

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.

Patents Sold, Leased. Correspondence solicited. Kochendoerfer & Urie, 200 Broadway, New York. 1,200 lb. One Man Hand Hoist, with Brake, now ready. Price, \$30. Penfield Block Co., Lockport, N. Y.

Wanted Manufactured in this and foreign countries, on royalty, a small, new, and very useful invention. No competition. Address Thomas McDonald, Austin, Texas.

Two Valuable Patents For Sale.—Air Compressor for Ale or Beer, and Fluid Pressure Regulator. Working machines ready to show. Both good. A. J. B. West Rochester, N. Y.

Wanted, after May 1, by a thoroughly competent Drop Forger, a position as Superintendent, Foreman, or Contractor. Address Reliable, P. O. Box 882, Meriden, Conn.

Wanted.—An experienced Mechanical Draughtsman and Pattern Maker. Steady employment in a good place for the right man. Address J. W. P., Box 773, New York. Lightning Screw Plates and Labor-saving Tools, p. 158.

Send name and address to Cragin & Co., Philadelphia, Pa., for Cook Book free.

The Lehigh Valley Emery Wheel Co., Lehigh, Pa., sell a new Stone Plate Grinder, with transverse motion; and an Automatic Planer Knife Grinder, with a cup wheel. Cuts and descriptions sent upon application.

Horizontal Engine, 20 in. cyl. by 48 in. stroke, for sale new. Atlantic Steam Engine Works, Brooklyn, N. Y.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsyth & Co., Manchester, N. H. Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

The Newark Filtering Co., of Newark, N. J., are filling orders from cities and manufacturers for their "Multifid Filters."

To Stop Leaks in Boiler Tubes, use Quinn's Pat. Ferrules. Address S. M. Co., So. Newmarket, N. H.

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

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Send for Pamphlet of Compilation of Tests of Turbine Water Wheels. Barber, Keiser & Co., Allentown, Pa. Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

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

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

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

Saw Mill Machinery. Stearns Mfg. Co. See p. 156.

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.

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

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

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, Limited, Erie, Pa.

Presses & Dies. Ferracite Mach. Co., Bridgeton, N. J.

Corrugated Wrought Iron for Tires on Tractor Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsbg., Pa. Brass & Copper in sheets, wire & blanks. See adv. p. 157.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

List 27.—Description of 3,000 new and second-hand machines, now ready for distribution. Send stamp for same. S. C. Forsyth & Co., Manchester, N. H., and N. Y. city.

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

Improved Skinner Portable Engines. Erie, Pa.

Ajax Metals for Locomotive Boxes, Journal Bearings, etc. Sold in ingots or castings. See adv. p. 125.

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

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 158.

Granville Hydraulic Elevator Co., 1193 B'way, N. Y.

Cutters for Teeth of Gear Wheels formed entirely by machinery. The Pratt & Whitney Co., Hartford, Conn. The Sweetland Chuck. See illus. adv., p. 142.

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

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 124.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 157. Supplee Steam Engine. See adv. p. 157.

Skinner's Chuck. Universal, and Eccentric. See p. 126.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil. C. B. Rogers & Co., Norwich, Conn. Wood Working Machinery of every kind. See adv., page 140.

The Universal Calculator.—A novel labor-saving machine for solving questions in arithmetic and mensuration without mental labor. The most tedious problems solved in less than half a minute. Invaluable to engineers, mechanics, and business men. Sent free for \$1. Send for circular. Address W. H. Wythe, Red Bank, N. J.

Ball's Variable Cut-off Engine. See adv. page 157.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

Paragon School Desk Extension Slides. See adv. p. 158

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'Frs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv., page 156.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.



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.

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) J. W. asks: Could you tell me what kind of a drill will go through chilled iron and highly tempered homogeneous steel? Is there any way of softening this steel with fire or acids or alkalis, so that you could cut it with a sharp edged tool? A. Your drill must be quite thick, and ground to a flat angle, so as not to have a thin edge; it must be of best steel, made quite hard, and revolved slowly. You can heat the articles to a dull red heat, and then allow them to cool off very slowly while buried in charcoal dust.

(2) E. T. L. writes: An electrical catalogue says: "Never put batteries of different kinds in the same circuit." What is the reason of this? A. The entire series of connected batteries has the quantity of the weaker one only.

(3) A. C. inquires how to make the milk of lime. A. Twenty ounces of well burned lime must be carefully slaked in the usual manner. When slaked, add the rest of the water; stir it well until all is dissolved; then pour off the milky liquor through a fine sieve. The imperfectly burned stone will remain in the sieve. Weigh this, and, by dissolving more lime in another vessel, make up the dissolved lime to twenty ounces to the gallon. If a little stronger it will not signify; but it should not be weaker. The milk of lime should be kept in a well bunged barrel. If kept tightly stopped it will keep any reasonable length of time, but if the air gets to it it absorbs carbonic acid and becomes weak as to be useless. Lime slaked with water and kept from the action of the air will keep its strength for any reasonable time.

(4) E. J. M. asks for a description of the process of making gelatin from seaweed. A. It is manufactured as follows: The sea-weed, called by the native name of "tengusa," is carefully washed and afterward boiled, so as to form a gluish decoction, which is strained off and put into square boxes. When cool it forms a stiff jelly, which can easily be divided into squares a foot in length. The manner in which the surplus water is removed is very ingenious. The jelly prisms are exposed in the open air during a cold night, and allowed to freeze. During the day the sun melts the water, which runs off, leaving behind what one might term the skeleton of white, horny substance, which is extremely light and easily dissolved in hot water; when cooled, it again forms a stiff jelly. This article can be applied to many purposes—for culinary uses, for making bobbons and jellies, for clarifying liquids, as a substitute for animal isinglass, for making moulds used by the plaster of Paris workers, for hardening the same material; in short, as a substitute for all kinds of gelatines, over which it has the advantage of producing a firmer jelly.

(5) O. asks how to oxidize gold, silver, and brass. A. Paint over the parts to be oxidized with a solution of chloride of platinum, then let it dry. To make the chloride of platinum in solution dissolve one drachm in two ounces of hot water.

(6) G. B. K. asks: How can I remove iron spots from clothing? A. The spots are colored blue with yellow prussiate of potash; wash with caustic soda, treat with oxalic acid, afterward washing well with water. Treated directly with oxalic acid, only fresh spots disappear.

(7) "Microscopist" asks how to clean diatoms for microscopic objects. A. Mr. James Neil, of Cleveland, uses glycerin as an easy and efficacious means of separating diatom shells from the foreign matter with which they are naturally mixed. He fills a two ounce graduated measuring glass three-quarters full of glycerin and water mixed in equal parts. The diatoms, after being treated with acid and thoroughly washed, are then shaken up in some pure water and poured gently over the diluted glycerin. If carefully done, the water and diatoms do not at first sink into the glycerin, but gradually the diatoms sink through the water and into the glycerin preceding the light flocculent matter held in the water. After a few minutes, a pipe introduced closed through the water and into the glycerin will bring up remarkably clean diatoms, which are to be afterward freed from glycerin by repeated washing and decanting.

(8) C. S. P. says: I am running a steam grist and saw mill. The mill is 24 horse power; portable

boiler, 40 inches diameter 16 feet long, dome on top; steam gauge attached to top of dome. In running with sixty or seventy pounds of steam the finger of the gauge vibrates from three to five pounds. Now, I would like to know what causes it. A. Each charge of steam admitted to the engine practically enlarges the steam room when the steam valve opens. The result is slight fall of pressure, which is somewhat exaggerated by the momentum of the pointer. This motion may generally be stopped by partly closing the cock in the gauge pipe or by making a U bend in the gauge pipe, in which a quantity of water should remain, serving the double purpose of keeping the gauge spring cool and also preventing the wear caused by the vibration.

(9) B. D. P. asks: What is the fastest time of any train in the United States and Europe? A. Sixty miles per hour has been made for short time on many roads both in this country and Europe. On the Inter-colonial Road, New Brunswick, it is claimed that eighty-four miles per hour has been made for a distance of twenty miles. We do not think any faster speed than this has been made on any road.

(10) D. F. H. writes: I have a four cell Daniell battery, which is running an electric bell. H. says if one cell will run the bell one month, four will run it four months. I say it will not. Who is right? A. It depends altogether upon the resistance of the bell magnet and upon the manner in which the battery cells are connected up. If the cells are connected in series, and if the bell magnet has a high resistance, four cells will work longer than one cell, but hardly four times as long. If the bell magnet is of low resistance, and the cells are connected for quantity, there would be little difference in the time required to run down one or four cells.

(11) E. P. R. writes: I have a steam boiler 12 inches diameter outside, 32 inches long, with 14 2-inch tubes running through the entire length, which I use upright. The boiler foams, so that it throws water over in the engine cylinder, making it pound. What is the cause of it? The water is pure, such as we use for drinking and cooking. A. Probably because you have not steam capacity enough in the boiler. You can add a steam chamber to it and connect it with the boiler by pipes.

(12) C. D. D. asks: If the light of the sun should be suddenly blotted out, how long would we continue to see it? A. Eight minutes.

(13) L. J. asks: 1. What is the effect of putting rings of rubber behind the diaphragm of the phonograph described in SUPPLEMENT, No. 131, vol. vi., page 211? A. It limits the vibrations of diaphragm and prevents too great movement of the needle.

(14) P. M. V. asks: Can I, in making an electro-magnet, screw the two soft iron cores directly into a base of wood, or will they have to have a metallic connection; and if so, would mere contact be enough? A. You will require a metallic connection, which must be of iron or other magnetic metal. Mere contact will do, if sufficiently perfect.

(15) R. H. S. writes: I desire to heat an inclosure, 4 feet square, moderately, say from 70° to 90° Fah., if possible by an electric current. Can it be done—and if so, how? A. It can be done by running the current through a wire of the proper size and length. We recommend a current sufficient to produce a small arc light connected with about 200 feet of No. 16 naked copper wire, arranged within the chamber so that the whole or a part of it may be thrown into the circuit. The convolutions of wire should have air spaces between and they should nowhere touch each other, neither should they come into contact with anything combustible.

(16) A. J. S. writes: I have a telegraph line 200 feet long of No. 18 insulated copper with five 6x8 gravity batteries for my return wire or ground wire. At one end it is attached to a lead water pipe; at the other end to an iron pipe driven about five feet into the ground. All my connections are perfect, but it will not work (it will if I use a double wire). Can you tell me through your paper what is the matter? A. Your ground is insufficient. Instead of driving a pipe five feet in the earth, you should dig a trench deep enough to reach earth that is always moist, and bury in it a copper plate having ten to fifteen square feet of surface, and connect this with your ground wire. Or you may fill this trench for a foot or so with finely broken coke, burying a large sized copper wire in the coke. Of course connection with the gas or water pipe—if you have them—will do. The connections should be soldered.

(17) J. F. B. asks: 1. What will be the size of a link for a reverse engine whose stroke is three inches and the distance from the outside of the ports is two inches, and from the inside of the ports is one inch and a half? And what is the rule for finding the size of the link? A. The best way to get the size of the link is to take actual dimensions of one in use, and reduce it, in the proportion of openings and travel of valve. 2. How do you find the throw of the eccentric? A. The throw is equal to twice the distance from the center of the shaft to the center from which the exterior of the eccentric is struck. 3. What is "kaolin," advertised in No. 4, page 52, in the treatment of comedones? A. Kaolin is the kind of pure clay used in making porcelain.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

J. B. B.—The white powder is carbonate of lead.

COMMUNICATIONS RECEIVED,

- On a Buncher for Hay and Straw. By J. C. M.
On Lubricants. By L. M. A.
Rapid Transit on Water. By D. E.
On Aerial Navigation. By O. F.
On the Conversion of Thermometric Scales. By D. J. K.
What Causes a Belt to Run on the High Side of a Pulley? By C. D.

[OFFICIAL.]

INDEX OF INVENTIONS

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

February 21, 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.

Table listing various inventions and their patent numbers, including items like Air compressor, hydraulic, W. A. Babcock; Air cooling and purifying apparatus, S. Whitnum; Air motor, compressed, R. S. Tice; Alarm, See Millstone alarm; Amalgam of gold and silver containing base metals, refining, E. N. Riotte; Amalgamating apparatus, A. D. Clarke; Animal trap, A. André; Banjo, E. J. Cubley; Basin and sink trap, C. H. Denison; Basket wicker, J. G. Miller; Bed bottom, D. D. Wyman; Bed, folding cabinet, S. H. Witmer; Bell, G. W. Goff; Belt shipper, Upham & Scovill; Belt, waist, P. Sternheimer; Bench, See Wire rope splicing bench; Bending machine, J. McDowell; Block, See Pulley block; Boat, See Canal boat; Root, R. Thompson; Boot and shoe heel, H. E. Clinton; Boots and shoes, manufacture of, T. Laycock; Boring machine, E. D. Davis; Bouquet support and former, F. D. Hake; Box, See Spool show box; Boxes and dishes, machinery for forging and fastening, L. Carpenter; Brace, See Tension brace; Brake, See Wagon brake; Brush for cleaning milk cans, J. K. Odell; Bung, racking, J. S. Lipps; Butter worker, G. A. Blanchard; Button fastener, J. Weidenmann; Button, sleeve, F. F. Bioren; Button, sleeve or other, S. Moore; Calendar, T. H. Hovenden; Camera, See Solar camera; Canal boat, J. Baker; Canie and umbrella, combined, G. T. Smith; Car coupling, G. Butler; Car coupling, L. W. Gates; Car coupling, E. Glover; Car coupling, E. H. Janney; Car coupling, E. Lasher; Car coupling, R. N. McKay; Car coupling, G. T. Osborne; Car, railway, A. Estrade; Car seat, E. T. Starr; Cars, apparatus for lighting the platforms and steps of railway, W. E. Chamberlain; Card and domino combined, playing, B. A. Sheldon; Card, playing, S. L. Cohen; Casting flask, J. K. Dimmick; Chain, ornamental, R. Barker; Chain wheel, (V. D. Ewart); Chair, See Child's chair, Photographer's chair; Chair, J. Green; Chasing and engraving machine, L. T. Carr; Cheese draining table and mould, Blair & Wilder; Child's chair and carriage, J. W. Kenna; Chinoline, manufacture of, Pichardt & Endemann; Churn, Minot & Rhoades; Churn, M. C. Wallace; Cigar and cigarette wrapper, W. B. Carpenter; Cigarette, W. Salomon; Cleaner, See Flue cleaner; Clock springs, machine for rolling blanks for, W. Barnes; Clocks, ornamental attachment for, A. C. Sanford; Clothes strainer, A. M. Dennison; Clutch, I. L. Roberts; Coal ores, etc., device for handling, A. Lawton; Coat hook, pocket, R. Onderdonk; Commode, J. Benorr; Commode, H. P. Stichter; Compass, transit, A. W. Elkins; Cooking apparatus, E. Robinson; Corn, husker, hand, A. W. Brinkerhoff; Corset, I. Strouse; Counter, store, W. J. Conrad; Coupling, See Car coupling, Pipe coupling, Shaft coupling, Thil coupling; Crank paddle, J. I. Lengsfeld; Cultivator, J. H. Jones; Cup, See Grain drill seed cup; Cut-off valve gear, automatic, J. W. Morgan; Cut-off valve gear, M. T. Stevens; Detector, See Time detector; Die, See Screw cutting die; Digger, See Post hole digger; Distillation, apparatus for fractional, E. F. Dietrichs; Ditching and tile laying machine, W. Wilson; Door spring, De Long & Schroder; Dowel pins, machine for making, E. Gager; Dress cutting and fitting mould, K. Walker; Drill, See Grain drill; Drilling machine, G. W. Longman; Drum, beating, A. Sires; Dyestuff coloring matter, J. H. Stebbins, Jr.; Egg pail, Hill & Simpson; Electric machine, dynamo, W. E. Sawyer; Electric wires, safety device for, S. M. Plush; Electromagnetic relay, C. A. Randall; Elevator, See Hod elevator, Hydraulic elevator; Emery grinding and polishing wheel, elastic center, M. Hofstad; Engine, See Rotary engine; Eraser, blackboard, C. M. Lothrop; Evaporating and cooling apparatus, A. Gontard;