

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. In every case it is necessary to give the number of the inquiry.

Marine Iron Works. Chicago. Catalogue free. Inquiry No. 3538.—For manufacturers of models of the Ferris wheel. "U. S." Metal Polish. Indianapolis. Samples free. Inquiry No. 3539.—For machinery for pressing straw into blocks for fuel purposes.

Inquiry No. 3540.—For second-hand machinery for the equipment of a cement mill, including four marine type engines of 80 to 1,000 h. p. Dies, stampings, specialties. L. B. Baker Mfg. Co., Racine, Wis. Inquiry No. 3541.—For the manufacturers of the "Katzenjammer Puzzle."

Inquiry No. 3542.—For machines for making fly-paper. Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt. Inquiry No. 3543.—For spraying devices for spraying vineyards.

Let me sell your patent. I have buyers waiting. Charles A. Scott, Granite Building, Rochester, N. Y. Inquiry No. 3544.—For a machine for removing the tops and stems of gooseberries. Want you to read our Ad. on page 455. A Money-making Metalworking and Stamping plant for sale.

Inquiry No. 3545.—For a machine for pouring jam. Machinery designed and constructed. Gear cutting, The Garvin Machine Co., 149 Varick, cor. Spring Sts., N. Y. Inquiry No. 3546.—For waterproof paper bags.

Manufacturers of patent articles, dies, stamping tools, light machinery. Quadriga Manufacturing Company, 15 South Canal Street, Chicago. Inquiry No. 3547.—For dealers in scrap buck horn.

FOR SALE.—Patent on cheap contrivance that is indispensable in every store. Certain to sell quickly. A. L. & O. Sevelius, Hancock, Mich. Inquiry No. 3548.—For a small, direct-current motor for battery circuits, to run on 15 to 25 v. current.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and hand organs. For prices and terms write to C. W. Parker, Abilene, Kan. Inquiry No. 3549.—For makers of 3/4 h. p. A. C. & D. C. electric motors for use in electric pianos, banjos, etc.

We manufacture anything in metal. Patented articles, metal stamping, dies, screw mach. work, etc. Metal Novelty Works, 43 Canal Street, Chicago. Inquiry No. 3550.—For makers of automobile passenger vehicles or cassettes.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York. Inquiry No. 3551.—For makers of voting machines.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$5. Munn & Co., publishers, 361 Broadway, N. Y. Inquiry No. 3552.—For a set of machinery for polishing, burnishing and grading pecan.

We manufacture on contract: patented hardware specialties, tools, dies, metal stampings, special machinery, etc. Edmonds-Metzger Mfg. Co., 778 West Lake Street, Chicago. Inquiry No. 3553.—For makers of hydraulic presses for bending the cranks of crank shafts for weaving looms.

Gasoline Automobile Batteries. William Roche's "Autogas" used properly will carry vehicle twice as far as any other battery of same weight. William Roche, inventor and manufacturer, 42 Vesey Street, New York, N. Y., U. S. A. Inquiry No. 3554.—For dealers in Robinson's cinematograph.



Notes and Queries.

HINTS TO CORRESPONDENTS. Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

(8769) L. W. B. says: Will you kindly tell me what are the contents of a piece of timber, board measure, in feet, 6x6 at one end and 18x18 at the other end, 12 feet long, and the mode of calculating same? One party claims 156 feet, another 144, and a third one 180. A. The tapering piece of timber whose contents you wish to know in board measure is a frustum of a pyramid. The easiest way to find its board measure will be to calculate its cubic contents and multiply these by 12 to change to board measure. Its volume is found by the following rule: Find the area of the two ends and the mean proportional between them. Add these together, and multiply the sum by one-third of the length of the frustum.

Large end..... 1.5 x 1.5 = 2.25 sq. ft. Small end..... .5 x .5 = .25 sq. ft. Mean proportional.. V2.25x .25 = .75 sq. ft. Sum 3.25 sq. ft. Volume, 3.25 x 12 = 39 cubic feet.

(8770) E. B. H. says: Can you suggest a remedy for the removal of rats from the yard? Such a remedy as will not kill domestic animals and such a remedy as will not destroy plants. A. All of the rat poisons, of which white arsenic is the most efficient and most frequently used, are equally poisonous to other animals. Putting a lot of broken glass into their burrows is said to be effective in driving away the rats, as they cut themselves badly in gnawing and burrowing. A ferret turned loose in the yard would quickly kill or drive away the pests.

(8771) J. J. O'B. writes: With the view of settling some technical mechanical problems, I respectfully ask that the following question be answered through the columns of the SCIENTIFIC AMERICAN. Is the elasticity of steel or metal spiral springs (of first-class construction) accurate enough to be employed in the regulating of a time mechanism, either as main parts thereof or as auxiliary parts to pneumatic retarding pistons, such as are employed in the modern photographic shutters? A. The resilience of a well-tempered steel spring is the greatest and most perfect in all parts of its range of any known metal. Its endurance when kept free from rust is also greater than other metals. Its time movement is also perfect if not retarded by other and frictional elements, as the piston and other mechanism of a photographic shutter.

(8772) J. T. M. asks: Do you know of any machine by which shavings and sawdust could be pressed and made available for fuel under boilers? A. Sawdust and shavings are now largely utilized in firing boiler furnaces by blowing the loose material into the furnace. The briquetting of sawdust and shavings has been tried and found inconvenient and expensive. In many woodworking factories the entire waste is burned under the boilers. It is drawn from the machines by a suction fan and deposited in bins at a higher level than the boiler furnaces, to which it is passed by a chute in measured quantities. In other factories it is moistened by a water jet as it passes into a vertical chimney through which the air from the fans passes off, and all dust saved and the nuisance of wood dust in the neighborhood is avoided. The firemen shovel the moist sawdust from the bottom of the chute to the furnace.

(8773) T. C. asks how to make a simple electric water heater suitable for heating a small glue pot, by using the current that supplies the ordinary incandescent light; some sort of arrangement that could be set in the water if possible. A. For an electric heater to be used in place of an ordinary incandescent lamp you should not take more than one ampere of current. German silver wire may be used. No. 24 being a good size. If the current is of 110 volts pressure, 330 feet will be required. If it is 52 volts, about 150 feet will answer. This must be wound and insulated by asbestos, else the fire insurance is void. It should be inclosed in a metallic tube, in order to place it in the water to be heated. Twice the length of iron wire may be used.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending December 9, 1902, AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with patent numbers. Includes items like Accumulator, Air brake for railways, Air pressure apparatus for alternating, Ale apparatus for carbonating and dispensing ginger, Alkaline salts of methylene citric acid, Aluminum or other metals by electrolysis, Amalgam, Amade compounds of the fatty series, producing same, aromatic derivative, Anode, F. McDonald, Automobile crane, M. W. Kouns, Automobile running gear, C. E. Neal, Awning, J. C. McNamara, Awning locking mechanism, L. A. Daus, Axle cap, F. T. Giles, Bailing press, R. McBride, Ball, See Playing ball, Barrel rammer, A. Collet, Berry V. Frask, Barrel washer, F. Aue, Basin support, wash, L. M. Hooper, Beaches, means for forming, F. W. Cushing, Bearing, sheave, T. R. Ferrall, Bed lounge, H. Hagedorn, Bed or seat bottoms, spring structure for, L. H. Lawhorn, Beer, etc., metallic storage vessel for, V. Lapp, Bell, electric call, W. E. McCormick, Bell picker, P. H. Emley, Blast furnace, Steeles & Ford, Blower, steam, E. Gibson, Bobbin carrier, G. H. Miller, Boiler, R. B. Hobson, Boiler front, R. Eisenmann, Boiler setting, steam, E. Gibson, Bolster, A. Pancaast, Book, triplicate order, A. V. Neumann, Bookbinding machine, W. E. Blauvelt, Bookcase, sectional, P. W. Casler, Booster system, G. Baehr, Bolt of shoe upper fastener, W. E. Sweeny, Bottle capping machine, H. G. Davis, Bottle illuminating machine, J. H. Keehler, Bottle, non-refillable, E. Kersey, Bottle stopper for preventing the refilling of bottles, Christian & Tierney, Box, See File box, Box and drawer, S. Lynn, Box blank pasting and folding machine, E. G. Staudel, Brake shoe, W. O. Belt, Brake shoe, T. Twist, Brick pier, J. Starkey, Brewer, R. P. Smith, Brush, tooth, A. Haussmann, Buckle, trace, C. C. Schwanner, Bunsen or like burner, W. Schaefer, Burner, H. B. Cary, Burning liquid fuel, H. B. Cary, Camera plate attachment, J. A. Smith, Can opener, E. N. Manzer, Can testing machine, Wachhorst & Ross, Cane, portable cable for hauling and handling, sugar, W. C. Gregg, Caps permanently with vessels, means for securing closing, A. A. Low, Car bolster, A. Pancaast, Car brake, hand, R. N. Edwards, Car dump, W. A. Lathrop, Car, dumping, J. J. Seuder, Car fender, street, J. Nosek, Car, freight, M. A. Dees, Car, freight, H. A. Johnston, Car, truck, side bearing, railway, J. J. Hennessy, Car sign and means for operating same, illuminated, H. P. Bristol, Carbureter, explosive engine, A. A. Longuemare, Card holder, A. S. Anderson, Carpet lining, W. A. Mauran, Carpet raveling machine, G. W. Heath, Carpet stretcher, F. Lenzner, Carriage steering gear, motor, Schryver & March, Cart, dumping, A. LaPorte, Cash register, Woodson & Lindsey, Casing point, O. Lindstrom, Caster, E. W. Wainwright, Casting apparatus, H. G. Underwood, Centering gage, I. A. White, Centrifugal mill, O. Gaiser, Chain, drive, J. M. Dodge, Chair, J. E. Gilson, Chair, A. Brubaker, Chair foot rest, J. S. Kenny, Charcoal furnace, fire clay, C. J. Kech, Chuck, F. A. Errington, Chuck, friction drill, C. C. Roberts, Chuck, planer, S. E. Walling, Cigar band, M. Regensburg, Cigar cutter, R. Stelnecke, Cistern, tank, or reservoir cleaner, Murray & Jackson, Clasp, Schenker & Aubry, Cloth clamping device for cutting, A. W. Curtis, Clutch mechanism, E. M. Couch, Clutch mechanism, reversible, W. J. Wright, Coin counter, J. W. Davis, Coin holder, C. W. McCarter, Coin receptacle safety device, A. C. Rogers, Collar, horse, B. Allen, Jr., Computing machine, J. M. Daly, Computing machine, gravity, J. M. Daly, Conveyor, J. H. Hahn, Conveyor, F. R. Wilson, Jr., Conveyor shaft hanger, F. R. Wilson, Jr., Conveying apparatus, E. R. French, Cooler, See Milk cooler, Cooling apparatus, J. E. Haarmann, Copper and copper alloys, manufacture of various articles from, G. A. Dick, Corset, J. Bowers, Corset stiffeners, machine for making, Holden & Ackerman, Cotton gin feeder and cleaner, J. W. Seifert, Coupling for tenders, etc., W. Wright, Cream separator, C. E. Potts, Cream separator, liner, centrifugal, C. J. Lundstrom, Cross tie cutting machine, C. A. Hege, Cultivator, lister, C. A. Brostrom, Curling iron heater, C. S. Buntington, Curtain fixture, F. Hofmann, Curtain pole, lace, J. R. Stillwell, Currents, generating alternating, C. S. Bradley, Cutter or tool gage, J. P. Hayes, Dental plugger, J. H. Wilkens, Dentistry, mechanical, H. A. Littig, Diaphragm meter and exerciser, J. E. Ruebsam, Dipping tank, J. Muller, Dish cutting machine, L. W. Tinkham, Display rack, J. L. Kragle, Door hanger, J. Handeschumacher, Drag rake, H. Bormann, Drawer attachment, J. T. Moyer, Drawing, apparatus for facilitating, F. A. Brown, Dress shields, metal, T. Davis, Drill, G. W. Griffiths, Drill bit, A. S. Jones

Table listing inventions with patent numbers. Includes items like Dust guard, E. Harris, Dye and making same, anthracene, M. H. Isler, Dyeing apparatus, J. A. Willard, Elastic goods, manufacturing molded, Dautz & Loewy, Electric battery, gravity, A. M. Friend, Electric conducting cables, forming, R. Spaulding, Electric elevator, H. Rowntree, Electric furnace, H. N. Pettey, Electric furnace, tubular, H. N. Pettey, Electric meters, reversing switch controller for, J. I. Ayrer, Electric roller, C. J. Marius, Electrical control, J. L. Schureman, Jr, Electrical switch, C. D. Platt, Electrical transmission, composite system of, F. Bedell, Electrode, accumulator, R. Alexander-Katz, Electrolytic apparatus, Matthews & Davies, Electromagnet, A. Stromberg, Electrotyping base, J. W. Cornelius, Elevating and controlling mechanism, J. F. Hardy, Elevator, F. F. Ellithorpe, Engine, W. F. Tesch, Engine structure, compound, L. D. Lovelkin, Eraser, R. J. Driscoll, Eraser cleaner, F. W. & W. A. E. Stutt, Eyeglass or spectacle case, J. G. Keenen, Fastening device, B. F. Sutton, Fastening device for articles of women's wear, I. H. Sessions, Faucet, L. C. Glisson, Faucet, Stretch & Crossley, Faucet and hose connector, J. Blumer, Feed water heater and purifier, W. A. Gibson, Feeding and scale removing device for steam boilers, water, J. M. Hogarth, Feeding device, stock, L. Helmick, Fence, woven wire, R. H. Bloomer, Fenders, See Car fender, Fertilizer distributor and planter, J. B. Crowder, File box, F. Tramblay, Filter, J. Kestalek, Filter, J. W. Craine, Firearm single trigger mechanism, C. F. Lefever, Fire engine, P. H. Dedrick, Fire escape, C. B. Smith, Fire escape, P. Zimmer, Fire escape, W. H. Porter, Jr., Fish hook, P. T. Bertholf, Fish jar or aquarium, F. R. Gillinder, Fishing reel, J. Kenigsberg, Fluid motor, expansive, J. A. Norton, Glass pressure engine, H. Romansk, Flush tank, heat, O. H. Jones, Fly escape, screen, J. J. Travis, Folding box, W. Van Horn, Folding chair, G. J. Kelley, Folding chair, S. R. Rodgers, Foot shield, W. E. Beswerth, Frame and calendar, F. E. Housh, Fumigator and refrigerator, combined, G. E. Alphin, Furnace, R. S. Franz, Furnace and air feeding apparatus therefor, Maslin & Thery, Furnaces, drying for blast, J. Gayley, Furnaces, end support and circuit terminal for carbon tube, H. N. Potter, Furnaces, operating melting, W. W. Lobdell, Fuse box, M. R. Utley, Game apparatus, E. H. Dunbar, Game apparatus, U. H. W. Schenck, Game board, L. B. Gayler, Garment fastening, Cox & Ackerman, Garment, protective, K. M. Davis, Garment rack, C. Deplat, Garment supporter, J. H. and J. L. Taylor, Garments, etc., fastener for, J. L. Dinkelspiel, Gas, generating producer, M. V. Smith, Gas meter, J. R. Dupuy, Gas producer, M. V. Smith, Gaseous fuel burner, O. Falkenwalde, Gate attachment, G. W. Peek, Gin saw filing machine, A. Fredrickson, Glass cutting device, W. Fankock, Gloves, etc., fastener for, J. L. Dinkelspiel, Governor stop automatic, W. G. Kachel, Grain elevator and transmitter, W. S. Sharpneck, Grain, steeping, W. P. Rice, Grinding mill, J. H. Pendleton, Hammering tool, portable automatic, F. M. Leavitt, Harness appliance, Beidleman & Cameron, Harness, traceless, H. W. & M. B. Dewey, Harvester or mower cutter bar, I. N. Graham, Harvesting machine, corn, Priamre & Benjamin, Hat fastener, J. Pomeroy, Hay rake and leader, combined, D. N. Schuberbert, Heating apparatus, steam, W. Webster, Heating system, L. J. M. Rouquaud, Hitching device, horse, B. R. Ueell, Hitching post, A. S. Hill, Hoist, telescopic, F. C. Weber, Hoisting of heavy machines, Hoist mechanism for, H. Sawyer, Hook and eye, Morgan & Krepper, Hop handling and drying apparatus, D. Wieting, Horizontal bar, T. Wallace, Horseshoe, F. Kaczynski, Hose bridge wagon, R. Filsinger, Jr., Hose coupling, J. Stifter, Jr., Hose coupling, H. T. Cronk, Hose supporter, M. H. Eisenman, Hydrocarbon burner, H. B. Cary, Hydrocarbon burner, A. F. Chace, Hydraulic press, O. Philipp, Hypodermic needle cleaning device, G. Porter, Hydrostatic presses, regulating means for, A. W. French, Indicator, See Pilot house indicator, Injector burner, E. Reagan, Insect screen, A. Frankel, Insulator, M. Harloe, Jack-jar, A. B. Johnson, Jar closure, H. S. Brewington, Knit goods, tubular, W. W. Burson, Knob, curtain, H. Higgin, Label holding cabinet, B. O. Cowles, Lace, shoe, E. L. Pitts, Lamp burner, E. F. Fowler, Lamp carbon guide, electric, W. J. Deming, Lamp protector, electric, F. B. Garrettson, Last, G. W. French, Lathes, pipe grinding attachment for jewelers, J. E. & W. R. Jackson, Lead and zinc fumes, refining, F. L. Bartlett, Life preserver, J. B. Hamilton, Lift safety door, J. Davies, Light effects, system of and apparatus for controlling, R. F. Spangenberg, Lining, waist, M. E. de Latour, Liquid receptacle stand, E. M. Paine, Liquids from the bottoms of casks, device for drawing off, G. H. Pabst, Liquors at high pressure and at various degrees of temperature, apparatus for dispensing, H. H. Atchison, Locomotive steam boiler, Thomas & Stetson, Loom shuttle motion, J. Poyser, Looms by the quantity of weft in the shuttles, mechanism for controlling, J. H. Klerx, Lubricator, G. Whitaker, Magnet coil, ventilated, W. Spencer, Jr., Mail bag fastener, C. A. & F. L. Merrill, Mail box, S. M. Birely, Mail drying apparatus, W. P. Rice, Malt drying apparatus, F. F. Dornfeld, Massage apparatus, electrical, O. A. Bu Helm, Match making machine, H. C. La Flamby, Mattress filling machine, A. Wuest, Jr., Meat tenderer, F. M. Robinson

(Continued on page 453)

"Star" Foot and Power Screw Cutting Lathes

FOR FINE, ACCURATE WORK

Send for Catalogue B.

SENECA FALLS MFG. CO.
695 Water Street,
Seneca Falls, N. Y., U. S. A.

ENGINE & FOOT MACHINE SHOP OUTFITS

LATHES TOOLS AND SUPPLIES

SEBASTIAN LATHE CO. CINCINNATI, O.

Foot and Power and Turret Lathes, Planers, Shapers, and Drill Presses.

SHEPARD LATHE CO., 183 W. 2d St., Cincinnati, O.

Walworth's Solid Die Plate

The Standard

Price List on application to

WALWORTH MANUFACTURING CO.,
128 to 136 FEDERAL STREET, BOSTON, MASS.

MAGNETIC Metal Separator

The best contrivance for separating iron turnings, filings, etc., from brass and other materials. Cylinder shown in cut has 300 magnets to which the iron adheres, separating it from all other particles. Brass stock thus cleaned can be used for best kind of work in 3 sizes, 1500 to 4000 daily capacity and upwards. In use in the leading factories. Manufactured by Ezra Sawyer, Worcester, Mass.

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.

GAS ENGINE IGNITERS

Price, \$15.00

LATEST TYPE. BEST MADE.

For Marine, Automobile or Stationary Engines. Fully Guaranteed.

Write for Circular.

The Carlisle & Finch Co.,
233 E. Clifton Ave., Cincinnati, Ohio

CREST 3, 5, 7 H. P. MOTORS.

Sparking Pugs and Coils.

CREST MFG. CO.,
Cambridge, Mass.

DO YOU USE GRINDSTONES?

If so we can supply you. All sizes mounted and unmounted, always kept in stock. Remember, we make a specialty of selecting stones for all special purposes. Ask for catalogue.

The CLEVELAND STONE CO.,
2d Floor, Wilshire, Cleveland, O.

THE EUREKA CLIP

The most useful article ever invented for the purpose. Indispensable to Lawyers, Editors, Students, Bankers, Insurance Companies and business men generally. Book marker and paper clip. Does not mutilate the paper. Can be used repeatedly. In boxes of 100 for 25c. To be had of all booksellers, stationers and notion dealers, or by mail on receipt of price. Sample card, by mail, free. Manufactured by Consolidated Safety Pin Co., Box 121, Bloomfield, N. J.

BOGART GAS ENGINES

Double Cylinder, 50 h. p. and upward to 500.

FARRAR & TREFFTS,
Steam Engine & Boiler Works....

54 to 56 Perry Street,
BUFFALO, N. Y.

Catalogue on Application.

Look at the CRANK SHAFTS.

Large in diameter and so strong, a soft steel forgings. No chance of break in line or failure when in operation.

OLDS Gas or Gasoline ENGINE.

Safe, sure and economical. Stationary engines 1 to 50 h. p. Portable engines 3/4, 1 and 1 1/2 h. p. Write for catalogue.

Olds Motor Works,
514 River St., Lansing, Mich.

GOLD DREDGING MACHINERY...

Golden State & Miners' Iron Works

MINING AND MILLING MACHINERY...

SPECIALTIES

Dredgers for gold of the chain bucket scoop, clamshell or suction types up to 3,000 cubic yards per day capacity

Dredgers for excavation, levee building or filling in, of either of the above classes, and of sizes suited to needs of any enterprise

San Francisco, Cal., U. S. A.

Write for information
Cable Address: "Wales"

D. L. HOLDEN
REAL ESTATE TRUST BLDG., PHILA., PA.
SOLE MANUFACTURER
REGALED ICE MACHINES
SEE FIRST PAGE SCIENTIFIC AMERICAN SEPT. 2 1899

Merchandise transfer apparatus, A. W. Swanitz 715,436
 Mercantile stock register, E. A. Weigley 715,444
 Metals by electrolysis, apparatus for obtaining, G. Taddel 715,626
 Milk cooler, A. H. Reid 715,604
 Milling apparatus, C. Reed 715,293
 Motor, J. G. Hudspeth 715,480
 Motor engine, D. A. Decrow 715,559
 Mower grass receptacle, lawn, L. Wildermuth 715,721
 Mower, lawn, F. L. Adams 715,452
 Multiple cylinder engine, Werron & Vanderbeek 715,725
 Musical instrument, D. H. Haywood 715,264
 Musical instrument, automatic, E. de Kleist 715,484
 Musical instrument players, tracker board for automatic, E. M. Skinner 715,307
 Napkin holder, L. J. Martin 715,675
 Nippers, G. A. Lewry 715,401
 Nut finishing machine, O. Tyberg 715,522
 Nut lock, W. E. Karns 715,270
 Nut lock, O. C. Moore 715,498
 Oil burner, W. D. Dawson 715,354
 Oil burner asphaltum collector, G. W. Arper 715,234
 Ordnance, J. Kurig 715,672
 Ordnance recoil check, G. A. Leeben 715,278
 Ore concentrator, G. E. Woodbury 715,328
 Organ, reed, P. C. Preston 715,693
 Packing for piston rods, metallic, F. E. Small 715,616
 Packing, piston rod, W. S. Jarboe 715,664
 Packing pulverulent and mastic substances, machine for, V. G. Apple 715,336
 Paper bag machine, C. E. Dulin 715,380
 Paper, etc., machinery for cutting and folding, R. C. Seymour 715,517
 Paper receptacle, E. B. Hay 715,659
 Paper trimming and pasting machine, A. C. Luke 715,402
 Pavements or roadways, preparing the ingredients of street sheet, F. J. Warren 715,630
 Peat fuel, manufacturing, R. A. Kelland 715,271
 Pen, fountain, R. B. Dickie 715,359
 Pencil holder, J. R. Booth 715,636
 Pencil sharpener, ink eraser, and paper cutter, H. Pease 715,419
 Pencil sharpening apparatus, F. Messberg 715,499
 Photograph holder, N. E. Harper 715,376
 Photographic film holder, W. H. Hamersly 715,372
 Photographic plate developing apparatus, J. G. Schaefer 715,301
 Photographic plate, L. L. Green 715,389
 Pile fabric, woven, Tweed & Mackintosh 715,521
 Pilot house indicator for steamboats, etc., J. N. Wainman 715,325
 Pin bender, F. L. Lemon 715,674
 Pipe joint, metallic and earthenware, G. F. Ryan 715,423
 Pipe union, swiveled valve, G. H. Schamp 715,425
 Pivot joint for tobacco stalk cutters, pruning shears, etc., J. S. Kauffman 715,482
 Plaiting machine, Finch & Crayne 715,469
 Planer, L. M. Curry 715,352
 Planters, means for manipulating marker-bars of, Glessner & Jones 715,475
 Planting machine, corn, A. Lindgren 715,491
 Playing ball, F. H. Richards 715,295
 Pleasure device, A. Kiddie 715,668
 Plow, E. L. Gillham 715,257
 Plow, G. M. McLaughlin 715,282
 Plow, beet harvesting, L. L. Umstead 715,320
 Plow, wheel, L. A. Weaver 715,733
 Pocket book class, C. J. Gustafson 715,573
 Poles, etc., tool for peeling, H. Hanssen 715,574
 Post hole, J. W. Griffin 715,269
 Potato bug destroyer, M. W. Pomraning 715,690
 Preservative box, M. Kohn 715,273
 Printer's chase, F. A. McGuire 715,685
 Printing press make ready or overlays, preparing, M. Dethlefs 715,561
 Printing presses, etc., stop motion for, G. R. Williams 715,446
 Propeller controlling device for submarine boats, S. Lake 715,395
 Pulley block, Laurent & Cherry 715,589
 Pulley, split, J. W. Berry 715,634
 Pulleys, construction of driving or similar, G. L. Scott, et al. 715,304
 Pump, oil well, A. B. Gahagan 715,253
 Pumps, motive power for operating systems of, D. D. Shaw 715,614
 Pumping and fluid actuated machine, fluid, W. C. Vandegrift 715,441
 Pyrographic tool, H. Wilcox 715,720
 Rail bonding machine, L. N. Farnum 715,363
 Rail chair and insulator, W. D. Young 715,329
 Rail joint, Burger & Williams 715,241
 Rail joint, G. Hirschell 715,579
 Rail joint, R. E. Van Naular 715,628
 Rail joint tie, keyway, F. P. Saleme 715,698
 Railway brake beam, T. H. Simpson 715,518
 Railway rail joining device, E. G. Baker 715,339
 Rake, W. S. Richards 715,694
 Ratchet drill, J. Petterson 715,597
 Receptacles, connecting apparatus for rotary, O. H. & W. M. Jewell 715,665
 Reclining chair, J. S. Kenny 715,388
 Rheostat, F. C. Watson 715,327
 Ribbon feeding mechanism, R. Burk 715,456
 Rivet calking tool, P. J. Sweeney 715,624
 Riveting machine, L. P. Taeye 715,317
 Roll, yielding, B. F. Conkle 715,553
 Roller. See Electric roller.
 Rope operating apparatus, Baechtold & Co. 715,338
 Rotary engine, F. E. Womer 715,722
 Sad iron holder, K. Barnickel 715,536
 Safe lock, electric, J. M. Allen 715,334
 Sash fastener and lift, Alfred & Martin 715,241
 Scaffold support, W. J. Bret 715,590
 Sealing device, can, A. W. Livingston 715,397
 Seam dampener, W. H. Rickey 715,296
 Seed drill and fertilizer distributor, combined, F. Bateman 715,633
 Sewing machine, boat or shoe, J. H. & J. B. Ursbruck 715,323
 Sewing machine hemming attachment, W. E. Durham 715,565
 Sewing machine presser foot lifting and locking mechanism, H. A. Klemm 715,669
 Sewing machine, waxed thread, P. Slatford 715,431
 Shade, window, M. E. Reilly 715,294
 Shaft, flexible, J. A. De Vito 715,356
 Shear spring, R. G. Titus 715,708
 Shears and punch, combined, W. F. Custer 715,459
 Sheep shears, Shipway & May 715,615
 Shock carrier, E. A. Johnston 715,383
 Sign, Smith & Watson 715,309
 Sign, electric, L. S. Cranall 715,555
 Slat and wire fabric making machine, J. Reif, Jr. 715,421
 Sled hand, J. Mauser 715,465
 Smelting furnace, iron, H. A. Jones 715,249
 Snap, harness, Getz & Rowsey 715,655
 Snap switch, H. E. Reeve 715,511
 Sound conducting horn, G. A. Baldwin 715,237
 Spectacle frame, J. C. Anderson 715,533
 Spindle adjusting device, O. Tyberg 715,526
 Spool, sheet metal jack, J. E. Zimmermann 715,729
 Square, adjustable, L. S. Starrett 715,703
 Square bevel attachment, J. Sampson 715,610
 Square, try, H. B. Cary 715,550
 Stack protector, adjustable, A. Quarrie, et al. 715,603
 Stacker for threshing machines, pneumatic straw, R. & T. B. Christie 715,349
 Stalk cutter, J. T. Kizer 715,586
 Starching machine, W. H. Rickey 715,297
 Steam pressure indicator, E. A. Hitchcock 715,382
 Steam separator, G. Engel 715,649
 Steam shovel, F. Franz 715,470
 Stirrup, P. W. Koontz 715,485
 Stirrup, riding, E. E. Dunnegan 715,647
 Stone post, artificial, H. D. Streator 715,433
 Storage battery, L. Baget 715,412
 Stove grate, C. A. Reif 715,283
 Stove hot water reservoir, W. J. Keep 715,686
 Stoves, etc., fire pot for, C. S. Prizer 715,510
 Street sweeper, J. T. Collins 715,458
 Structure brace, E. Kidwell 715,390
 Stump puller, S. H. Pickett 715,688
 Sugar, means for preserving maple, A. A. Low 715,400
 Suturing instrument, D. Schisgal 715,425
 Tap or die, collapsible, P. Krastin 715,671
 Teeter totter, automatic revolving, Unkefer & Berleson 715,321
 Telegraph, J. E. Carney 715,347
 Telegraph, electric, T. D. Penniman 715,686

(Continued on page 454)

Dr. Deimel Underwear

Don't smother yourself with woolen underclothing, but wear the Dr. Deimel Linen Undergarments and give the skin a chance to breathe. You'll be warmer and healthier all winter long.



For catalogue and samples of material address

The Deimel Linen-Mesh Co.,
Dept. J. 43-491 Broadway, N. Y.

SAN FRANCISCO, CAL., 111 Montgomery St.
WASHINGTON, D. C., 728 Fifteenth St., N. W.
BROOKLYN, 510 Fulton St.
MONTREAL, CAN., 222 St. Catherine St.
LONDON, W. C., ENG., 83 Strand, (Hotel Cecil).

"SUN" Incandescent Gasoline Lamp.

Safe as a candle, powerful as 100 candles.

Agents make \$25 to \$75 per week.

Branch Supply Depots in all larger cities.

Sun Vapor Light Co.
Box 605, Canton, O.

Write for catalogue.

The "Sun" Outshines Them All.

EVOLUTION OF THE AMERICAN Locomotive.—By Herbert T. Walker. A valuable series by a member of the National Railway Museum Committee. The locomotive from 1825 to date is described and illustrated by careful drawings, great attention being given to historical accuracy. 21 illustrations. SCIENTIFIC AMERICAN SUPPLEMENTS 1112, 1113, 1114. Price 10 cents each. For sale by Munn & Co. and all newsdealers.

12-inch Pipe cut off and Threaded with ease by one man and a

FORBES PATENT DIE STOCK

Smaller sizes proportionately easy. Send for Catalogue.

THE CURTIS & CURTIS CO.,
6 Garden St., Bridgeport, Conn.

SPECIAL INSTALLMENT OFFER

\$1.00 in advance and **\$1.00** a month for four months will obtain...

Judge, one year, or Leslie's Weekly, one year, and your choice of either the Memorial War Book or Caricature

We offer a YEAR'S SUBSCRIPTION TO EITHER Judge or Leslie's Weekly, TOGETHER WITH The Memorial War Book (a book of 600 pages and 2,000 illustrations), or Caricature (a book of 250 pages and illustrations in color and in black and white, each book being fully described in the accompanying circular, for only \$1.00 with the order and \$1.00 per month for four months, or \$50.00 cash with order. Mail this coupon to us with only ONE DOLLAR, and we will send prepaid your choice of the books and enter your subscription to either JUDGE or LESLIE'S WEEKLY, as you may select.

THE JUDGE COMPANY, 110 Fifth Avenue, New York

I accept your offer of The Memorial War Book or Caricature, and Judge or Leslie's Weekly for one year. Enclosed \$1.00 for first payment, \$1.00 to be remitted by me for four months, \$5.00 in all.

Indicate which book and which paper is desired by running your pen through the name of that not desired.

NAME.....

ADDRESS.....

ENGINEER'S POCKET-BOOK

By CHARLES H. HASWELL

A pocket-book of tables, rules and formulas pertaining to mechanics, mathematics, and physics, including areas, squares, cubes and roots, etc.; logarithms, hydraulics, hydrodynamics, steam and the steam-engine, naval architecture, masonry, steam-vessels, mills, etc.; limes, mortars, cements, etc.; orthography of technical words and terms, etc., etc. Sixty-fourth edition. xlvii, 952 pages.

To the mechanic and the engineer it is simply indispensable; like their tools, it is something they need to have always at hand for use.

I cannot find words to express my admiration of the skill and industry displayed in producing the same. To you belongs the honor of having presented to the world a book containing more positive information than was ever before published.—Extract from a Letter from CAPT. J. ERICSSON, the celebrated Engineer.

12mo Leather Pocket-Book Form \$4.00

HARPER @ BROTHERS, Franklin Square, New York.

NOW READY.

Compressed Air

ITS PRODUCTION, USES AND APPLICATIONS.

By GARDNER D. HISCOX, M. E.
AUTHOR OF "MECHANICAL MOVEMENTS."

LARGE 8V0. 820 PAGES. 547 ILLUSTRATIONS.
PRICE, bound in Cloth, \$5.00. Half Morocco, \$6.50.

A complete treatise on the subject of Compressed Air, comprising its physical and operative properties from a vacuum to its liquid form. Its thermodynamics, compression, transmission, expansion, and its uses for power purposes in mining and engineering work; pneumatic motors, shot-tubs, air blasts for cleaning and painting. The Sand Blast, air lifts, pumping of water, acids and oils; aeration and purification of water supply; railway propulsion, pneumatic tube transmission, refrigeration. The Air Brake, and numerous appliances in which compressed air is a most convenient and economical vehicle for work—with air tables of compression, expansion and physical properties.

A most comprehensive work on the subject of Compressed Air.

A special illustrated circular of this book will be sent to any address on application.

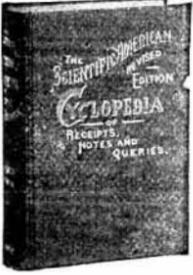
MUNN & CO.,
Publishers of the Scientific American, 361 Broadway, New York.

Holiday Books!

REVISED and ENLARGED EDITION of 1901

The Scientific American Cyclopedia

Of Receipts, Notes and Queries. 15,000 Receipts. 734 Pages. Price, \$5.00 in Cloth. \$6.00 in Sheep. \$6.50 in Half Morocco. Post Free.



This work has been revised and enlarged. 900 New Formulas. The work is so arranged as to be of use not only to the specialist, but to the general reader. It should have a place in every home and workshop. A circular containing full Table of Contents will be sent on application. Those who already have the Cyclopedia may obtain the 1901 APPENDIX. Price, bound in cloth, \$1.00 postpaid.

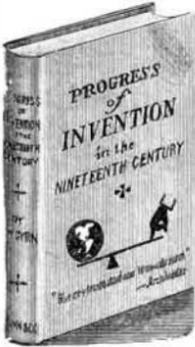
The Progress of Invention In the Nineteenth Century

By EDWARD W. BYRN, A.M.

Large Octavo. 480 Pages.

300 Illustrations. Price \$3.00 by Mail, Postpaid. Half Red Morocco, Gilt Top \$4.00.

The most important book ever published on invention and discovery. It is as readable as a novel, being written in popular style. The book gives a most comprehensive and coherent account of the progress which distinguishes this as the "golden age of invention," resulting in industrial and commercial development which is without precedent. A chronological calendar of the leading inventions is one of the most important features of the book, enabling the reader to refer at a glance to important inventions and discoveries of any particular year. The book is printed with large type, on fine paper, and is elaborately illustrated by 300 engravings and is attractively bound.



NOW READY

TWENTY-THIRD EDITION

Experimental Science

By GEORGE M. HOPKINS

Revised and Greatly Enlarged. 2 Octavo Volumes. 1,100 Pages. 900 Illustrations. Cloth Bound, Postpaid, \$5.00. Half Morocco, Postpaid, \$7.00. Volumes Sold Separately: Cloth, \$3.00 per Volume; Half Morocco, \$4.00 per Volume.



EXPERIMENTAL SCIENCE is so well known to many of our readers that it is hardly necessary now to give a description of this work. Mr. Hopkins decided some months ago that it would be necessary to prepare a new edition of this work in order that the many wonderful discoveries of modern times might be fully described in its pages. Since the last edition was published, wonderful developments in wireless telegraphy, for example, have been made. It was necessary, therefore, that a good deal of new matter should be added to the work in order to make it thoroughly up-to-date, and with this object in view some 200 pages have been added. On account of the increased size of the work, it has been necessary to divide it into two volumes, handsomely bound in buckram.

A Complete Electrical Library.

By PROF. T. CONOR SLOANE.

An inexpensive library of the best books on Electricity. Put up in a neat folding box, as shown in cut. For the student, the amateur, the workshop, the electrical engineer, schools and colleges. Comprising five books, as follows:

- Arithmetic of Electricity 138 pages, \$1.00
- Electric Toy Making, 140 pages, \$1.00
- How to Become a Successful Electrician, 189 pages, \$1.00
- Standard Electrical Dictionary, 682 pages, \$3.00
- Electricity Simplified, 158 pages, \$1.00



Five volumes, 1,800 pages and over 150 illustrations.

A valuable and indispensable addition to every library. Our Great Special Offer.—We will send prepaid the above five volumes, handsomely bound in blue cloth with silver lettering, and inclosed in a neat folding box, as shown in the illustration, at the Special Reduced Price of \$5.00 for the complete set. The regular price of the five volumes is \$7.00.

Full descriptive circulars of above books will be mailed free upon application.

MUNN & CO., Publishers, 361 BROADWAY NEW YORK.

| | |
|--|---------|
| Telegraphic distribution system, H. A. Rowland | 715,696 |
| Telephone transmitter sanitary attachment, H. Baethig | 715,455 |
| Test indicator, Jacobs & Waterhouse | 715,582 |
| Theater appliance, A. M. Zinn | 715,730 |
| Thermo-electric pile, A. Heil | 715,265 |
| Thill support, D. W. Thoma | 715,438 |
| Thill, vehicle, W. H. Schultz | 715,303 |
| Threshing machine band cutter and feeder, G. W. Parsons | 715,418 |
| Threshing machine band cutter and feeder, A. Vanhouswiler | 715,443 |
| Tie. See Rail joint tie | |
| Tire, detachable pneumatic, F. A. Seiberling | 715,430 |
| Tire for vehicles, elastic, H. H. Durr | 715,361 |
| Tire, pneumatic, E. H. Seaden | 715,305 |
| Tobacco, etc., machine for packing, E. Belot | 715,340 |
| Tobacco stripping machine, F. G. Frankenberg | 715,651 |
| Tooth, artificial, M. I. Rubin | 715,422 |
| Top roll saddle, T. E. Norman | 715,502 |
| Toy fountain, H. P. Attwater | 715,357 |
| Toy pistol, C. A. Bailey | 715,632 |
| Track sanding apparatus for electric or similar cars, J. S. Lang | 715,486 |
| Traction engine, H. C. Jones | 715,583 |
| Tramway, wire rope, A. Paluter | 715,414 |
| Tree trunks, removing cores from, H. B. Ayres | 715,631 |
| Trolley, electric railway car, L. E. Walkins | 715,714 |
| Trolley wire hanger, electric, A. Palmres | 715,415 |
| Truck, car, R. E. Powers | 715,601 |
| Truck, car, B. W. Tucker | 715,711 |
| Truss, J. L. Adams | 715,334 |
| Truss, M. B. Smyth | 715,701 |
| Tube compressor, G. J. Seabury | 715,429 |
| Tube covering die, P. H. Friel | 715,570 |
| Tunnel, H. Meeser | 715,497 |
| Tunnel roof, J. C. Meem | 715,406 |
| Tunneling shield, pneumatic, T. Cooper | 715,244 |
| Turbine engine, J. H. K. McCollum | 715,410 |
| Turbine governor, elastic fluid, C. G. Curtis | 715,246 |
| Turpentine box, E. L. Vickers | 715,529 |
| Type casting and composing machines, omitting means for automatic, W. Ackerman | 715,233 |
| Vaccinating tool, E. M. Houghton | 715,661 |
| Valve, W. Heston | 715,266 |
| Valve, balanced automatic safety, H. P. Tippett | 715,706 |
| Valve, flushing, S. W. Lewis | 715,675 |
| Valve for water heaters, automatic, D. S. Cole | 715,551 |
| Valve, safety, H. P. Tippett | 715,707 |
| Valve, tank, D. M. Wright | 715,726 |
| Vehicle driving mechanism, L. G. Wilson | 715,596 |
| Vehicle spring, pneumatic, W. C. Wood | 715,723 |
| Vehicles, system of control for electrically propelled, W. B. Patter | 715,291 |
| Vehicles, variable speed gear for, F. Markgraf | 715,404 |
| Vending machine, F. J. Beier | 715,539 |
| Vine cutter, fertilizing, J. M. Barnes | 715,535 |
| Washing machine, J. N. Uri | 715,322 |
| Washing machine, clothes, O. E. Michaud | 715,496 |
| Water closet flushing device, F. Adee | 715,453 |
| Water cooler, A. N. Rose | 715,609 |
| Water trap, exhaust, J. W. Newman | 715,234 |
| Weather strip, M. B. Stanfield | 715,619 |
| Welded cast metal process, W. Kent | 715,584 |
| Wheel, F. Lyon | 715,593 |
| Whip, driver's, P. S. Harrington | 715,576 |
| Window lock, T. Choep | 715,731 |
| Window screen and slide, C. L. Taylor | 715,437 |
| Wood or iron poles and timbers, preserving, H. Etheridge | 715,362 |
| Woodworking machine, Sterba & Wright | 715,432 |
| Wound closing device, G. J. Van Schott | 715,612 |
| Wringer bench and ironing board, combined, G. W. Underwood | 715,627 |

DESIGNS.

| | | |
|--|------------------|--------|
| Belt, M. H. Eisenman | 36,163 | 36,164 |
| Breach or similar article, W. C. Bowlen | 36,152 | 36,152 |
| Buckle member, belt, A. J. Houle | 36,165 | 36,165 |
| Coffee pot or similar article, A. F. Jackson | 36,155 | 36,155 |
| Filter top, E. D. Morrison | 36,154 | 36,154 |
| Platter or similar article, A. F. Jackson | 36,154 | 36,154 |
| Poker chip, S. A. Cohen | 36,151 | 36,151 |
| Silverware border or mount, A. F. Jackson | 36,153 | 36,153 |
| Steve, E. C. Warren | 36,159 to 36,161 | 36,161 |
| Steve, cook, W. L. Mersfelder | 36,166 | 36,166 |
| Steve, heating, Kennedy & King | 36,157 | 36,157 |
| Steve, heating, W. L. Mersfelder | 36,158 | 36,158 |
| Teapot or similar article, S. G. Wilkes | 36,156 | 36,156 |

TRADE MARKS.

| | | |
|---|--------|--------|
| Antiseptic or antizymotic wash, liquid, Voegeli Bros. Drug Co. | 39,452 | 39,452 |
| Beer, "Saazer Genossenschaftsbrauerei, Reg. Genossenschaft mit Beschränkter Haftung, Saaz" | 39,436 | 39,436 |
| Boots and shoes, leather, Civilian Shoe Co. | 39,424 | 39,424 |
| Canned fruit, berries, and vegetables, C. Shenkberg Co. | 39,435 | 39,435 |
| Catsup, sauces, and salad dressings, Berdan & Co. | 39,432 | 39,432 |
| Chemical products, certain named, Farbenfabriken of Elberfeld Co. | 39,427 | 39,427 |
| Cigars, J. C. Dornell | 39,440 | 39,440 |
| Confectionery, certain named, Trowbridge Chocolate Chip Co. | 39,426 | 39,426 |
| Creamery products, certain named, St. Charles Condensing Co. | 39,451 | 39,451 |
| Dyestuffs, Farbenfabriken of Elberfeld Co. | 39,428 | 39,428 |
| Electrical motor appliances, Electrical Devices Co. | 39,419 | 39,419 |
| Feed for stock, M. W. Savage | 39,430 | 39,430 |
| Fruits, citrus and deciduous, Fancy Fruit Co | 39,425 | 39,425 |
| Glassware for illuminating purposes, Holophane Glass Co. | 39,450 | 39,450 |
| Grinding machinery, F. L. Smith & Co | 39,418 | 39,418 |
| Hair tonics or lotions for the scalp, Cuterine Pharmaceutical Co. | 39,459 | 39,459 |
| Indexes, books and bindings, J. B. Connolly | 39,423 | 39,423 |
| Insulators, electrical, Insular Co. | 39,449 | 39,449 |
| Insulators, varnished electrical, Sils-Eddy Mica Co. | 39,443 | 39,443 |
| Lamp chimneys, Lippincott Glass Co. | 39,420 | 39,420 |
| Lamp chimneys, Kauffeld Glass Co. | 39,421 | 39,421 |
| Lubricants, F. C. Drew | 39,444 | 39,444 |
| Malt extract, Malt Diastase Co. | 39,437 | 39,437 |
| Massaging the ear, apparatus for, Hutchison Acoustic Co. | 39,417 | 39,417 |
| Medicine for certain named diseases, F. G. Passino | 39,463 | 39,463 |
| Mouth wash, Tilt Laboratorium, Carol Bernard Nachfolger | 39,458 | 39,458 |
| Oils, cotton seed, Southern Cotton Oil Co | 39,434 | 39,434 |
| Painters' supplies, certain named, E. D. Smith | 39,442 | 39,442 |
| Paper, carbon, Mittag & Volger | 39,446 | 39,446 |
| Paper, writing and drawing, American Writing Paper Co. | 39,445 | 39,445 |
| Petroleum fluid for certain named purposes, H. S. Blackmore | 39,429 | 39,429 |
| Pills for preventing or reducing corpulency, F. S. Barnay | 39,455 | 39,455 |
| Preparation for curing certain named affections of the body, Vail Brothers | 39,456 | 39,456 |
| Remedies for the cure of certain named diseases, C. A. Oppelt | 39,454 | 39,454 |
| Remedy for the cure of certain named diseases, W. D. King & Co. | 39,453 | 39,453 |
| Rubber goods, certain named, Miller Rubber Mfg. Co. | 39,422 | 39,422 |
| Salves and ointments, K. Mason | 39,457 | 39,457 |
| Sauces, Kuper Pickle Co. | 39,431 | 39,431 |
| Saws, tool for fitting and sharpening, E. C. Insulators & Co. | 39,441 | 39,441 |
| Stationery, certain named articles of Biebstiftfabrik vormals Johann Faber Actiengesellschaft | 39,448 | 39,448 |
| Toy carpet sweeper, Bissell Carpet Sweeper Co. | 39,416 | 39,416 |
| Veterinary remedies, certain named, J. Baker | 39,460 | 39,460 |
| Whisky and brandy tonic, H. Kaehler | 39,439 | 39,439 |
| Whisky, Scotch, Hill, Thomson & Co. | 39,438 | 39,438 |
| Witch hazel, American Witch Hazel Corporation | 39,461 | 39,462 |

(Continued on page 455)

THE IDEAL SIGHT RESTORER

RESTORES THE SIGHT WEAK EYES MADE STRONG. SPECTACLES ARE A NUISANCE. NECESSITY ONLY MAKES ONE WEAR THEM.

SAVES THE EYES ALL EYE TROUBLES CURED BY USING RESTORER ONE MINUTE EACH NIGHT BEFORE RETIRING.

PREVENTS FAILING SIGHT DULL EYES MADE BRIGHT. Write for TREATISE ON THE EYE, Mailed Free. THE IDEAL COMPANY 239 BROADWAY, NEW YORK.

ROTARY ENGINES.—ARTICLES ON this type of engine, giving many details and illustrations, are contained in SUPPLEMENT Nos. 1158, 1186, 1193 and 1309. Price 10 cents each. For sale by Munn & Co. and all newsdealers.

A GOOD INVESTMENT

For \$1.75 we will send by express (not prepaid), complete N. D. Outfit with full instructions for learning TELEGRAPH OPERATING. A fascinating study that will enable you to earn good wages. Send 25 cents for universal dating stamp, by mail, postpaid. Send for our catalog. Established 1874. J. H. BUNNELL & Co. Inc. 20 Park Place New York.

WORK SHOPS

of Wood and Metal Workers, without steam power, equipped with BARNES' FOOT POWER MACHINERY allow lower bids on jobs, and give greater profit on the work. Machines sent on trial if desired. Catalog Free. W. F. & JOHN BARNES CO. Established 1872. 1999 RUBY ST., ROCKFORD, ILL.



BABBITT METALS.—SIX IMPORTANT formulas. SCIENTIFIC AMERICAN SUPPLEMENT 1123. Price 10 cents. For sale by Munn & Co. and all newsdealers. Send for catalogue.

Traveling at Night

Said a noted traveler: "I always use the Lake Shore & Michigan Southern Railway in my travels because I am sure of a good night's rest in the sleeping car." This statement hits the nail squarely on the head. No heaving and lurching of the car, noisy rail joints, nor rough, sharp jolts, but just an even, quiet, steady gliding ahead. Minimum of fatigue, maximum of pleasure and safety, and punctual service, these things have made the Lake Shore the greatest through train line in America. Chicago and Cleveland, Buffalo, Boston and New York are knit closely together by its great trains. Send for booklet, "Privileges for Lake Shore Patrons," contains useful information; also "Book of Trains." A. J. SMITH, C. P. & T. A., Cleveland, O.

ROBERT E. PEARY

The Arctic Explorer

tells the story of his travel over polar ice—a story full of adventure and hardship—in the January number of

OUTING

This is the FIRST ARTICLE Commander Peary has written since his return from the Arctic. It is illustrated with photographs of his own taking, which are unusually interesting and instructive.

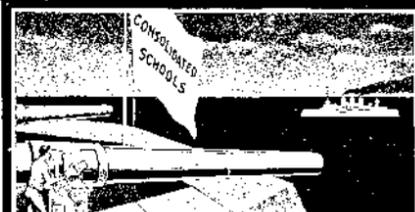
OUTING

is the magazine of ALL out-of-door life. There are more than twenty features in this January number to interest the out-of-door man and woman. Edited by CASPAR WHITNEY. Buy a copy from your newsman,—Twenty-five cents,—or send three dollars for a year's subscription to

OUTING

239 Fifth Avenue New York

CONSOLIDATED SCHOOLS



A Secure Position

is yours, if you are properly trained. What manufacturers and business men are calling for every day are trained men. Our booklet "How to Earn More," contains interesting facts and helpful information. Send for a copy. IT'S FREE. Our courses for home study include

Engineering, Illustrating, Architecture, Decorating, Mining, Journalism, Metallurgy, Bookkeeping, Art, Stenography, and English Branches.

SEND FOR CATALOGUE &

THE CONSOLIDATED SCHOOLS,
156 Fifth Ave., New York.

ELECTRICAL ENGINEERING TAUGHT BY MAIL.

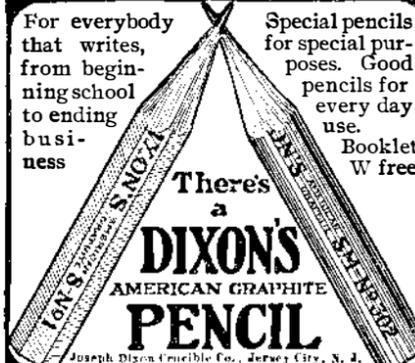
Write for our Free Illustrated Book. "CAN I BECOME AN ELECTRICAL ENGINEER?"

We teach Electrical Engineering, Electric Lighting, Electric Railways, Mechanical Engineering, Steam Engineering, Mechanical Drawing, at your home by mail. Institute founded by Thos. A. Edison and others.

ELECTRICAL ENGINEER INSTITUTE,
Dept. A, 240-242 W. 23d St., New York.

For everybody that writes, from beginning school to ending business

Special pencils for special purposes. Good pencils for every day use. Booklet W free



There's a DIXON'S AMERICAN GRAPHITE PENCIL

Joseph Dixon Pencil Co., Jersey City, N. J.

ELECTRICAL APPARATUS REPRESENTED by Conventional Diagrams in Drawings.—Fifty diagrams showing the usual method of illustrating electrical apparatus in drawings. A labor saving paper. Contained in SUPPLEMENT 1106. Price 10 cents. For sale by Munn & Co. and all newsdealers.

REMOH JEWELS

Are Marvels of Beauty

Upon receipt of your name and address a magnificent catalogue containing nearly 400 handsome engravings of artistic and exclusive designs in high class imitation Diamond and Pearl Jewelry will be mailed

FREE

REMOH JEWELRY CO., 834 Olive St., St. Louis

A. W. FABER

Manufactory Established 1761.

LEAD PENCILS, COLORED PENCILS, SLATE PENCILS, WRITING SLATES, INKS, STATIONERS RUBBER GOODS, RULERS, ARTISTS' COLORS.

78 Reade Street, New York, N. Y.

GRAND PRIZE, Highest Award, PARIS, 1900.

TYPEWRITERS MADE

All the Standard machines SOLD or RENTED ANYWHERE at HALF MANUFACTURERS' PRICES. Shipped with privilege of examination. Send for Cat. Typewriter Emporium, 243 LaSalle St., Chicago

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 dry cells. With three illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1401. Price 10 cents. To be had at this office and from all newsdealers.

MAGNETISM PERSONAL

Will power, the art of fascination, call it what you please—is the intangible force that sways the minds of men. Our new free book "The Secret of Power" tells how anyone can acquire this marvelous, mysterious force, how to learn to read the secret natures, character, abilities, talents and weaknesses of others, how to determine what vocation you should follow to succeed best, and develop wonderful physical and mental power.

You can possess a fine physique, a charming personality, the ability to read human nature, and rule the minds of men, so as to achieve marvelous business and social success, and gratify your highest ambitions, if you will but devote a few minutes per day to the study of our wonderful mail course. You need no subjects on which to practise. You can learn in the privacy of your own room without the knowledge of your most intimate friend. You can use what we teach the very first day after you get our course. Write at once for "The Secret of Power." Address

COLUMBIA SCIENTIFIC ACADEMY
Dept. 193 M. 1931 Broadway, New York.

LABELS.

| | |
|---|-------|
| "Am-Bo-Line, The Worlds Eradicator," for a cleansing compound, V. A. McCoy | 9,588 |
| "Best in the World," for meats, provisions, meat products, bolognas, and sausages, B. Miller | 9,592 |
| "Cats-Eye Dry Battery," for dry batteries or their containers, Manufacturers' and Inventors' Electric Co. | 5,594 |
| "Cold Cucumber Cream," for a cosmetic, K. Blood | 9,589 |
| "Dr. Tickle's Cough Drops," for cough drops, J. F. Burden | 9,601 |
| "Eberl's Corn Cure," for a corn cure, Eberl & Dupuy | 9,604 |
| "Eczemaline," for a remedy for skin diseases, C. Murphy | 9,603 |
| "Elesco Baltimore Rye Whiskey," for whiskey, L. Stern & Co. | 9,590 |
| "First Cable," for cigars, American Lithographic Co. | 9,608 |
| "Gem Washing Compound," for soap and washing compound, C. Pearce | 9,612 |
| "Guaranteed Strictly Kosher for Orthodox," for meats, provisions, bolognas, sausages, and meat products, B. Adler | 9,593 |
| "King Bee," for flour, Huston & Huston | 9,610 |
| "Korbinus," for cornmeal and cereal products, Robinson Danforth Milling Co. | 9,613 |
| "La Rosilla," for cigars, American Lithographic Co. | 9,605 |
| "La Teolina," for cigars, American Lithographic Co. | 9,607 |
| "Metabolin," for a medicine, J. Korntitzer | 9,598 |
| "Milwaukee Tonic Brew," for beverages, Chas. L. Kiewert Co. | 9,595 |
| "Nottingham Curtains," for curtains, Mills & Gibb | 9,587 |
| "Prostatol," for a medicine, J. Korntitzer | 9,599 |
| "Rival Pale Ale," for ale, S. S. Pierce Co. | 9,596 |
| "Rollman Food Chopper," for food choppers, C. Schoeck | 9,591 |
| "Rosy Daisy," for cigars, American Lithographic Co. | 9,606 |
| "Sanitary Safety Pins," for safety pins, S. Kahn Sons & Co. | 9,611 |
| "Sex-of-the," for a medicine, T. E. Smith | 9,600 |
| "Strenuous Stout," for stout, S. S. Pierce Co. | 9,597 |
| "U'dorf," for a medicine, Prussian Chemical Co. | 9,602 |
| "Wonder Horn," for cigars, American Lithographic Co. | 9,609 |

PRINTS.

"Grouching Water," for spring water, R. D. Reynolds 585 |

"The 20th Century Egyptian Diamonds," for Egyptian diamonds, J. Saadi 586 |

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.

NEW BOOKS, ETC.

LITTLE MASTERPIECES OF SCIENCE. Edited by Geo. Iles. 32mo. New York: Doubleday, Page & Co. 1902. Invention and Discovery. Pp. xiii, 183. Health and Healing. Pp. x, 175. The Skies and the Earth. Pp. xxi, 191. Explorers. Pp. ix, 171. The Naturalist as Interpreter and Seer. Pp. xii, 173. Mind. Pp. xii, 185.

Mr. George Iles has edited six little volumes that bear the titles "Mind," "Explorers," "Health and Healing," "Invention and Discovery," "The Skies and the Earth," and "The Naturalist as Interpreter and Seer." Wherever possible he has drawn upon the accounts of the discoverers themselves. The result is that the six little volumes which he presents to us, contain, in a most concise and readable form, a very good summary of modern science. The publishers have seen to it that the little volumes appear in a dress commensurate with their importance.

THE AUTOMOBILE. By Paul V. Hasluck. Philadelphia: David McKay, 1902. Pp. 608, 536 illustrations. Price \$4.50.

This latest work on the automobile, from the pen of the editor of *Work* and the *Building World*, is founded on Gerard Laverigne's "Manuel Theoretique et Pratique de l'Automobile sur Route." Mr. Hasluck has not only translated this French treatise in a very able manner, but he has also added much original matter, thus making the book one of the most comprehensive works on the subject that has so far appeared. After an introductory chapter on the evolution of the automobile, the author discusses the various kinds of motive power available. He then goes into a description of the corresponding kinds of motors and the various parts that go to make up a steam, electric, or gasoline carriage. The descriptions are non-technical, though complete and thorough. They will be found helpful to the man well versed in mechanics, as well as to the tyro. All of the live problems of the day with regard to automobiles are discussed, and much valuable data given, including tabulated results of most of the French and English tests held for several years past. An elaborate index of 4,000 items completes the book.

ELECTRICAL DICTIONARY. English, German and French. By Paul Blaschke. Leipzig: S. Hirzel. 1902. 8vo. Pp. 226. Price \$1.50.

This is the third and last installment of an electrical dictionary to which we have had previously occasion to refer. Since the publication of the reviews of the parts thus far issued, more than one opportunity has presented itself of testing the serviceability of Blaschke's work. It must be confessed that so far as the French and German installments are concerned, he has performed his task faithfully and trustworthily. With this third installment he has completed an electrical dictionary, the need of which has been very severely felt by translators for years.

PERFORATED METALS

OF EVERY DESCRIPTION AND FOR ALL USES.

HARRINGTON & KING PERFORATING CO.

225 N. UNION ST. CHICAGO, ILL. U.S.A.

I PRINT MY OWN CARDS

Circulars, newspaper. Press, \$5. Larger size, \$18.00. Money saver. Big profits printing for others. Type setting easy, rules sent. Write for catalog, presses, type, paper, etc., to factory, The Press Co., Meriden, Conn.

I Can Sell Your Real Estate

no matter where it is. Send description, state price and learn how. Est. '96. Highest references. Offices in 14 cities. **W. M. Ostrander,** 1833 N.A. Bldg., Philadelphia

THE FRANKLIN DYNAMO

50 Watts, 10 Volts, 5 Amperes

3,000 to 4,000 revolutions. Sets of materials, finished parts, complete machines. For amateur construction—very efficient. Will drive a dental engine, sewing machine or small lathe; runs a generator, will furnish current for six 6-candle lamps. Parts, \$3.50. \$2.00. \$3.50. Complete, \$12.50. Write for circular.

Parsell & Weed, 129-131 W. 31st St., N. Y.

"The Sharer"

A new foot power that can be applied to all light machinery. A kick starts the machine and an occasional kick keeps it going. Send for our Booklet.

SLOTKIN & PRAGLIN,
210A Canal St., New York.

Capital to Invest

I have capital to invest and will buy outright or make liberal arrangements with party having anything to offer suitable for mail order business. Address, giving full particulars, Mail Order, Box 773, N. Y.

THE CLIPPER CLIP

Its triangular shape prevents entangling and gives three times the capacity of any other clip for attaching papers together.

Best & Cheapest. All Stationers.

CLIPPER MFG. CO.,
New York, U. S. A.

BRASS OR STEEL. For free samples and information write to us.

CONTROL OF FIRE.—VALUABLE PAPER on fire extinguishment. SCIENTIFIC AMERICAN SUPPLEMENT 1134. Price 10 cents. For sale by Munn & Co. and all newsdealers.

A SOUTHERN LOCATION

For Manufacturing, Mining, Lumbering or Farming on SOUTHERN RAILWAY

In Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. Write for information and a copy of the *Southern Field*, a 16 page magazine, giving information about the South.

M. V. RICHARDS,
Land and Industrial Agent,
Washington, D. C.

FACTORY For Sale

Complete with heat, light and power. Ready for occupancy. Ten acres of land. Five trunk railroads. Suitable for almost any line of work. Beautiful city of 45,000 inhabitants. For particulars address

THE SINGER MANUFACTURING CO.,
South Bend, Ind.

PATENTS THE WEALTH OF NATIONS

A PATENT GIVES you an exclusive right to your invention for a term of seventeen years. You can sell, lease, mortgage it, assign portions of it, and grant licenses to manufacture under it. Our Patent system is responsible for much of our industrial progress and our success in competing in the markets of the world. The value of a successful Patent is in no degree commensurate with the almost nominal cost of obtaining it. In order to obtain a Patent it is necessary to employ a Patent Attorney to prepare the specifications and draw the claims. This is a special branch of the legal profession which can only be conducted successfully by experts. For nearly sixty years we have acted as solicitors for thousands of clients in all parts of the world. Our vast experience enables us to prepare and prosecute Patent cases and Trade Marks at a minimum of expense. Our work is of one quality and the rates are the same to rich and poor. Our unbiased opinion freely given. We are happy to consult with you in person or by letter as to the probable patentability of your invention.

Hand Book on Patents, Trade Marks, Etc., Sent Free on Application.

MUNN & CO., Solicitors of Patents,

Branch Office, 625 F Street, Washington, D. C.

Main Office, 361 BROADWAY, NEW YORK.

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

VOLNEY W. MASON & CO.,
Friction Pulleys, Clutches & Elevators
PROVIDENCE, R. I.

EXPERT MODEL MAKERS, Models, Patterns, Dies & Novelties. Experimental work. **WAGNER MFG. CO.,** 9 Mohawk St., Chicago, Ill.

Special Screw Machine Work. Pleased to quote Prices.

HANDY THINGS CO., LUDINGTON, MICH.

Latest Moving Picture Machines. No vibration. New Spectacular effects, etc. Booklet "Projection Optics," free. **Bullard & Breck,** 131 Post, San Francisco, Cal.

MATCH Factory Machinery. W. E. WILLIAMS, Mfr., 217 South Clinton St., Chicago, U. S. A.

Magical Apparatus. Grand Book Catalogue. Over 700 engravings, 25c. Parlor Tricks Catalogue, free. **MARTINKA & CO.,** Mfrs., 495 Sixth Ave., New York.

MODELS & EXPERIMENTAL WORK. Inventions developed. Special Machinery. **E. V. BAILLARD,** Fox Bldg., Franklin Square, New York.

SHOE BLACKING.—FORMULAS FOR liquid and solid blacking are given in SUPPLEMENT Nos. 1213 and 1219. Price 10 cents each. For sale by Munn & Co. and all newsdealers

Experimental & Model Work

City & advice free. **Wm. Gardam & Son** 45-51 Rose St., N. Y.

SPECIAL EXPERIMENTAL WORK

TYPE WRITERS, MODELS & EXPERIMENTAL WORK, SMALL MACHINERY, NOVELTIES & ETC. NEW YORK OPTICAL WORKS 100 NASSAU ST. N. Y.

A MONEY MAKING METAL WORKING AND STAMPING PLANT FOR SALE. Orders easy to get and at good prices. Good specialties and ready customers for them. Capable of great expansion, and profits will pay at a rapid rate for all additions and improvements. Special reasons for selling. Price \$25,000. Address Box 156, Niagara Falls, N. Y.

ELECTRICITY. HOW TO MAKE. 10 Cts. A Dynamo, Storage Battery, Wimshurst Machine, Telegraph Instrument, Electric Bell, 5 Books, 10 cents each. **Bubier Pub. Co.,** Box 8, Lynn, Mass.

NOVELTIES & PATENTED ARTICLES Manufactured by Contract. Punching Dies, Special Machinery. **E. Konigsow & Bro.,** 181 Seneca St. Cleveland, O.

AMERICAN AMATEUR PHOTOGRAPHER. A monthly magazine giving reliable information on the art and technique of photography. Useful to beginners and experts. Subscription \$1.50 per year. Foreign \$2. Specimen ten cents. Address A. B., 361 Broadway, N. Y.

ICE MACHINES, Corliss Engines, Brewers' and Bottlers' Machinery. THE VILTER MFG. CO., 835 Clinton Street, Milwaukee Wis.

H. A. KAYSAN—Cassel, Germany

Importer of American Specialties

Manufacturers will kindly quote prices and mail samples

"THIS BEATS NEW JERSEY." Charters procured under South Dakota laws for a few dollars. Write for Corporation laws, blanks, by-laws and forms to PHILIP LAWRENCE, Inc. 257 1/2 Sec. of State, Huron, S. Dak. or Cushing & Cushing, 228 R'way, N. Y.

MODELS & CHICAGO MODEL WORKS

ESTABLISHED 1867. 178 E. MADISON ST. CHICAGO, ILL. WRITE FOR CATALOGUE OF MODEL SUPPLIES.