

Business and Personal.

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Automatic Cut-off Engines, and the best, cheapest, and most economical, Balanced Slide Valve, Throttling Engine in the Market.

Portable and Stationary Engines; Boilers of all kinds; 45 Cortlandt St., N. Y. Erie City Iron Works, Erie, Pa.

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Machinists' Tools. New and Second hand. Geo. Gage, Waterford, N. Y.

For Town and Village use, comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N. H.

Patentees, etc.—Correspondence is solicited from parties desiring goods manufactured from Iron or Steel, by a firm having unusually good manufacturing facilities, and who are willing to make and introduce any good articles suitable for the Hardware Trade, upon royalty or otherwise. Address, in first instance, Chas. P. Thore, 105 Fulton St., New York.

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Patent Agency.—J. R. Howell, Atlanta, Ga., will exhibit Models and represent Inventors.

F. Lunkenheimer's Brass Goods for Engine Builders, Automatic Oil Feeders, Glass Oil Cups, Cody Shaft Oilers, etc. Address Cincinnati Brass Works.

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Best Steam Pipe & Boiler Covering. P. Carey, Dayton, O. Polishing Tools and Supplies. Send for new price list. Greene, Tweed & Co., 18 Park Place, N. Y.

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For Brush Makers' Machinery, address Geo. Gage, Waterford, N. Y.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J.

Cheap but Good. The "Roberts Engine," see cut in this paper, June 1st, 1878. Also horizontal and vertical engines, and boilers. E. E. Roberts, 107 Liberty St., N. Y.

Foot Lathes, Fret Saws, &c., 90 pp. E. Brown, Lowell, Ms. Warranted best and cheapest Planers, Jointers, Universal Woodworkers, Band and Scroll Saws, etc., manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

For Shafting, Pulleys, Hangers, etc., send for price list and discount to Hilles & Jones, Wilmington, Del.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburgh Steel Casting Company, Pittsburgh, Pa.

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

Valuable Invention to users of Steam Boilers. See advt., page 318, last issue. Address U. S. Automatic Stoker Co., No. 2 Chestnut St., Philadelphia, Pa.

Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1878.

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

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

The great Wheelock Engine, which furnishes the power to the machinery of the American Exhibit at the Paris Exposition this year, is lubricated by Patent Lubricene and Cups. Our exhibit will equal that which we made in Philadelphia in 1876. R. J. Chard, 134 M. Lane, N. Y. city.

Friction Clutches for heavy work. Can be run at high speeds, and start gradual. Safety Elevators and Hoisting Machinery a specialty. D. Frisbie & Co., New Haven, Ct.

The only genuine Geiser Self-regulating Grain Separator. Address the Geiser Manuf. Co., Waynesboro' Franklin Co., Pa.

Wreches.—The Lipsey "Reliable" is strongest and best. Six inch sample by mail 60 cents. Roper Caloric Engine Manufacturing Co., 91 Washington St., N. Y.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth.

Send for large illustrated catalogue. For the best Bone Mill and Mineral Crushing Machines—five sizes, great variety of work—address Baugh & Sons, Philadelphia, Pa.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y. Machine Cut Brass Gear Wheels for Models, etc. (New List.) D. Gilbert & Son., 212 Chester St., Phila., Pa.

Boilers & Engines cheap. Lovegrove & Co., Phila., Pa. Address Star Tool Co., Providence, R. I., for Screw Cutting Engine Lathes of 13, 15, 18, and 21 in. swing.

Skinner Portable Engine, Improved, 2 1/2 to 10 H. P. Skinner & Wood, Erie, Pa.

Notes & Queries

(1) E. A. C. asks: Which side of a belt should run next to the pulley, the finished or flesh side? A. In practice the finished side is found to give the least slip.

(2) G. M. K. & Co. ask: 1. How much water will 1 lb. of anthracite coal convert into steam at 70 lbs. pressure, in an ordinary boiler? A. 8 or 9 lbs. 2. How much steam will 7,000 feet of 1 inch pipe, in lengths of 60 feet, connected with 4 inch supply pipes, condense in an atmosphere of 125°? A. While an exact determination of this can only be made by experiment, you can calculate it approximately on the assumption that each square foot of the pipe will radiate 2.9 units of heat per hour for each degree in difference between internal and external temperature.

(3) W. J. C. asks: How many drops of water are there in a pint. A. At 60° Fah., about 7,680.

What is the volatile liquid generally used in making ice, and is it injurious to solder, tin plate, copper, zinc, and vegetable tissues? A. Machines employing anhydrous sulphurous oxide, ammonia, or the light hydrocarbon oils or ethers, have, we believe, met with the greatest success. None of these liquids have action upon the metals mentioned when properly managed. On vegetable tissues, gums, etc., the former have the least action.

What is the thickness of a soap bubble, say of 4 inches in diameter? A. The film is not of constant thickness; it varies between 0.0001 and 0.000017 of an inch.

(4) J. L. F. asks: What will render timber fireproof? A. Saturate it as far as may be with strong hot aqueous solutions of sodium tungstate (crude), silicate (water glass), or sulphate; ammonium sulphate has also been used. Wood thus prepared is not ignited by sparks or transient contact of flame. Unaltered woody fiber cannot, however, be rendered, by these or other simple means, incombustible.

(5) M. V. O. asks: How are the steel faces fastened on cast iron anvils and malleable iron scissors? A. The faces are put in the mould, and the melted cast iron is allowed to run through the mould until the steel faces are welding hot. Then the flow of metal through the mould is stopped and the casting poured, welding the steel to the iron.

COMMUNICATIONS RECEIVED.

- The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects: Hydrophobia Cure. By A. J. B. Bursting of Fire Hose. By A. H. Paper Barrels. By J. N., Jr. Torpedo Balloons. By J. C. M. Virginia Gold Mines. By J. E. E. Preve tion of Explosions in Flour Mills. By J. R. V. A New Percussion Shell. By F. W. P. Lucky and Unlucky Days. By E. G. B. The Star Wheel Feed. By T. J. B. Singular Locomotive Accident. By W. J. T. Boiler Explosions. By J. W. S. Cochituate Water. By W. B.

OFFICIAL.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending April 9, 1878, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, 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.

Table listing inventions with patent numbers and dates, including items like Advertising medium, Awning frame, Ax, T. K. Downing, Bale tie, W. S. Davis, Barrel pitching machine, H. Lehmann (r), Basin and urinal, J. Reid, Bath, J. Ketzschner, Bed bottom, H. S. Cate, Bed bottom, T. & J. N. Tracy, Bed, sofa, A. Hansen, Bedstead, invalid, A. J. Goodwin, Bedstead, wardrobe, A. Stark (r), Bee hive, C. R. Macy, Bit for horses, J. H. Robinson, Bolt, door, F. Davis, Books, preparing fly leaves for, E. Crawley, Boot and shoe, F. Goff, Boot and shoe, pat sole, D. R. Proctor, Boot, lady's, J. Dean, Bottle stopper, A. E. Barthel, Bottle stopper, N. Fritzer, Bottle stopper, W. G. Whitman, Bottle stopper fastener, A. E. Barthel, Bottle, measuring stopper, W. L. Keller, Brick kiln roof, T. F. Adams, Bridle rosette, N. Le Blond, Bung and bushing, P. K. O'Lally.

Table listing inventions with patent numbers and dates, including items like Butter mould, H. A. Rees, Cane, G. P. Clarke, Cans, attachment for oil, J. H. Stump, Cap and collar combined, M. Isidor, Car coupling, J. Chapman, Car coupling, E. A. Howland, Car coupling, F. P. Iannarone, Car coupling, E. R. Quimby, Cars, unloading, Merrill & Dowling, Card, sample, A. Zerhan, Carriage and chair, Tenney & Hobbs (r), Carriage door, A. Bink, Carriage window, J. Woods, Jr., Cartridge, signal, E. W. Very (r), Caster for trunks, M. Schwerin (r), Centrifugal machine, B. T. Babbitt, Centrifugal machine, G. F. Eisenhardt, Chair, convertible, H. C. Hayman, Chair, rocking, C. S. E. & J. G. Spoerl, Chuck, M. C. Holmes, Cigar lighter, I. N. Clawson, Clock, H. W. Ley, Clock case, H. J. Davies, Cloth measuring and rolling, C. Q. Smith, Cock, cylinder, G. F. Hammer, Coin, holding and counting, J. Ostergard, Collar, W. Wilson (r), Cooler, milk, W. H. White, Cotton gin feeder and cleaner, W. L. Crowson, Cotton lint room, fireproof, Z. N. Morrell, Cranberry gatherer, A. K. Gile, Crimping form, J. Ryan, Cultivator, F. C. Leffer, Cultivator, harrow, C. La Dow (r), Currycomb, J. E. Finley, Ditching machine, G. E. Stewart, Drain trap, J. H. Shedd, Dredger, T. B. Carr, Drill and fertilizer, M. V. Dadisman, Dry closet, P. McMackin, Egg carrier, J. T. Fogg, Egg carrier and tester, C. H. Wyman, Egg carrier, fastening, N. C. Amaden, Elevator Johnston & Marshall, Elevator, ice, J. Macomb, Elevator, W. B. Doty, Elevator valve gear, C. W. Baldwin, Engine, reciprocating steam, T. A. Henderson, E. gine, rotary, B. T. Babbitt, Engine, traction, G. Rogers (r), Envelope, E. Ridge, Felting machine, G. B. Field, Fence post, S. N. Lennon, Fifth wheel for vehicles, M. Powe, Firearm, C. W. Snelder, Fire escape, J. P. R. James, Fire escape, C. R. Mott, Flooring, laying, C. Mudge, Fruitpacking box, P. C. Burke, Fuel, compound, D. C. Breed, Furnace for pulverized ores, C. Stetefeldt (r), Furnace, quicksilver, R. F. Knox, Furnace, heating attachment, S. N. Carvalho, Game apparatus, G. L. Witsil, Gas manufacture, Macy & Reed, Gate, flood, D. Bowles, Glass face protector, C. A. Kirtland, Governor, J. A. Rigby, Grading machine, W. L. Freese, Grain drying apparatus, H. G. Seeber, Grain meter, J. C. Hunt, Gun tool and whistle, A. E. Barthel, Hams, putting up boneless, T. Culver, Harrow and weed cutter, J. W. Fees, Harvester, H. Kelly, Hat, W. A. Bate, Herder, B. D. Soper, Hinge, T. Fowler, Hoisting mechanism, S. E. Stokes, Jr., Horse collar, Staufenbell & Staehl, Horses from vehicles, detaching, W. A. Bryant, Hose nozzle, A. Weber, Hub, J. M. Whiting, Hub, C. T. Wecker, Hydrant, White & Kupperle, Ice machine, congealing plate, J. P. Jones, Indicator for ships, shoal, C. C. Miller, Jar, L. Clabaugh, Knife blade manufacture, S. M. Moore, Ladder, D. D. Hays, Lamp, G. H. Chinnock, Lamp, H. Craighead, Lamp shade, G. H. Chinnock, Lamp shade and base, G. H. Chinnock, Lavatory, A. J. Bell, Leaf turner, G. F. Spiess, Leather shaving and whitening, J. G. Buzzell, Lifti g jack, B. M. Sherman, Lock bolt and handle, W. S. Montgomery, Lock, car seat, A. K. Waddill, Locomotive head light, C. Byrne, Locomotive exhaust, G. S. Brainerd, Locomotive variable exhaust, G. S. Brainerd, Lubricator, W. A. Clark, Mallet handle, G. B. Goddard, Mattress, invalid, C. B. Price, Meat mixing machine, O. E. Walker, Medical compound, H. Bowie, Medical compound, T. P. Childs, Medical compound, G. P. Delisser, Middlings separator, C. H. Sinderson, Mill pick, A. W. Straub, Millstones, lubricating bearings for, J. W. Batty, Napkin holder, L. Thompson, Nutlock, R. Dunn, Nut lock, W. Walter, Ordnance, loading attachment, D. D. Johnson, Ore separator, D. C. Roberts, Pan, dust, G. Macardale, Paper bag holder, S. L. Chapman, Paper, machine for, R. D. Mossman, Paper machine, B. F. Barker, Papermachine, W. A. Doane, Pencil sharpener, E. D. Miller, Piano action, electro-magnetic, M. Delaney, Plaiting machine, J. E. Wilson, Planter attachment, corn, W. F. Senter, Planter, B. F. Adams, Planter, G. I. Butler, Plow, E. Barber, Plow, A. W. Tucker, Press follower, baling, E. M. Ivens, Press, hydraulic, J. G. Steen, Psychrometer, N. M. Lowe, Pulley, friction clutch, J. B. Warner, Pump, W. S. Laney, Pump valve, A. W. White, Radiator, steam, J. R. Reed, Rails, pile for re-rolling old, L. Jones, Rake, horse hay, W. B. Jackson, Rein holder, G. & H. Piper, Revenue register, S. J. Tucker, Saccharine liquids, defecating, F. L. Stewart.

Table listing inventions with patent numbers and dates, including items like Sand paper roll, Rathbun & Adams, Sandal, A. M. Woodhull, Sash fastener, O. R. Cooke, Sash fastener, L. S. Gibson, Sash fastener, M. L. Kingsley, Sash, window, G. W. Dickinson, Saw mill head block, J. Cain (r), Saw mill steam feed works, D. C. Prescott (r), Saw sharpening machine, J. Wagner, Screen, coal and potato, W. Van Houten, Seal fastening, S. Keeler, Sewerage valve, W. L. Belt, Sewer trap, Dunn & Birdsall, Sewing machine needle, W. C. Cross, Sewing machine attachment, H. J. Watkins, Sewing machine presser foot, W. F. Trowbridge, Sewing machine wax thread, H. J. Watkins, Shell, percussio, J. M. Urquhart, Shoe shank machine, J. Hyslop, Jr. (r), Shutter worker, P. C. Close, Sifter, ash, J. E. Cumings, Silk, regulator for reeling, E. W. Serrell, Jr., Skid, C. A. & J. A. Koehler, Skylight, M. T. Durkin, Spring, door, C. Ferchlandt, Square, adjustable centering, H. B. Little, Stench trap, T. G. Knight, Storehouse, J. E. Walsh, Stove, D. L. Stiles, Stove and furnace grate, W. B. Geddes, Stove, cooking, G. W. Walker, Stove door and window, D. L. Stiles, Stump extractor, C. Haines, Switch, brace and plate, J. T. Richardson, Table, S. W. Steves, Target, J. Gobbels, Target thrower, ball, P. Taltavul, Thrashing machine, H. B. Stevens, Tire upsetter, J. W. Bodge, Tobacco, manufacture of plug, D. W. De Forest, Tongs, pipe, H. Baacock, Tool handle, P. A. Gladwin, Top, spinning, C. Raetz, Toy, flying, C. Mettam, Tey money box, J. W. Hoard (r), Trace, wire rope harness, F. M. Collier, Tray machine, wooden, Brown & Kimball, Jr., Tuxey, J. F. Maguire, Type writing machine, Brady & Warner, Umbrella cases, eyeletting, W. Harnah, Umbrella holder, J. H. Bowers, Valve, air, E. A. Wood, Valve gear for engines, C. Brown, Valve motions, link for, S. Hamblin, Valve, stop, Worthen & Gillespie, Vehicle gear, J. J. Gallagher, Vehicle running gear, J. Bowman, Ventilator, car, C. A. Daniels, Wash bench and wringer, P. H. Cooney, Wash board, F. W. Parsons, Wash stand, H. S. Hale, Washing machine, Gladwell & White, Washing machine, J. R. Underwood, Washing machine, J. Will, Washing machine, D. J. H. Davies, Water meter, Stannard & Reynolds, Wave power mechanism, C. W. Lord, Weather strip, H. B. Alvord, Welding chain links, J. Haley, Wheel, T. Burnett, Wheel, T. H. King, Whiffletree attachment, R. W. Smalley, Window cleaner, W. C. Gayton, Wrench, C. W. Hilton.

TRADE MARKS.

Table listing trade marks with patent numbers and dates, including items like Adhesive materials, D. D. Comes, Baking powder, Smith, Hanway & Co., Chewing tobacco, J. W. & C. G. Holland, Cigars, cigarettes, etc., Kerbs & Spiess, Cigars, cigarettes, etc., J. Blakely, Cigars, cigarettes, etc., E. Hilsen, Essence of petroleum, Weeks & Potter, Flour, F. W. Brickey, Flour, G. V. Hecker & Co., Horseshoe nails, Anusable Horse Nail Company, Lead pencils, Eagle Pencil Company, Linctant, Clark & Co., Locks and keys, The Smith & Egge Mfg. Co., Medicines for catarrh, etc., Heintzelman & Coe, Pile ointment, Coussens & Tabler, Plug chewing tobacco, H. M. Cochran, Printing presses, J. W. Daughaday & Co., Spool cotton, C. T. Smith, Smoking, etc., tobacco, J. W. & C. G. Holland, Smoking tobacco, R. M. Chambers, Smoking tobacco, B. Leidersdorf & Co., Tonic, G. W. M. Reed, Tooth wash and powder, C. D. S. Fruh, Woolen or worsted yarns, J. C. Graham, Yeast, Richard & Wood.

DESIGNS.

Table listing designs with patent numbers and dates, including items like Breastpin, W. Britton, Font of printing types, G. Giesecke, Font of printing types, A. Little, Ornamental chain, D. A. Beam, Pistol handles, Harrington & Richardson, Wall pockets, F. E. Porter.

For the Week ending April 16, 1878.

Table listing inventions with patent numbers and dates for the week ending April 16, 1878, including items like Advertising apparatus, E. Bostock, Amalgamator, Bancroft & Walker (r), Amalgamator, W. S. Shotwell, Anchor, E. N. Twiss, Bale tie, J. Knipscheer, Bale tie hook machine, P. L. Van Derzee, Batting machine for folding, H. A. Stearns, Bedstead, invalid, M. Gillespie, Beehive, D. P. Miller, Bee hive, A. E. Wenzel, Billiard cushion, J. E. Boyle (r), Bit stock, W. A. Ives, Boiler, steam, L. Shook, Boilers, bolt for patching, F. A. Bidwell, Boilers, supplying feed water to, S. M. Fulton, Boot and shoe counter support, B. W. Campbell, Boot and shoe stiffeners, W. N. Sprague (r), Boot upper, Allen & Cook, Boot and shoe channeling tool, C. K. Sharood, Boot and shoe manufacture, L. E. De Waru (r), Bosom form, J. D. Banfield, Bottle stopper, W. D. Doremus, Bottle stopper, G. W. Gomer, Brake, car, A. Rosenfield, Brake lever, wagon, T. C. Lawrence, Brakes, coupling for air, G. H. Newton, Brick kiln, J. Haas, Brick kiln, S. W. Underhill, Brick machine, W. T. Duvall, Brick machine, E. R. & W. E. Gard, Bridge, truss, W. O. Douglas, Bridle safety attachment, T. E. Clark.