

Business and Personal.

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For Sale—New and second hand iron-working machinery. Prompt delivery. W. P. Davis, Rochester, N. Y. Acme engine, 1 to 5 H. P. See adv. next issue.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Burnham standard turbine. Burnham Bros., York, Pa. Combination mill for crushing & grinding. See last issue Billings' Patent Breech-loading Single Barrel Shotgun. Billings & Spencer Co., Hartford, Conn.

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

Best Ice and Refrigerating Machines made by David Boyle, Chicago, Ill. 155 machines in satisfactory use. Money provided for manufacturing patented articles of superior merit. Manufacturer, P. O. box 2581, N. Y.

Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 13.

Wanted—A 50 in. x 46 in. x 10 ft. Planing machine. State make and width of table. F. X. Hooper & Co., Baltimore, Md

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.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J. S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y.

The Dwight Slate Machine Co., of Hartford, Conn., make the most extensive line of hand, foot, and automatic feed drills for light work, 1/2 in. holes and less. 1891 catalogue free.

Send for new and complete catalogue of Scientific and other books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & 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 This is for our information and not for publication.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.

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.

(2888) T. F. D. asks for gold luster for china painting. A. Dissolve 1 dram gold in 3/4 ounce aqua regia, or simply dissolve this weight of chloride of gold in water. Add 6 grains of metallic tin, and enough aqua regia if required to dissolve it. Pour with constant stirring into a mixture of 1/2 dram balsam of sulphur and 20 grains oil of turpentine. As it stiffens add 1/2 dram oil of turpentine and mix. More gold gives a brighter effect; tin inclines it to a violet tinge. Balsam of sulphur is made by boiling together in a covered vessel 1 part flowers of sulphur and 4 parts oil until the mass thickens.

(2889) F. T. asks for a receipt for a composition, by putting which in a small piece of cotton batting the size of a small marble, and placing in a glass of water, it will produce sparks of fire. A. Possibly it is sodium or potassium. It is very dangerous.

(2890) A. A. B. writes: X contends that the point of solidification of a substance is the freezing point of that substance, or in other words that any substance that solidifies when its temperature is sufficiently lowered may be termed frozen when in its solid state. As for example: Glass, iron, china ware, etc., in their solid state may be correctly termed frozen. Y contends that this is not so. It is conceded that in general conversation it would not be correct, but from a physical standpoint it would not be incorrect to apply the expression, after the molecules have once congealed. Please decide the question. A. Generally we should say that freezing applies to particular cases of congelation only, and we should not advocate X's contention. It is a question of etymology, not of science.

(2891) C. T. asks how to remove stains, made by handling in damp weather, from the highly polished brass work of a microscope. A. Your brass work is evidently not lacquered. Clean with putz powder, then with whiting, and finally lacquer if the surface is not one having frictional contact with another surface. In this case have the work nicked.

(2892) C. P. writes: Your answer to the following, also the way of doing it, will interest several of your readers. A horse is hitched to a barn 25 feet square at one corner, by a rope 100 feet long; how much area in square feet can the horse feed over? A. He can feed over 4 quadrants, one of 100 feet radius, one of 75 feet radius, one of 50 feet radius, and one of 25 feet radius. These can be calculated by the regular formula pi r^2 giving 14,727 square feet.

(2893) T. F. D. asks for a good receipt for a harness dressing. A. Mutton suet 2 ounces, beeswax 6 ounces, powdered sugar 6 ounces, soft soap 2 ounces, indigo (real) or lampblack 1 ounce. Dissolve the soap in 1/2 pint of water, add other ingredients, melt and mix, and add 1 gill of turpentine. Apply with a sponge and polish with a brush.

(2894) E. L. asks (1) how to compound a mixture with which he could coat the inside of a wooden box so that he could use it as a jar for a storage battery. A. Use resin 4 parts, gutta percha in scraps 1 part, and a little linseed oil. Thicken if desired with ground pumice. 2. Would a rubber tube placed between the primary and secondary coils of an induction coil assist in its efficiency? A. No.

(2895) M. M. L.—For artificial cider the following is given: 28 gallons soft water, 2 pounds tartaric acid, 28 pounds New Orleans sugar, 1 pint yeast. Stir thoroughly. Let stand in cask with bung out for 24 hours, add 3 gallons spirits, bung tightly, and let stand 48 hours.

(2896) L. K. writes: I have a 25x30 hard rubber tray which I use for the silver bath; it has a piece broken from one of the sides; can you give me recipe for mending the same and making a good joint? A. Stockholm pitch 3 parts, resin 3 parts, crude rubber 6 parts, turpentine 12 parts; heat and mix. Roughen edges before applying.

(2897) W. A. L. writes: I have seen a combination of the usual vulcanite and aluminum in a dental plate. Is the latter likely to develop anything deleterious in contact with acidulous food? A. No. It is simply a question of durability.

(2898) C. N. C. asks: 1. What will take quicksilver off a gold ring? A. Heat it very carefully to a temperature of 100° Fah. It is best to intrust it to a jeweler, as you may melt it. 2. What to mix with hydrofluoric acid to make etchings on glasslook white and rough like ground glass? A. Do not apply the acid too long. The first effects are frosted, which disappear with deeper etching. You may apply the gaseous acid, evolving it from fluorspar and oil of vitriol in a leaden dish the size of the glass to be treated. The latter is held by cross pieces or otherwise well above the liquid. All glass in the room may be injured. It is best done out doors or in a cellar.

(2899) B. W. says: We are having a discussion in class as to what has become of the Great Eastern, the ship that laid the Atlantic cable. Please inform me. A. The Great Eastern was sold in 1888 for old iron, and is now being broken up near Liverpool.

(2900) H. D. D. says: Will you kindly, through the SCIENTIFIC AMERICAN, give a rule for finding the velocity in feet per second of a body falling through space at any given time? Example: A body falls 16 feet the first second and 64 feet the first two seconds; what is the velocity in feet per second at any given point? A. Velocity at end of 1 second, 32.166 feet per second; velocity at end of 2 seconds, 64.333 feet per second; 8.02x√height in feet=velocity at end of fall, in feet per second; 32.166xtime in seconds=velocity in feet per second at the end of fall; 16.083xsquare of the time in seconds=height of fall in feet.

(2901) W. H. McL. says: Can you tell me where I can get some seeds of the eucalyptus tree, the variety best adapted to the coast of the Southern States? Also, kindly tell me the name of the worm that cuts off small branches from trees; they seem to prefer the wood of the persimmon and hickory to any other. Is there any way to keep these worms from destroying a grove of small Pecan trees? A. Prof. C. V. Riley, of the Entomological Division, Department of Agriculture, Washington, to whom we referred the above inquiry, replies as follows: The department has no eucalyptus seeds on hand at present for distribution. Mr. McLeod can doubtless secure them from some seed dealer in San Francisco. The insect cutting off branches of persimmon, hickory and other trees is the twig girdler (Oncideres Cingulatus), a species of the coleopterous family Cerambycidae, or Longicorn beetles. The female beetle girdles with her jaws the twigs in August or September, and inserts one or several eggs into the wood above the girdled place. During winter time these twigs are usually broken off by the wind, and the larvae develop in them on the ground during the next spring and summer. If the girdled and fallen twigs of such trees are known to be infested are carefully collected and burned in winter or spring, the insect will be kept measurably in check. Good illustrations of the beetle, its earlier stages and its work, are given in the American Entomologist, vol. iii, p. 297.

(2902) T. W. asks: 1. What is the most conclusive proof for the existence of atmospheric pressure? A. The barometer, which varies in height at different elevations. 2. How close has air been compressed by powerful machinery? A. There is no known limit to its compressibility. Theoretically, a limit can be approximated to. It has been compressed to many atmospheres. 3. Can a tight-fitting piston be drawn out of a cylinder, supposing no air could get behind it? A. Yes. 4. Place a drop of water on dry surface, take piece of straight paper by one end, bring other end down flat on water, it sucks down and is hard to draw away; why is this? A. Capillary attraction. 5. Will condenser fill with water or crush, provided only heat of steam can escape? A. Yes. 6. In breathing a piece of soft iron, do the molecules change from one side to the other, or what is supposed to take place? A. The molecules are supposed to be torn apart. 7. Is not the wear on the same half of the crank pin, no matter which way an engine is running? A. No; it is on opposite halves for the two ways of running. The fallacy of the geometrical puzzle you submit is in the fact that the pieces as cut will not fit. There is a space left unfilled, which accounts for the apparent increase.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

March 10, 1891,

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing inventions and their patent numbers, including Abattor, J. W. Moyer, Adressing machine, G. C. Sherman, Adjustable pattern for draughting garments, S. Biscochia, Air brake, automatic, A. P. Massey, Air cleaner, lubricator, compressed, H. C. Seaman, Air purifier, J. W. Collins, Alarm, See Burglar alarm, Electric alarm, Annunciator and telephone system, combined, J. C. Francis, Annunciator, train order, L. T. Crabtree, Axle box, car, W. Cross, Bak, See Paper bag, Bag frame, B. Mayer, Bale tie fastener, D. W. Gish, Ballooning, M. C. Jackson, Band cutter and feeder, E. S. Wilhite, Banjo, G. B. Durkee, Banjo, W. Titus, Basket hamper, D. J. Johnson, Battery, See Body battery, Bed, F. H. B. Baber, Bell operating device, door, A. Iske, Bells and burglar alarms, trip for door, A. Iske, Belt, want, H. A. Hayden, Bench spur, W. J. Strain, Berry box, C. Tondeur, Bicycle, F. H. Bollescomps, Blind, window, W. N. Garry, Blower, fan, J. S. Schoonover, Board, See Game board, Board or game table, J. S. Burroughes, Body battery and attachments for the same, Crisp & Webb, Boiler, See Egg boiler, Boiler furnace, smoke preventing water tube, Reese, Jr., & Seller, Boilers, apparatus through which air is supplied to furnaces of steam, W. J. Chubb, Bolt, See Sew bolt, Book, combined receipt and record, H. Loewnbach, Bottles, etc., closing device for, M. Rheinstrom, Bottle stopper, F. W. Perry, Box, See Axle box, Berry box, Hitching box, Letter box, Locking box, Metal box, Signal box, Box jointing machine, M. D. Knowlton, Brake, See Air brake, Car brake, Brick machine, Frazier & Milam, Brick or tile machines, automatic wire cleaner for, G. Kuckenhal, Brickwork, combined for, G. L. Cross, Bricks, manufacture of, E. L. Ransome, Bromine and iodine, obtaining, H. H. Wing, Brush, M. Young, Brush, toilet, J. O. Nightingale, Buckle, S. E. Harsh, Buckle, suspending, A. A. Traut, Buildings, construction of fireproof, E. V. Johnson, Burglar alarm and door bell, automatic, Kierson & Young, Burner, See Hydrocarbon burner, Incandescent burner, J. J. Robinson, Button, A. Mandel, Buttonhole cutting and stitching machine, J. A. Osterhout, Button, separable, W. F. Whiting, Cable grip, P. A. C. Goode, Cage pen, A. C. Goode, Cakes, etc., treating, J. H. Mitchell, Calendar, discount and interest, W. R. Will, Calipers, R. Yanda, Camera shutter, L. Prosch, Jr., Can cooping machine, M. Jensen, Canals, construction of, A. Pickard, Cane and slide gauge, combination, R. Fuchs, Cane cutter, R. R. Wilson, Cane, music stand, and music holder, Harders & Richter, Car brake, H. H. Sessious, Car brake and starter, C. J. Luce, Car brake shoe, C. H. Emerson, Car, cattle or stock, D. L. Sylvester, Car coupling, D. L. Barnes, Car coupling, J. M. Ewing, Car coupling, M. Hobson, Car coupling, W. McConway, Car coupling, J. Schatz, Car, observatory, T. J. McBride, Car registering apparatus, street, H. G. Canfield, Car register, W. Hornberger, Car replacer, Stephens & Mott, Car, restitule, H. M. Jones, Cardboard making machine, J. McCoy, Carpet fastener, H. E. Leeman, Carpet fastener, Parmeter & Stetson, Carriage, C. B. Bailey, Carriage cover, E. F. Partridge, Carriage curtain attachment, D. Argerbright, Cartridge, B. Long, Carving machine, Smith & Post, Case, See Map or sheet case, Piano case, Cash register, apparatus, A. Iske, Cash register, W. R. Gilman, Cash register and indicator, J. J. Webster, Cattle dehorning implement, G. H. Stout, Chain, drive, S. Elliott, Chains, making oiling links for drive, S. Elliott, Chair, See Universal seat chair, Checkrein holder, E. P. Thompson, Churn, W. N. Wachter, Cigar bunching machine, F. J. Hagen (P.), Clear cutter, Quin & Duncel, Cigar lighter, A. F. Hawksley, Cigar tip cutter, Brunhoff & Lehmann, Clasp, See Hose clamp, Clamp for holding chisels, J. A. Islin, Cleaner, See Fruit cleaner, Clip, See File clip, Clipping shears, L. G. Werner, Cloth, M. B. Judkin, Clover hullers, feeder attachment for, J. W. Harvey, Clutch, friction, J. A. Moncrief, Coat holder, H. R. Rusk, Combination lock, E. M. Wilson, Comb, W. Hornberger, Cord hanging and adjusting device, J. A. Matteson, Cord receptacle, H. T. Simmons, Cork grinding machine, C. D. Armstrong, Corner strip, F. Kees, Counting, See Car coupling, Electric wire coupling, Fence rail coupling, Shaft coupling, Thill coupling, Creamer, J. G. Smith, Culinary fork, S. A. Merrill, Cultivator, B. P. Whitney, Cultivators, replanting attachment for, Cunningham & Ferry, Current wheel, W. Stephens, Currents and waterfalls, appliance for utilizing river, F. S. Martin, Cuspidor, C. L. Beers, Chair, See Band cutter, Cigar cutter, Cigar tip cutter, Flue hole cutter, Metal cutter, Milling cutter, Weed cutter, Wire cutter, Cutting tool, R. Gabel, Decorating glass and porcelain, Westwood & Malton, Dental service stand, W. E. Warner, Dining room service apparatus, H. W. Clapp, Distilling water, apparatus for, N. Hunting, Door check, G. W. Moulton, Door opener, electric, L. Bates, Draught bail, T. Harnsh, Draught equalizer, D. B. Croft, Draught equalizer, T. Thompson, Drier, See Clothes drier, Grain drier, Drills, etc., covering wheel for, J. Campbell, Drying machine, P. Dillon, Educational appliance, A. F. Garben, Egg boiler, automatic, G. L. Dale, Electric alarm, G. W. Adams, Electric circuits, automatic switch board and safety cut-out for, E. A. Sweet, Electric conductor, F. J. Nash, Electric current generator, alternating, N. Tesla, Electric light, See Car coupling, Electric light signal, McCann & Crider, Electric motor, W. H. Chapman, Electric starting switch, W. Hochhausen, Electric switch, H. P. Clark, Electric switch, Orford & English, Electric switch and cut-out, W. Hochhausen, Electric wire coupling, Knight & Hawken, Electric wiring in buildings, conduit for, S. Bergmann, Electricians, apparatus for intensifying, J. C. Ludwig, Elevator, N. P. Otis, Engine, See Pulp refining and dressing engine, Rotary engine, Steam engine, Traction engine, Engines, means for governing or regulating the action of gas or other like explosive, Delamare-Debutteville & Malandin, Envelope moistener and closer, D. Coyle, Equatorial mounting, G. N. Saegmuller, Eraser, tube, C. Hanmann, Evaporating apparatus, T. Gaunt, Evaporating apparatus, multiple effect, T. Gaunt, Excelsior cutting machine, C. G. Smith, Exhibitor, sample or picture, H. F. Ferecks, Fence, measuring, F. C. H. Strasburger, Feed water heater and purifier for boilers, W. H. K. Fence, hood, H. A. Mace, Fence post, J. E. Daniels, Fence post, T. S. Riddell, Fence rail coupling, iron, C. Hanika, Fence, wire, P. Mast, Fencing standard, R. Woodard, Fender, See Ship's fender, Fertilizer distributor, W. G. De Berry, Fertilizer distributor and seeder, combined, S. E. Clarkson, Fertilizer distributor, hand, Bates & Wren, File, bill or letter, J. W. Hendrickson, File clip, Brunhoff & Lehmann, File handle, J. Reilly, Files, apparatus for recutting, A. P. De Sennevoy, Filter, oil, A. S. Krotz, Fire escape, E. W. Hull, Fire escape, E. R. Whittier, Fireplace heater, F. D. Woodruff, Fishing rod support, S. Hall, Flower pot, folding, M. H. Piper, Flue hole cutter, W. R. Craig, Fly frutener, J. Bosworth, Fork, See Culinary fork, Frame, See Bag frame, Mosquito canopy frame, Fruit cleaner, W. H. Perry, Furnace, See Boiler furnace, Garbage furnace, Glass melting furnace, Retort furnace, Furnace, J. T. F. Meldrum, Furnaces, apparatus for consuming smoke and saving fuel in, Moffatt & Stuttford, Furniture fastener, W. G. Jarvis, Gauge, See Micrometer gauge, Gaiter apparatus for the human body, P. G. Williams, Game board, H. Wachter, Garbage furnace, A. Brownlee, Gas and air mixer, E. Meredith, Gas, apparatus for manufacturing, J. L. Stewart, Gas burners, device for cleaning, J. Reilly, Gas device for separating liquids from vapors, C. L. Stock, Gas meter, J. B. Knickerbocker, Gate, See Swinging gate, Generator, See Electric current generator, Steam generator, Glass, means for intensifying, H. P. Clark, Globe holder, H. R. Burk, Gong, C. Callahan, Grain cleaning device, F. F. Landis, Grain drier, J. V. Curbin, Grain separator, D. Scott, Grinding, drying and incorporating machine, P. C. Close, Grinding mill, roller, C. G. W. Kapler, Grinding the edges of band saw blanks and other metallic strips, machine for, J. Wallwork, Guard, See Razor guard, Gun, automatic, H. S. Maxim, Gun, sight, W. Lyman, Gymnastic apparatus, C. H. Dinkelmann, Hammer, steam, J. A. Henckels, Handle, See File handle, Harrow, spring, combined, E. T. Combs, Harrow spring tooth, W. M. Brinkerhoff, Harvester, cornstalk, P. S. Lundgren, Harvester pitman connection, J. Baum, Hat pounding machine, Newman & Oakley, Hay loader, M. Beck, Hay rake, W. L. Hays, Heater, See Feed water heater, Fireplace heater, Heel stiffener machine, L. Cote, Hinge, L. Porter, Hinge, lock, C. W. Fare, Hinge, spring, M. R. Soper, Hitching box, I. Brooke, Hoisting and conveying apparatus, T. S. Miller, Holder, See Checkrein holder, Coat holder, Globe holder, Paper holder, Pen holder, Rein holder, Sash holder, Horse blanket, A. H. Kinder, Horse blanket, A. F. Ransom, Horseshoeing rack, S. M. Martin, Hose clamp, H. Gersting, Jr., Hot air register, J. Northern, Hydrant, W. R. Thropp, Hydraulic, McCall & Dillmann, Incandescent burner and method of using the same, H. C. Campbell, Indicator, See Mileage book indicator, Post office indicator, Station indicator, Inkstand receptacle and pad holder, combined, J. H. H. Insulation of electric conductors, F. J. Nash, Iron, See Soldering iron, Ironing machine, L. H. Watson, Jack, See Wagon jack, Kettle ear and cover, M. & M. Griswold, Jr., Key button, M. R. Hastings, Knife, See Pocket knife, Knitting machine stripping mechanism, J. Bradley, Labeling machine, S. L. Salomon, Ladder, step, A. A. Brandenburg, Lamp, electric arc, A. C. Seibow, Lamp, electric arc, H. C. Fergason, Lamp sockets, switch for incandescent, A. T. Trezutha, Lamps, device for raising or lowering incandescent electric, C. F. Reinmann, Lamps, electric arc, A. C. Seibow, Lamps, operating arc, N. Tesla, Lantern, tubular, W. Baldwin, Laryngoscope and tongue depressor, combined, G. Henckel, Lasting tacks, machine for extracting, W. Gordon, Lathe for making luted wooden bodies, B. Merklen, Lathe reversing mechanism, F. Higgins, Ledger and index, combined, Kirtley & Phillips, Lemon presser or squeezer, S. C. Rupe, Letter box, W. M. Goshawk, Letter box house door, G. M. Shinn, Light, See Signal light, Live stock releaser, N. R. Sheets, Lock, See Combination lock, Nut lock, Lock, L. S. Ellsworth, Lock, J. Kubler, Locking box, secret, C. J. Theuermer, Locomotive bearing, R. B. McWhirter, Loom picker staff operating device, T. McCarty, Lubricator, See Air cylinder lubricator, Lubricator, A. Krautter, Mail or sheet case, P. B. Strong, Match machine, C. R. Bell, Measuring machine, automatic, J. W. Gaede, Mechanical movement, H. D. Mentzel, Metal box, C. J. Hauck, Jr., Metal cutter, H. B. Todd, Metal planing machine, Gray & Richter, Metallic casting, W. L. Chase, Meter, See Gas meter, Micrometer gauge, L. S. Starrett, Mileage book indicator and guard, combined, W. H. Knight, Milk can, W. C. Thornton, Mill, See Grinding mill, Roller mill, Rolling mill, Sawmill, Milling cutter, E. R. Pallen, Mirror, lady's shoe, S. Goodman, Mould, See Suppository mould, Mould rack, Wooster & Andrus, Mosquito netting frame, A. Jatho, Motor, See Electric motor, Mowers, grass receptacle for lawn, T. F. Eartlett, Musical instrument, mechanical, C. Pietschmann, Musical instruments, tail piece for, G. B. Darkee, Nail making attachment, wire, G. W. McKim, Nut, lock, W. R. Goshawk, Nut lock, P. B. Grimes, Obstetrical harness, W. A. Conant, Organ action, M. Clark, Oyster tongs, F. T. Maddrix, Packages, etc., apparatus for carrying, J. O. Lupp, Paint roof, J. B. Zook, Paper bag, F. O. Falge