

RECENTLY PATENTED INVENTIONS. Electrical Apparatus.

ELECTRIC LAMP.—W. McCONNELL, Brooklyn, N. Y. The lamp or torch is of the class designed to be carried in the hand or pocket, and the invention lies in a circuit-closer, by means of which an intermittent or flash light may be produced, or the circuit held closed for any desired length of time.

Mechanical Devices.

MACHINE FOR MAKING PIPE.—J. H. MARTIN and D. ORMAND, Riverside, Cal. Two patents have been granted to these inventors for a machine of this kind. The inventions relate to apparatus for making pipe of plastic material, such as asphalt.

The second machine is designed for making continuous lengths of pipe, such piping being adapted particularly for use in conduits or trenches carrying electrical wire. The plastic material is placed in a hopper and automatically pushed down into the throat of the machine.

COAL-WASHER AND ORE-CONCENTRATOR.—A. C. CAMPBELL, Asheville, N. C. A reciprocating motion and a percussive action is given to the pan to cause the separation of more dense stuff and the less dense stuff into two principal layers.

MACHINE FOR MAKING COMPOUND PAPER.—C. P. BROWN, Comstock Bridge, Conn. The machine is designed for pasting together two webs of paper during the process of manufacture, and comprises a plurality of press rolls arranged in the form of a hollow square in which is located a paste roll for applying paste to one of the webs before they are pressed together.

PROPELLER GEAR.—G. W. GARDINER, Philadelphia, Pa. The propeller gear comprises a frame arranged in a trunk formed in the vessel and adapted to be lowered below the bottom of the vessel. The invention is applicable to boats of all kinds, and if applied to a centerboard vessel, the trunk carrying the centerboard may be enlarged so as to receive also the propeller gear and one or more centerboards.

ROCKER ATTACHMENT FOR SEWING-MACHINE TREADLES.—F. P. HARRIS, Greenville, Ky. The physical exertion required for operating the ordinary sewing-machine treadle is greatly reduced by using the rocker attachment here described. A foot rocker is mounted on the treadle, being held thereto by springs which tend to keep it balanced.

RAKING DEVICE FOR FURNACE GRATES.—J. C. McDONALD and M. BRENNAN, Sidney, N. Y. The device comprises a raking frame normally located under the grate and provided with spaced bars adapted to pass between the grate bars. A crank shaft is connected to one end of the raking frame, which gives the frame an up-and-down swinging and lengthwise-traveling motion between the grate bars.

Vehicles and Their Accessories.

WHEEL.—A. A. VEREL, Glasgow, Scotland. The distinguishing feature of this wheel is found in an outer rim held to the hub by spokes passing through slots in an inner rim. Tension and compression springs are applied to the inner ends of the spokes, and interpose between them and the hub.

TRUCK.—E. S. PERKINS, Auburn, Logan county, Ky. The truck comprises a bed or platform provided with an opening, into and out of which a platform section is vertically movable. This section may be raised to receive or deliver goods at different heights, this being desirable when the truck is used for baggage or freight in connection with railroads or in commercial houses.

WAGON GEAR.—J. AUSTIN, Pitkin, Colo. The invention relates to mechanism for facilitating the starting movement of wagons or other vehicles. It consists in a gear connected directly with the team and arranged to act directly on the wheels so as to impart turning movement thereto, after which the gear is automatically thrown out of action, and the vehicle is drawn in the usual manner.

MEANS FOR SECURING ELASTIC TIRES TO WHEELS.—W. F. WILLIAMS, London, England. Improved means are employed for se-

curing elastic tires to the rim of a wheel by bands. The invention consists essentially of a combined tension screw and worm gear, the latter acting as a nut to apply the requisite tension to the screw. The tension screw is curved approximately to the curvature of the wheel rim, and is provided with a hook or other means of making detachable engagement with one end of the holding band, the other end of which is fixed.

WHEEL FOR VEHICLES.—H. EDENBOROUGH, Snarebrook, England. The invention relates to wooden wheels of field guns, wagons or other vehicles, and provides for readily tightening up the wheel when the felloes and spokes become loose. The wheel has its rim coned in opposite directions on the external circumference. An outer encircling tire-band forms the tread of the wheel, and two opposed series of segmental wedges are located between the rim and the tire-band, these wedges being oppositely coned on their internal circumference to correspond with the circumference of the wheel rim.

VEHICLE ATTACHMENT.—W. P. LEE, Fairfax, Minn. The purpose of the invention is to provide an attachment for single-horse vehicles which will enable the wheels to run in the beaten track, while the horse may travel at one side of the center of the road in one of the tracks made by a double team of horses. The thills are attached to the front axle at one side of the center. In order to compensate for the non-uniform draft which this arrangement transmits to the axle, a compensating spring is provided.

Miscellaneous Inventions.

STAMP PAD.—E. G. WOODY, New York, N. Y. With the usual form of stamping pad constructed of felt, at certain times, especially in warm weather, an unnecessary quantity of ink rises to the surface, resulting in a blurred and imperfect impression. In this pad a practically uniform surface thickness is at all times maintained. The stamp pad consists of open grained wood impregnated with ink and having a rough surface which serves to insure an even distribution of the ink.

BED SPRING.—F. MOEHLE, Sheffield, Iowa. The object of the invention is to provide a bed-spring that may be readily adjusted to beds of different sizes and may be quickly taken apart and packed in a small space. The frame of the bed-spring comprises side rails of tubular metal threaded at their ends into corner castings. The head and foot rails consist of pairs of bars. Rollers or tubes are mounted on these bars. If it be desired to widen the frame, it is merely necessary to add short tubesections. The springs consist of metal plates which pass over the rollers at the head and foot of the frame, and whose ends underneath are connected one with another by helical springs.

WASH BOILER ATTACHMENTS.—MARY C. SONNEBORN, Laporte, Ind. The device is designed for lifting clothes from a wash boiler, and is so arranged that upon lifting the device it will operate to squeeze a portion of the water out of the clothes, after which it may be suspended from an attachment on the boiler to permit draining.

CARPET STRETCHER.—J. WHITEHART, Zanesville, Ohio. The stretcher has a longitudinal member provided at one end with a metallic claw. Pivoted to the other end is a lever which rests at one end on the floor and has pivoted to its other end the stretching lever. This lever has a handle and terminates at its lower end in a cross bar provided with teeth. By pressing down on the handle these teeth are caused to force the carpet toward the anchor claw. A ratchet bar holds all the parts in the position they assume when the handle is depressed.

FENCE JACK.—L. C. KELLY and C. E. AMSPACHER, Charlotte, Mich. The leading object of the invention is to provide improved details for a fence jack which will keep the carrying wires of the fence taut and compensate for the general shortening of these wires when twisted to retain upright pickets in spaced position thereon.

GRADER.—J. BAGLEY, Tacoma, Wash. The apparatus is adapted for scraping and hauling earth in grading, and is also applicable in ditching and dredging. It has vertical side plates rigidly connected together. A rear end plate extends between the side plates and is curved around a horizontal axis presenting the concave side to the front of the grader to form a bucket. Blades are fastened along each edge of the bucket.

ARTIFICIAL DENTURE.—A. F. COGSWELL, Crete, Neb. The invention relates to artificial crowns for natural roots of teeth and provides metallic backing for the wearing surface of the tooth, also, in connection with this backing, an anchor post or stud. This stud extends through the crown tooth and is anchored in the canal in the root to which the crown is applied. The metallic backing and the stud are separable from the crown so that the latter can be conveniently ground to accurately fit upon the outer end of the root.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

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.

MUNN & CO.

Marine Iron Works. Chicago. Catalogue free. Inquiry No. 2370.—For manufacturers of malleable iron.

Motor Vehicles. Duryea Power Co., Reading, Pa. Inquiry No. 2371.—For makers of laundry machinery.

"U.S." Metal Polish. Indianapolis. Samples free. Inquiry No. 2372.—For manufacturers of match-making machinery.

WATER WHEELS. Alcott & Co., Mt. Holly, N. J. Inquiry No. 2373.—For dealers in asbestos paper. Stove, range and heater castings. Atlantic Foundry, Phillipsburg, New Jersey.

Inquiry No. 2374.—For dealers in ascending balloons of large size.

WANTED.—Sole agency, Pacific coast, good article. Have capital. Box 856, Fresno, Cal.

Inquiry No. 2375.—For makers of cheap thin metal which can be bent by the fingers. FOR SALE.—A valuable patent for the right parties. Address Profit, Box 773, New York.

Inquiry No. 2376.—For a machine for pasting paper or pasteboard together. Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 2377.—For manufacturers or dealers in machines for lapidary work, slitting saws, table laps, etc.

Rigs that Run. Hydrocarbon system. Write St. Louis Motor Carriage Co., St. Louis, Mo.

Inquiry No. 2378.—For dealers in lamps and cooking stoves using carbureted alcohol of 60 O. F., specific gravity 818 to 83.

Metal Stamping Co., Niagara Falls, N. Y., cuts and forms sheet, bar, rod, or wire any shape.

Inquiry No. 2379.—For a planter for planting cotton seed.

Specialty salesman for late up-to-date inventions, etc. Address A. W. Kirkpatrick, Greenville, Tenn.

Inquiry No. 2380.—For parties making small steam turbines of 5 h. p. and less.

Are you looking for anything in bent woodwork? Write Tucker Bicycle Woodwork Co., Urbana, Ohio.

Inquiry No. 2381.—For a machine for placing stamps on letters.

WANTED.—A firm to sell valuable patents to foreign countries, on commission. Address Patents, Box 773, New York.

Inquiry No. 2382.—For parties to undertake the manufacture of an improved thread-cutting die. We design and build special and automatic machinery for all purposes. The Amstutz-Osborn Company, Cleveland, Ohio.

Inquiry No. 2383.—For manufacturers of aluminum hooks.

Automobiles built to drawings and special work done promptly. The Garvin Machine Co., 149 Varick, cor. Spring Streets, New York.

Inquiry No. 2384.—For machinery for coating blue-print or other sensitive surface papers.

IDEAS DEVELOPED.—Designing, draughting machine work for inventors and others. Charles E. Hadley, 584 Hudson Street, New York.

Inquiry No. 2385.—For manufacturers of spring motors. Factory room with power, steam, elevator, etc.; good light, also storage room. Chas. F. Kilburn, 84, 86, 88 Mechanic Street, Newark, N. J.

Inquiry No. 2386.—For manufacturers of springs for bodies of automobiles and vehicles.

WANTED.—Partner to finance several inventions. Foreign and domestic patents to secure. Address Inventor, Box 81, Cynnet, Ohio.

Inquiry No. 2387.—For dealers in granite-steel and tin cooking utensils.

FOR SALE.—To party direct, for cash, patent 608,925 on folding umbrellas. No selling agencies need answer. M. R. Studams, Bridgeton, N. J.

Inquiry No. 2388.—For dealers in uncured sheet rubber of different thicknesses and degrees of softness. Manufacturers of patent articles, dies, stamping tools, light machinery. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 2389.—For manufacturers of mortar-mixing machines. Patents developed and manufactured, dies, special tools, metal stamping and screw machine work. Metal Novelty Works Co., 43-47 S. Canal St., Chicago.

Inquiry No. 2390.—For a portable machine for extracting hemp fiber from the hemp plant.

ELECTRIC DRY BATTERY.—Manufacturers submit free samples with casting qualities. Quote prices for quantities. Darling Motor Company, Chicago, Pa.

Inquiry No. 2391.—For machinery for making sticky fly paper.

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. 2392.—For manufacturers of double-braid asbestos wire.

The best book for electricians and beginners in electricity is "Experimental Science" by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Inquiry No. 2393.—For parties to spin asbestos in sheet form.

Wanted—Revolutionary Documents, Autograph Letters, Journals, Prints, Washington Portraits, Early American Illustrated Magazines. Correspondence Solicited. Address C. A. M. Box 773, New York.

Inquiry No. 2394.—For machinery for weaving or knitting elastic patches for stockings, also underwear. PATENT FOR SALE ON ROYALTY.—Domestic creamer for household garbage. Effective, odorless, cheap, disposes of all garbage daily. Address E. S. Nowlan, 452 East Division Street, Chicago, Ill.

Inquiry No. 2395.—For machinery used for cleaning carpets by air-blast exhaust fan.

LAUNCH DESIGNS AND WORKING DRAWINGS FOR SALE.—Special designs made to order. Send stamp for booklet of designs of modern gasoline launches. Harry J. Perkins, Naval Architect, Grand Rapids, Mich.

Inquiry No. 2396.—For makers of lawn mower grinders.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

April 1, 1902,

AND EACH BEARING THAT DATE

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

Table listing various inventions and their patent numbers, including items like Account device, Accumulator, Acid ether, Adding and subtracting machine, Advertising wagon, Air brake pistons, Air compressor, Amalgamator, Apron fastener, Arch construction, Armature coil, Assayer's furnace, Assaying furnace, Automobile, Automobile condenser, Badge and pencil holder, Bag, Bag for remedial applications, Baling machine, Baling press, Bailing press, Ball, Baling machine, Band fastener, Battery plate separator, Bearing ball, Beating engine, Bed, interconvertible couch, Bedstead, Bicycle gear, Biscuits, Beat, etc., Boiler flue, Boiler furnace, Bolt anchor, Boring tool, Bottles, etc., Box, Brake slack adjuster, Brake slack adjuster, railway, Bridge gate, Broiler or toaster, Brooch, Broom holder, Brush, Brush bath, Brush machine, Brush, polishing, Bucket and operating mechanism, clam shell, Burial casket, Burner, Buttonhole machine, Buttonhole stitching machine, Button making machine, Button, separable trousers, Cam fastener for stamp mill shafts, Camera, Cane and whip, combination, Car brake, Car, convertible railway, Car door, grain, Downs' and Draper, Car, motor, Car motors and brakes, means for automatically controlling, Carbureter, Lane & Davenport, Carbureting device for explosive engines, McCormick & Miller, Carding machine, Hinceliff & Hall, Cards, machine for copying patterns for Jacquard, Caster, warehouse truck, Catamenial bandage, Chair attachment, Check book, Harrison & Platts, Chimney and ventilator, Chuck, J. Hartness, Chuck, punch, H. O'Brien, Chute, V. B. Johnson, Cigar moistener and price and brand ticket, S. Strauss, Cigar packing machine, Clamp for washbowls, etc., Clamping wrench, Cock adjuster for air brakes, angle, Cock, spring compression, Coffin protector, Coin freed apparatus for sale of stamps, tickets, etc., Collapsible box, Combined or laminated material, Commutator, Priest & Schermerhorn, Commutator trimming apparatus, Composing machines, differential letter space register, Concentrator, Conduit for underground conductors, Conduit outlet box, interior, Conduit outlet boxes, making, Connecting device, Conveyor, pneumatic, Cork extractor, A. Baumgarten, Corset, P. J. Menahan, Counter guard wall telescoping wicket, R. B. Browne, Culin arier and separator, Cultivator, Curbstone, J. E. Bedell, Curtain fixture, W. H. Bengart, Curtain pole, J. Assel, Cutter head, N. Bly, Dental articulator, Tiffin & Bentley, Dental crown slitting tool, G. W. Teufel, Dental engine wall bracket, A. W. Browne, Dental lathe, J. J. Brown, Dental obturator, A. F. Merriman, Jr., Designs, apparatus for producing repeat, H. Mackintosh, Detachable coupling, H. M. Sturgis, Dish washer, I. Ervin, Disintegrating machine, A. M. Dickson, Dividing apparatus, J. Guilmartin, Door check, liquid, H. G. Voight, Dough, etc., machine for mixing and kneading, J. Lee, Draft equalizer, J. D. Ingram, Draftman's instrument, E. C. Loetscher, Dredging, self-loading bucket, R. J. A. Munter, Dress shield holder, J. F. Murphy, Dye and making same, blue sulfur, C. Ris, Educational device, J. E. Murray, Eggs, preserving, J. A. Rylander, Electric circuits, automatic regulator for, F. C. Newell, Electric indicating instrument, R. Fleming, Electric lighting and apparatus therefor, Electric system, Laport et al., Electrical instruments, shunt for, M. C. Rybinski, Electrical switch, E. G. Kastenhuber, Elevator, C. W. Baldwin.

(Continued on page 264)

WOOD or METAL Workers

Without Steam Power should use our Foot and Hand Power Machinery. Send for Catalogues

A—Wood-working Machinery, B—Lathes, etc.

SENECA FALLS MFG. CO.
695 Water St., Seneca Falls, N.Y.

ENGINE & FOOT MACHINES SHOP OUTFITS

LATHES

SEBASTIAN LATHE CO. CINCINNATI, O.

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

SHEPARD LATHE CO., 133 W. 2d St., Cincinnati, O.

Walworth's Solid Die Plate

Standard

Price List on application to
WALWORTH MANUFACTURING CO.,
128 TO 136 FEDERAL STREET, BOSTON, MASS.

Witte Gas and Gasoline Engines

are without equal. The construction is practical, the improvements modern, the operation perfect. Cat. "C."

WITTE IRON WORKS CO.
519 W. Fifth St.,
Kansas City, Mo.

FRICITION DISK DRILL

FOR LIGHT WORK.

W. F. & JNO. BARNES CO.,
Established 1872.
1999 Ruby Street, Rockford, Ill.

TRUSCOTT MARINE MOTORS.

The simplest, most powerful, and highest speed gasoline engines of their class upon the market.

Made single, double, and triple cylinder, both two and four cycle, ranging from 1 to 40 H.P.

Truscott Boat Mfg. Co.,
ST. JOSEPH, MICH.

If You Want the Best Lathe and Drill CHUCKS

BUY WESTCOTT'S Strongest Grip, Capacity and Durability, Cheap and Accurate.

Westcott Chuck Co., Oneida, N. Y., U. S. A.
Ask for catalogue in English, French, Spanish or German.
FIRST PRIZE AT COLUMBIAN EXPOSITION, 1893.

"WOLVERINE" Gas and Gasoline Engines

STATIONARY and MARINE.

The "Wolverine" is the only reversible Marine Gas Engine on the market. It is the lightest engine for its power. Requires no licensed engineer. Absolutely safe. Mfd. by WOLVERINE MOTOR WORKS, 19 Huron Street, Grand Rapids, Mich.

Gas Engine IGNITER

Complete with spark coil, \$12.00. The Best Thing on the market. Latest and most improved model.

Carlisle & Finch Co., 233 E. Clifton Av., Cincinnati, O.

GAS OR GASOLINE ENGINES

The "PERLINS" and "TANDEM" Unexcelled for Economy and Regulation. Write us for Catalog.

Northern Engineering Works, 641 Atwater Street, Detroit, Mich.

BOGART GAS ENGINES

Double Cylinder, 50 h. p. and upward.

FARRAR & TREFTS, Steam Engine & Boiler Works...
54 to 56 Perry Street, BUFFALO, N. Y.

PLUMBERS' LEVEL

An adjustable Incline Level, a fixed Level, and a Plumb. Shows incline by 32nds, or less, to 2 in. to the foot. A longitudinal groove in seat of frame adapts it to rest on pipe or shaft. Price 15 in. with plain glass, \$3.00; with ground glass, \$6.00.

Catalogue of Fine Tools free. THE L. S. STARRETT CO., Box 13, Athol, Mass., U. S. A.

The Franklin Gas Engine

One-Half Horse Power

worth \$100 complete. We sell all necessary castings, materials and detail drawings for \$10.00. For real work—Not a toy—450 revolutions per minute. Upright or horizontal form. Finished parts sold separately. Runs by gas or gasoline. For boys and men with a mechanical turn. Write for circular.

PARSELL & WEED,
129-131 West 81st St., New York.

Elevator for cinder pits, etc., W. Robertson	696,491
Elevator safety attachment, G. Donnelly	696,726
Embroidery seam, C. E. Bentley	696,540
End gate for manure spreader or similar beds, C. L. V. Kinney	696,643
End gate rod fastener, W. A. Day	696,899
Engine. See Beating engine.	
Engine, F. H. Sleeper	696,766 to 696,768
Engine or motor, W. H. Markler	696,663
Engine speed regulator, gas, H. H. Henneghin	696,903
Envelop, Hammond & Kable	696,431
Exhaust apparatus, automatic variable, H. H. Huff	696,639
Exhaust head, H. Sims	696,601
Fabrics, making repaired, D. Margolius	696,830
Fan, C. S. Fitzhugh	696,426
Fatty compound of iodine and sulfur and making same, O. Begner	696,900
Faucet and water controlling connection, safety, E. G. Gassen	696,731
Feather cleaning and renovating machine, M. R. Ruble	696,494
Feed bag, D. Schurman	696,760
Fence post, R. T. Van Valkenburg	696,520
Fertilizer distributor, C. H. Pelton	696,476
Fibers, retting vegetable, B. S. Summers	696,515
Fire door holding and releasing device, P. Olsen	696,693
Fire engine fire kindler, H. W. Hines	696,438
Fire escape, W. Stewart	696,508
Fire escape, T. J. Briner	696,711
Fire escape, W. R. & N. B. Gaine	696,855
Fire extinguisher, M. E. Weller	696,780
Fire extinguisher, automatic, W. Esty	696,884
Fire resisting staircase, W. Seefels	696,503
Fish bait, J. Heddon	696,433
Flash light machine, photographic, L. G. Bigelow	696,402
Fluid pressure apparatus for applying, W. S. Johnson	696,905
Fork making die, S. D. Risson	696,408
Foundry sand, apparatus for feeding and tempering, A. M. Acklin	696,787
Fuel regulator, automatic, H. A. House, Jr.	696,638
Furnace, W. Wakely	696,701
Fuse box, H. R. Sargent	696,497
Game, J. B. Singer	696,602
Game, L. Ernst	696,862
Game apparatus, W. C. Heimbuecher	696,435
Game apparatus, L. C. Heidinger	696,735
Garment clasp, J. Cohen	696,626
Garment supporter, G. H. Phelps	696,842
Gas fixture, globe holder attachment, Kirby, J.	696,644
Gas for use in explosion engines, device for generating, J. S. Killian	696,569
Gas generating apparatus, acetylene, E. N. Dickerson	696,418
Gas generator, acetylene, F. Simonson	696,765
Gas generator, acetylene, J. B. Clopton	696,859
Gas lines, automatic shut off for, Leezler & McPherson	696,827
Gas or oil engine, E. D. Thomson	696,518
Gas producers, mechanical stirrer or poker for, J. W. Dougherty	696,420
Gate, E. Graham	696,559
Gate, T. A. Hill	696,676
Gear, driving, C. F. Allen	696,704
Gear, driving, J. C. Woody et al.	696,782
Gearing, reversing and variable speed, H. G. Underwood	696,849
Glass polishing machine, W. Labodny	696,455
Glass refining and delivering apparatus, W. D. Keyes	696,738
Glassware, apparatus for fire finishing, H. Schaub	696,500
Glass working machine, F. R. McBerty	696,467
Gold dredge, T. B. Lee	696,576
Golf ball, E. Kempshall, 696,887, 696,889	696,895
Golf balls, making, E. Kempshall	696,888
Golf balls, manufacture of, E. Kempshall	696,886
Governor, automatic pressure, J. W. Neil	696,471
Grab hook, H. C. Porter	696,573
Grain crusher, H. & C. Rose	696,555
Grain scourer, W. Lee	696,577
Grain separator, F. Witte	696,915
Guide yoke bracket, J. Player	696,483
Gun, semi-automatic, L. V. Benet	696,851
Gun, spring air, W. F. Markham	696,461
Hair drying device, W. W. Cowley	696,412
Hammer sling, J. B. Dalrymple	696,413
Hanger. See Picture hanger.	
Harrow jack, W. W. Thompson	696,697
Harvester attachment, M. Hopfner	696,442
Harvester, bean, C. C. Fast	696,698
Hay derrick, H. O. Sparks	696,505
Heat regulating or governing apparatus, T. Clarkson	696,799
Heater, Thomas & Van Stoyoc	696,773
Heater for liquids, flooding regenerative, E. Ahborn	696,882
Heaters, automatic regulating device for steam, Allen & Salmon	696,789
Heating apparatus, D. M. Sturgis	696,514
Heating furnace, Suppes & Crooker	696,607
Heating furnace, L. S. Baker	696,791
Hides or skins, machine for treating, F. J. Perkins	696,588
Hinge, furniture, E. A. Gay	696,671
Holdback, R. W. Walker	696,527
Horseshoe, W. L. King	696,450
Horseshoe, G. A. Luck	696,649
Horseshoe, H. C. Porter	696,635
Horseshoe, metal and rubber, A. Riehl	696,490
Hose coupling, electric, G. G. Weitz	696,702
Hose supporter, G. H. Phelps	696,911
Hose supporter, C. J. Ross	696,912
Hydraulic motor, J. C. Gelly	696,809
Hydrocarbon burner, C. W. Poole	696,591
Ice box, folding, D. F. Rogers	696,754
Ice cream sandwiches, machine for making, L. Weglein, Jr.	696,778
Ignition system, F. L. Gregory	696,885
Insulator, wire, W. C. Benbow	696,605
Internal combustion engine, P. Burt	696,547
Ironing table, E. S. Churchman	696,625
Jar closure, O'Brien	696,407
Jewel setting machine, W. Rundquist	696,756
Journal bearing, J. Stieckel	696,509
Kitchen table, C. L. Markstrom	696,462
Lace, shoe, T. O. Holland	696,440
Ladder iron, G. A. Truitt	696,548
Lamp, alcohol, Sternaul & Strassburger	696,507
Lamp, electric arc, R. Froment	696,807
Lamp, gas, A. H. Humphrey	696,640
Lamp, self-extinguishing non-explosive, Freeman & Henderson	696,864
Lasting machine, J. Cavanagh, Jr.	696,717
Lasting machine, S. W. Ladd	696,740
Latch and bolt combined, H. Chesher	696,411
Latch, self-locking, J. H. Kruse	696,684
Lawn seat, M. C. Farr	696,425
Leather stretching device, J. Caldwell	696,716
Leg guard, B. F. Shibe	696,764
Lever, reverse, J. Player	696,482
Life raft, D. G. Martens	696,463
Lifting and track aligning jack, combined, P. J. M. Waslyng	696,613
Lifting jack, L. R. Goodwin	696,558
Line pulverizing and separating machine, C. M. Avery	696,396
Linotype machine, P. T. Dodge	696,806
Linotype machine, tool for cutting cast type lines in, C. A. Albrecht	696,532
Linotype mold block, automatically cored, C. Hollivell	696,637
Liquid for brewers' grain, etc., machine for extracting, L. Atwood	696,883
Lister, sulky, G. Engelmann	696,525
Lock case, B. Hoyt	696,820
Lock hub, W. H. Taylor	696,608
Lock storm hood attachment, T. H. Young	696,620
Locomotive ash pan, J. Player	696,485
Locomotive brake, H. A. Wahlert	696,426
Locomotive cylinder, J. Player	696,484
Loom shuttle guard, J. P. Lange	696,826
Loom wett replenishing mechanism, J. M. Shay	696,657
Lubricating can, J. Schmidt	696,501
Mail box, J. W. Currier	696,721
Mailing tube, T. Wheatley	696,614
Mantle support, J. I. Robin	696,492
Mattress, adjustable invalid, M. Damburn	696,402
Measuring cabinet, computing, E. Hornaday	696,564
Metal binding strips, machine for making, F. W. R. Yager	696,784

(Continued on page 265)

HYPNOTISM

Would you possess that strange mysterious power which charms and fascinates men and women, influences their thoughts, controls their desires and makes you supreme master of every situation? Life is full of alluring possibilities for those who master the secrets of hypnotic influence; for those who develop their magnetic powers. You can learn at home, win the friendship of others, increase your income, gratify your ambitions, drive worry and trouble from your mind, improve your memory, overcome domestic difficulties, give the most thrilling entertainment ever witnessed and develop a wonderfully magnetic will power that will enable you to overcome all obstacles to your success.

You can hypnotize people **instantaneously**—quick as a flash—put yourself or anyone else to sleep at any hour of the day or night. Our free book tells you the secrets of this wonderful science. It explains exactly how you can use this power to better your condition in life. It is enthusiastically endorsed by ministers of the gospel, lawyers, doctors, business men and society women. It benefits everybody. It costs nothing. We give it away to advertise our college. Write for it to-day.

AMERICAN COLLEGE OF SCIENCES, Dept. SH15, 420 Walnut Street, Philadelphia, Penn.

NIGHT LIGHT & CLOCK

PRICE \$4.50

ALSO PORTABLE ELECTRIC TORCH AND CANDLE

PRICE AND DISCOUNT TO THE TRADE

ELECTRIC CONTRACT CO., 53 Maiden Lane, New York

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.

ACETYLENE GAS LIGHTING

Reduced to the Most Efficient, Safest, Simple and Economical Use.

We guarantee our machines perfectly automatic in action, to extract all the gas from the carbide, and absolutely no overproduction or loss of gas. Approved by the various Boards of Fire Underwriters. Standard sizes 10 to 150 lights. Exclusive territory given to responsible agents. Correspond with Niagara Falls Acetylene Niagara Gas Machine Co., Falls, N. Y. & Can.

FEDERATION OF WOMEN'S CLUBS.

April 19 to 27, the NICKEL PLATE ROAD will sell special round trip tickets to Los Angeles, Cal. at rate of \$2.00 from Buffalo, N. Y., giving choice of route, with reverse routes going and returning, stop-over privileges, and final return limit June 25. For full information inquire of A. W. Ecclestone, D. P. A., 385 Broadway, New York City.

FREE About the Dr. Deimel Underwear.

This little booklet tells how to secure bodily comfort—how to be free from colds—tells of an underwear that is more cleanly, more comfortable, and more healthful than any other—the Dr. Deimel Underwear—which is now worn by thousands, who wonder how they were ever satisfied with the prickly, irritating wool, or the cold and clammy cotton. Write for a copy. Free for the asking.

The Deimel Linen-Mesh Co.

491 Broadway, New York.

WASHINGTON, 725 Fiftieth St., N.W.
SAN FRANCISCO, Hayward Building.
MONTREAL, 220 2 St. Catherine St.
LONDON, E. C., Eng., 10-12 Bread St.

FACTORY PRICES

Our prices on all kinds of carriages and harness are actual factory prices. The dealers and jobbers have been eliminated in our system of selling direct from factory to customer. We are saving money for thousands of carriage buyers all over the country—we can save money for you.

Write for our catalogue, descriptive of buggies, phaetons, surreys, etc. It gives full particulars of our system, and shows the carriages. It also gives wonderfully low prices on harness, robes, etc. The largest assortment in America to select from—and the broadest guarantee goes with each purchase. Catalogue Free.

THE COLUMBUS CARRIAGE & HARNESS CO., ST. LOUIS, MO. { Write to } COLUMBUS, O. { nearest office. } P. O. Box 54. { P. O. Box 772.

CARRY IN A BUGGY

Canvas Boat Co. Kalamazoo, Mich. Send 6c for Catalogue 50 ENGRAVINGS

Last a Lifetime

Ribbed Longitudinally and Diagonally

OUR LIFT BOAT

American Yacht and Motor Company,

Builders from a Row Boat to a Yacht

Cherokee and DeKalb Streets, ST. LOUIS, MO

ELECTRIC WONDERS AT LITTLE COST

Send for Free Book. Describes and illustrates many of the most useful electric devices, at wonderfully small prices. All practical. The lowest price in the world on everything electrical. Agents can make handsome commissions and many sales. Write for complete information.

OHIO ELECTRIC WORKS, Cleveland, Ohio.

- Electric Table Lamp (as shown in illustration) with Battery complete..... \$3.00
- Battery Hanging Lamp..... 10.00
- Telephone, with Battery complete..... 5.95
- Electric Door Bells, all connections..... 1.00
- Electric Carriage Lamp..... 5.00
- Fan Motor, with Battery..... 5.95
- Electric Hand Lanterns..... 2.00
- \$2.00 Electric Medical Batteries..... 3.95
- \$12.00 Belt, with Suspensory..... 2.50
- Telegraph Outfits, complete..... 2.50
- Battery Motors from..... \$1.00 to 12.00
- \$6.00 Bicycle Electric Light..... 2.75
- Electric Railway..... 3.50
- Pocket Flash Lights..... 1.80
- Necktie Lights, 76c. to 3.00

The "Best" Light

Is a portable 100 candle power light, costing only 2 cts. per week. Makes and burns its own gas. Brighter than electricity or acetylene, and cheaper than kerosene. No Dirt. No Grease. No Odor. Over 100 styles. Lighted instantly with a match. Every lamp warranted. Agents Wanted Everywhere.

THE "BEST" LIGHT CO.
87 E. 5th Street, CANTON, OHIO.

WELL DRILLING Machines

Over 70 sizes and styles, for drilling either deep or shallow wells in any kind of soil or rock. Mounted on wheels or on sills. With engines or horse powers. Strong, simple and durable. Any mechanic can operate them easily. Send for catalog.

WILLIAMS BROS., Ithaca, N. Y.

MACHINE WORK WANTED

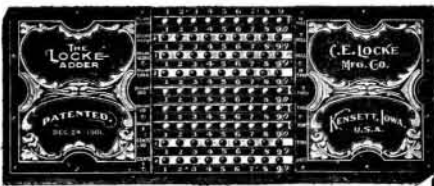
Have your Models of Engines, etc., made, and small Machine Work done in a thoroughly equipped machine shop. Estimates cheerfully given.

H. BARTOL BRAZIER,
Engineer and Machinist, Manufacturer of Gasoline Vehicles,
1811-1815 Fitzwater Street, Philadelphia, Pa.

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.,
MACHINE No. 30,
Range 4-2 in. R. & L. 6 Garden St., Bridgeport, Conn.



The Locke Adder

Only Calculating Machine that adds, subtracts, multiplies and divides and sells for \$5.00. It is the modern office appliance that

QUICKLY PAYS FOR ITSELF

Needed in every business to lessen the detail. No other calculating device so simple, durable, speedy and convenient. It will perform all computations that any higher priced machine will do.

Capacity 800,000,000. Adds all columns simultaneously.

This letter is one of many. I have received the Locke Adder and immediately put it into practical use; and am very pleased to inform you that it meets my requirements just as well as a \$125.00 machine.

PRICE \$5.00 prepaid. Descriptive Booklet FREE. Write to-day. Agents Wanted. C. E. LOCKE MFG. CO., 25 Walnut St., Kensett, Iowa.



IF YOU SHOOT A RIFLE. Pistol or Shotgun, you'll make a Bull's Eye by sending three 2c stamps for the Ideal Home-Book "A," 128 pages FREE. The latest Encyclopedia of Arms, Powders, Shot and Bullets. Mention SCIENTIFIC AMERICAN. Address IDEAL MFG. CO., NEW HAVEN, CONN., U. S. A.

ELECTRIC AUTOMOBILE. - DIRECTIONS, with many illustrations, for making a complete machine from two bicycles are given in SUPPLEMENT No. 1195. The motor and battery are also treated in detail. Price 10cents. For sale by Munn & Co. and all newsdealers.



The MEDART SYSTEM of supplying Boat Building Materials enables anyone ordinarily handy with tools, to build boats of the highest character at one half the boat factory's price. Freight low. Launches, Sailing Yachts and Row Boats. Send stamp for catalog. FRED MEDART, 3545 DeKalb St., St. Louis, Mo.

CORK WALLS AND FLOORS as well as Cork Ceilings, are now in vogue among up-to-date architects and builders on account of their durability, artistic beauty and economy.

NONPAREIL CORK is water-proof, sound-proof and germ-proof; a non-conductor of heat or cold; noiseless and sanitary and is excellent for decorative ceilings and walls and for the floors of houses, churches, schools, etc., and the decks of yachts, etc.

THE B. F. BARNES WATER EMERY TOOL GRINDER is the best on the market—bar none. No pump to cut out, no float to rust out, no adjustments required. It is all that a Tool Grinder should be, and the price is right. Details on request B. F. BARNES COMPANY, Rockford, Ill.

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 Confidential Safety Pin Co., Box 121, Bloomfield, N. J.

READ THIS Consult Your Engineer Perhaps you are using oil lamps or gas. Both are a nuisance and expense. Use our dynamo and motors. Write for Circular 61. THE E. G. BERNARD CO., TROY, N. Y., U. S. A.

Cash Buyers for Farms or other real estate may be found through me, no matter where located. Send description and price and learn my successful method for finding buyers. W. M. OSTRANDER, North American Building, Philadelphia, Pa.

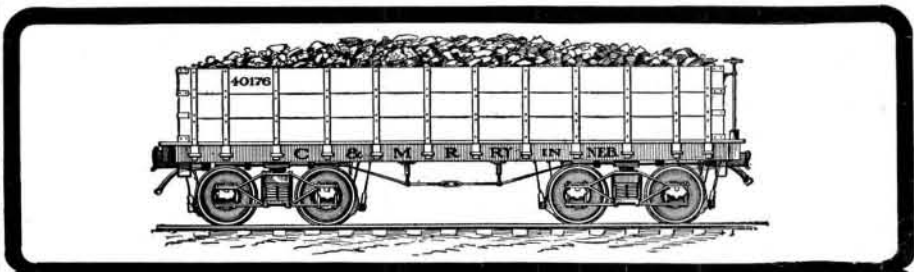
...A Chemical Discovery... Prof. Emil Droscher, the eminent Chicago chemist, has accidentally discovered that the scales of fish dissolved by certain acids produce a solution which has a wonderful effect on fine tempered steel. This glutinous solution, when applied to grain leather, makes a strap which is said to act like magic on a razor. It puts new life into a razor and keeps it in condition without the use of a hone or any other sharpening device. It is in no way injurious to the steel as it contains nothing of a gritty nature but is oleaginous in character.

On Trial One Dollar. Sent to Any Address.

Send one dollar to the American Razor Strop Co., 4566 Cottage Grove Avenue, Chicago, and one of these remarkable strops will be sent you for trial on the understanding that the dollar will be returned to you on demand after trying the strop.

WORLD'S RECORD. BICYCLE TRICYCLE RUNABOUT AUTOMOBILE & LAUNCH MOTORS \$50.00 UP UNQUESTIONABLY THE LARGEST AMERICAN MANUFACTURERS. E. R. THOMAS MOTOR CO., 100 BROADWAY, BUFFALO, N. Y.

Table listing various mechanical items and their prices, including: Metallic tie and rail fastener, Meters, Milk modifying gage, Molding apparatus, Mop boiler, Motion converting mechanism, Motor, Mounting entomological specimens, Mowing machine attachment, Musical instrument, Mutoscope, Nail coating, Nail holding implement, Nailing machine, Necktie fastener, Note sheet or music disk, Nozzle for fluid holding tanks, Nut and pipe wrench, Nut cracker, Oil sayer, Optical objective, Ore classifier, Ore concentrator, Press, treating, Packing, Packing, stuffing box, Padlock wheel for propelling ships, Pail, dinner, Paper hanging machine, Paper making machine, Pencil, C. V. Cullipp, Photographic fabric and preparing same, P. C. M. Grenier, Photographic negatives, etc., apparatus for judging the color and density of, J. W. Dawson, Photographs, automatic and instantaneous apparatus for producing, F. D. Romani, Physician's examining chair and table, R. P. Curtis, Piano vibrato sostenuto attachment, H. H. Northrop, Picture frame, R. Seebach, Picture hanger, C. I. Still, Pin, H. A. Klumb, Pipe coupling clamping ring, F. N. Smith, Pistol, magazine, T. J. Bennett, Plane, G. P. Davidson, Planter and cultivator, J. R. Jones, Planter, corn, W. L. Bogle, Plaster of paris, indurating, A. Broodsky, Playing ball, F. H. Richards, Plow, electrically operated, M. T. A. Kubierschky, Plow, motor, R. J. Gating, Plow, shale rock, H. G. Butler, Plow, sulky, H. Sommerfeld, Pneumatic despatch terminal, E. C. Phillips, Poke, animal, A. Axelton, Press, See Baling press, Press, mold for hollow articles, W. J. Greenwood, Pressing, stamping, embossing, printing flat surfaces, apparatus for, C. Huber, Printing, invisible impression, E. W. Hall, Printing machine, stencil, J. A. Ambler, Printing press delivery table, E. M. Howell, Propeller, hand power, I. A. Wilson, Pulley attachment, split, A. W. Hight, Pulley, lubricating, W. Reid, Pump, balance attachment, centrifugal, F. Ray, Pump, diaphragm, W. F. Runnels, Pump, eccentric chain lift, W. C. Buck, Pump rod guide, oil well, C. E. Rigby, Pumping apparatus, well, B. Winkelman, Rail joint, A. Eisenrath, Railway, marine, C. M. Davis, Railway rail, E. E. Myers, Railway rail joint, A. A. Strum, Railway signaling and communicating apparatus, H. Gulliver, Railway track special, T. J. McTighe, Raisin cleaning and assorting machine, E. J. Kessler, Refreshment receptacle and boutonniere, J. A. Goetz, Refrigerator, A. B. Kokernot, Refrigerator attachment, A. B. Kokernot, Rein. holder and storm apron supporter, combined, W. H. Woodbridge, Rendering apparatus, J. C. W. Stanley, Retort furnace, D. Laird, Roller die, H. Herden, Roller mill feeder, Geschwender & Dearholt, Rope clamp, C. F. Rigby, Rotary engine, I. V. Kitcham, Rotary engine, M. J. Hewitt, Rubber, vulcanizing india, O. F. J. Duwez, Rubber tired wheel, R. Muhlolland, Rubbish storing and removing apparatus, S. Maschke, Rule, W. and G. Meyer, Sand dischargers, compressed air controlling device for, J. Farley, Sand drier, J. A. Mumford, Sash lock, Hoyt, Sash lock, automatic, F. George, Sash, revolving window, C. D. Tabor, Screw clamp, temper, P. H. Mack, Seine pursing machine, W. B. Lantz, Separating and bolting machine, D. W. Marmon, Sewer basin and trap, C. F. Neil, Sewing machine, W. H. Beck, Sewing machine felling and hemming attachment, W. B. Jenkins, Sewing machine hemming and cording attachment, A. H. De Voe, Sewing machine, lock stitch, Marx & Guerra, Sewing machine take up mechanism, J. L. Kieffer, Sewing machine tension mechanism, J. L. Kieffer, Shade roller bracket, E. F. Kaiser, Shaft or pole support, E. B. Dikeman, Shoe polish r, J. F. Brougner, Sign, changeable, T. P. Heineemann, Sign, electric light, Tripp & Stephenson, Signaling apparatus, electrical hose, G. G. Weitz, Skirt lifter, dress, J. & M. Hammer, Skirt supporter, J. Mathison, Soldering iron, Geisenhoner & Van Aller, Soldering machine, can, Cox & Odin, Sparking plug, H. C. Folger et al., Spike drawing tool, J. K. Reid, Spike fastener and tire tightener, combined, E. Leveille, Squeeze roll, W. P. Denegre, Stacker, pneumatic, D. Dow, Stacker, straw, A. Hagemeister, Station indicator, J. A. Mead, Steam and internal combustion motor, combined, F. D. Clark, Steam boiler, A. Spencer, Steam boiler, vertical tube, Burger & Williams, Steam in cylinders, means for reducing condensation of, G. R. Harvey, Steam separator, W. L. James, Steam trap, W. H. & R. Thompson, Stock, E. J. Ryerson, Stocking guard, H. Weil, Stove, A. K. Beckwith, Stove for the ventilation of rooms, etc., H. Turk, Stove gas burner, H. J. Henry, Stove or range, cooking, E. Clarke, Stove shelf, E. W. Anthony, Stud, P. Neumann, Stump extractor, C. R. Redman, Stumps, destroying tree, J. J. E. McLelland, Sugar, converting cellulose into, A. Classen, Sugar mold, maple, J. M. Lyons, Supporting or connecting means, D. H. Warner, Supporting tool, A. Dooly, Surveying instrument lateral adjuster, C. L. Berger, Sweeper, rotary, J. J. Hoppes.



A CAR OF ORE RUNS 16.31 per cent. Copper per ton from BLACK HILLS COPPER CO.

The Greatest Copper Mine in the World, the Calumet and Hecla of Michigan, runs 3.05 per cent. copper, with profits paid, \$77,350,000.

Prof. Lawson, in his report after examining our property, says: "The average percent. of this body of ore is above the principal producing copper mines of the World." (See page 13 of our prospectus.)

Work is going forward on this property night and day. To install more machinery and rapidly open up the immense ore reserves, we offer for a short time, shares at 25 cents each, par value one dollar, full paid, and forever non-assessable.

This is not a speculation, but a legitimate investment in an enterprise officered by conservative business men. Remember, copper mines are the safest investments, and largest dividend earners. \$15, \$25, \$100 or \$500 invested now promises an income for life.

Aside from our Copper property (510 acres) we are also working a producing Gold mine. Last 100 tons milled averaged more per ton than the great Homestake.

Handsome Illustrated Prospectus Free.

BLACK HILLS COPPER COMPANY, 115 Territorial Street, BENTON HARBOR, MICH.

REFERENCES: FARMERS AND MERCHANTS BANK, Benton Harbor. BENTON HARBOR STATE BANK, Benton Harbor.

DIXON'S GRAPHITOLEO An all around lubricant for Cylinders, Engine Slides, Chains, Gears, Etc. of Automobiles. It is made of pure vaseline and Dixon's No. 888 Graphite. It is equally useful for general use. Small Sample Free. JOSEPH DIXON CRUCIBLE CO. Jersey City, N. J.

SEAMLESS STEEL TUBING ALL SIZES 2 INCHES IN DIAMETER BY 1/8 INCH WALL AND SMALLER. THE STANDARD WELDING CO. CLEVELAND, OHIO.

SHIPPED ON APPROVAL and Ten Days Free Trial to any person in U. S. or Canada. Not a cent deposit required on our Bicycles in advance. 1902 Models, \$9 to \$15 1900 & 01 Models, best makes, \$7 to \$11 500 Second-hand Wheels all makes and models, good as new, \$3 to \$8. Great Factory Clearing Sale at half factory cost. Tires, equipment & sundries, all kinds, half regular prices. EARN A BICYCLE distributing 1000 catalogues on our new plan. A RIDER AGENT in each town \$25 to \$8. Great Factory Clearing Sale at half factory cost. Write at once for lowest net prices to agents and our special offer. MEAD CYCLE CO. Dept. 590 CHICAGO, ILL.

HOMES IN THE WEST. Now until April 30th, tickets can be purchased via Nickel Plate Road, at extremely low rates. For the benefit of those desiring new homes in the West, including the Pacific Coast States, Montana, Idaho, Minnesota, North and South Dakota, the Canadian Northwest, Colorado, Arizona, etc. Get full information from A. W. Eccleston, 335 Broadway, New York City.

There is Risk of Personal Injury in Working Around Machinery Accidents usually mean loss of income. You can secure for yourself a weekly income while disabled by taking out An Accident Policy in The Travelers Insurance Company of Hartford, the oldest Accident Company in America and the largest in the world. These policies guarantee large amounts for loss of legs, arms, hands, feet or eyes. If death ensues, a stated sum is paid. The Life Policies of The Travelers Insurance Company appeal particularly to business and professional men because they furnish straight life insurance at the lowest possible cost. Travelers policies are issued on the stock plan and the net cost is known in advance. The difference between the lower cost in the Travelers and the higher cost in the mutual and dividend-paying companies remains in your pocket as a dividend in advance. Agents in every town; or write for interesting literature. The Travelers Insurance Company Hartford, Conn. (Founded 1863)

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

FORGINGS for Automobile Running Gear—Owners of Design Patents affording protection to users. Full line of each and every part in stock. ENGINES Good, Strong, Simple—for Automobiles, Yachts, Light Traction Purposes, Etc. JOHN R. KEIM, Buffalo, N. Y., U. S. A.

Automatic Machines FOR FORMING WIRE from coil into shapes similar to cuts. We can furnish machines or goods, as desired. Send for Catalogue. BLAKE & JOHNSON, WATERBURY, CONN. P. O. Box 7.


THE OBER LATHES For Turning Axe, Adze, Pick, Sledge, Hatchet, Hammer, Auger, File, Knife and Chisel Handles, Whitetrees, Yokes, Spokes, Porch Spindles, Stair Balusters, Table and Chair Legs and other irregular work. Send for Circular A. The Ober Mfg. Co., 10 Bell St., Chagrin Falls, O., U. S. A.

LAUNCHES Steam & Sail Yachts, Row Boats, Canoes Our Catalog gives the truth in detail about the best boats built. Write for it to-day. RACINE BOAT MFG. CO. Box 85. Racine, Wis.



"That Settles It"

WEBSTER'S INTERNATIONAL DICTIONARY



RECENTLY ENLARGED
By the addition of 25,000 New Words
Edited by W. T. HARRIS, Ph.D., LL.D., U. S. Commissioner of Education.
Will readily settle questions about words, men, places, scientific subjects, etc. It has 2364 quarto pages with 5000 illustrations.

LET US SEND YOU FREE
our Chart of English Sounds for home study with the children, also "A Test in Pronunciation" which affords a pleasant and instructive evening's entertainment.
Illustrated pamphlet also free.
G. & C. MERRIAM CO., Publishers, 8 Main St., Springfield, Mass.

For SPINAL TROUBLES

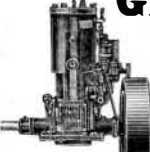
the latest and best invention is our **Scientific Appliance.**
It is light but very strong in its sustaining capacity. Intended for men, women and children. Better than plaster or leather jackets, comfortable to wear, easily adjusted. Best thing on the market for weak or deflected spines. Endorsed by reputable physicians everywhere. Can be worn without detection. **Satisfaction Guaranteed.** Write for catalog and special information to-day. Sent free.
No experiment but a fact.
THE PHILO BURT MFG CO.,
69 Fourth St., Jamestown, N. Y.



Apple Economical Gas Engine Igniters.
Are positively the best built for Stationary, Automobile and Marine Gas Engines, either touch or jump spark system. We are the leaders in the manufacture of Igniting Dynamos, Magnets, Governors, Coils, Plugs, etc. Write for printed matter. **The Dayton Electrical Mfg. Company,** No. 80 South St. Clair St., Dayton, Ohio, U. S. A.
New York stock carried by Chas. E. Miller, 97 Reade Street, N. Y.; Philadelphia Office, The Bourse; Chicago Office, 19-21 La Salle Street.



GASOLINE ENGINES
from 3 to 30 H. P.
Satisfaction Guaranteed.
Write for Catalogue S.
H. W. HUBBARD
MIDDLETOWN, CONN.



ACETYLENE GAS AND CARBIDE OF Calcium.—All about the new illuminant, its qualities, chemistry, pressure of liquefaction, its probable future, experiments performed with it. A most valuable series of articles, giving in complete form the particulars of this subject. Details of furnaces for making the carbide, gas generators, gasometers, burners, etc. Contained in **SCIENTIFIC AMERICAN SUPPLEMENT**, Nos. 998, 1004, 1007, 1012, 1014, 1015, 1016, 1022, 1035, 1038, 1057, 1064, 1071, 1072, 1082, 1083, 1084, 1085, 1086, 1104, 1121, 1132, 1149, 1150, 1203, 1204, 1206 and 1209. Price 10 cents each, by mail. From this office, and all newsdealers.

To MANUFACTURERS GENERALLY
All factories should be equipped with our exhaust system for conveying shavings, sawdust and dust from wood-working machinery, mill, dust, etc. from polishing wheels, chips and bark in paper mills, dust from tanning barrels, smoke from forges, dust from shoe factories, to convenient receptacles. The Hartford patent Exhauster is adjustable, interchangeable and reversible. Particulars and prices on application. Catalogue No. 5, 100, 101.
THE HARTFORD BLOWER CO., 79 Sheffield St., Hartford, Conn.



ELECTRICAL SUPPLIES
of every kind for Electricians, Bell Hangers and all experimental work. State your wants and get illustrated lists free. **Liberty Electrical Supply Co.,** 136 Liberty Street, New York.

Ensure Speed and Strength
by having proper tires upon your vehicle. The best in the light of actual tests for speed and strength has been proven to be the **G & J Detachable Tires**, the edges of which alone seat in the rim, leaving the sides free to bend. These tires have the greatest resilience of any on the market, and though costing a little more are certainly the cheapest in the end. Catalogue free.



G & J TIRE CO., INDIANAPOLIS, U. S. A.
SYNCHRONOGRAPH.—A NEW METHOD of rapidly transmitting intelligence by the alternating current. A full description of the interesting apparatus of Crehore and Squier. 13 illustrations. **SCIENTIFIC AMERICAN SUPPLEMENTS 1114 and 1115.** Price 10 cents each. For sale by Munn & Co. and all newsdealers. Send for new catalogue.

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

Switch and plug receptacle box, combined, P. J. Russell	696,597
Syringe, R. H. Eddy	696,728
Table leg joint, E. Tyden	696,519
Tag, R. C. Hill	696,678
Tank lug, C. S. Brennan	696,793
Target trap, L. A. Sherman	696,763
Telegraphy, wireless, J. Barry	696,715
Temperature of heated substances, apparatus for gauging, E. P. Morse	696,916
Temperatures of heated substances, gauging, E. P. Morse	696,878
Tenoning machine, J. A. Barnes	696,537
Theater, miniature, A. L. McCormick	696,835
Thill coupling, A. Paul	696,859
Thill coupling, Bishop & Tolino	696,897
Threshers and separators, clover hulling attachment for grain, C. Saylor	696,498
Threshing machine, grain, W. Maloney	696,460
Ticket, pin, J. P. Kuhns	696,573
Tilting chair, J. Ellenbecker	696,667
Time recorder, C. J. C. & C. A. Krumm	696,572
Time recorder and signal, watchman's, J. B. Yeake	696,619
Tire, bicycle, R. L. Lewis	696,875
Tire for vehicle wheels, rubber, J. M. Sweet	696,771
Tire, vehicle, W. I. Ostrander	696,585
Tire, vehicle, F. Tillman	696,700
Tire, vehicle, C. A. Pettie	696,746
Tobacco curing apparatus, G. F. Hillman	696,677
Tool, compound, C. Sandler	696,758
Toothpick holder, C. A. Yarnall	696,785
Top, spinning, H. C. Cover	696,719
Track jack, Fryk & Johnson	696,866
Track wrench, J. W. Morehouse	696,579
Traction system, F. J. Sprague	696,880
Trolley catcher and retriever, C. F. Wilson	696,781
Truck, adjustable, M. E. Bailey	696,535
Truck bolster, railway car, O. M. Stinson	696,511
Truck, car, E. S. Woods	696,617
Truck, car, E. A. Curtis	696,627
Truck, car, W. M. Johns	696,641
Trunk, J. P. Levergood	696,685
Trunk, S. E. V. Seward	696,846
Tube covering die, P. H. Friel	696,865
Turbine, axial flow, Bok & Rebsam	696,795
Turbine, compound steam, H. F. Fullagar	696,867
Turning device, G. H. Hildreth	696,817
Turning machine, wood, W. T. Jones	696,824
Type, font of, A. A. Goodson	696,734
Type founding matrix, G. Goodson	696,733
Typewriter, C. E. Maxwell	696,833
Typewriter cabinet, W. Horrocks	696,545
Valve, S. Wilson	696,615
Valve and switch apparatus, combined, E. C. Garland	696,630
Valve apparatus for locomotives, vacuum and water relief, A. Spencer	696,847
Valve, balanced slide, P. C. Charles	696,718
Valve, engine, J. C. McCormack	696,675
Valve, piston, W. Hoston	696,675
Vapor generator, Castellan & Thilone	696,797
Vehicle brake, W. G. Price	696,653
Vehicle brake mechanism, W. Winkler	696,530
Vehicle frame, self propelled, A. A. Ball, Jr.	696,397
Vehicle ground wheels, mechanism for transmitting power from, L. V. Kinney	696,642
Vehicle, motor, W. W. Robinson	696,596
Vehicle, motor, E. J. Pennington	696,694
Vehicle seat lock, C. H. Lambert	696,648
Vehicle top rest, J. S. Truslow	696,661
Vending machine, coin operated, Morgan & Tillotson	696,742
Ventilating apparatus, L. G. Swanson	696,914
Vessel, non-refillable and non-re-emptible, R. Fye	696,917
Waist lengthening device, E. De Laney	696,804
Washer. See Dish washer.	
Washing machine, J. R. Hartman	696,562
Washing machine, P. Botz	696,853
Water closet water supply apparatus, V. J. Emery	696,424
Water heater, electric, Shoenberg & Levy	696,599
Water meter, Nash & King	696,692
Water purifying device, J. M. A. Lacomme	696,647
Water tube, rotary, A. S. Hughes	696,596
Wenner, calf, J. J. Hesser	696,563
Weevil or other insect destroyer, boll, Doak & Farrington	696,419
Weighing machine, coin controlled, G. F. W. Schultz	696,598
Well and test boring machine, portable tubular, C. D. Pierce	696,480
Whistle, brass, A. P. Hatch	696,814
Windlass and warping winch, combined, J. R. Andrews	696,394
Windmill, W. Bauer	696,622
Window, J. Fryer	696,428
Window screen, Obermeyer & Ambacher	696,744
Window screen, H. T. Wright	696,783
Winker stay fastener and holder, A. L. Archambeault	696,533
Wire reeling and stretching machine, H. C. Lund	696,906
Wire reeling machine, W. O. Dunlap	696,727
Wire stretcher, Walls & Boyter	696,881
Wire stretcher and cutter, J. A. Armour	696,395
Wooden butter dishes, etc., machine for making, G. R. Daub	696,445
Wrench, R. A. Breul	696,406
Wrench, Howard & Langhart	696,679

DESIGNS.

Belt, L. A. Myers, Jr.	35,842
Belt, apparel, O. A. Lehman	35,841
Cabinet, wall, C. E. Larrabee	35,837
Clock, H. Mayer	35,849
Clock case, H. Jacobs	35,832
Gas arc light, H. E. Franke	35,835
Gear casing, C. W. Hunt	35,836
Glass dish, W. C. Anderson	35,830
Lamp fixture, T. M. Jamison	35,834
Pattern, dress skirt, H. S. Wiedez	35,843
Picture frame, E. Goette	35,831
Spoon, J. P. D'Arcy	35,829
Type, font of, J. W. Phinney	35,839
Type, font of printing, H. Hilenburg	35,838
Violin case, N. E. Kennedy	35,833

TRADE MARKS.

Bitters, stomach, Baton Rouge Liquor & Cigar Co.	38,026
Boots and shoes, Fryk & Dunston	38,007
Boots and shoes, Peters Shoe Co.	38,008
Coffee and tea, F. N. Wilcox	38,036
Coffee, tea and spices, Steinvender-Stoffregen Coffee Co.	38,037
Collars and cuffs, Union Collar Co.	38,004
Corsets, Kops Bros.	38,002
Corsets, Strouse, Adler & Co.	38,003
Drugs, certain named, L. Richardson Drug Co.	38,025
Engines and hoists, gas and gasoline, Weber Gas and Gasoline Engine Co.	38,047
Fabrics, cotton, Ward, Hanbury & Co.	38,011
Fencing, wire, P. A. Reid	38,044
Flour, wheat, H. D. Fallis & Co.	38,038
Glanders, preparation for the cure of, P. Schmidt	38,024
Head gear, Glyn & Co.	38,000
Horse blankets, W. Ayres & Sons	38,010
Hosiery, Pilling & Madeley	38,006
Insect powder, W. F. Steinmetz	38,023
Jewelry, F. Pernas	37,996
Lard and lard compound, Armour & Co.	38,039
Malt preparations, L. Hoff	38,035
Medicinal preparations for asthma, catarrh, and hay fever, T. & A. Chemical Co.	38,030
Medicinal tablets, C. C. Diggs	38,027
Medicinal tablets, Egyptian Manufacturing Co.	38,028
Medicines for certain named diseases, Powers Manufacturing Co.	38,048
Medicines, proprietary, Herbogen Medical Co	38,029
Metal, babbit, M. J. Rogers	38,043
Music, sheet, Howley, Haviland & Dresser	37,998
Paper, writing, Byron Weston Co.	37,997
Perfumery and certain named toilet preparations, H. Mack	38,016
Perfumes, A. La Fevre	38,015
Periodical, weekly, F. Lamond	37,999
Petroleum, H. D. Fletcher	38,021
Plaster fiber, A. M. Sheakley	38,041
Publications, periodicals, magazines, and books, H. C. Fisher	38,049
Ridging, Glove Ventilator Co.	38,042
Salve, E. Hoxworth	38,022

(Continued on page 267)

PERFORATED METALS
OF EVERY DESCRIPTION AND FOR ALL USES.
HARRINGTON & KING PERFORATING CO.
225 N. UNION ST. CHICAGO, ILL. U.S.A.

TUBULAR STEEL WHEELS



STRENGTH BEAUTY DURABILITY

American Tubular Wheel Co.
5917 Penn Ave., Pittsburg, Pa.
Write for our NEW CATALOGUE...

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.

WE MAKE A SPECIALTY OF
GREY IRON CASTINGS
FOR AUTOMOBILE WORK
UTICA STEAM ENGINE AND BOILER WORKS
UTICA, N. Y.

TRAVEL IN COMFORT and SAVE MONEY.
The NICKEL PLATE ROAD is selling tickets to points all through the west at greatly reduced rates. Round trip home-seekers' tickets for the benefit of those endeavoring to locate a new home in the West; one way Colorists' tickets for those who have decided to locate West. Through tourists car placed on W. S. R. R. train No. 1, every Monday and Wednesday evening, due Chicago following evening, where excellent connections are made with principal through tourist cars for all western points. Write, phone, or call on A. W. Ecclestone, D. P. A., 385 Broadway, New York City.

2 Battery Call Telephones for \$4.50
Good for 600 feet
Metallic Circuit.

2 Generator Call Telephones for \$7.50
Good for 3 miles single Iron Wire.
"Batteries included." Sent C. O. D. if \$1.00 sent with order.

FARR & FARR, 119 W. Jackson Boulevard, CHICAGO.

8.95



EIGHT DOLLARS AND NINETY-FIVE CENTS
Buy the celebrated, high grade, new 1902 Model EDGE MERE BICYCLE, including high grade guaranteed pneumatic tires, adjustable handle bars, fine leather covered grips, padded saddle, fine ball bearing pedals, nickel trimmings, beautifully finished throughout, any color enamel. Strongest Guarantee.

\$12.95 for the celebrated 1902 Kenwood Bicycle.
\$12.75 for the celebrated 1902 Elgin King or Elgin Queen Bicycle.
\$15.75 for the highest grade 1902 bicycle made our three crown nickel joint, Napoleon or Josephine, complete with the very finest equipment, including Morgan & Wright high grade pneumatic tires, a regular \$50.00 bicycle.

10 DAYS FREE TRIAL on any bicycle ordered. Offer ever heard of, write for our free 1902 Bicycle Catalogue.

Address: SEARS, ROEBUCK & CO., CHICAGO.

SELECT A PEN

Suitable for your handwriting from a sample card of 12 leading numbers for correspondence, sent postpaid on receipt of 6 cents in stamps.

SPENCERIAN PEN CO.
349 Broadway, New York.




WE TRUST YOU

For one dozen boxes **THOMAS A. EDISON, JR., INK TABLETS** for you to sell at 10c, a box, retain your profits and remit us the balance, and if we find you honest and industrious we will offer you such inducements as will enable you to earn money very rapidly.

THE WIZARD INK TABLET sells in every home and every business house. They retail at 10c per box containing eight tablets. Each tablet when dissolved in water makes the same quantity of ink that would cost 10c at the stores.

Over two thousand testimonials from Banks and Business Men. Made in six colors. Write for sample tablets and full particulars of our offer to Agents.

THOMAS A. EDISON, JR., CHEMICAL CO., 31-33-35 Stone Street, New York, N. Y.

Patents Protected
Against Infringers.
Dealers in and Manufacturers of **PATENTED ARTICLES.**
Owners and Users of **COPYRIGHTS AND TRADE-MARKS** PROTECTED
against dangerous litigation at a nominal cost.
Booklet on application.

PATENT TITLE & GUARANTEE CO.,
CAPITAL \$500,000.00.
Tel. 4232 Cortlandt. 150 Broadway, New York.

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., 381 Broadway, New York City, or any bookseller or newsdealer.

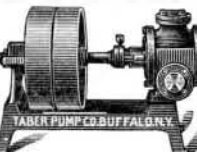
NEW BINOCULAR.
(The Trieder.)
Small as an opera glass. More powerful than the largest field glass. Send for Circulars.

QUEEN & CO.
Optical and Scientific Instrument Works,
1010 Chestnut Street,
NEW YORK: 59 Fifth Ave. PHILADELPHIA, PA.



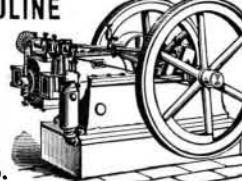
MAXIMUM POWER—MINIMUM COST.
If you use a pump for beer, lard, acids, starch, petroleum, brewer's mash, tanner's liquor, cottonseed oil or fluids, hot or cold, thick or thin you want to get the **TABER ROTARY PUMP** which does the most work at the least expense. Simply constructed. Can be run at any desired speed. Perfectly durable. All parts are interchangeable. Needs no skilled workman. Derets guaranteed. Catalogue free.

TABER PUMP CO., 22 Wells St., Buffalo, N. Y., U. S. A.



GAS and GASOLINE ENGINES.
Using Natural Gas, Coal Gas, Producer Gas, and Gasoline direct from the tank. 1 to 40 H. P., actual.

The Springfield Gas Engine Co.
21 W. Washington St. Springfield, O.



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, shop tools, 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.

Grasp this Opportunity to Rise

For ten years we have been training ambitious men and women to be specialists—to fill positions beyond the reach of ordinary workers that lack this special training. We can do this for you if you will write for information, mentioning the subject that interests you.

LEARN BY MAIL.

Courses in Mechanical, Steam, Electrical, Telephone, Telegraph, Civil and Mining Engineering; Shop and Foundry Practice; Mechanical Drawing; Architecture; Plumbing; Chemistry; Ornamental Design; Bookkeeping; Stenography; Teaching English Branches; German; Spanish; French.

International Correspondence Schools, Box 942 Scranton, Pa.

ELECTRICAL ENGINEERING TAUGHT BY MAIL.

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

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

YOUR PAY

can be increased more quickly by us than by any one else if you will study in some of your spare time. We'll help you learn what you need and give you the best books free to study from, while giving you a chance to

EARN MORE WHILE LEARNING

Courses in Electrical, Mechanical, Steam and Civil Engineering, Drafting, Art, Architecture, Mining, Metallurgy, Business, Stenography, Journalism, Bookkeeping, etc.

Write for free catalogue 6, with full particulars. THE CONSOLIDATED SCHOOLS, 156 Fifth Ave., N. Y.

The Key to a Good Situation

is a technical education. Great industries require trained workers. Carnegie's partners rose from the ranks. We teach by mail. We have helped thousands to better themselves. A few

FREE SCHOLARSHIPS

in Mechanical, Electrical, Steam, Textile Engineering; Heating, Ventilation and Plumbing—including Mechanical Drawing—will be awarded to early applicants. The only expense is the actual cost of instruction papers and postage.

Handbook describing courses, methods and regular terms on application.

American School of Correspondence, Boston, Mass.

THE SCIENCE OF Psychratism

was thoroughly investigated at the last session of the New York Legislature and is warmly endorsed by many prominent Senators, Assemblymen and prominent State Officials. It is taught in a full course by mail by

PROF. ALBERT VERNON

Founder and Professor in Psychology of

THE VERNON ACADEMY OF MENTAL SCIENCES AND VERNON SANITARIUM

The Science of Psychratism teaches the superior power of the mind and enables men and women of all ages and conditions to so self-develop their latent powers that they cannot only become masters of themselves, but of others and the conditions under which they work and live.

"Psychic Phenomena of the Twentieth Century" SENT FREE

postpaid, if you address

VERNON ACADEMY OF MENTAL SCIENCES, occupying famous WARNER OBSERVATORY BLDGS., 2206 East Avenue, Rochester, N. Y.

LEARN TO WRITE

A Big Help in Your Present Position and Helps You to a Better Position. Ad. Writers are earning from \$150 to \$1000 a year. Youngest and best calling in business writing today. Irregular future. Good demand. Taught successfully by Mail. Ed. P. Page and Sam. A. Davis, founders of original school. Irregular, sole instructors. Employers of Ad. Writers are constantly looking to our institution for available talent. 64 pages of particulars mailed free. PAGE DAVIDSON, Suite 20107 Adams St., CHICAGO.

50 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. Patents taken through Munn & Co. receive special notice, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months, \$1. Sold by all newsdealers.

MUNN & Co. 361 Broadway, New York Branch Office, 626 F St. Washington, D. C.

Shoes, Tobin & Hicks	38,009
Shoes, while cleaning or polishing the same, device for holding, A. J. Skinner	38,040
Smoke distilled from wood liquid, E. H. Wright & Co.	38,022
Soap and cream, shaving, F. B. Chaderton	38,918
Soap, laundry, Maple City Soap Works	38,020
Soaps and oils for treating and softening leather, hides and hair, E. A. Warren	38,019
Specific for the cure of kidney and bladder complaints, Foster-McClellan Co.	38,031
Suspenders, Chester Suspenders Co.	38,001
Syrups, tinctures, pills, plasters, ointments, soaps and perfumes, G. R. White	38,014
Tablets or pellets for the breath, R. A. Brachvogel	38,013
Type, fonts of, American Type Founders' Co.	38,045
Wadding, wool, Norman & Evans	38,012
Wine, Currier Wine Co.	38,033
Writing machines and typewriters, Imperial Writing Machine Co.	38,046

LABELS.

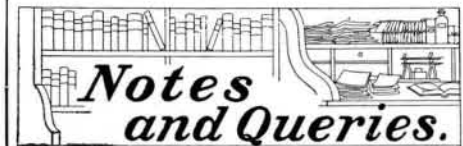
"Bartmer's Floral Cream," for complexion preparation, A. H. Bartmer	9,047
"Blue Ribbon," for oil, Consolidated Oil Co.	9,057
"Bowler's (Club Rye Whiskey," for rye whiskey, W. Stastny	9,058
"Eclipse Laundry Soap," for soap, Gettysburg Steam Soap Co.	9,046
"English Mustard Sauce," for mustard sauce, J. & J. Coleman	9,056
"Granules," Tonico-Luxantes Bel Doctor Roberts, for a medicine, R. J. & J. A. Salicrup	9,054
"Heroids," for a medicine, Dinot & Delfosse	9,050
"Kishacoquillas Axe," for axes, J. H. Mann	9,063
"Kraum's New Red Blood," for a medicine, Kraum Medicine Co.	9,051
"La Rosica," for cigars, American Lithographic Co.	9,060
"Luminoso," for cigars, Landfield Bros & Co.	9,061
"Mrs. Dismore's Great English Cough and Croup Balsam," for a medicine, L. M. Brock & Co.	9,049
"Oxyneura," for a medicine, J. Stolze	9,055
"Regal," for brooms, New Bremen Broom Co.	9,062
"Rocky Mountain Tea," for a medicine, Madison Medicine Co.	9,052
"Royal Crown Ginger Ale," for ginger ale, C. Valaer	9,059
"Soule's Infallible Moth, Tan, Freckle and Pimple Eradicator," for a skin preparation, L. M. Brock & Co.	9,048

PRINTS.

"Clothing," for clothing, W. C. Both	479
"Emerson Spring Lift Chainless Reaper," for reapers and mowers, American Lithographic Co.	484
"Foot Lift Emerson Gang," for plows and mowers, American Lithographic Co.	483
"Nabisco," for biscuits, National Biscuit Co.	480
"Plasters," for plasters, J. Ellwood Lee Co.	482
"Steckler's Mammoth Pecans," for pecans, J. Steckler Seed Co.	481

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.



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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(8581) A. C. asks for a recipe to take an instantaneous picture similar to a tintype upon surface of a sea shell. What chemicals, etc., are required for the purpose? A. The surface of the shell must be coated with a sizing and then sensitized. You can obtain the materials and chemicals from any dealer in photo materials.

(8582) J. S. B. asks: In your issue for February 22, on page 124, you have an article on hydrate of potassium. You say that it burned in oxygen, forming potassium hydrate and water: then this equation would be true: $KH + 2O = KOH + H_2O$, which cannot be balanced. Can you make this clear? A. If the formula for potassium hydride is KH and it were burned in O, the product would be at first K_2O , potassium oxide. Upon cooling this would combine with water, which would be formed and yield KOH. This is the reaction: $2KH + O_2 = K_2O + H_2O$; and $K_2O + H_2O$ becomes $2KOH$. Chemists think that hydrogen does not form definite compounds with the alkaline metals.

(8583) A. B. McK. asks: Will you kindly give me what information you can on the following subject? Take a piece of steel and cut in two pieces. Make one as soft as possible and the other as hard as possible; now, what will be the difference in resistance in ohms, if any? A. Barus and Strouhal give the specific resistance of glass-hard steel as 45.7 and of soft steel at the same temperature as 15.9. This is the resistance in thousandths ohms of a bar one square centimeter in cross section.

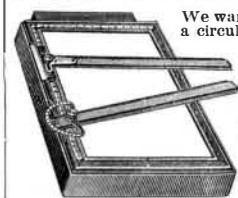
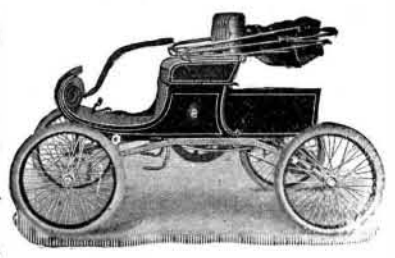
The Best Thing on Wheels

ALL ROADS ARE ALIKE TO

The OLDSMOBILE

RUNS EVERYWHERE

Our new red catalog illustrates and describes it in detail. THE PRICE IS RIGHT. OLDS MOTOR WORKS, DETROIT, MICH.



We want to send you a circular of the

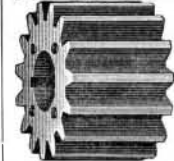
Rich Handy Drawing Outfit

It is a time saver for the Draughtsman, and an aid to the learner.

(Circulars free.)

J. & G. RICH, 125 N. 6th St., Philadelphia, Pa., U.S.A.

NOISELESS GEARS



We are specialists in Noiseless Gearing. If you are interested in anything in this line, write for our catalogue. Our New Process Gears are the only Noiseless Gears which are durable. We have pinions in operation transmitting from 350 to 450 horse power. We also make metal gears to order, both spur and bevel, the latter planed accurately to cone lines.

THE NEW PROCESS RAW HIDE CO., Syracuse, N. Y.

50 MILES FOR 10 Cts.

is the maximum cost of operating

Mitchell Motor Bicycle

makes an average of 3 miles an hour over most any sort of road without effort and with

PERFECT SAFETY.

The Mitchell is a Bicycle Automobile built for one; is always under perfect control; as simple in operation as an ordinary wheel. It is built for wear and tear and not for a toy, and is FULLY GUARANTEED. Information sent free. Mfd. only by WISCONSIN WHEEL WORKS, Dept. G, Racine, Wis.

THE HOPPES Feed-Water Heater

Heats and Purifies Water and Removes Oil and Grease.

Send for new catalog of Heaters, Purifiers and Separators. HOPPES MFG. CO. 25 Larch St., Springfield, O.

APRIL, 1902

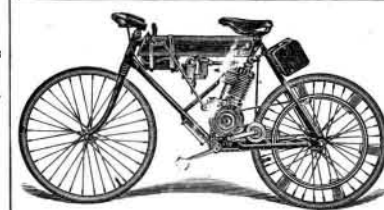
THE FOUR-TRACK NEWS

A MONTHLY MAGAZINE OF TRAVEL AND EDUCATION

Published by the Passenger Department of the NEW YORK CENTRAL HUDSON RIVER R.R.

5 CENTS PER COPY. 30 CENTS PER YEAR.

Fifty cents a year. Send five cents for a sample copy to George H. Daniels, G. P. A. Grand Central Station, New York.



THE NEW MARSH MOTOR CYCLE

Model 1902. Price \$175.

A Gasoline Motor made with crank-disk, shaft in one piece, extra strong bearings, exhaust valve mechanism entirely within base, perfect lubrication, secured against dust, carburetor of the float-feed type which has reached the greatest perfection. This Motor Cycle is the latest acquisition in the art. Made of the best material, simple and perfect in every detail. Constructed by high skilled experts in every department and is without a peer. Full descriptive circular on application. MOTOR CYCLE MANUFACTURING CO., Brockton, Mass., U.S.A.

CANTON Incandescent Gasoline Lamps

100 candle power only 3 cents per week

Ask for Catalogue N

Permitted by Underwriter and fully guaranteed

All kinds and shapes. Chandeliers, Pendants, Stand, Wall and Arc Lamps, Overhead and Under Generators.

Canton Incandescent Light Co. East Fourth Street Canton, Ohio U.S.A.

GOING WEST? It would be to your advantage when arranging for a trip to any point in the west, to get rates and full information via the NICKEL PLATE ROAD, from A. W. Ecclestone, D. P. Agt., 385 Broadway, New York City. The Nickel Plate Road is noted for its low rates, excellent train service, and those individual club meals at 35c. to \$1.00. Travel in comfort and save money by using the Nickel Plate Road.

Automobile Engine for Business

After careful testing we offer to the public, with confidence, the S. B. & M. Compound Engine. Dimensions of Cylinder are 3 1/2 and 5 in. x 4 in. stroke. Height of Engine 21 in. Base 8x12 in. Weight, Engine, 95 lbs. 3 crank shaft bearings. All working bearings of bronze. Piston rods of machinery steel. Air and boiler pumps connected from cross head. Plain slide valves. We also build running gears and make parts.

SHAFFER, BUNCE & CO., Lockport N. Y. Successors to SHAFER, BUNCE & MARVIN.

BURNISHINE

The most marvelous metal polish in the world.

Contains no Acids or anything injurious to the Metal or Hands. Produces a wonderful brilliant lustre on Brass, Copper, Tin, Zinc, Silver, Nickel and all Metals. A few rubs and the article is handsomely burnished. Will not soil the hands or leave deposits in corners or surface of the metal. Will restore burnt or rusty Nickel on Stoves to its original lustre. Put up in cans at prices as follows: 1/2 Pint, 25c. 1 Pint, 40c. 1 Gallon, \$1.25. If your dealer does not keep it write direct to J. C. PAUL & CO. 59 Dearborn St., Chicago.

MATCH FACTORY MACHINERY. W. E. WILLIAMS, Mfr., 1001 Monadnock Block, Chicago, U.S.A.

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

Experimental & Model Work. Cit. & advice free. Wm. Garlam & Son, 45-51 Rose St., N. Y.

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

CASH For your Real Estate. Send description and lowest price. No hump. Buyers wanted. C. J. CLATYSEN, Clinton, Ia.

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

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

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

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

MODEL AND EXPERIMENTAL WORK. An engineering department and a thoroughly equipped laboratory at your service. Lawrence J. Zimmerman, Electrical and Mechanical Engineer, 106-110 Centre Street, New York.

HORNS FOR TALKING MACHINES. Crane Bros., Mfrs. Westfield, Mass.

Magical Apparatus. Grand Book Catalogue. Over 700 engravings, 25c. Parlor Tricks Catalogue, free. MARTINKA & CO. Mrs., 485 Sixth Ave., New York.

INVENTORS Sell your patented articles through Mail-Order trade. Let us tell you how. Particulars free. Central Supply Co., Kansas City, Mo.

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

I Pay The Freight \$25

Will ship C. O. D. to any station in the United States for

The "WILLARD STEEL RANGE"

Has 6 8 in. lids, oven 17x12x21, 15 gallon reservoir, large warming closet, duplex grate, burns wood or coal, weighs 400 lbs., fired through with ashes to.

GUARANTEED TO BE AS REPRESENTED. Write for free descriptive circulars and testimonials from parties in your section who are using one.

WM. G. WILLARD, Dept. 14, 619 N. 4th St., St. Louis, Mo.

AGENTS WANTED TO SELL FOR CASH OR ON CREDIT.