 |
| Plane, P. Duffy..... | 841,238 |
| Pigment and making same, W. J. Armbruster..... | 841,303 |
| Piling, sheet, C. C. Tomkinson..... | 841,197 |
| Pipe boiler, L. Anderson..... | 841,368 |
| Pipe expanding tool, J. Gapp..... | 841,388 |
| Pipe threading machine, F. W. Hoefler..... | 841,396 |
| Piston, J. Imler..... | 841,527 |
| Planing device, rotary wood, W. D. Plue..... | 841,439 |
| Plaster composition, J. M. Snelus..... | 841,464 |
| Plate lifter, W. H. Clark..... | 841,626 |
| Plow, A. Gullickson..... | 841,390 |
| Plow, T. J. Johnson..... | 841,530 |
| Plumber's trap, C. T. Byrne..... | 841,118 |
| Pole splicing device, F. N. Drane..... | 841,489 |
| Power transmitting device, J. Putnam..... | 841,179 |
| Presser, A. H. Gibson..... | 840,140, 841,141 |
| Pressure gage, C. E. Sargent..... | 841,141 |
| Printer's furniture, Alkman & Stevens..... | 841,098 |
| Printing machine moistening device, H. Gramlich..... | 841,142 |
| Propelling device for steam vessels, J. Greaves..... | 841,243 |
| Propelling mechanism, boat, R. Rutherford..... | 841,452 |
| Pulp, manufacture of purified soda pine, W. H. Sharp..... | 841,190 |
| Pump, centrifugal, J. Degen..... | 841,643 |
| Pump stroke regulator, Summers & Mast..... | 841,601 |

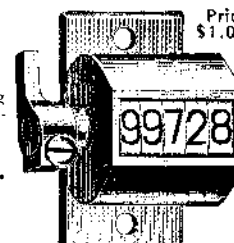
"Star" Lathes Food and Power Screw Cutting
Automatic Cross Feed
FOR FINE, ACCURATE WORK
Send for Catalogue B.
SENECA FALLS MFG. CO.
695 Water Street,
Seneca Falls, N. Y., U. S. A.




Engine and Foot Lathes
MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. BEST MATERIALS. BEST WORKMANSHIP. CATALOGUE FREE
SEBASTIAN LATHE CO., 120 Culvert St., Cincinnati, O.

Foot and Power and Turret Lathes, Planers, Shapers, and Drill Presses.
SHEPARD LATHE CO., 133 W. 30 St. Cincinnati, O.

Veeder Counters Price \$1.00
to register reciprocating movements or revolutions. Cut full size.
Booklet Free
VEEDER MFG. CO., 18 Sargeant St., Hartford, Conn.
Cycloimeters, Odometers, Tachometers, Counters and Fine Castings.




FRICITION DISK DRILL
FOR LIGHT WORK.
Has These Great Advantages:
The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage.
W. F. & JNO. BARNES CO.,
Established 1872.
1999 Ruby Street, Rockford, Ill.



PATENTS
Our Hand Book on Patents, Trade-Marks, etc., sent free. Patents procured through Munn & Co. receive free notice in the
SCIENTIFIC AMERICAN
MUNN & CO., 361 Broadway, N. Y.
BRANCH OFFICE: 625 F St., Washington, D. C.

Manufacturers should investigate the
B. F. BARNES MACHINE TOOLS
before placing orders. The Tool here illustrated is our 20-inch Drill, and we have many other sizes to make a very complete line, including Multiple Spindle Drills. If interested in the latest Tools for reducing costs of production, let us tell you what we have. Ask for Catalog S.
B. F. BARNES CO. Rockford, Ill.
European Branch
149 Queen Victoria St., London, E. C.



SORE THROAT Hydrozone

To prove the Efficiency of
to Sore Throat Sufferers, I will send One 25 Cent Bottle Free to everyone sending me this advertisement with 10 cents to pay postage and packing. Hydrozone is a harmless germicide, indorsed and successfully used by leading physicians. Not genuine without my signature on label. Ask for Booklet on Treatment of Diseases. Sold by Leading Druggists. Good until Feb. 10, 1907.
Prof. Charles Townsend
Dept. U, 63 Prince Street, New York

Saving Energy means much in these strenuous days. That is why
Telephone Service is so helpful in both home and office.
NEW YORK TELEPHONE CO.
15 Dey Street.

SENSITIVE LABORATORY BALANCE
By N. Monroe Hopkins. This "built-up" laboratory balance will weigh up to one pound and will turn with a quarter of a postage stamp. The balance can be made by any amateur skilled in the use of tools, and it will work as well as a \$125 balance. The article is accompanied by detailed working drawings showing various stages of the work. This article is contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1184. Price 10 cents. For sale by MUNN & Co., 361 Broadway, New York City, or any bookseller or newsdealer.

DO YOU USE GRINDSTONES?
If so we can supply you. All sizes mounted and unmounted, always in stock. Remember, we make a specialty of selecting stones for all special purposes. Send for catalogue "1".
The CLEVELAND STONE CO.
2d Floor, Wilshire, Cleveland, O.



| | |
|--|------------------|
| Pumps, balancing centrifugal, J. Degen..... | 841,642 |
| Pumps, means for balancing centrifugal, J. Degen..... | 841,641 |
| Rail fastener, D. E. Olds..... | 841,267 |
| Rail fastener, J. W. Wyke..... | 841,298 |
| Rail joint, A. E. Boman..... | 841,482 |
| Rail joint, L. M. Sartain..... | 841,575 |
| Rails or the like, device for marking the lengths of, W. Thomas..... | 841,355 |
| Railway block system, W. L. Rummel..... | 841,457 |
| Railway roadbed, L. R. Zillingger..... | 841,367 |
| Railway signaling mechanism, E. J. Adams..... | 841,607 |
| Railway structures with suspended cars, crossing for elevated, D. M. Pfautz..... | 841,437 |
| Railway structures with suspended cars, switch for elevated, D. M. Pfautz..... | 841,436 |
| Railway tie, D. C. Graham..... | 841,242 |
| Railway tie, C. H. Collins..... | 841,628 |
| Railway tie, metallic, F. M. Cain..... | 841,119 |
| Rams, pulsating valve for hydraulic, J. Northley..... | 841,563 |
| Ratchet brace, G. W. A. Dawson..... | 841,638 |
| Rear safety, R. H. Arnold..... | 841,343 |
| Reducing wheel, F. L. Wolfe..... | 841,207 |
| Refrigerating attachment for milk cans, H. S. Parker..... | 841,567 |
| Refrigerating device, G. A. Baker..... | 841,104 |
| Revetment, W. E. Thorne..... | 841,281 |
| Rheostat, electric, Dana & Knott..... | 841,232 |
| Rock drill, A. H. Gibson..... | 841,139 |
| Rolling mill work-reversing mechanism, Norton & Chartner..... | 841,427 |
| Roof connection for vent pipes, G. F. Ryan..... | 841,274 |
| Roof joint, R. Stasch..... | 841,376 |
| Root cutter, G. W. Keeler..... | 841,534 |
| Rope and cable clamp, A. H. Meech..... | 841,165 |
| Rotary engine, F. Nelson..... | 841,425 |
| Rotary switch, F. C. De Reamer..... | 841,234 |
| Rotating apparatus and magnetic compasses, suspension of, H. Anschutz-Kaempfe..... | 841,612 |
| Rubber shoes, machine for preparing, J. F. Cavanagh..... | 841,121 |
| Rule, N. H. Cloud, Jr..... | 841,627 |
| Sand molding machine, J. Pickles..... | 841,569 |
| Sawing machine, B. E. Harrel..... | 841,516 |
| Sawmill track sweeper, E. Hoops..... | 841,522 |
| Scythe snath bending machine, A. Tewe..... | 841,357 |
| Separator. See Centrifugal separator..... | |
| Sewing machine attachment, L. M. Tynes..... | 841,604 |
| Sewing machine ruffing mechanism, A. Laubscher..... | 841,546 |
| Sewing machines, fabric withdrawing or feeding means for, H. H. Bates..... | 841,480 |
| Sharpener, scissors, W. M. Kellogg..... | 841,537 |
| Sharpening device for grain mills, S. Vessot..... | 841,287 |
| Sheep shears, W. A. Scott..... | 841,458 |
| Sheel, collapsible, wall, E. A. Campbell..... | 841,484 |
| Sheel loader, F. Hart..... | 841,556 |
| Shoe dipping machine, J. H. Warr..... | 841,361 |
| Show window corner post construction, R. H. Jones..... | 841,324 |
| Sifter, flour, C. A. Carlson..... | 841,310 |
| Sign, adjustable, J. V. Petrusich..... | 841,174 |
| Signal reading device, H. H. Brown..... | 841,616 |
| Signal system, automatic stop, C. L. Lungenrich..... | 841,403 |
| Signal transmitter, recording, R. A. Baldwin..... | 841,105 |
| Signaling, harmonic selective, W. W. Dean..... | 841,640 |
| Sleeks, wheel runner for, H. F. Castle..... | 841,623 |
| Slings, kicking, O. A. Ritzman..... | 841,447 |
| Slung shot, J. B. Sweetser..... | 841,195 |
| Spanner, adjustable, A. G. Taylor..... | 841,602 |
| Spark arrester, A. M. Harris..... | 841,393 |
| Speaking tubes, electric signal for, Castello & Hart..... | 841,377 |
| Speculum, horse, J. Sklar..... | 841,590 |
| Spinning spindle and bearings therefor, C. H. Chapman..... | 841,485 |
| Spittoon, G. Zweigle..... | 841,301 |
| Splice bars, apparatus for the manufacture of, G. E. Thackray..... | 841,354 |
| Spring bell, C. H. Chellis..... | 841,227 |
| Spring wheel, C. Dellinger..... | 841,375 |
| Stacker, hay, J. H. C. Carrall..... | 841,376 |
| Steam boiler, W. Downey..... | 841,235 |
| Steam boiler, E. R. Gustavus..... | 841,513 |
| Steam loop, Conrad & Gillespie..... | 841,311 |
| Steam trap, R. M. Dixon..... | 841,129 |
| Step and seat, automatically folding, S. Orr..... | 841,565 |
| Steering supporting class, G. Devall..... | 841,127 |
| Stone in imitation of marble or granite and the like, manufacture of artificial, L. Lefranc..... | 841,160 |
| Stone plates, slabs or tiles, manufacture of imitation, L. Hatschek..... | 12,594 |
| Stone sawing machine, J. S. Young..... | 841,300 |
| Stove, coal, C. T. McCarrall..... | 841,169 |
| Sulfur burner, C. E. Savage..... | 841,576 |
| Switch, E. L. Nugent..... | 841,337 |
| Tag, laundry, W. J. Baker..... | 841,217 |
| Tank supporting means, water, F. C. Smith..... | 841,462 |
| Target shooting, back stop and receiver for, W. T. Alsop..... | 841,611 |
| Target trap, A. M. McCrear..... | 841,423 |
| Teaching of fractions, device for facilitating the, Koops & Reimers..... | 841,158 |
| Telegaphy, wireless, L. De Forest..... | 841,336 |
| Telephone, F. Edwards..... | 841,491 |
| Telephone calling apparatus, electric, C. Adams-Randall..... | 841,476 |
| Telephone, compound, Holmgren & Brahm..... | 841,399 |
| Telephone system, W. W. Dean..... | 841,233 |
| Telephone system, A. H. Weiss..... | 841,292 |
| Telephone system, secret service, A. K. Andriano..... | 841,478 |
| Telephone, telegraph, and trolley wires, sectional pole for, H. M. Seiple..... | 841,344 |
| Telephones, listening apparatus for, W. W. Grigsby..... | 841,244 |
| Telescope, prism, K. Martin..... | 841,262 |
| Tire, adjustable wheel, S. F. Mudge..... | 841,561 |
| Tire protector, O. Kelly..... | 841,155 |
| Tire repairing apparatus, J. Hart..... | 841,518 |
| Tire retaining attachments, locking device for, R. S. Bryant..... | 841,619 |
| Tire, vehicle, F. M. Georgi..... | 841,505 |
| Toaster, bread, A. M. Skinner..... | 841,191 |
| Tobacco cutter, N. Du Bruin..... | 841,236 |
| Tobacco plant bed burner, J. D. & H. F. Flowers..... | 841,317 |
| Tongs, iron, J. Kirk..... | 841,523 |
| Track sanding device, J. H. Hanlon..... | 841,144 |
| Traction device for vehicle wheels, H. S. Weaver..... | 841,473 |
| Traction wheel, A. E. Glascock..... | 841,507 |
| Train ventilating apparatus, J. A. Shires..... | 841,460 |
| Trap. See Animal trap..... | |
| Trundle, adjustable, W. L. Milner..... | 41,418 |
| Trimming, ornamental, C. P. Schlegel..... | 841,187 |
| Trolley, J. Tellew..... | 841,467 |
| Trolley base, automatic, Fellows & Cammett..... | 841,497 |
| Trolley head, O. Hoffmann..... | 841,397 |
| Trolley track, W. J. Sumner..... | 841,351 |
| Trousers, T. Halligan..... | 841,514 |
| Truck for electrically propelled cars, swivel, D. M. Pfautz..... | 841,435 |
| Truck, locomotive, W. Daiten..... | 841,380 |
| Trunk harness, E. N. Buchanan..... | 841,620 |
| Trunk line, incoming, H. M. West..... | 841,339 |
| Tubular drill, lubricating, W. E. Roeske..... | 841,184 |
| Tuning device, stringed instrument, E. E. England..... | 841,384 |
| Turbine, J. G. Callan..... | 841,483 |
| Turbine, elastic fluid, O. Jungren..... | 841,254 |
| Turbine, elastic fluid, C. W. Duke..... | 841,486 |
| Turbine wheel, H. Keller..... | 841,255 |
| Turbines, attachment of blades for, Geipke & Kugel..... | 841,503 |
| Turbines, means for decreasing leakage in, O. Jungren..... | 841,253, 841,650 |
| Turbines, means for securing buckets in, C. E. Little..... | 841,258 |
| Turn designating apparatus and coin counter, combined, A. W. Mahon..... | 841,554 |
| Type casting machine, single, L. Schmitz..... | 841,457 |
| Typewriter, music, L. C. & I. P. Bodeau..... | 841,101 |
| Typewriting machine, C. W. Walker..... | 841,288 |
| Typewriting machine, G. Swenson..... | 841,352 |
| Umbrella, C. S. Gurney..... | 841,245 |
| Umbrella locking device, B. Moses..... | 841,421 |
| Universal joint, A. R. & F. S. Welch..... | 841,363 |
| Valve, H. C. Farrell..... | 841,133 |
| Valve and tapping device, barrel, R. Stock..... | 841,350 |
| Valve, check, E. F. Wendelken..... | 841,474 |
| Valve, cut off, S. Mucci..... | 841,422 |
| Valve for air brake systems, pressure, W. V. Turner..... | 841,469 |
| Valve for mufflers, cut out, A. S. Hamilton..... | 841,392 |
| Valve mechanism for turbines, J. G. Callan..... | 841,374 |
| Valve, steam, W. Baker..... | 841,327 |
| Valve, throttle, E. Hoyle..... | 841,322 |
| Vault, W. H. Hollar..... | 841,378 |
| Vehicle draft rigging, W. J. Drets..... | 841,192 |
| Vehicle, foot propelled, W. M. Dailey..... | 841,635 |

YOU NEED IT!


Modern Gas-Engines AND Producer-Gas Plants

By R. E. MATHOT, M.E.

314 Pages Bound in Cloth 152 Illustrations
Price \$2.50, Postpaid

A Practical Guide for the Gas-Engine Designer and User.
A book that tells how to construct, select, buy, install, operate, and maintain a gas-engine.
No cumbersome mathematics: just plain words and clear drawings.
The only book that thoroughly discusses producer-gas, the coming fuel for gas-engines. Every important pressure and suction producer is described and illustrated. Practical suggestions are given to aid in the designing and installing of producer-gas plants.
Write for descriptive circular and table of contents.

MUNN & COMPANY, Publishers
361 Broadway, New York



TRANSMISSION STEEL TOWERS GALVANIZED

For high tension transmission lines. They are made from 30 to 150 feet in height, and to withstand horizontal strains at the top of from 2,000 to 30,000 pounds. We design and build these towers and guarantee them under actual test to fully meet the specified requirements. Completely GALVANIZED by the hot process after all work of manufacture has been completed.

AERMOTOR CO., CHICAGO

| | |
|---|---------|
| Vehicle, motor, E. R. Fouts | 841,239 |
| Vehicle wheel, W. E. Schneider | 841,578 |
| Vehicle wheel, elastic, R. Schnicke | 841,189 |
| Vehicle wheel, motor and other road, F. Walton | 841,290 |
| Vehicles, number transparency for, D. Lynch | 841,553 |
| Vehicles, transmission gearing for motor, F. P. & E. S. Cameron | 841,373 |
| Veelipede handle bar, cushioned, M. Rosen | 841,450 |
| Vending machine, C. Yocum | 841,210 |
| Ventilator, W. Scharnweber | 841,455 |
| Vermix extermicator, W. P. Wyard | 841,297 |
| Wagon, dump, C. E. Kaufman | 841,406 |
| Wagon, dump, R. H. MacClerman | 841,411 |
| Wagon dumping bed, D. E. Graves | 841,143 |
| Wagon rack, J. L. Hartnett | 841,246 |
| Washing machine operating mechanism, T. J. Winans | 841,605 |
| Water closet seat, E. B. Hagner | 841,519 |
| Water cooler, M. F. Bates | 841,220 |
| Water meter, rotary, C. A. Lockwood | 841,410 |
| Water meter, Howe & Ornelo | 841,649 |
| Water treating and storing apparatus, W. A. Powers | 841,176 |
| Waters, device for detecting subterranean, A. Schmid | 841,188 |
| Weather strip, C. E. Saint Clair | 841,185 |
| Weed and grass trimmer, etc., O. Shidler | 841,586 |
| Weeder, E. Pearl | 841,431 |
| Well drilling apparatus, G. D. Loomis | 841,259 |
| Wheels, means for preventing slippage of traction, R. Shipman | 841,588 |
| Whip holder, E. H. Morris | 841,560 |
| Whip socket, T. Armstrong | 841,479 |
| Winding machine, G. F. Atwood | 841,305 |
| Wing operating mechanism, E. M. Hartman | 841,394 |
| Wire belt or rope, flat, J. Kast | 841,154 |
| Wire fabric, L. Swank | 841,194 |
| Wort, cooling, H. E. Deckebach | 841,126 |
| Wrench, R. H. Legg | 841,549 |
| Wrenches, pipe jaw attachment to, J. R. Hill | 841,248 |

LOFTIS SYSTEM DIAMONDS ON CREDIT

A DIAMOND FOR A VALENTINE. Pay one-fifth on delivery, balance in 8 equal monthly payments. Catalog Free.—Write today.

LOFTIS BROS. & CO. Old Reliable, Original Diamond Dealers, 92 State Street, Chicago, Ill.

LEARN to Mount Birds

and animals. Fascinating work for Men, Women and Boys. Quickly learned in your own home. Satisfaction guaranteed or no tuition fee. Save your fine specimens. Decorate home and den. Highly profitable business or side line. Fine catalog and taxidermy magazine free. Write today.

N. W. School of Taxidermy, Omaha, Neb.

Home-Made Experimental Apparatus

The following articles, published in the Scientific American Supplement, describe in clear, simple English, without the aid of mathematics, and with the help of lucid drawings, the construction of useful scientific instruments. It will be found, in most cases, that elaborate tools are not required.

ELECTRIC LIGHTING FOR AMATEURS. The article tells how a small and simple experimental installation can be set up at home. Scientific American Supplement 1551.

AN ELECTRIC CHIME AND HOW IT MAY BE CONSTRUCTED AT HOME, is described in Scientific American Supplement 1566.

THE CONSTRUCTION OF AN ELECTRIC THERMOSTAT is explained in Scientific American Supplement 1566.

HOW TO MAKE A 100-MILE WIRELESS TELEGRAPH OUTFIT is told by A. Frederick Collins in Scientific American Supplement 1605.

A SIMPLE TRANSFORMER FOR AMATEUR'S USE is so plainly described in Scientific American Supplement 1572 that anyone can make it.

A MINIATURE HOT-AIR ENGINE. Scientific American Supplement 1573.

THE CONSTRUCTION OF A SIMPLE PHOTOGRAPHIC AND MICRO-PHOTOGRAPHIC APPARATUS is simply explained in Scientific American Supplement 1574.

A SIMPLE CAMERA-SHUTTER MADE OUT OF A PASTEBOARD-BOX, PINS, AND A RUBBER BAND is the subject of an article in Scientific American Supplement 1578.

HOW TO MAKE AN AEROPLANE OR GLIDING MACHINE is explained in Scientific American Supplement 1582, with working drawings.

EXPERIMENTS WITH A LAMP CHIMNEY. In this article it is shown how a lamp chimney may serve to indicate the pressure in the interior of a liquid; to explain the meaning of capillary elevation and depression; to serve as a hydraulic tourniquet, an aspirator, and intermittent siphon; to demonstrate the ascent of liquids in exhaustive tubes; to illustrate the phenomena of the bursting bladder and of the expansive force of gases. Scientific American Supplement 1583.

HOW A TANGENT GALVANOMETER CAN BE USED FOR MAKING ELECTRICAL MEASUREMENTS is described in Scientific American Supplement 1584.

THE CONSTRUCTION OF AN INDEPENDENT INTERRUPTER. Clear diagrams giving actual dimensions are published. Scientific American Supplement 1615.

AN EASILY MADE HIGH FREQUENCY APPARATUS WHICH CAN BE USED TO OBTAIN EITHER D'ARSONVAL OR OUDIN CURRENTS is described in Scientific American Supplement 1618. A plunge battery of six cells, a two-inch spark induction coil, a pair of one-point Leyden jars, and an inductance coil, and all the apparatus required, most of which can be made at home.

SIMPLE WIRELESS TELEGRAPH SYSTEMS are described in Scientific American Supplements 1363 and 1381.

THE LOCATION AND ERECTION OF A 100-MILE WIRELESS TELEGRAPH STATION is clearly explained, with the help of diagrams, in Scientific American Supplement 1622.

THE INSTALLATION AND ADJUSTMENT OF A 100-MILE WIRELESS TELEGRAPH OUTFIT, illustrated with diagrams, Scientific American Supplement 1623.

THE MAKING AND THE USING OF A WIRELESS TELEGRAPH TUNING DEVICE, illustrated with diagrams, Scientific American Supplement 1624.

HOW TO MAKE A MAGIC LANTERN, Scientific American Supplement 1546.

THE CONSTRUCTION OF AN EDDY KITE, Scientific American Supplement 1555.

THE DEMAGNETIZATION OF A WATCH is thoroughly described in Scientific American Supplement 1561.

HOW A CALORIC OR HOT AIR ENGINE CAN BE MADE AT HOME is well explained, with the help of illustrations, in Scientific American Supplement 1573.

THE MAKING OF A RHEOSTAT is outlined in Scientific American Supplement 1594.

Good articles on SMALL WATER MOTORS are contained in Scientific American Supplement 1494, 1049, and 1406.

HOW AN ELECTRIC OVEN CAN BE MADE is explained in Scientific American Supplement 1472.

THE BUILDING OF A STORAGE BATTERY is described in Scientific American Supplement 1433.

A SEWING-MACHINE MOTOR OF SIMPLE DESIGN is described in Scientific American Supplement 1210.

A WHEATSTONE BRIDGE. Scientific American Supplement 1595.

Good articles on INDUCTION COILS are contained in Scientific American Supplements 1514, 1522, and 1527. Full details are given so that the coils can readily be made by anyone.

HOW TO MAKE A TELEPHONE is described in Scientific American Supplement 966.

A MODEL STEAM ENGINE is thoroughly described in Scientific American Supplement, 1527.

HOW TO MAKE A THERMOSTAT is explained in Scientific American Supplements 1561, 1563, and 1566.

ANEROID BAROMETERS, Scientific American Supplements 1500 and 1554.


A WATER BATH, Scientific American Supplement 1464.

A CHEAP LATHE UPON WHICH MUCH VALUABLE WORK CAN BE DONE forms the subject of an article contained in Scientific American Supplement 1562.

Each number of the Scientific American Supplement costs 10 cents by mail.

Order from your newsdealer or from **MUNN & CO., 361 Broadway, New York**

Wouldn't You Like to Own This 16 Shot Repeating Rifle? Only \$7.75



Hopkins & Allen .22 Caliber Repeater

The squirrels and rabbits can't get away from you when you carry this rifle. If you miss one the first time—you have 15 more shots coming almost before he can move.

It makes a ramble in the forest a pleasure—productive of full game bags—and all the excitement of quick successful shots.

Description: This is the finest and most reliable repeating rifle ever offered at the price. It shoots 22 long or short or 22 long rifle cartridges—16 shots for shorts and 12 for long or long rifle—and the ejector works like lightning. You can deliver 12 or 16 shots (depending on the cartridge used) almost as quick as you can pull the trigger. **THE GAME SIMPLY CANNOT GET AWAY.**

Quick take-down pattern—full length 38 1/2 in., length of barrel 20 in.—weight 5 1/2 lbs. Has that excellent military bolt action—the first ever put on an American sporting rifle. HAS THE BEST SAFETY DEVICE—A SIMPLE TOUCH OF THE LEVER PREVENTS ACCIDENTAL DISCHARGE. HAS THE ONLY EJECTING DEVICE THAT WILL QUICKLY EMPTY THE MAGAZINE WITHOUT FIRING A CARTRIDGE. HAS MORE UNIQUE, DESIRABLE FEATURES THAN ANY OTHER 22 CALIBER REPEATER. Has beautifully polished walnut stock, military butt plate, every part drop forged—lock work made of spring steel. AN EXCELLENT RIFLE FOR FIELD, FOREST OR GALLERY PRACTICE—SURE TO GIVE SURPRISING PLEASURE TO ITS POSSESSOR.

PRICE—Safe delivery guaranteed—\$7.75—IF YOUR OWN DEALER CANNOT SUPPLY YOU.


We publish two delightful stories—"William Tell," the experience of an expert with his first Junior Rifle, and "My First Rifle," by the famous marksman, Capt. Jack O'Connell, WHICH WE WILL SEND FREE, with our illustrated catalogue of rifles, revolvers and shotguns.

HOPKINS & ALLEN ARMS CO., Dept. 138, Norwich, Conn., U. S. A.

London Office: 6 City Road, Finsbury Square, London, England.

The largest manufacturers of High Grade Shot Guns, Rifles and Revolvers in the World.

BECOME A CARTOONIST



Qualify at home in spare time to earn \$25.00 a week. Men like McCutcheon, Briggs, Davenport, Outcalt, Kemble and others earn \$5,000 and upwards a year.

We shape the course to meet your individual needs; develop you to do the original work that enables artists to hold high salaries positions. We guarantee proficiency to earnest students, and secure positions when competent.

You incur no obligation by writing now for full information about the "Acme Way" of teaching drawing by mail. We also teach Illustrating, Designing, Architectural, Mechanical, or Sheet Metal Pattern Drafting successfully. "At 18 years."

THE ACME, School of Drawing
A-273 Acme Bldg., Kalamazoo, Mich.
Resident instruction if preferred.

A. M. Tiber


Manufactory Established 1761.

Lead-Colored & Slate Pencils, Rubber Bands, Erasers, Ink, Penholders, Rulers, Water Colors, Improved Calculating Rules.

Send for descriptive Circular S.

44-60 East 23d Street, New York, N. Y.
Grand Prize, Highest Award, St. Louis, 1904.

Dykema Cement Brick \$35 MACHINE



Makes 5 FACE DOWN brick. A quick heavy machine at a low price. 10 brick Machine \$65.00. Block Machine \$35.00 up. Concrete Mixers \$100.00 up. Book Cement Plans 30c. Send for catalog.

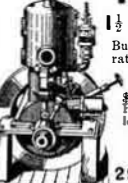
DYKEMA COMPANY
4327 Huron Street, Grand Rapids, Mich.

Electrical Engineering and Experimental Work of Every Description

We have every facility for producing first-class work promptly. Our factory is equipped with modern machinery throughout.

C. F. SPLITDORF
Engineering Dept. 17-27 Vandewater St., N. Y. City

THE "LEADER."



H. P. Gasolene Auto-Marine Engine

Built like a watch. Beautifully Finished. Accurately Constructed. Light, Strong, Reliable. Noiseless in operation. Suitable for launches from 15 to 19 feet in length. Price complete, \$75 net, no discount. Thoroughly guaranteed. Perfect Speed Control. Complete descriptive Catalog upon application. Manufactured by

CLAUDE SINTZ,
292 S. Front St., Grand Rapids, Mich.

NOBLE HONEYCOMB BLOCK.

The average Cement Block looks like pressed sheet iron. The Noble Cement Block Machine makes perfect Rough Hewn Stone Blocks, single or double faced. In setting, the mortar is pressed into the voids forming lugs, an ideal bond, resisting lateral pressure. Blocks made any size. Dead Air cells resist dampness, frost or heat. Let us post you on Modern Concrete Building Methods.

NOBLE CONCRETE MACHINERY COMPANY
558 West Fremont St., Fostoria, O.

The Kickdrive Circular Saw



Is a simple power for tight work on the kind most done by carpenters, cabinet, box, pattern and picture-framemakers, and wood workers generally, besides engravers and electrotypers. This Machine has a strong, solid iron frame and steel shaft; is thoroughly well-built and suitable for various kinds of work, as ripping, cross-cutting, grooving, etc. Can be operated sitting or standing. We also make all kinds of foot power devices.

MAYER SLOTKIN
210-212 Canal St., New York.

BUY A Ferro Auto-Marine Engine

"High Grade from the Ground Up." An engine with a factory behind it, with an absolute Reliability Insurance. Built entire and guaranteed by the strongest marine engine factory in the world. With Gasoline Engine & pays to buy the best. The Ferro Engine pronounced at Chicago Show, by Yachtmaster, Boat and other Engine Builders, the Best Marine Engine built. Cuts no more than 60 horse power.

Send 10 cents for loaned "Treatise on Modern Marine Engines," invaluable to every user. Send to-day for sample leaf and Complete Catalog free.

THE FERRO MACHINE & FOUNDRY CO.
75 Wade Building, Cleveland, O.
Large stock at Eastern Branch, 79 Cortlandt Street, New York

JAGER Marine 4-Cycle Engines



Skillfully designed and well built. Single lever control, combining automatic carburetor with spark advance. Develops wide speed range and reliability under most trying conditions. Sizes 3 to 60 h. p. Send for catalog.

CHAS. J. JAGER CO.
281 Franklin, cor. Batterymarch St., Boston, Mass.

GARDNER H. P. GASOLINE ENGINES



Simplest, safest, lightest running, most compact and durable engine built. Always ready to run; never out of order. The ideal engine for driving motor boats, dynamos, lathes, water and air pumps, and for every practical purpose where light motive power is required.

Engine complete as shown herewith sent C. O. D. anywhere in the world for \$250. Or complete set of rough castings and detailed blue print with instructions how to build the engine yourself for \$12. Write to-day for descriptive pamphlet and full information.

JOHN W. GARDNER
1037 Goodfellow Avenue, St. Louis, Mo.

Classified Advertisements

Advertising in this column is 50 cents a line. No less than four nor more than ten lines accepted. Count seven words to the line. All orders must be accompanied by a remittance. Further information sent on request.

SALE AND EXCHANGE.

FOR SALE.—A complete guide for Machinists. Four volumes bound in morocco leather. Cost \$18.00. A bargain at \$6.00. For information and particulars, address B. A. R., Box 420, Chicago, Ill.

FOR SALE.—PROFITABLE BUSINESS. ADDING Machine, Metal. Patented January 2, 1906. Unequaled. Cost to make, 75c. For full information and particulars, address 422 Westside Avenue, Jersey City, N. J.

WILL SELL FOR CASH, IF TAKEN AT ONCE, patent rights for U. S. west of the Mississippi, in machine which reduces cost of sugar and flour barrels at least ten cents each. For further information and particulars, address American Barrel and Machine Company, 23 Court Street, Boston, Mass.

NASSAU STAMP CO., LTD., 2 PARK PLACE, New York City. Postage stamps for advanced collectors bought and sold. All albums, catalogues and supplies in stock.

BUSINESS OPPORTUNITIES.

WE WANT A HALF DOZEN associates with \$1,000 to \$10,000 each to join us in a close corporation for the growing of bananas. Land and one-half of capital already secured. Hundreds of miles nearer the markets than any commercial banana plantation in the world. Shipping facilities unequalled, both rail and water transportation. Soil and climate perfect. Business in the hands of experienced, responsible people. Land ready to plant. Investment returned within 18 months, and enormous profits assured thereafter. Less than \$30,000 needed. Let us tell you about it now. Banana, 24 Milk Street, Room 910, Boston, Mass.

EXPERT STEEPLE CLIMBER, 17 years experience, will teach business complete. Models, illustrated lectures, practice. Or by mail. Experience unnecessary. Very profitable. John F. Meighan, 311 W. 114th St., N. Y.

ANYBODY CAN MAKE GOOD CUTS AT VERY small cost with my simple zinc etching process; price \$1; specimens and particulars for stamp. Address T. M. Day, Box S, Windfall, Ind.

A PATENT FERRIS DEVICE.—I WANT TO FIND someone to manufacture it for me, or I will sell or let on royalty. For further information and particulars, address G. W. Russell, Amarillo, Texas.

HAND AND MACHINE WOOD TURNING OF every description; job and contract work solicited. Pioneer producers of Rustic Novelties. Established 1875. Barton & Spooner, Cornwall-on-Hudson, N. Y.

MINING INVESTMENTS.—Good, bad and indifferent. The Copper Handbook describes 462 mines, exposing many brazen swindles. Address, for particulars, Handbook, 3 Montezuma St., Houghton, Mich.

ACTIVE FIRM IN PHILADELPHIA HANDLING several machinery and hardware specialties, desires to represent one or two more specialties to develop the market for and force the trade on the whole, taking the agency in Philadelphia and its vicinity; carrying stock for immediate delivery. For full information and particulars, address Box 52, Philadelphia, Pa.

WANTED SMALL PATENTED ARTICLE OR Tool in iron, steel, or any metal, by manufacturing concern to make and put on the market. For full particulars, address Box 83, Philadelphia, Pa.

INVESTMENT involving half ownership or more and any official position in old established works in important New York city is offered satisfactory young gentleman with \$50,000 to \$100,000; same required for working capital and improvements. Principal specialty absolutely staple. General engineering opportunities many. Particulars only upon suitable introduction financial and general. Positively no brokers. Address "Iron Works," Box 773, New York City.

WE ARE IN POSITION to secure capital, special or active partners for good, sound business propositions; we have several clients on hand who will consider business openings that will stand the roughest investigation. Saml T. Bondhus & Co., 97-99 Nassau St.

INCORPORATE.—Conduct your business by modern methods and avoid individual liability. We attend to all the details and furnish capital for favorable enterprises. Reply in all States. Write for information today. The Corporation Company of America, 68 William St., New York.

LEARN TO INVENT and develop your ideas for profit; we are not patent lawyers. Boston School of Inventing, P. O. Box 3566, Boston. Further particulars free.

FOR SALE.—Portable Compressed Air House Cleaning Wagon and Machinery sold to responsible parties to operate in cities, five thousand inhabitants upwards. Each Portable Cleaning Plant has an earning capacity of from \$50.00 to \$70.00 per day, at a cost of about \$30.00 per day. Capital required from \$2,000.00 upwards. Stationary Residential Plants also from \$450.00 upwards. Over 100 companies operating our system. We are the pioneers in the business and will prosecute all infringers. State references. Address General Compressed Air House Cleaning Co., 4453 Olive Street, St. Louis, Mo.

SELL PATENTS.—To buy or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

WE MANUFACTURE METAL SPECIALTIES OF all kinds. Best equipment. Send sketch or mode s. or estimate, stating quantity. Hayes Manufacturing Co., 465-75 Maybury Avenue, Detroit, Mich.

HELP WANTED.

SPECIALISTS.—THE MORE OUT-OF-THE-ORDINARY your ability, the better our facilities for serving you. Write us to-day, stating age and experience. Haggoods, 305 Broadway, N. Y.

TYPEWRITERS.

TYPEWRITERS, \$15, \$25, \$50.—Remington, Smith Premier, Oliver, Underwood, and all other makes. Cash or payments. Free trial. St. Louis Typewriter Exchange, No. 507 Olive St. Established 20 years.

AMERICAN TYPEWRITERS.—Our own manufacture, fully guaranteed, \$10.00 to \$50.00. Special prices in towns where we have no agency. For particulars, address American Typewriter Co., 201 Broadway, N. Y. C.

SPECIAL BARGAINS.—Remington No. 2, writing two colors; Densmore, Hammond, Franklin \$15 each, shipped privilege of examination. Write for complete catalogue "F," Eagle Typewriter Co., Suite 11, 337 Broadway, N. Y.

PATENTS FOR SALE.

FOR SALE.—U. S. AND CANADA PATENTS ON Improvement in Fence Posts, wherein the line wires may be positioned in any desired spaced relation. For full particulars, address H. C. Youngs, Attica, Mich.

AUTOMOBILE PATENT FOR SALE.—Protects damaged tires, prevents skidding. Sure of big sale. Made cheaply. Not able to manufacture. Will sell patent or on royalty. G. A. Ams, 712 Pine St., St. Louis, Mo.

FOR SALE.—Basic patent. Prevents fires following earthquakes. Small, simple device; positive action; cheap to make and install. No expense for upkeep. B. D. Merchant, 2150 Central Ave., Alameda, California.

WANTED.—Purchaser Canadian rights (just issued) of "Rapid" Turbine Tube Cleaner. Adopted U. S. Navy. Guaranteed superior to any. Free trial machine for tests. Andrews Mfg. Co., Rockaway, N. J.

PATENTS SOLD ON COMMISSION. If you wish to buy or sell patent write for particulars to E. L. Perkins, 72 Broad Street, Boston. Patent Sales Exclusively.

FACTORY AND MILL SUPPLIES.

STOP PAYING WATER RENT at your mill or factory. Erect a Caldwell Tank on a Caldwell Tower or your building. Plenty of pressure for every purpose. Fire protection besides. First cost only cost. Dozens of references right around you. John T. Stearns & Co., Silk Manufacturers, of Elmira, N. Y., say "Don't see how a factory could do without it." Send for Illustrated Catalogue and Price List. W. E. Caldwell Co., Station D D, Louisville, Ky.

FOUNTAIN PENS.

FILLS ITSELF BY A BREATH.—No sticky threads, no leaky joints. Can't leak. Positively cleanest, most practical fountain pen made. Get catalogue. S. C. Crocker Pen Co., 79 Nassau St., New York.

PHOTOGRAPHY.

ALL THAT'S GOOD IN PHOTOGRAPHS.—For publication or private orders. Developing, printing private orders. Spurr & Wells, Inc., 1821 Broadway, cor. 65th St., New York. Tel. 3472 Col.

DIFFICULT PHOTOGRAPHY OUR SPECIALTY. Fine interior and architectural views. Copies and enlargements. Mercantile and half tone work. Paintings copied by color value process. Models and machinery, etc. C. C. Langill, 10 E. 14th St., N. Y.

BLUE PRINT PAPER.—The finest made. Oblig Quality stands back of it. 4x5, 16c; 5x7, 28c; 8x10, 55c, each 2 doz. Postage add 3, 4 and 5c. Other sizes in proportion. Per roll, 42 in. by 10 yds., \$2.25. Send for lists of photographic supplies. For full particulars address Obrig Camera Co., 147 Fulton Street, New York.

WE PHOTOGRAPH any thing, any where, any time. Building, Paintings, Plans, Models, Machinery, Estates, etc. Illustrations for Advertisers. The General Photographing Co., 125 B'way, Daly's Theatre Bldg., N. Y. City

LUMIERE PLATES, PAPERS & CHEMICALS For 30 years the standard in Europe. A free Sample for the asking. Write N. Y. Office, 11 West 28th St. Factories, Lyons, France, and Burlington, Vt.

GAS-LIGHTING APPLIANCES.

"SIMPLIQUE" ELECTRIC GAS LIGHTER. Simple; Economical. Household necessity where gas is used. Fits any standard dry battery. By mail \$1.00. Without battery 50c. Wm. Roche, 383 Clerk St., Jersey City, N. J.

MACHINERY FOR SALE.

IF INTERESTED IN POWER for any kind of light manufacturing, electric lighting, marine or other purposes, get information on the most improved kerosene oil engine by sending for catalogue to Remington Oil Engine Co., 41 Park Row.

REMOVED to larger quarters, we offer our large stock of new and second-hand machinery; also boilers, engines, dynamos, motors, materials and supplies. Liberty Machinery Mart, 153 West Street, New York.

WANTED—MISCELLANEOUS.

\$150 per dwl. for clean PLATINUM SCRAPS. Send by Regular Mail for Safety. National Refinery, 239 Taylor Ave., Newport, Ky.

ALCOHOL MANUFACTURING.

EXPERT ADVICE in the manufacturing of alcohol and compressed yeast. Analysis of all raw materials and by-products. H. H. Freund, Technical Fermentation Chemist, 145 East 23d St., New York.

EDUCATIONAL.

MONEY IN DRAWING.—AMBITIOUS MEN AND Women send for my booklet "A New Door to Success." Full year's practical art instruction for \$30. Grant E. Hamilton Studio, 141 Flatiron Building, N. Y.

ASTRONOMY.

STARS AND PLANETS—learn to know them at a glance. Astronomy in simplest and most fascinating form. The Revolving Planisphere shows clearly practical stars visible any hour in year. Simple, handy, reliable. Only 50c. T. Whitaker, Publisher, 123 Bible House, New York.

SCHOOLS AND COLLEGES.

PATENT LAWS AND OFFICE PRACTICE.—Thoroughly practical course by mail for attorneys and inventors. Postal brings free specimen pages and full information. Cor. school of Patent Law, Dept. A. 1853 Mintwood Place, Washington, D. C.

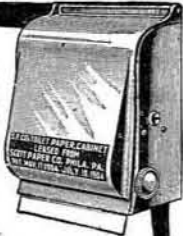
Table listing various items and their prices, including Hammers, Hats and caps, Hats, stiff fur, Horns and supports, Tray Company of Newark, Hosiery, Hosiery, F. A. Patrick & Co., Insulating compounds, Jewelry and silver metal ware, Fishel, Nessler & Co., Jewelry and solid and plated precious metal ware, Knitted shirts, drawers, and vests, Reins & Meiss, Lamp and lantern globes, R. E. Dietz Company, Lawns, Eddystone Manufacturing Co., Laxative salts, Body Builders Medicine Co., Leather and products from the same, J. M. Delaney & Co., Leather, harness, C. F. Paul & Son, Leather manufacturers, certain, Gray & Dudley Hardware Co., Leather, paste for filling defects in, H. C. Bee, Leather, shoe and glove, Surpass Leather Co., Linen goods, certain, Dayton Dry Goods Co., Liniment or counter irritant, Dr. D. Jayne & Son, Liquid separators and parts therefor, centrifugal, Aktiebolaget Salenius Werkstad, Magazines, monthly, E. Hubbard, Malt extracts, Paragon Malt Extract Co., Medicinal malt extracts, Paragon Malt Extract Co., Medicinal preparation, certain, Jno. M. Scott & Co., Medicinal preparation, certain named, E. M. J. Mahr, Medicinal preparation for purifying and treating the blood, McKesson & Robbins, Medicinal preparations, certain, W. R. Warner & Co., Medicines, laxative, F. A. Luyties, Medicines, tonic, alterative, laxative, and diuretic, Wells & Richardson Co., Metal manufactures, certain, Thomas Devlin Manufacturing Co., Milk, cream, butter, and cheese, H. J. Nietert, Mowers, lawn, George Worthington Co., Nutritive, restorative, stimulative, and anti-septic compound, Tilden Co., Oil, certain named cooking, Union Oil Company, Oil, lubricating, Galena-Signal Oil Company, Oil, olive, E. L. Corazzini, Ointment, K. M. Brown, Opera and field glasses and binoculars, A. Taussig, Paper, drawing, E. G. Seltmann, Paper, drawing and tracing, E. G. Seltmann.

Advertisement for Remington Typewriter. Features an illustration of a typewriter and text: 'The ... Remington Typewriter has completed the thirty-third year of its history with a gain in business of 31% Over the Year Before. Our enormous increases are derived from three sources: from the man who is buying his first Remington; from the man who is buying more Remingtons; and from the man who has tried other than Remingtons. Remington Typewriter Co. New York and Everywhere.'

Advertisement for 'The New Agriculture' by T. Byard Collins. Features a decorative border and text: 'Just Published The New Agriculture By T. BYARD COLLINS 12mo, 374 pages, 106 illustrations, cloth, price \$2.00. THIS new and authoritative work deals with the subject in a scientific way and from a new viewpoint. Dr. Collins has devoted his lifetime to the study of changing economic agricultural conditions. "Back to the soil" was never a more attractive proposition and never so worthy of being heeded as during these opening years of the twentieth century. Farm life to-day offers more inducements than at any previous period in the world's history, and it is calling millions from the desk. The reason for this is not at first obvious, and for this reason Dr. Collins has prepared the present work, which demonstrates conclusively the debt which agriculture owes to modern science and the painstaking government and State officials. Much of the drudgery of the old farm life has been done away with by the use of improved methods, improved stock and varieties. All this tends to create wealth by increased value of the product and decreased cost of production. Irrigation, the new fertilization, the new transportation, the new creations, the new machinery, all come in for a share of attention. The illustrations are of special value, and are unique. All who are in any way interested in agriculture should obtain a copy of this most timely addition to the literature of agriculture. A full table of contents, as well as sample illustrations, will be sent on application. MUNN & CO., Publishers of "Scientific American," 361 Broadway, New York'

The Modern Toilet Paper

The new, soft, strong toilet tissue, made perfectly anti-septic by being thoroughly impregnated with Canada Balsam. In rolls and sheets.



Balsam Sanitissue

comes wrapped in parchment, in sealed cartons. Price 10c, 15c, 25c. 25 sheets free. \$1 worth sent prepaid anywhere. For \$2 we will send with the paper an S. P. Co. oxidized copper cabinet.

SCOTT PAPER CO., 504 Glenwood Ave., Philadelphia.

Let Us Arrange a Month's Test of

Prest-O-Lite

for Your Automobile Pay Us Nothing If Not Satisfied

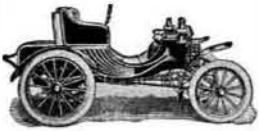


Simply write us a postal and say you want to try Prest-O-Lite, and we'll have one of our 400 stations put a tank on for you; connect it, and have your lights going in five minutes.

When your tank is empty we exchange it for a full one in one-quarter the time it takes to dig out a caked-up box—fill it with carbide—fill a tank with water and perform a hairpin operation upon these flimsy little lamp pipes so they'll work—and then it's ten to one they work only 10 minutes.

The Prest-O-Lite Co. Dept. 75, 18-24 So. East St., Indianapolis, Ind.

DURYEA AUTOS



If you are thinking of getting an auto next Spring, write us at once for our "Maker to User profit-sharing plan," and save money

DURYEA POWER CO., Aeyrud Street, Reading, Pa.

"Success" Automobile, \$250



Practical, durable, economical and absolutely safe. A light, strong, steel-tired auto-buggy. Suitable for city or country use. Speed from 4 to 30 miles an hour.

\$40 MOTORCYCLE



We have the largest line of New and used Motorcycles, Pads and Supplies in the country, at the lowest prices. Every machine guaranteed.

HARRY R. GEER CO., 1015 Pine St., St. Louis, Mo.

GAS ENGINE DETAILS.—A VALUABLE and fully illustrated article on this subject is contained in SUPPLEMENT No. 1292. Price 10 cents. For sale by Munn & Co. and all newsdealers.

Automatic Water Supply

Most economical, reliable and efficient. If you have running water the Niagara engines will elevate 31 feet for each foot-fall obtainable from spring, brook, or river, delivered to any distance.

Niagara Hydraulic Engine Co. 140 Nassau St., N. Y.

60 YEARS' EXPERIENCE

PATENTS

TRADE MARKS DESIGNS COPYRIGHTS & C.

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.

Scientific American. A handsomely illustrated weekly. Largest circulation of any scientific journal. 7c per copy a year; four months, \$1. Sold by all newsdealers. MUNN & Co. 361 Broadway, New York

Table listing various scientific and industrial products with prices, including items like Paper, Paste, Pens, Pottery, and various oils and chemicals.

Table listing various types of Whisky and other beverages with prices.

Table listing various types of Labels with prices.

Table listing various types of Prints with prices.

Table listing various types of Dies, Tools, Models and Special Machinery with prices.

Table listing various types of Experimental & Model Work with prices.

Table listing various types of Mason's New Pat. Whip Hoists with prices.

NOVELTIES & PATENTED ARTICLES. MANUFACTURED BY CONTRACT. PUNCHING DIES, SPECIAL MACHINERY. E. KONIGSLOW-STAMPING & TOOL WORKS, CLEVELAND, O.

What You Get When You Get a CADILLAC

You get a car as scientifically designed and as perfectly finished as if the reputation of this, the greatest automobile establishment in the world, depended upon that one car.

This painstaking care dominates to the smallest details of Cadillac construction—in the engine it is so apparent that the minutely-accurate finish of this vital part has made it a signal triumph in automobile manufacture.

The Cadillac Runabout and Light Touring Car are fitted with our wonderful single-cylinder engine, to which the dependability and remarkably low cost of maintenance of these models are chiefly attributable.

Don't fail to get a demonstration—you will be surprised how great are the possibilities of the "Car that Climbs."

CADILLAC MOTOR CO. Detroit, Mich. Member A. L. A. M. Includes a large illustration of a Cadillac car and pricing information for various models.

LET US BE YOUR FACTORY. WRITE FOR ESTIMATE ON ANY ARTICLE YOU WANT MANUFACTURED. STAMPINGS, MODELS, EXPER. WORK. THE GLOBE MACHINE & STAMPING CO.

ICE MACHINES. Corliss Engines, Brewers and Bottlers' Machinery. THE WILTER MFG. CO.

MODELS & EXPERIMENTAL WORK. Inventions developed. Special Machinery. E. V. BAILLARD.

RUBBER. Expert Manufacturers. Fine Jobbing Work. PARKER, STEARNS & CO.

THE SCHWERDTLE STAMP CO. STEEL STAMPS, LETTERS & FIGURES. BRIDGEPORT CONN.

GEO. M. MAYER, 1131 MONADNOCK, CHICAGO. WORKING DRAWINGS.

Specialties & Patents Bought and Sold. American Commerce & Specialty Co., Inc.

DRYING MACHINES. For Sand, Clays, Minerals, Wood Pulp, Fertilizers, Chemicals, Ores, Ground Silica and Mica.

MODELS. CHICAGO MODEL WORKS. ESTABLISHED 1867. 179 E. MADISON ST. CHICAGO, ILL.

MR. INVENTOR. Send us your models or drawings for our lowest prices. We can develop, perfect or manufacture your invention.

Dies, Tools, Models and Special Machinery. HOEFT & MOORE, Chicago, U. S. A.

Experimental & Model Work. Cir. & advice free. Wm. Gardam & Son.

MASON'S NEW PAT. WHIP HOISTS. save expense and liability incident to Elevators.

NOVELTIES & PATENTED ARTICLES. MANUFACTURED BY CONTRACT. PUNCHING DIES, SPECIAL MACHINERY.

INVENTORS. We manufacture METAL SPECIALTIES of all kinds.

SEALED PROPOSALS. PROPOSALS will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

LEARN WATCHMAKING. We teach it thoroughly in as many months as it formerly took years.

LEARN PLUMBING. A few months' instruction at our school under the supervision of expert plumbers will enable you to earn regular plumber's wages.

TYPEWRITERS. ALL MAKES. All the Standard Machines SOLD or RENTED ANYWHERE.

NAME PLATES—STEEL STAMPS. EMPLOYEE CHECKS, KEY TAGS & BADGES. J. ROBBINS MFG. CO.

High Grade Brass Manufacturers. BRASS CASTINGS of any composition and for any class of service Made to Order.

To Book Buyers. We have just issued a new 112-page catalogue of recently published Scientific and Mechanical Books.