

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line.

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.

Vertical Scientific Grain Mills. A. W. Straub & Co., Phila.

Cornice Brakes. J. M. Robinson & Co., Cincinnati, O.

Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass.

Power and Foot Presses, Ferracute Co., Bridgeton, N. J.

Painters' Metal Graining Plates. J. J. Callow, Cleveland, O.

For Swivel Head Engine Lathes, address Geo. Gage, Waterford, N. Y.

Bolt Forging Machine & Power Hammers a specialty. Send for circulars. Forsaith & Co., Manchester, N. H.

J. F. Tallant, Burlington, Iowa, makes a specialty of saving fuel and increasing power of Steam Engines.

Pulverizing Mills for all hard substance and grinding purposes. Walker Bros. & Co., 23d and Wood St., Phila.

Daniels' Planers of all sizes, both new and 2d hand. Send for circular. Steptoe & Co., 214 W. 2d St., Cin., O.

Safety Linen Hose. Protects factories and stores. Saves insurance. Greene, Tweed & Co., 13 Park Place, N. Y.

For Sale.—Electro Plating Shop cheap; established 2 years; good business. H. B. Chamberlin, 78 1/2 4th St., Louisville, Ky.

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.

Zero Refrigerator, with cooler. Centennial award. Send for catalogue. A. M. Lesley, 372 Sixth Ave., N. Y.

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.

Wanted.—A Second-hand Foot Lathe and a Scroll Saw. Must be cheap and in good order. Address, with full particulars, W. F. Keeler, Mayport, Fla.

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.

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J. 1,000 2d hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

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.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon & Co., 470 Grand St., N. Y.

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.



(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.
Prevention 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 numbers and dates, including items like Advertising medium, Awning frame, Ax, T. K. Downing, etc.

Large table listing various inventions and their patent numbers, including items like Butter mould, Cane, G. P. Clarke, Cans, attachment for oil, J. H. Stump, etc.

TRADE MARKS.

Table listing trade marks and their associated numbers, including items like Adhesive materials, Baking powder, Smith, Hanway & Co., etc.

DESIGNS.

Table listing designs and their associated numbers, including items like Breastpin, W. Britton, Font of printing types, G. Giesecke, etc.

For the Week ending April 16, 1878.

Table listing inventions granted for the week ending April 16, 1878, including items like Advertising apparatus, E. Bostock, Amalgamator, Bancroft & Walker (r), etc.