

TO INVENTORS.

An experience of more than thirty years, and the preparation of not less 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. In addition to our facilities for preparing drawings and specifications quickly, the applicant can rest assured that his case will be filed in the Patent Office without delay. Every application, in which the fees have been paid, is sent complete—including the model—to the Patent Office the same day the papers are signed at our office or received by mail, so there is no delay in filing the case. A complaint we often hear from other sources. Another advantage to the inventor in securing his patent through the Scientific American Patent Agency, it insures a special notice of the invention in the SCIENTIFIC AMERICAN, which publication often opens negotiations for the sale of the patent or manufacture of the article. A synopsis of the patent laws in foreign countries may be found on another page, and persons contemplating the securing of patents abroad are invited to write to this office for prices, which have been reduced in accordance with the times, and our perfected facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Valves and Hydrants, warranted to give perfect satisfaction. Chapman Valve Manuf. Co., Boston, Mass.

Nickel Plating.—Wenzel's Patent Perforated Carbon Box Anode for holding Grain Nickel.

H. Prentiss & Company, 14 Dey St., N. Y., Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

Needle Pointed Iron, Brass, and Steel Wire for all purposes. W. Crabb, Newark, N. J.

Assays of Ores, Analyses of Minerals, Waters, Commercial Articles, etc. Technical formulae and processes. Fuller & Stillman, 40 & 42 Broadway, N. Y.

Nickel Platers and Manufacturers use Bunnell's New Nickel Solution, warranted to be no infringement upon any patent. Its low cost, easy, rapid action, white and beautiful deposit on iron, brass, copper, etc., commend it as the best working solution yet produced. Materials for solution, which is easily made, together with prices, etc., furnished upon application. J. H. Bunnell, Electrician, 112 Liberty St., New York.

Hydraulic Elevators for private houses, hotels, and public buildings. Burdon Iron Works, Brooklyn, N. Y.

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

Blake's Belt Studs; strongest, cheapest, and best fastening for Leather or Rubber Belts. Greene, Tweed & Co., New York.

Ophir Mine, Gold Hill, Nevada, Jan. 4, 1879: I have applied H. W. Johns Asbestos Double Air Chamber Covering to our pipes, and it gives perfect satisfaction. I consider it the very best covering introduced on the "Comstock," and I can apply it at less than half the cost of cements or any other material. Yours truly, M. C. Foot, Chief Engineer. Ophir Mining Co., Virginia, Nev., Jan. 6, 1879: Having used these goods, I fully concur in Mr. Foot's opinion. James Brown, Chief Engineer. The genuine Asbestos materials are manufactured only by the H. W. Johns Manufacturing Company, 87 Maiden Lane, N. Y. Beware of imitations.

38 in. Swing Lathe, 12 foot bed, triple geared, compound rest, cross feed, \$400. Will exchange for Horizontal Boring Mill. Stiles & Parker Press Company, Middletown, Conn.

Inventors of Small Articles suitable for Hardware Trade, seeking a market, please address Courtenay & Trull, No. 17 Dey St., New York.

Calvin Carr's Cornice Machines. Cleveland, O. Best and cheapest.

Eagle Anvils, 9 cents per pound. Fully warranted.

Wanted.—A good draughtsman, boiler maker, smith, and hammerman. Apply to Noble Bros. & Co., Rome, Ga.

Walrus Leather, Walrus Wheels; all kinds of Polishing Supplies, in quantities to suit. Greene, Tweed & Co., New York.

For Sale Cheap.—Second-hand 8 foot Boring and Turning Mill, Lathes, Planers, Drills, Bolt Cutters, etc. Circulars. D. Frisbie & Co., New Haven, Conn.

A Proprietary Medicine Business.—Its right, title, trade marks, etc.; five medicines established over 30 years; well known curatives; well authenticated; will be sold cheap. For particulars address Medico, care Druggists Circular, 36 Beekman St., New York.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

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

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Bl'k's, Mech's, Ma'fs. address Box 73, Willimantic, Ct.

For Sale.—Brown & Sharp Universal Milling Machine; Bement Profiling Machine; first-class 2d hand Machine Tools. E. P. Bullard, 14 Dey St., N. Y.

Send for circulars of Indestructible Boot and Shoe Soles to H. C. Goodrich, 40 Hoyle Ave., Chicago, Ill.

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

1,000 2d hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

Galland & Co.'s improved Hydraulic Elevators. Office 26 Broadway, N. Y., (Evening Post Building, room 22.)

Brush Electric Light.—20 lights from one machine. Latest & best light. Telegraph Supply Co., Cleveland, O.

J. C. Hoadley, Consulting Engineer and Mechanical and Scientific Expert, Lawrence, Mass.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are to be sold out very low by the George Place Machinery Agency, 121 Chambers St., New York.

Bevins & Co.'s Hydraulic Elevator. Great power, simplicity, safety, economy, durability. 94 Liberty St., N. Y.

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

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

Inventors' Models. John Ruthven, Cincinnati, O.

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J.

Pulverizing Mills for all hard substances and grinding purposes. Walker Bros. & Co., 234 & Wood St., Phila., Pa.

The Lambertville Iron Works, Lambertville, N. J., build superior Engines and Boilers at bottom prices.

Band Saws, \$100; Scroll Saws, \$75; Planers, \$150; Universal Wood Workers and Hand Planers, \$150, and upwards. Bentel, Margedant & Co., Hamilton, Ohio.

Diamond Engineer, J. Dickinson, 64 Nassau St., N. Y.

Machine Cut Brass Gear Wheels for Models, etc. (new list). Models, experimental work, and machine work generally. D. Gilbert & Son, 212 Chester St., Phila., Pa.

The best Friction Clutch Pulley and Friction Hoisting Machinery in the world. D. Frisbie & Co., N. Haven, Ct.

Texas Machinery Depot for any kind of machinery or special hardware. P. H. Gerhard, Austin, Texas.

The only Engine in the market attached to boiler having cold bearings. F. F. & A. B. Landis, Lancaster, Pa.

Improved Meat Cutter. Capacity 600 lbs. an hour. Circular and price list, J. W. McFarland & Co., Alliance, O.

Fine Taps and Dies for Jewelers, Dentists, and Machinists, in cases. Pratt & Whitney Co., Hartford, Conn.

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, Pittsburg, Pa.

Dead Pulleys that stop the running of loose pulleys and their belts, controlled from any point. Send for catalogue. Taper Sleeve Pulley Works, Erie, Pa.

Correct thing for Holidays, Whist and Dinner Parties, is the Vandy Fair Cigarettes, with your monogram.

Vertical & Yacht Engines. N. W. Twiss, New Haven, Ct.

Partner Wanted.—See advertisement on inside page.

Best results obtained from Success Turbine Water Wheel. References given. S. M. Smith, York, Pa.

Neophonography—The best and easiest short hand. Only the alphabet to be mastered. 50 cents. Harroun & Bierstadt, 58 Reade Street, New York.



(1) W. C. M., J. B. C., and E. F., who ask for books, should address the publishers who advertise in the SCIENTIFIC AMERICAN, for catalogues.

(2) H. R. R. has an engine of the following dimensions: 10 inches cylinder, 18 inches stroke, piston rod 2 inches, crank pin 2 inches, shaft 4 1/4 inches diameter, 6 feet long, fly wheel weighs 800 lbs., rim 14 inches wide x 3/4 thick; engine makes 130 revolutions per minute, and asks what sized fly wheel he may use instead of the present one. A wheel of three times the diameter and double the weight of the present one may be used.

(3) E. E. H. asks: 1. What kind of pump runs with the least power? A. Pumps made without packing generally give the highest efficiency. 2. Will two pumps of the same size pump enough water to fill a pipe of the size of one of the pump barrels? A. They can be made to do so.

(4) F. W.—For receipts for tempering mill picks, see p. 219 (27) vol. 39.

(5) P. A. D. asks: 1. Why is the outside rail on a curve on the railroad the highest? A. To counteract the centrifugal force of the train as it passes the curve. 2. Do the outside wheels of a railroad car slide any in going around a curve? A. Generally, the inside wheel slips.

(6) C. W. G. asks: Is it possible to obtain CO from K₂FeC₂N₆+6H₂SO₄ without adding the 6 parts H₂O? A. Yes, but the decomposition is not complete. The gas is usually prepared from the crystallized salt (K₂FeC₂N₆+3H₂O) with eight or ten times its weight of strong oil of vitriol. If the acid is diluted with water, hydrocyanic acid is given off with or instead of carbonous oxide, thus: 2K₂FeC₂N₆+6H₂SO₄+xH₂O=FeK₂FeC₂N₆+6HKSO₄+6HCN+xH₂O.

(7) R. H. E. writes: I have read that 33-1 cubic feet of steam expended per minute was equal to an actual horse power. Is this so? A. The power of an engine cannot be estimated by the capacity of its cylinder, nor by the number of cubic feet of steam used in a given time. These are only factors of the calculation.

(8) "Subscriber" writes: A friend of mine says that when a river is rising it will either rise till 12 o'clock at noon or 12 o'clock at midnight. I claim that this is not true, excepting when there is a tide which would change at that time. A. We agree with you.

(9) F. H. asks: What causes hammering in steam pipes, the steam pressure being about the same at all times and the pipes are constantly fed with live steam? A. It is probably due to defective circulation.

(10) X. asks: What is gained by forcing cold feed water into the steam room of a boiler instead of pumping it into the water space in the usual way? A. There is no gain of efficiency, and, generally, no gain of any kind, although, in some special cases, the circulation might possibly be promoted by this method of feeding.

(11) W. A. P. writes: I have in my house two gas lights in different rooms, both 18 inches from the ceiling, one has a globe and the other has not; the one without the globe blacks or spots the plastering, the one with the globe does not; why is it? A. The globe probably insures more perfect combustion by directing a uniform current of air over the flame.

(12) E. W. asks for directions for making a Leyden jar. A. Take an ordinary candy jar one or two quart, according to size required, coat it inside and outside for about three fourths the distance from the bottom toward the top with thin tin foil. The jar is coated with thick shellac varnish, and the foil is immediately pressed on. The jar should have a wooden cover, through the center of which passes a rod having at its lower end a chain that touches the tin foil at the bottom of the jar, and at its upper end a brass knob.

(13) R. D. McN. asks what will bring out the color on parchment. I have some deeds that got wet, and have faded. A. Moisten the ink with a strong aqueous solution of tannic acid.

(14) R. P. S. asks: How will I obtain a finish or polish on wood lathe work, to imitate gutta-percha? A. A small quantity of good Japan black will probably give satisfaction. The wood should be dry, and if possible, warm.

(15) L. B. R.—For solution of the wagon wheel problem, see p. 394 of last vol. of SCIENTIFIC AMERICAN.

(16) J. C. G. writes: I am building a steamer 30 feet long, 6 feet beam; my engines are a double 3 x 4. Have I power enough to propel such a boat 8 miles an hour? Do I get the same effective force in fresh water as I would in salt? A. The engines are of sufficient size. In fresh water, the immersed section is a little greater than in salt water.

(17) J. E. W. says: 1. Can an ice yacht, vessel, or any other object, sail faster than the wind? A. A first class ice boat running on smooth ice, managed by an experienced captain, will travel sixty miles an hour, the velocity of the wind that drives the boat being only fifteen miles an hour. For explanation, with engraving of boat see SCIENTIFIC AMERICAN SUPPLEMENT No. 61. 2. If so, is not the cause greater than the effect, or is not the created greater than the creator? A. These queries are a little mixed. 3. The above questions were discussed before the Wilmington, N. C., Library Association, and were left for your decision in your journal. A. Your association should take the SCIENTIFIC AMERICAN, in which hundreds of interesting practical questions are presented, with information promotive of intelligent discussion.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects: Human Knowledge. By G. V. On Telephones and Sounders. By J. E. N.

[OFFICIAL.]

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 3, 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 and their patent numbers, including items like Advertising apparatus, Animal trap, Axle box, Barrel, Battery car, Bed bottom, Belt fastener, Boilers, Book cover protector, Boot and shoe, Bottle stopper, Bottle stopper fastener, Bottle stopper fastener, Braid, Brake rod attachment, Brake, Brick mould, Bung for casks, Burring machine, Button, Camera, Can, Cane juice defecator, Capstan, Capsule filler, Car coupling, Car pipe coupling, Carriage dash, Carriage step, Carriage top joint, Cartridge, Caster, Casting, Chair back and bottom, Chair, Barber's, Chair, sewing, Chuck, C. Gage, Churn motor, Cigar perforator, Cloth folder, Clothes line reel, Cock, Cock stop, Coffee pot, Coffin head rest, Cotton chopper, Cultivator and seeder, Cutter head, Door hanger, Dredger and ditcher, Driers, Drill for stone working, Drill, seed, Electric light reflector, Engine, traction, Engine condenser, Fare box, Feather renovator, Feed water heater, Felting machine, Fence, W. Hyatt, Fence, iron, Filtering frame, Firearm lock, Firearms ornamentation, Fire escape, Fire kindler, Flour, buckwheat, Fly trap, Fork, horse hay, Fountain pen, Furnace, hot air, Garbage receptacle, Glass designs, Glass, ornamented window, Grafting implement, Grain binder, Grain binder, H. A. & W. M. Holmes, Grain binder, Grate bar, Grate bearing bar, Guano distributor, Gun barrel fore end stock, Gun, breech-loading, Harrow, Harrow and cultivator, Hat, Hat shaving machine, Hat and cap wove band, Headlight, Heating apartments, Hoisting apparatus, Hoop fastener, Hoop, trundling, Horseshoe calk, Hose band, Hose clamp, Hose rack, Hydrant, Incubator, Ironing and bosom board, Kerite, Leather finisher, Lighting apparatus, Load binder, Lock, alarm, Lock, indicator, Locomotive tender buffer, Lubricating, Mail bag, Mail bag, Mail bag fastener, Malt extract, Meat tenderer, Mechanical movement, Medical compound, Middling separator, Millstone driver, Mould, sand core, Mop and brush holder, Motion transmitter, Motion transmitter, Musical instrument, Necktie, Nut lock, Oar and oar lock, Package band, Packing piston and valve, Paper box, Paper folding machine, Paper for bank notes, Paper pulp screen, Pipe coupling or joint, Planter, corn, Planter, corn, Planter, seed, Plow, Plow jointer, Plow, riding, Pole, vehicle, Polishing iron, Press, baling, Press, hay, Printing machine, Radiator, Rake, Registering machine, Refrigerator, Refrigerator building, Rein attachment, Rubber or kerite, Saddle, harness, Sails, reefing and furling, Salt, recovering, Sash balance, Saw guide, Sawmill head block, Saw, scroll, Scales, spring weighing, Screen, window, Sewer gas extractor and consumer, Sewing machine thread cutter, Show box cover, Sieve, L. E. Ambrose, Smokestack cone, Spinning ring, Spittoon, Spring, bed, Spring, wagon bolster, Stamp drier, Stamp hand, Stave dresser, Steam generator, Stove back lining, Stove pipe elbow, Stove draught deflector, Tack driver, Tank, service, Thrasher, band cutter, Tobacco substitute, Tool handle, Toy perambulator, Trimmings, shaping dress, Valve grinder, Vapor burner, Vehicle, J. C. Russell, Velocipede, Vise, standing bench, Vulcanized compounds, Washer cutter, Well packers, anchor for oil, Whiffletree.