

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Patent Calendar for sale, or manufacture upon royalty. Gives the days, months, and years. Stamps and dies to manufacture with. Address J. Bath, 79 Washington Avenue, Brooklyn, N. Y.

A Valuable Patent.—McDonald's Pocket Hanger for sale, or lease on royalty for Canada, Great Britain, and France. Address Thomas McDonald, box 454, Austin, Texas.

Julius Caesar was accustomed to read and write, listen and dictate at the same time. In one of these an Esterbrook Steel Pen would have aided him wonderfully.

Wanted Immediately.—A first-class Steel Letter Cutter. H. W. Gordon, Lynn, Mass.

Two or three first-class journeymen machine pattern makers can find steady employment with Poole & Hunt, Baltimore, Md. Location pleasant and healthful.

Small articles in sheet or cast brass made on contract. Send models for estimates to H. C. Goodrich, 66 to 72 Ogden Place, Chicago, Ill.

Automatic Planer, Knife Grinders, best Solid Emery Wheels, Machine to run Emery Belts, etc. All warranted satisfactory. Amer. Twist Drill Co., Meredith, N. H.

See Bentel, Margedant & Co.'s adv., page 61.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Diamond Engineer, J. Dickinson, 64 Nassau St., N. Y.

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

Gould & Eberhardt's Machinists' Tools. See adv., p. 62.

Engines, 10 to 50 H. P., \$250 to \$500. See adv., p. 61.

Barrel, Key, Hoghead, Stave Mach'y. See adv., p. 61.

For Heavy Punches, etc., see illustrated advertisement of Lilles & Jones, on page 61.

Vertical Engines, varied capacity. See adv., p. 61.

Hand and Power Bolt Cutters, Screw Plates, Taps in great variety. The Pratt & Whitney Co., Hartford, Ct.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blin Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

Catechism of the Locomotive. 625 pages, 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 B'way, N. Y.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Ave., Phil. Pa. The Sweetland Chuck. See illus. adv., p. 62.

Improved Skinner Portable Engines. Erie, Pa.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil.

Lighting Screw Plates, Labor-saving Tools. p. 62.

Magic Lanterns, new model; best made, small and cheap. Wm. T. Gregg, 77 Fulton street, New York.

See New American File Co.'s Advertisement, p. 46.

Combination Roll and Rubber Co., 68 Warren street, N. Y. Wringer Rolls and Moulded Goods Specialties.

For Sale.—New High Speed Engine, 10x10; will indicate 50 horse power; price complete, \$250. S. M. York, Cleveland, O.

Draughtsman's Sensitive Paper, T. H. McCollin, Phila., Pa.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 44.

Steam Pumps. See adv. Smith, Vaile & Co., p. 46.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 28.

The Berryman Feed Water Heater and Purifier and Feed Pump. I. B. Davis' Patent. See illus. adv., p. 29.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 29.

Bostwick's Giant Riding Saw Machine, adv., page 28.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co., Box 423, Pottsville, Pa. See p. 29.

4 to 40 H. P. Steam Engines. See adv. p. 28.

Pure Water furnished Cities, Paper Mills, Laundries, Steam Boilers, etc., by the Multifold System of the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Red Jacket Adjustable Force Pump. See adv., p. 13.

Malleable and Fine Gray Iron Castings to order, by Capital City Malleable Iron Co., Albany, N. Y.

"Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N. H.

List 23, describing 3,600 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N. H., and N. Y. city.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

First Class Engine Lathes, 30 inch swing, 8 foot bed, now ready. F. C. & E. Rowland, New Haven, Conn.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

Jas. F. Hotchkiss, 84 John St., N. Y.: Send me your free book entitled "How to Keep Boilers Clean," containing useful information for steam users & engineers. (Forward above by postal or letter; mention this paper.)

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

Wood Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other (an) Tools. E. W. Bliss, Brooklyn, N. Y.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York. Presses & Dies, Ferracute Mach. Co., Bridgeton, N. J.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) H. L. writes: 1. Please let me know how to make a top which is kept in motion by electricity? A. You will find an illustrated description of the electrical gyroscope on p. 335, No. 22, vol. xxxviii, SCIENTIFIC AMERICAN. 2. What kind of acid is used for taking off the polish from glass beads and how to handle it? A. Use hydrofluoric acid. Dip the beads into the aqueous acid for a few minutes, then wash in running water, and dry in sawdust.

(2) H. W. asks: 1. What proportions of nitric and muriatic acids are strongest for dissolving gold? A. Use a mixture of 3 parts hydrochloric (muriatic) and 1 part nitric acids. 2. How may the gold and acid be separated so as to leave the latter pure for further experiment? A. Filter and evaporate the solution to dryness over a water bath, redissolve the residue in water, precipitate with a strong solution of pure iron sulphate (copperas), heat to boiling, filter, wash the precipitate, dry, mix it with a little powdered borax glass, and melt on charcoal or in a black lead crucible.

(3) N. L. T. asks: Of what is the substance composed that is used by frame makers for decorating frames? Its appearance is similar to putty. A. The substance referred to is composed of fine whiting and glue size. The size is dissolved in small quantity of hot water and mixed into a stiff paste with the whiting for use.

(4) C. T. asks: Will a given volume of steam raise the same quantity of water by means of an injector as it would if applied to the piston of a pumping engine? Or does steam through the jet of an injector exert its full mechanical energy on the water before being condensed, the full energy being that due to its initial or boiler pressure added to its expansive power between the initial pressure and the pressure of the head of water against which the injector works? A. In the injector the full mechanical effect is not attained as in the best engines.

(5) D. C. W. asks: Can you recommend anything special to me, through your SCIENTIFIC AMERICAN, to keep mice, jellies, jams, etc., from working and spoiling? A. You should try Barf's new antiseptic, boric glyceride. See SUPPLEMENT, No. 332.

(6) H. M. G. writes: In a 16 foot 35 horsepower boiler, would you advise filling up behind the bridge wall and carrying the inverted arch back from throat of the bridge wall to the end of the boiler? If so, how much space should be left, or how near to the bottom of the boiler should the arch be built? A. Yes; leave eight or nine inches space between the boiler and the inverted arch.

(7) H. S. writes: Myself and friend have got into an argument, from which we have decided you shall help us out. Dispute is this: I say one ton of coal coked is capable of making one ton of pig iron from ore that contains seventy-five per cent iron. He says it takes two tons. A. Coke furnaces average 3,000 pounds coke to one ton of iron; but with extra good furnaces and ore it may be as low as 2,000 pounds, and in exceptional cases somewhat less.

(8) J. B. asks: Which are the best and most recent publications considering the manufacture of wines from gooseberries, currants, rhubarb, etc.? A. For recent practical works on wine making address the booksellers who advertise in this paper.

(9) J. H. M. writes: I am about to make an air pump, and I wish to make it as perfect an exhauster as possible. Would cast nickel make good valves, and would it be proper to have the barrel of cast brass lined with nickel? The cement used in fastening the glass plate to the pump, how is it prepared, and now used? A. A brass barrel will make a good air pump, if it is not too soft. If you decide to make a barrel have it and all the valves made of a composition of 16 parts copper, 2 of tin, and 1 of zinc. This is a tough, strong metal, and will wear smooth. The casting of nickel is difficult unless it is alloyed; then it becomes

German silver, which if made hard will make excellent, but expensive, working parts. Ordinary beeswax is used in the ground ball joint.

(10) D. A. Y. writes: A friend and I have a dispute as to whether pure limestone, ground to the fineness of flour, is better than lime for a fertilizer. I claim that the pure limestone ground is best. He says that lime is best. Now we wish you to decide for us. A. Air-slaked lime is much the best.

(11) W. H. K. asks: How can I best make a filter for filtering roof rain water for drinking only—say two quarts per day? How can I keep it? Shall I filter and then keep, or filter slowly? Shall I keep in stone or wood? A. Procure a small quarter barrel with a tap near the bottom and another close to the top. Fill this vessel about one-sixth full of clean coarse gravel, then put over it an equal quantity of coarsely granular, well burned charcoal, freed from dust, and over this again another equal measure of fine gravel. Then fill up to within about three inches of the top with fine quartz sand and head up. The rain water reservoir is connected by a rubber tube or other suitable pipe with the bottom tap, and water is drawn from the upper tap slowly, as required. The filtration should not be allowed to proceed too rapidly. For drinking purposes stoneware or porcelain enameled iron vessels are better reservoirs than wood.

(12) A. W. G. writes: Would like you to inform me through the columns of your paper how I can make the cement used for fastening the rubber tubes on a bicycle. A. Melt together in an iron pan over a gentle fire one part each of gutta percha and shellac, and gradually stir into the mixture one-tenth each of melted sulphur and red lead. Use hot. It makes a surer joint if applied to very loosely woven fine cotton cloth or netting, which is then inserted between the parts to be joined. These should be held under pressure for several hours to allow the cementing material to set before putting under strain.

(13) L. McN. writes: I wish to produce an intense heat in a small blast furnace. If I use coke and a blast of oil (in the form of an atomizer for fuel, will it produce the desired result? A. You can warm the air blast by causing it to pass through a coil of heated metal tubing, and then cause this warm blast to pass through a small quantity of benzine before projecting into the tuyere (or its equivalent) of the furnace. It will be necessary to use small jets to avoid danger from the liability of this carburized air to inflame and cause an explosion in the blast pipes and apparatus. You can use coke, or fine coal and coke mixed.

(14) F. B. writes: 1. I am building a post fence in alkali soil. The earth ends decay very fast. A good cheap preventive would be in demand. I have heard of coal tar being good. What is your opinion? A. The best method of protecting fence posts in such a soil is to char the ground end superficially and then dip the charred parts in melted coal tar. 2. Which should be best regarded, short cars or long cars on curves at fast speed, and why? A. Short cars, because they adapt themselves better to short curves.

(15) S. R. W. writes: I would like to know what is the best available application (paint or other wise) to the outside of a galvanized iron boat, to protect it from the corrosive action of salt water, and also, perhaps, from barnacles. A. If the dark color is not objectionable, lay on several coats of finest quick-drying japan varnish, letting each get quite hard before applying the next. The last coat may be a flowing one if a very smooth surface is desired.

(16) J. G. M. writes: In No. 23 of the SCIENTIFIC AMERICAN I find an article on crystalline glass, which reminds me of some of my own experiments. One day (in the winter) I was staining some boards imitation walnut with a water stain, setting them away to dry; afterward I found that the stain froze and had formed some beautiful crystals, as seen on our windows in winter. This led me to experimenting on the subject. I prepared some pieces, stained them, and immediately exposed them to the cold winter atmosphere. As soon as the stain was frozen I removed them into a warm room, letting them gradually thaw out; the peculiar markings remained on the wood, and when thoroughly dry it could be varnished and finished in the usual way. I obtained some most beautiful designs in this way. I found that the quicker the stain freezes the better the result. Now, I would ask you to inform me if there are any salts that will crystallize and can be used in the same manner on wood, so as to make the work possible in summer as well as in winter? A. Try warm concentrated solutions of lead acetate, ammonium chloride, sodium sulphate, and potassium ferriocyanide and ferrocyanide.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

July 4, 1882.

AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Acid, etc., device for expressing stearic, G. J. Dannecker, 260,542. Alarm, See Burglar alarm. Clock alarm. Amalgamating gold and silver ores, apparatus for, W. Hamilton, 260,389, 260,390. Amalgamator, ore, B. Hershey, 260,682.

Ash barrel and coal hod cover, J. A. Brown, 260,364. Atomizer, T. E. Studley, 260,505. Auger, W. L. Parmelee, 260,497. Ax and brush hook, L. T. Shelton, 260,423. Bag holder, J. R. Pendleton, 260,707. Bale band replacer and tightener, W. R. Lenard, 260,402. Bale tie, J. B. Allen, 260,515. Bales and bundles, wire tightener for, L. Miller, 260,792. Bar. See Chain bar. Horseshoe blank bar. Battery. See Secondary battery. Bearing, rolling, F. W. Marston, 260,585. Beds, head rest for cot, H. D. Hard, 260,677. Beds, head section for, E. F. Meter, 260,405. Beer, etc., cooler for, A. Zoeller, 260,630. Bench. See Wash bench. Bird skin, ornamented, A. H. Ward, 260,629. Blind-slat adjuster, G. W. Springsted, 260,622. Block. See Sawmill head block. Blower and damper for grates, combined, G. W. Ranson, 260,413. Board. See Wash board. Boat, J. Dean, 260,459. Boiler. See Steam boiler. Boiler tube expander, Z. J. Ferguson, 260,555. Boilers, sediment collector for, D. Hanna, 260,676. Bone black and reinvigorating old bone black, treating new, S. M. Lillie, 260,486. Bone blanks for tooth brushes, machine for milling, A. C. Estabrook, 260,376. Bone into blanks for tooth brush handles, working, A. C. Estabrook, 260,374. Bone sawing machine, A. C. Estabrook, 260,375. Book holder, J. Pusey, 260,500. Boot, W. Smith, 260,426. Boots and shoes, manufacturing felt, J. K. Feick, 260,554. Boring machine, C. D. Blevins, 260,362. Box clamp or fastening, O. P. Ratnour, 260,608. Bracelet, S. Cottle, 260,540. Brake. See Car brake. Carriage brake. Brush, electric, J. W. Weakley, Jr., 260,718. Brush handles, machine for boring, A. C. Estabrook, 260,377. Brush handles, machine for graving, A. C. Estabrook, 260,378. Buckle holder, E. R. Cahoone, 260,450. Buffing wheel, H. E. Fowler, 260,558. Burglar alarm, electric, C. E. Chinnock, 260,536. Burner. See Lamp burner. Button, glove, E. Pringle, 260,411. Calendar and letter box combined, W. L. Caldwell, 260,531. Camera. See Photographic camera. Can. See Sheet metal can. Cane stripper, sugar, E. P. Putnam, 260,709. Car brake, B. F. Smith, 260,618. Car coupling, J. H. Smith, 260,619. Car coupling, D. W. Woods, 260,725. Car safety step, S. M. Beery, 260,525. Car, stock, C. W. Rogers, 260,421. Car wheel, E. B. Meatyard, 260,593. Cars, propulsion of street, R. F. Bridewell, 260,648. Cars, sand box for street, G. F. Huntington, 260,572. Card tooth, G. Eddy, 260,466. Carriage brake, E. S. Davis, 260,543. Carriage, child's, J. W. Krueger, 260,399. Carriage curtain fastening, F. Westwood, 260,719. Carriages, canopy support for children's, Butler & McClinchie, 260,530. Carrier. See Trace carrier. Car, road, C. W. Watson, 260,434. Case. See Clock case. Photographic picture case. Caster, table, Banghart & Treat, 260,353. Caster, trunk, J. J. Cowell, 260,728. Casting apparatus, W. Hainsworth, 260,388. Centrifugal separator, E. E. Quimby, 260,412. Chain bar and pencil, combined watch, L. W. Fairchild (r), 10,147. Chain, drive, C. H. Labelle, 260,400. Chair. See Railway chair. Chimney ventilator, H. Hahn, 260,564. Chopper. See Cotton chopper. Churn, R. Campbell, 260,451. Cigar bunches, forming and drying, J. J. Bach, 260,638. Cigar press, H. J. Watteyne, 260,510. Clamp. See Box clamp. Whip socket clamp. Cloak, C. F. Hamilton, 260,565. Clock alarm, O. H. Woodworth, 260,514. Clock case, H. J. Davies, 260,544. Clothes wringer, bench, E. A. Jones (r), 10,148. Clutch, friction, F. O. Deschamps, 260,460. Clutch, friction, J. A. Hafner, 260,386. Clutch, friction, D. McIntosh, 260,698. Coffee, roasting, J. W. Drummond, 260,672. Compressing dry and plastic materials, machine for, C. Killgore, 260,578. Connecting rod coupling, J. C. Brannon, 260,448. Cornice, window curtain, H. H. Winger, 260,439. Corpse supporting table, T. Condon, 260,665. Cotton, device for handling, C. H. Merry, 260,493. Cotton chopper, B. J. Curry, 260,458. Cotton gin, J. E. Carver, 260,660. Cotton gins, combined feeder and breaker for, J. E. Carver, 260,661. Coupling. See Car coupling. Connecting rod coupling. Pipe coupling. Shaft coupling. Crate. See Fruit crate. Crucible furnace and brick for constructing the same, H. Swindell, 260,429. Culinary vessel, J. W. Fisher, 260,470. Cultivator, Berlew & Kissell, 260,447. Cultivator, Colton & Schermerhorn, 260,664. Cultivator, J. L. Jensen, 260,686. Cultivator, J. G. Jordan, 260,576. Cultivator, J. Weymouth, 260,720. Curtain fixture, A. B. Shaw, 260,616. Desk, J. A. Moore et al., 260,703. Drains, etc., in cement, apparatus for forming underground, W. M. Campbell, 260,533. Drill. See Ratchet drill. Drop handle, C. S. Barnard, 260,520. Ear ring, G. Kremetz, 260,692. Eaves troughs, machine for making, G. Huth, 260,481. Electric condenser, S. Borden, 260,646. Electric current generators, thermic regulator for, C. F. Brush, 260,651. Electric lighting, Starr & Peyton, 260,624. Electric machine, dynamo, C. F. Brush, 260,652. Electric machine, dynamo, J. A. I. Craig, 260,541. Electric machine, dynamo, C. Heisler, 260,480. Electric machine regulator, dynamo, J. H. Irwin, 260,575. Electric motors, controlling, E. T. Starr, 260,623. Electric wires, underground conduit for, J. S. Du Bois, 260,548. Electro motor, J. H. Irwin, 260,574. Elevator. See Hay elevator. End gate, wagon, R. Barnard, 260,521. Engine. See Gas engine. Gas motor engine. Lever engine. Rotary engine. Steam engine. Traction engine. Wind engine. Engraving machine, J. Earle, 260,463. Engraving script, J. Earle, 260,464. Excavating earth for sinking tubing, C. H. Leach, 260,483. E tractor. See Stump extractor.