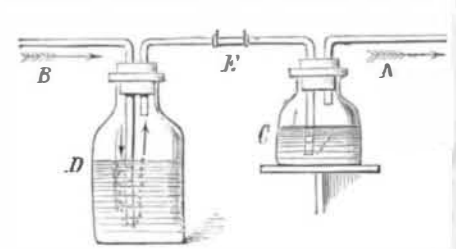


plied just before turning on steam, that became very hard; but lost some of article. A. Iron cements or rust joints are generally used for such purposes. The following receipts are good: 1. Iron borings, pounded fine in a mortar, 1 lb.; sal-ammoniac, in powder, 2 oz.; flowers of sulphur, 1 oz. Mix the whole thoroughly dry. For use mix 1 part of the above with 20 of fine iron borings, and mix with water to the consistence of mortar. Use at once. 2. Iron borings, 2 lb. (clean); flowers of sulphur, 1 oz.; sal-ammoniac, 1 oz. 3. 98 parts fine, clean iron borings, and 1 part each flowers of sulphur and sal-ammoniac, all dry. Mix thoroughly and moisten with hot water, when required for use. 4. Fine clean iron borings, 1 lb.; sal-ammoniac and spirit of salt, each half an ounce; water to moisten thoroughly when required for use. The joint should be allowed to rest for at least 10 hours before putting under pressure. For cracks calk in a little rope yarn fiber first, then calk in the cement.

(26) C. M. asks for an easy chemical test for injurious gas in rooms warmed by a coal furnace. A. We know of no simple way of testing air for such impurities. Carbonic oxide, the most to be dreaded of such products of combustion is very difficult to detect, in such a connection by chemical means, but as it usually accompanies or is accompanied by carbonic acid gas, in such cases the detection of any considerable quantity of the latter serves as an indication of the presence of the former. Carbonic acid is detected in air by drawing the air through a solution of lime in distilled water (clear filtered). Carbonic acid precipitates carbonate of lime from such a solution, making the liquid more or less milky. It should be remembered that all air contains a trace of carbonic acid, hence the liquid will always be more or less affected. Experiment first with pure out-of-door air, then with the air of a badly ventilated room, passing about the same volume of air, and you will soon be able to judge whether very much



carbonic acid is present or not. A simple apparatus for such tests is made from two glass bottles with good stoppers and a few pieces of glass tubing, as indicated above. D contains the lime water. C, a safety bottle to prevent the entrance of air from the lungs entering through E. The mouth is applied at A. The air enters at B.

(27) R. A. & J. S. ask: Have you ever known machinery of 170 horse power driven by a rubber belt? What should be the width of a belt to convey that amount of power? A. Yes, if the speed of your belt is 3,000 feet per minute it should be about 30 inches wide. We refer you to two cases mentioned in "Cooper on Belting," page 157.

(28) A. M. B. and others inquire how to make an oxyhydrogen jet for a magic lantern. A. The cut shows a very convenient form of oxyhydrogen jet. It is provided with two interchangeable jets, A B; the spindle, which holds the lime cylinder, is adjustable lengthwise of the gas tubes, and is rotated by a flexible shaft connected with a revolving spindle extending to



the back of the lantern. The burner is supported by a rod (not shown) projecting from a movable base. The jet, A, is of the annular form, the small central jet being for oxygen and the annular jet surrounding it for the hydrogen. There is no internal communication between the two pipes. The jet, B, combines both gases in the chamber beneath, and is not safe unless both gases are under equal pressure. Common illuminating gas may be used in place of pure hydrogen in the jet, A, and it may be taken directly from the burner of an ordinary gas fixture. Where two lanterns are employed the dissolving effect is secured by turning off the oxygen.

(29) S. M. W. asks for the process of gilding on common stone china, such cheap ware and gilding as we see so frequently at present in the shops. Also can such ware be gilt by a gold solution without the use of fire? A. The gilding is done either by an adhesive varnish or by heat. The varnish is prepared by dissolving in hot boiled linsed oil an equal weight of either amber or copal. This is diluted with a proper quantity of oil of turpentine so as to be applied as thin as possible to the parts to be gilt. Let stand after varnishing about 24 hours, then heat in an oven until so warm as almost to burn the fingers when handled. The heat softens the varnish, which is then ready to receive the gold leaf, which may be applied with a brush or pledget of cotton, and the superfluous portions brushed off. Burnish when cold, interposing a piece of thin paper between the gold and burnisher. Where burning in is practiced the gold reduced to powder is mixed with powdered borax glass (anhydrous borax), moistened with a little gum water, and applied to the clean surface with a camel hair pencil. When quitted the article is put into a stove heated to about the temperature of an annealing oven. The gum burns off, and the borax, by vitrifying, cements the gold with great firmness to the surface.

(30) M. M. H.—To temper gun springs, heat them evenly to a low red heat in a charcoal fire, and quench them in water with the cold chill off, keeping them immersed until reduced to the temperature

of the water. Place an iron pan containing lard oil and tallow, in about equal quantities, over a fire, and place the springs therein, and heat the pan until its contents take fire; then hold the springs in the flames, turning them over and over and dipping them occasionally in the oil to keep them blazing; when the oil adhering to them blazes freely when they are removed from the flames, place them aside to cool off.

(31) B. A. and others ask how to produce an illuminating composition. A. Cleanse oyster shells by well washing, expose them to a red heat for half an hour, separate the cleanest parts, and put into a crucible in alternate layers with sulphur; now expose the vessel to a red heat for an hour at least. When cold break the mass, and separate the whitest parts for use. If inclosed in a bottle it is said the figures of a watch may be distinguished by its aid. To renew the luminosity of the mass place the bottle each day in the sun, or in strong daylight; or burn a strip of magnesium wire close to the bottle. The sulphide of lime will thus absorb light, which will again be available at night.

(32) A. R. asks how to utilize old bones for fertilizing purposes. A. Unless the quantity is very large, the bones should be crushed fine as possible with a heavy iron hammer, mall, or with a large stone mortar. Place the fragments in a heating compost of yard manure and ashes, taking care to moisten it frequently with liquid manure if to be had, or with water in default of the urine. By spreading a thin coat of fresh earth or plaster over the pile, the escape of the valuable ammonia will be prevented. Six months' time will suffice to disintegrate the bones and produce as complete and effective a manure as can be made on the farm. The proportion of ashes to bones should be at least an equal amount of ashes as of bones; more will do no harm. The larger the amount of manure, within reasonable bounds, the better; at least two or three times as much as of both the others is advisable.

(33) H. P. R. asks how to make a small battery for operating electric jewelry. A. The essential parts of such a battery are, two plates of carbon, one plate of well amalgamated zinc, and a solution made by dissolving 2 parts of bichromate of potash in 20 parts of hot water, and when cold adding 1 part of sulphuric acid. The zinc plate is placed between the two carbon plates, leaving a space on each side. The carbon plates are connected together and with one of the conducting wires, the zinc plate is connected with the other conducting wire. The zinc and carbon plates may be attached to a rubber stopper fitted to a small jar or bottle containing the bichromate solution at the bottom below the ends of the plates, and the solution may be brought into contact with the plates by turning the bottle down on its side. This battery works powerfully for a short time, but the solution soon becomes exhausted and must be replaced.

(34) M. B. B. asks: What is the best and easiest way of making a magneto or crank battery—one that can be made at home? A. There is no really easy way, but perhaps the easiest way is to mount an electro-magnet wound with No. 36 wire on a shaft so that it may revolve in proximity to the poles of a permanent U magnet. The sides of the magnet should be parallel to the plane of rotation of the electro-magnet and as near to the latter as possible without actual contact. The terminals of the magnet wire should be soldered to a commutator consisting of a split ferrule attached to an insulating cylinder on the magnet shaft. The ferrule should be divided at diametrically opposite points, and one end of the wire should be attached to each half of the ferrule. The commutator cylinder thus formed and connected is pressed by two springs insulated from each other and connected with metallic handles to be grasped by the person treated by the current. The commutator cylinder is turned upon its shaft until the maximum current is realized, when it is fastened. The machine may be driven by a small round belt, and its power may be augmented by using a compound permanent magnet.

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

M. M.—The boiler incrustation consists of iron, lime and alumina sulphate, carbonate and silicate, derived from impure feed water. It may injure the metal if allowed to accumulate.—C. S. T.—No. 1. Garnets—the stones are hardly clear or perfect enough to be of much value to jewelers. No. 2. Diallage—a lime magnesia silicate. No. 3. Limonite—an iron ore. No. 4. Marcasite—white iron pyrite. No. 5. Serpentine and calcite. No. 6. Calcite—crystallized lime carbonate.—F. F.—No. 1. Quartz rock. No. 2. Granite.—G. D. H.—It contains lead acetate, besides much organic matter. Would require a chemical analysis.

COMMUNICATIONS RECEIVED.

On a Method of Applying Tin Foil to Leyden Jars. By T. S. On Multicolor Printing. By E. G. B.

English Patents Issued to Americans.

From January 14 to January 18, 1881, inclusive. Boats and vessels, masting and rigging for, J. McLeod, New York city. Cake machinery, J. H. Mitchell, Philadelphia, Pa. Caoutchouc, treating, G. M. Mowbray, North Adams, Mass. Carpet-cleaning machine, W. McArthur, Philadelphia, Pa. Dumping boats, N. Barney, Bergen Point, N. J. Fog signal, F. Brown, New York city. Grain grier, G. B. Boomer, New York city. Metallurgical furnace, J. G. McAuley, Denver, Col. Piston rod packing, C. C. Jerome, Chicago, Ill. Screws, countersinking wood, J. Eckford, San Antonio, Texas. Tool holders, J. M. Bibbins, Williamsport, Pa. Valves for steam engines, J. N. Rowe, Rockland, Me. Waterproof fabric (2 cases), D. M. Lamb, New York city.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending January 18, 1881, 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 one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, 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 inventions with patent numbers. Includes items like Air compressor, Air purifying apparatus, Apparel, Baling press, Beehive, Belting joint, Beveling tool, Blind, Bolt cutter, Book rest, Boot and shoe counter stiffener, Boot and shoe counter support, Boot and shoe sole edge trimmer, Box fastener, Bracelet, Brick kiln, Buckle, Bulletin board, Burglar guard for doors and windows, Button, Cabinet, Cane and camp stool combined, Car coupling, Car coupling attachment, Car, metallic, Car, preserving and freight, Car, stock, Car, stock, Car, stock, Car warmer, Card and sample holder, Carding machine trumpet, Carpet cleaner, Carriage top, Cartridge loading implement, Ceiling, fireproof, Chain, ornamental, Cigar tip cutter, Clock and watch escapement, Collar pad, Collar pad, horse, Collar fastening, Coop, folding, Corset steel fastening, Corset steel fastening, Cot and settee, combined folding, Cotton cleaning machine, Cotton gin, Currycomb, Cylindrical bars, tubes, etc., burishing and ductilizing, Diving apparatus, Door spring, Door spring, Doubling and winding machinery, Edge iron, Egg carrier, Elevator roof for hay or grain, Engine bed plate, Explosive compounds, manufacture of, Eyeglass frame, Eyeglasses, Fan, exhaust or blower, Fanning mill, Fence, L. M. & A. E. Austin, Fence, J. Heacock, Fence, portable, Fifth wheel, vehicle, Firearm, breech-loading, Firearm, magazine, Fire escape ladder, Fishing line, sinker for heavy, Fog signal, Folding table, Friction coupling device, Fruit basket, Fruit crate, Fruit evaporator, Gate, B. C. Cressey, Gate, E. A. Peasley, Gem setting, Governor stop motion, Grain drier, Graining zincographic and like plates, device for, Grating or perforated plate of metal and other materials and constructions made therefrom, Illuminating, Harness, Harrow, Harrow, Harvester, Harvester, Heel burnishing tool, Hides, compound for liming, Hinge for school desks, stop, Horse detacher, Hotel register, Ice and cold, artificial production of, Ice box, Ice box, Infusions or extracts, apparatus for making, Knitting machine, circular, Lamp, electric, Lamp, hanging, Lantern holder, Life raft, Liquids, apparatus for storing and drawing, Lock case, Locomotive draught device, Lounge, folding or bed, Lubricator for steam valves of locomotives, Manures, making artificial, Middlings purifier, Mirror, toilet, Molasses evaporator, filter, cooler, and furnace, Moulding machine, Motion, machine for converting reciprocating into rotary, Mower, lawn, Musical instruments, key board attachment for, Packing, machine for making asbestos, Paddlewheel, feathering, Paint guard for window panes, Paper pulp, machine for preparing wood for, Piano sounding board, Picture frame, Picture hook, Picture stand, Plane, edge, Plow, Melancon & Ayraud, Sr., Plow, cultivating, Plow, steam, Portmanteau and camp stool, comb'd, Preserving and storing building, fruit, Pressure regulator, steam, Printing presses, device for securing forms on the beds of, Pulp and fiber, machine for reducing wood to, Pump, J. S. M. Wilcox, Pump, M. L. Wood, Pump attachment, S. J. Adams, Pump, rotary, J. W. Sutton, Railing and fence, iron, Ram, double-ended, Refrigerator car, Refrigerator, J. C. Bowen, Refrigerator, J. G. Gerrish, Rice drill, Road engine, Rotary steam engine, Rubber cloth, etc., composition for treating, P. Kropp, Rubber, desulphurizing and devulcanizing waste vulcanized India, Saddle, rig, Saw tooth, Screens, machine for shaking, Screw driver, S. B. Peakman, Screw driver, reversible, Sewer bottoms, invert block for, Sewering and draining cities, Sewing machine, Sewing machine treadle attachment, Shade roller, Sheet metal, straightening, Shirt, C. A. Brown, Shirt, C. A. Gilbert, Shoe nail, Shoulder brace, Skate attachment, Skimmer, Kemp & Poy, Sleeve nut and the method of making sleeve nuts, G. H. Sellers, Stamp, hand, Steam supplying apparatus, Stove, E. Blackman, Stove, oil, J. M. Whitmore, Stove, petroleum cooking, Straw stacker, extension, Striking drill for mining purposes, Butler & Bullock, Stump puller, Swinging gate, Tea kettle top, Telephone line apparatus, Thill coupling, Thill lug, Tool, compound, Toy, E. R. Parsil, Traction engine, Transfers, freight and other, Traveling bags, boxes, etc., corner piece for, Truck, hand, Type case, Valve, stop, Vehicle wheel, Vent plug, Vignetting apparatus, automatic, Vinegar making apparatus, Wagon coupling, Wagon standard, Waste pipe valve, Watch stem winding, Water elevator, Waterproof wearing apparel, Whip socket, Wick raiser, lamp, Wick ratchet stop for lamp burners, Winding yarn or thread, machinery for, Windmill, Window and door button, Window screen, Wood bending machine, J. A. Toppliff.

Table listing inventions with patent numbers. Includes items like Middlings purifier, Mirror, toilet, Molasses evaporator, filter, cooler, and furnace, Moulding machine, Motion, machine for converting reciprocating into rotary, Mower, lawn, Musical instruments, key board attachment for, Packing, machine for making asbestos, Paddlewheel, feathering, Paint guard for window panes, Paper pulp, machine for preparing wood for, Piano sounding board, Picture frame, Picture hook, Picture stand, Plane, edge, Plow, Melancon & Ayraud, Sr., Plow, cultivating, Plow, steam, Portmanteau and camp stool, comb'd, Preserving and storing building, fruit, Pressure regulator, steam, Printing presses, device for securing forms on the beds of, Pulp and fiber, machine for reducing wood to, Pump, J. S. M. Wilcox, Pump, M. L. Wood, Pump attachment, S. J. Adams, Pump, rotary, J. W. Sutton, Railing and fence, iron, Ram, double-ended, Refrigerator car, Refrigerator, J. C. Bowen, Refrigerator, J. G. Gerrish, Rice drill, Road engine, Rotary steam engine, Rubber cloth, etc., composition for treating, P. Kropp, Rubber, desulphurizing and devulcanizing waste vulcanized India, Saddle, rig, Saw tooth, Screens, machine for shaking, Screw driver, S. B. Peakman, Screw driver, reversible, Sewer bottoms, invert block for, Sewering and draining cities, Sewing machine, Sewing machine treadle attachment, Shade roller, Sheet metal, straightening, Shirt, C. A. Brown, Shirt, C. A. Gilbert, Shoe nail, Shoulder brace, Skate attachment, Skimmer, Kemp & Poy, Sleeve nut and the method of making sleeve nuts, G. H. Sellers, Stamp, hand, Steam supplying apparatus, Stove, E. Blackman, Stove, oil, J. M. Whitmore, Stove, petroleum cooking, Straw stacker, extension, Striking drill for mining purposes, Butler & Bullock, Stump puller, Swinging gate, Tea kettle top, Telephone line apparatus, Thill coupling, Thill lug, Tool, compound, Toy, E. R. Parsil, Traction engine, Transfers, freight and other, Traveling bags, boxes, etc., corner piece for, Truck, hand, Type case, Valve, stop, Vehicle wheel, Vent plug, Vignetting apparatus, automatic, Vinegar making apparatus, Wagon coupling, Wagon standard, Waste pipe valve, Watch stem winding, Water elevator, Waterproof wearing apparel, Whip socket, Wick raiser, lamp, Wick ratchet stop for lamp burners, Winding yarn or thread, machinery for, Windmill, Window and door button, Window screen, Wood bending machine, J. A. Toppliff.

DESIGNS.

Table listing designs with numbers. Includes items like Bottle, C. Roberts, Carpet, T. J. Stearns, Chain link, ornamental, V. Draper, Chair seat, I. N. Dann, Coffin handle, W. R. McComas, Gimp, W. V. Oothout, Key, J. H. Barnes, Lacing hook, S. N. Smith, Lamp, C. F. A. Hinrichs, Spoon and fork handle, H. W. Hirschfeld, Spoon and fork handle, G. Wilkinson, Type, font of printing, J. M. Conner, Type, font of printing, H. Ihlenberg, Type, font of printing, W. W. Jackson, Type, font of printing, A. Little, Type, font of printing, J. K. Rogers.

TRADE MARKS.

Table listing trade marks with numbers. Includes items like Cheese, W. A. Lawrence, Dentifrice, L. T. Sheffield, Dress goods, cashmeres and other, Iselin, Neeser & Co., Paper collars, cloth-faced, H. A. Mann, Jr., Remedy against yellow fever, L. Dominique.