

purpose. A. Common gas pipe not suitable; you should use sap-welded tubes. 2. At what speed of said engine can I attain the greatest power? A. With the same pressure, the higher the speed the greater the power.

(20) W. S. K. asks: With a given cylinder, say 12 inches diameter, why will one engine cut off at 1/4 stroke and another at 1/2 or 3/4 stroke; that is, what different conditions must exist? Will not the one which cuts off at 1/4 stroke use less steam and thus result in a saving of fuel? Understand that both engines are same horse power. A. The one with the short cut off will be most economical, but will not give out so much power as the other with a given pressure of steam.

(21) J. H. C. W. writes: About two months since I moved into a new house, and although, of course, we are constantly using hot water, the water is sometimes very thick and muddy with iron rust, is always darkly tinted; it is worse when the range fire has been fiercer than usual, ironing days, etc. Can you tell me any way of stopping the trouble? A. We know of no better method than heating up the water in the tank and then running it off as rapidly as possible, repeating the operation till the pipes and water back are cleaned out.

(22) C. L. J. asks for a receipt for coloring white soap a light yellow. I am making an excellent soap, but find it difficult to sell it because it is not yellow. I have added rosin, but that makes it too dark. A. Color with solutions of annatto and turmeric.

(23) P. J. B. asks how to tin light wire work, and wants a metal that will run freely and smoothly and not leave any drops, as there is no opportunity to brush or rub off any superfluous metal. I have used all ordinary alloys used in tinning, to wit: pure tin, tin and lead; tin lead and bismuth; tin, lead, antimony, and bismuth; and have cleaned my work (before dipping) in dilute sulphuric acid, then thoroughly rinsed in pure cold water, then dipped in muriate of zinc, then into my bath of metal, which is covered with tallow to the depth of one-eighth of an inch. I have frequently found wires with a scale that I cannot remove with the sulphuric acid. In dipping a piece of straight work, the wires being about ten inches long, if I draw it out lengthwise of the wire the metal will remain on too thickly, and if I attempt to shake it, it will cool and set in ridges. Do you know of any method for doing away with these difficulties? A. Pure tin, or tin with a little bismuth, will answer about as well as anything. Try dipping the tinned article in very hot grease until the coating is equalized. In such work the wire is usually tinned in the coil and finished in the grease pot or by passing through a loose draw-plate on cooling. If the wire is much oxidized use a stronger pickle, or give a longer exposure in a dilute hot pickle. If oily, dip in hot potash solution and rinse in plenty of water first.

(24) J. T. W. writes: 1. I propose laying a two inch wrought iron pipe, 5,000 feet in bed of a stream which falls in that distance 20 feet. How much water would said pipe deliver by natural flow? A. 16 cubic feet per minute. 2. How high would it rise vertically from lower end? A. As a jet, not over about 12 feet, but in a steady pipe the height of the head. 3. With a stream pump attached how much could be drawn through it? A. 266 cubic feet per minute.

(25) A. W. D. writes: We have a backlash in the bevelgearing on crank shaft and upright shaft in a flouring mill. Some say that it is caused by the governors on engine, and some say it is caused by mill machinery; and to test the governors I weighted down the stem so as to use boiler pressure, and regulated speed by the throttle valve, and it backlashed just the same as it did when running with the governors. Increase of speed increases the trouble alike in both cases. Was that a sufficient test for governors? We have an irregular feed on one of the burrs. Do you think that would cause a backlash? A. Your fly wheel is too small. Increase its diameter at least two feet.

(26) A. S. F. asks: 1. Can you tell me how many pounds (troy) of metallic sodium and water are required to produce ten cubic feet of hydrogen gas (at 60° Fah.)? A. 1 lb 6 oz. sodium and 1 lb. 2 oz. water. 2. What are the relative weights of ten cubic feet of hydrogen and a like volume of atmospheric air (at 60° Fah.). A. Ten cubic feet of hydrogen weigh about 0.77 oz.; the same volume of air under like conditions about 11.16 oz. 3. What measure and weight of oxygen gas will this quantity of hydrogen require to form water? A. 5 cubic feet, equivalent to about 6.16 oz. 4. How much oxygen does atmospheric air contain on an average? A. About 20 per cent. 5. How much oxygen can be obtained from chlorate of potash. A. 16 oz. will yield about 5 cubic feet of the gas.

NEW BOOKS AND PUBLICATIONS.

ILLUSTRATED CATALOGUE OF THE PLUMBING AND SANITARY DEPARTMENT OF THE J. L. MOTT IRON WORKS. 1881.

Contains upwards of six hundred engraved illustrations of as many styles of plumbing and sanitary appliances, lamp pillars, and stable fixtures. The high character of the products of this establishment, both with regard to artistic design and the quality of the iron and enamel, is known everywhere. The scientific construction of the various sanitary devices here illustrated will commend them to prudent house owners and architects. The stable fittings in cast and wrought iron show some remarkably artistic designs.

BRIGHT FEATHERS. By Frank R. Rathbun. Auburn, N. Y.: the Author. Part I. Quarto, paper, pp. 24. \$1.

Mr. Rathbun has chosen the purple finch for the initial number of this series of ten or more illustrations of the most attractive of the birds of our northeastern States. Each number will carry a plate figuring the male and female of the species described. The figures are carefully drawn from nature and colored by hand.

MODERN ARCHITECTURAL DESIGNS AND DETAILS. New York: Bicknell & Co. stock. Parts IV. and VI. \$1.

Part IV. comprises plates 25 to 32; store fronts and details; plans and elevations of a country house by Cabot & Chandler, Boston, with many details of porches,

windows, gables, etc.; cornices and belt courses. Part VI, plates 45 to 48, contains perspective views, plans, and elevations of two country houses, with many exterior and interior details. Part V. was noticed some weeks since.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending March 22, 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 names and page numbers, including Alumina, manufacture of sulphate of, J. H. East-wick; Annunciator, electrical, C. Heisler; Armorer plate, J. D. Ellis; Axle box, car, S. A. Bemis; Axle box, car, C. A. Haskins; Axle skein, W. P. Brown; Bale tie, W. M. Freeman; Baling clamp, A. Kiger; Baling press, W. P. Groom; Barrel bodies, windlass for setting up, E. & B. Holmes; Bean cutter, A. Flohr; Bean pod stringer, J. L. Scharf; Bed bottom frame, Thompson & Wells; Beehive, J. E. Frazer; Belt fastener, I. M. Dunckleberg; Belt tightener, H. D. Hicks; Belting, mechanism for the transmission of power by metallic, J. Reese; Berth, self-leveling, W. T. Milligan; Berth, self-leveling, Millikan & Mainland; Billiard and pool table ball pocket, G. H. Stone; Bobbin winder, C. Raymond; Bodkin and tweezers, combined, W. R. Whitmore; Bolsters, inserting tubes in, A. Berney; Bolster plates, manufacture of, J. C. Herman; Bolster spring, J. F. Bohler; Book holder, L. W. Noyes; Boot and shoe, H. White; Boot and shoe crimping machine, J. W. D. Fifield; Boot and shoe heel, C. Neil; Boot and shoe shank laster, W. R. Barton; Bottle and stopper, H. Barrett; Bottle stopper, J. D. McDade; Box, H. A. Schadowsky; Box fastener, G. G. Neidomanski; Bracelet, E. P. Beach; Brick and tile moulding machine, hollow, W. L. Drake; Brick kiln, McCue & Davis; Broom handle tip, E. Wagner; Burr or grinding ring, metallic, E. Totman; Butter, lard, etc., package for, C. Claussen; Button hole cutter, Snyder & Ivins; Callipers, spring, F. J. Thomas; Can and sifter, combined, S. Whitnum; Can sealer, J. L. Camp; Canning and sealing machine, vacuum, E. R. Powell; Candle shade holder, A. W. Crockett; Cap, S. Corn; Cap, I. Neuman; Cap, band, W. Finster; Capstan, D. N. B. Coffin; Car brake and starter, T. B. Webster; Car coupling, J. Deline; Car coupling, M. Downey; Car door, freight, Hewitt & Susseml; Car draw bar, railway, A. B. Putman; Car heater, street, G. B. Kerper; Car ventilator, C. F. Norris; Car wheel, G. S. Shefield; Car wheels, constructing, C. Kingsland; Carbon filaments, forming enlarged ends on, T. A. Edison; Card for playing games, W. Stranders; Carriage top prop, R. Brayton; Carriage loading implement, D. Brown, Jr.; Chair brace, F. Heavener; Chandelier, J. J. Nichols; Check roller, rotary, W. E. Lowrie; Cheese, machinery for manufacturing, A. H. Brintnell; Cheese safe, I. S. Formcrook; Chuck, A. F. Hyde; Churn power, T. W. Hogsett; Cider mill press, J. King; Cigar mould, C. Du Brul; Circle iron support, F. Mutimer; Coast defense, T. R. Timby; Cock for gaseous and liquid fluids, C. R. Bergreen; Cockle machine, W. Richardson; Coffee roasting apparatus, P. Pearson; Corn, device for cribbing and conveying, H. Keiser; Cornet, E. Dupont; Corset, M. K. Bortree; Corset, woven, M. W. Henius; Cot'on gin, J. A. Scarborough; Cotton gin rib, S. Z. Hall; Crane, D. H. Williams; Crate, W. S. Braman; Cultivator and cotton chopper, combined, S. M. Love; Cultivator coupling, J. B. Paradis; Cultivator, rotary, J. W. Bodley; Cutlery pocket, N. B. Slayton; Doors and shutters, spring catch for, W. M. Chance; Drying moist or varnished sheets, machine for, J. E. Hinds; Egg and cake beater, J. W. Condon; Electric call and signal, L. S. White; Electric lightning system, T. A. Edison; Electric machine, dynamo, L. G. Woolley; Eyelet setting machine, A. B. Edmonds; Fan, fly, L. Woodrum; Fence, portable and sectional, S. L. Bailey; Fence, wire, T. Wright;

Table listing inventions with names and page numbers, including Fence wire, securing, Braby & Searles; Fencing wire, J. Westgarth; Fifth wheel coupling for vehicles, D. D. Gitt; Fifth wheel, vehicle, Magner & Thomas; Filter, water, Kolthoff & Perkuhn; Fire alarm and gas lighting apparatus, combined, G. D. Bancroft; Firearms, extractor for revolving, B. R. Franks; Fire extinguisher, automatic, J. W. Bishop; Fishing float, B. W. Ross; Flue cleaner, boiler, T. R. Wingrove; Forging apparatus, metal, W. B. Hayden; Fruit drier, J. Williams; Furnace, A. Berney; Furnaces, apparatus for charging blast, L. Bert; Gas by electricity, apparatus for lighting, S. Gardner, Jr.; Gas meter, T. Tansley, Jr.; Gate, A. F. Wright; Glass engraving machine, J. E. Miller; Glassware, machine for grinding, E. Hutter; Glazier's points, tool for driving, H. D. Musselman; Governor, steam engine, E. Huber; Grader, road, J. F. McGarry; Grain binder, S. Johnston; Grain binder, A. Stark; Grain separator, J. H. Creter; Grain separator, Roberts & Schafer; Grate bar, A. Berney; Guns, lock for breech-loading shot, J. Reeves; Hame fastener, H. Beagle; Handle and case, A. Roeber; Harness hook, safety, M. R. Thurber; Harrow, spring tooth, T. Gray; Harvesting, cotton, W. J. Powell; Harvesting machine, W. T. Wilde; Hat sweat linings, machine for flanging, K. Elckemeyer; Hay gathering and loading machine, E. Spencer; Hay tedder, H. Hitchcock; Heating apparatus for sanitary purposes, W. R. Macdonald; Heel shave, W. R. Barton; Heliotrope, F. C. Grugan; Hinge, coach, F. W. Tiesing; Hoist, J. Fensom; Horse detaching device, L. B. Furdal; Horse power, McCarty & Lindsay; Hot air register, W. Highton; Hub, vehicle, F. Culham; Hub, vehicle wheel, J. Nagele; Ice cream freezer, A. C. Albrecht; Ice cutting machine, J. Gregory; Incrustation preventive, W. J. Gillespie; Index cutting machine, J. Dodder; Inhaler, A. Rousseaux; Insulated electrical conductor, H. Spltdorf; Jar or bottle stopper, R. Gordon; Journal box, A. Worden; Knitting machine, circular, W. J. Ford; Knitting machine, circular, W. D. Huse; Lamp, W. B. Robins; Lamp, electric, T. A. Edison; Lamp, electric, C. Heisler; Lamp, house, J. Bassemir; Lamp, incandescing electric, T. A. Edison; Lamp lighter, W. H. D. Newth; Lamps, treating carbons for electric, T. A. Edison; Lantern, C. H. Fry, Jr.; Lap mat, A. Rescinski; Lifting motor, S. T. Wellman; Link welding machine, H. C. Szirk; Log turner, R. E. Gleason; Loom web stop motion, G. Crompton; Mattress frames, corner iron for woven wire, Sherman & Bondell; Meat cutter, Streicher & Hoehl; Middlings purifier, J. M. Case; Middlings purifier, R. Kersey; Milk can, G. B. Ransom; Mouldings with cloth, machine for covering, J. D. Ripson; Monument, iron corner, T. Wagner; Muff, J. C. Brush; Music leaf turner, O. M. Robinson; Musical instrument, mechanical, O. H. Arno; Nut lock, J. W. Tombow; Oil can, F. H. Furniss; Oil reservoir, fireproof automatic, J. A. Shepard; Ore concentrator, J. J. Embrey; Ore treating apparatus, A. Ryder; Ore washing apparatus, J. H. Totman; Oven, hot blast, H. L. Brooke; Packing boxes, apparatus for, R. Neill; Packing, steam, H. W. Winans; Pantaloon, R. Gibbons; Pants protector, G. W. Watson; Paper machine, deckel for, J. M. Shew; Paper machines, manufacture of screen plates for, J. M. Shew; Paper pulp, process of and apparatus for reducing wood to, H. A. Frambach; Paper pulp, treating wood for conversion into, H. A. Frambach; Pen, fountain, J. Friedmann; Pen fountain attachment, J. W. Green; Pen holder, R. Wilson; Pen, stylographic fountain, Sutherland & Brown; Petroleum, plastics from, J. I. Livingston; Photographic plates, table for holding, D. M. Little; Piano action, L. Plass; Pier, iron, B. T. Hitchcock; Plating machine, F. R. Smith; Planing machines, feed mechanism for wood, A. W. Goodell; Planter, combined cotton seed and corn, Evans & Moore; Planter, corn, Campbell & Chambers; Planter, cotton, C. P. Kenyon; Plow, sulky, F. A. Hill; Plows, slip nose attachment for, Anderson & Oliver; Pocketbook, G. Lustig; Pocket for wearing apparel, R. Gibbons; Post socket, L. C. Baker; Pressure regulator for air compressing engines, G. H. Reynolds; Printing press, W. C. Evans; Propeller, screw, J. P. Holland; Railway rails, machine for sawing, T. Critchlow; Railway signals, circuit closer for electric, C. J. Means; Railway train arrester, automatic, J. Wood; Reamer, D. K. Overhiser; Roofing tile, Lane & Woodworth; Rubber goods, manufacture of, I. F. Williams; Rubber, etc., manufacture of vulcanized India, D. Gausen; Safe, M. Mosler; Salt manufacture and apparatus therefor, process of, J. H. W. Biggs;

Table listing inventions with names and page numbers, including Sash weight, W. C. Joslin; Saw, crosscut, J. E. Emerson; Saw filing machine, gin, J. Hosey; Saw swage, G. F. Simonds; Saw tooth, E. J. Hill; Scoop, W. B. Romig; Sewing machine, E. Marshall; Sewing machine, J. H. Osborne; Sewing machine tuck marker, M. G. Price; Sewing machines, tension and thread controlling device for, J. W. Corey; Ship railway car and dry dock, J. B. Eads; Shoe, A. Nichols; Sickle holder, C. Lehman; Skate, W. A. Sutton; Snapping, T. K. Work; Snow shovel, H. E. Vosburgh; Spark arrester, A. Berney; Spark arrester and consumer, A. Berney; Spoon and fork, N. S. Boardman; Starch from grain, obtaining, T. A. & W. T. Jebb; Steam boilers, sediment collector for, B. Kane; Steam generator furnace, G. B. Brock; Steam muffler, A. Berney; Steel, composition for tempering, W. Fogleson; Stirrup, W. W. Brower; Stove, G. S. Blaney; Stove water back, A. & J. W. Geddes; Strainer, handled, W. J. Johnson; Sugar cane juice, etc., centrifugal extractor for, H. Burgess; Sulky, J. H. Blackmore; Swinging gate, G. D. Zimmerman; Swinging gate, vertically, Finler & Hollinger; Switch board, T. D. Lockwood; Tablet, writing, J. B. Burwell; Telegraph relay, T. A. Edison; Telegraphic key or transmitter, W. E. Tinney; Telephone exchange, G. L. Anders; Telephone exchange system, Anders & Lockwood; Telephone systems, signaling apparatus for district, G. L. Anders; Telephones, coil for, R. M. & W. V. Lockwood; Therapeutic bath, McFarland & Martin; Thill coupling, W. E. Kinnear; Threshing machine feeder, J. S. Bayley; Threshing machines, spreading and distributing device for, B. Jackson; Tile mill attachment, R. W. Stewart; Tilt alarm, W. L. Cheney; Tool handle, W. R. Barton; Toy, C. L. Travis; Valve, balanced side, T. Poore; Valve gear of steam engines differential, H. Davey; Vapor burner, C. S. Phillips; Vapor burner, F. H. Shepherd; Vehicle dash, J. Smith; Vehicle spring, S. A. Bailey; Vehicle torsion spring, T. J. Magner; Vehicle torsion spring, Magner & Thomas; Washers, disks, etc., of vulcanized rubber, manufacture of, J. O'Meara; Washing machine, C. A. Bentzen; Waste picker, F. G. Sargent; Watch regulator, C. M. Howard; Watchman's electric register, W. A. Wilson; Water closet, A. Edwards; Water pipe casing, W. Weisbarth; Weather strip, W. B. Jones; Whistle, steam, Miller & Smith; Wire stretcher, J. F. Landers; Wire twisting machine, I. A. & E. E. Kilmer; Wood, preserving, Dixon & Card;

DESIGNS.

Table listing designs with names and page numbers, including Carpet, C. Chambellan; Carpet, W. J. Gadsby; Carpet, C. Magee; Carpet, W. McCallum; Saddle, R. E. Whitman; Type, font of printing, A. Little.

English Patents Issued to Americans.

From March 18 to March 22, 1881, inclusive.

Table listing English patents issued to Americans with names and page numbers, including Bale tie, C. B. Morse; Bicycles, C. H. Veeder; Cop spindles, G. W. Stafford; Desiccating eggs, L. J. Cadwell; Dynamo-electric machine, T. A. Edison; Feed water regulator, C. H. Kuhne; Ingots, casting, E. Wheeler; Lamps, W. B. Robins; Pig iron, machine for breaking, T. A. Blake; Refrigerators, J. H. Forshay; Sewing machine, button hole, D. Mills; Sewing machine, J. Bond Jr.; Shovel handles, W. H. Johnson; Steam boiler, O. D. Orvis; Telegraphy, O. Lago.

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