

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 is 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.

Jarvis Patent Boiler setting burns wet peat, screenings without blast. A. F. Upton, Agent, 48 Congress St., Boston, Mass.

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

West Broadway, Reade and Hudson Sts., N. Y., Aug. 2, 1877. Messrs. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York. Dear Sirs:—In my application of it, as a Boiler and Steam Pipe Covering, your Asbestos Felting (single and double air chamber) gives most complete and thorough satisfaction, and is far superior to any of the various non-conductors that I have tried or am familiar with. I very willingly recommend it to engineers and the public generally as the best non-conductor of heat that has been put upon the market. Yours respectfully, Chas. D. Doubleday, Engineer for H. K. & F. B. Thurber & Co.

Manufacturers of Hand and Power Brick Machines. Please send circulars and prices to H. P. Gregory & Co., San Francisco.

Two Iron Coal Dumping Cars for elevated track, \$80; cost \$250. 310 York Ave., Philadelphia, Pa.

One half of patent for sale of Tubular Iron Grindstone Frame. J. E. Defreest, 73 Ferry St., Troy, N. Y.

Wallace Electric Light Machine, 1,500 candle power; in use only two months, and guaranteed in perfect order. Cost \$40; price \$200. E. T., Jr., P. O. Box 3814, N. Y.

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

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

Empire Gum Core Packing, Soap Stone Packing, Piston Packing; all kinds. Greene, Tweed & Co., 18 Park Place, N. Y.

1,000 24 hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

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

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

Galland & Co.'s improved Hydraulic Elevators. Office 206 Broadway, N. Y., (Evening Post Building, room 22.)

Consumption cured.—An old physician, retired from active practice, having had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of consumption, bronchitis, catarrh, asthma, and all throat and lung affections, also a positive and radical cure for general debility and all nervous complaints, after having thoroughly tested its wonderful curative powers in thousands of cases, feels it his duty to make it known to his suffering fellows. The recipe will be sent free of charge, to all who desire it, with full directions for preparing and successfully using. Address, with stamp, naming this paper, Dr. J. C. Stone, 146 South Eighth Street, Philadelphia, Pa.

If you are troubled with leaky valves, use the Chapman. Warranted to give satisfaction. Chapman Valve Manufacturing Company, Boston, Mass.

For Fire or Power Pumps, address the Gould's Manf. Co., Seneca Falls, N. Y., or 15 Park Pl., N. Y. city.

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

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

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

The Hancock Inspirator received a gold medal at Paris, as being the best boiler feeder ever made, and the Old Colony Railroad (who have twenty-three machines in constant use) have just given it their unqualified indorsement, as the cheapest and most effective feeder ever used on their locomotives. Those interested are referred to their letter of recommendation, which may be found in our advertising columns.

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.

For the best advertising at lowest prices in Scientific, Mechanical, and other Newspapers, write to E. N. Freshman & Bros., Advertising Agents, 186 W. 4th St., Cin., O.

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

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

Rubber Hose, Suction Hose, Steam Hose, and Linen Hose; all sizes. Greene, Tweed & Co., 18 Park Pl., N. Y.

Punching Presses, Drop Hammers, and Dies for working Metals, etc. The Stiles & Parker Press Co., Middletown, Conn.

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

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

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

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.

Nickel Plating.—Wenzel's Patent Perforated Carbon Box Anode for holding Grain Nickel. A. C. Wenzel, 114 Center St., New York City.

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

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

To Manufacturers.—Messrs. Bignall & Ostrander, 806-808 N. 2d St., St. Louis, Mo., have added to their present establishment a Machinery Department, from whence the wants of the Western machine-using public will be supplied. Manufacturers will do well to correspond with them.

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign circulation.

24 x 48 in. Wright's Automatic Engine, with 16 foot band wheel, 30 in. face, for sale. Price low. Atlas Works, Indianapolis, Ind.

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

Inventors' Models. John Ruthren, Cincinnati, O.

The Lawrence Engine is the best. See ad. page 13.

North's Lathe Dog. 347 N. 4th St., Philadelphia, Pa.

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

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

Steel Castings true to pattern, of superior strength and durability. Gearing of all kinds. Hydraulic cylinders, crank shafts, cross heads, connecting rods, and machinery castings of every description. For price list and circular, address Chester Steel Castings Company, Evelina St., Philadelphia, Pa.

The SCIENTIFIC AMERICAN Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the SCIENTIFIC AMERICAN, with other appropriate contents, business announcements, etc. It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts.

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

Eagle Anvils, 9 cents per pound. Fully warranted.

The well named Leader Lathe is far ahead of competitors. For descriptive circular, address Frasse & Co., 62 Chatham St., New York.

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

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

Self-feeding upright Drilling Machine of superior construction. Drills holes from 1/2 to 1 1/2 in. diameter. Pratt & Whitney Co., Manufs., Hartford, Conn.

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

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

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Pittsburgh Steel Casting Company, Pittsburgh, Pa.

Notes & Queries

(1) J. L. J. asks: What composition for steam valves and cocks will expand the least? A. The following composition answers well: 20 parts by weight, copper; 3 parts by weight, zinc; 3 parts by weight, tin.

(2) J. N. B.—We know of no work especially devoted to nickel plating. You will find a comprehensive article on nickel plating on p. 209, vol. 38, SCIENTIFIC AMERICAN.

(3) A. R.—You will find a receipt for cementing rubber on p. 250 (15), vol. 38, SCIENTIFIC AMERICAN.

(4) J. R.—No reward has been offered for perpetual motion.

(5) J. R. M.—Lepidolite is found at Hebron, Me., and near Middletown, Conn. It has about the following composition: SiO<sub>2</sub> Al<sub>2</sub>O<sub>3</sub> Fe<sub>2</sub>O<sub>3</sub> MgO CaO RbO LiO NaF K H<sub>2</sub>O 50-33 28-54 0-73 0-51 1-01 0-24 0-7 1-77 2-6 3-12 Stillman has lately shown several lepidolites to contain cesium—one sample from Bonn, Prussia, contained as much as 0-68 per cent, CsO.

(6) M. M. asks for the best method of cutting glass tubes used for water gauges. A. File in one side a slight notch; upon the opposite side place the two thumbs with ends of nails exactly opposite the notch; now grasp the tube with both hands and pull lengthwise on it, while you break it as you would a stick.

(7) J. H. A. G. asks how many cells of a Callaud battery are necessary to heat a short strip of platina foil 1/8 of an inch wide and 1/4 of an inch long, hot enough to explode gunpowder? A. Eight.

(8) W. E. K. asks: 1. What quantity and size of wire shall I use for an electro motor? A. This depends on the kind of battery used, as there exists a certain relation between the resistance of the magnet coil and that of the battery. Where a quantity battery is used the wire may be larger than when the battery is arranged for intensity. 2. I have straight soft iron cores 1/4 inch in diameter, eight in number: I calculate to use both ends of the cores if possible: the cores will be about 4 1/4 inches in length; would such an arrangement generate any power for propelling light machinery? A. Yes, but U-magnets would be better. 3. What size wire is generally used for winding the permanent magnets of dynamo-electric machines, and also what size for winding the electro-magnets? A. Where permanent magnets are used they are not wound. When electro-magnets are employed, the size of wire varies greatly with the use to which the machine is applied; the same is true of the armature.

(9) S. D. C. asks: 1. How many pounds pressure will a boiler stand which is made of heavy tin, 10 inches diameter, 15 inches high, having 7 or 8 1/4 inch tubes? A. Safe working pressure, 15 to 20 lbs. per square inch. 2. Give directions for making a good machine which will furnish sufficient electricity to produce an electric light, said machine to be run by a small engine. A. See SCIENTIFIC AMERICAN SUPPLEMENTS Nos. 17 and 151.

(10) W. H. A. asks: 1. What is the weight of a United States gallon of water, and how many cubic inches in it? A. 8 331 lbs., 230 8 cubic inches. 2. What material will fit a piston in a cylinder water tight, so that when working the amount of friction shall be as small as possible? A. Any hard metal, accurately fitted. 3. Does it take as much power to raise a piston (lifting air tight in a cylinder) with water standing under it so that the water will rise as piston rises, as it requires to form a vacuum beneath piston? A. Yes.

(11) W. S. L. asks: 1. What size of copper wire gives the best effect in an electro magnet, such as is used in the De Merits machine? A. For a small machine we think No. 14 or 16 would do. 2. Can the wire be purchased already covered, and where? A. From dealers in this city who advertise in our columns. 3. Is the effect the same if the permanent magnets are revolved instead of the electro-magnets? If so, it would seem as if the wear of brushes, springs, or commutators, would be avoided by this plan. A. Permanent magnets lose their magnetism by jarring; it is, therefore, best that they should remain stationary. 4. Will steel wire bent into proper shape, hardened, magnetized, and wound into a bundle, magnet shape, make a magnet equally powerful with a compound plate magnet as used in the De Merits machine? A. We think not, but it might answer very well. 5. Can the magnets be made with a set of bar magnets? A. Yes. 6. Will cotton do for covering for the wire? A. Yes. 7. Have you a recent work on the subject of Magneto-Electricity and the Electric Light? A. We intend publishing papers on these subjects at an early day in the SCIENTIFIC AMERICAN SUPPLEMENT.

(12) T. S. M. asks which will consume the most power, to place the driving pinion in a hoisting machine above or below the center of the large spur wheel? A. We think it will make no difference.

(13) G. E. F. asks: 1. How to make or mix the substance used in cold water pens. A. Mix any of the soluble coal tar dyes with gum water to form a thick paste, and after filling the case, dry at a gentle heat. 2. Also a good mucilage. A. Triturate 1 ounce of gum arabic with about 4 fluid ounces of hot water in a mortar, and add a few drops of clove oil. Or make a solution of dextrine in about 3 1/2 parts of boiling water.

(14) W. E. G. asks what would be the power of an engine 2 inches bore and 4 inches stroke. Will an oscillating engine of the same size produce the same power with the same amount of steam, say 60 lbs.? What size should a boiler be for such an engine? Would an engine of this size run a lathe that swings 12 inches for turning iron? A. There will be no difference in the power of the two engines, if properly constructed. To determine the horse power, multiply together the mean pressure during stroke in pounds per square inch, the area of the piston in square inches, the length of stroke in feet, and twice the number of revolutions per minute, and divide the product by 33,000. Make a boiler whose heating surface is in the proportion of from 15 to 20 square feet per horse power. The engine can be used to run the lathe.

(15) J. F. S. writes: I am about to select a trade or profession. I have a taste for mechanical trades of all kinds, farming and mercantile business. I have a chance to go as runner in a bank in New York, or to go on a 400 acre farm in Indiana. 1. Which shall I do? A. Go on the farm by all means. 2. How can I distinguish oleomargarine butter from the genuine article? A. According to Professors Sechartier and Taylor, oleomargarine may be distinguished from pure dairy butter by examining a sample under a good microscope. The latter presents a nearly uniform color; the forms seen consist of oil globules and crystals of salt. When observed by polarized light very little change is observed, but if the specimen contain oleomargarine the field is speckled with shining particles which change color with every quarter turn of the analyzer. A power of 75 diameters exhibits these changes very markedly. With a power of 250 diameters more or less animal tissue may usually be detected.

(16) H. S. asks how to solder German silver. I have tried what they call silver solder, with a blow pipe and a spirit lamp; the solder will not melt. A. Rub a lump of borax with a drop or so of water on a common slate or porcelain slab, until a thick paste is produced. Clean the surfaces to be soldered and paint on the borax paste; dip your silver solder in the borax paste and place it in position on the work. Pin the work on a charcoal or piece of pumice stone, with common tacks (not tinned), direct the reducing flame of a blow pipe upon the work until it becomes red hot, then project it on the solder. The small silver three cent pieces make excellent solder for German silver, brass, copper, iron, and steel. SCIENTIFIC AMERICAN SUPPLEMENT No. 20, contains full practical directions for soldering.

(17) J. S. writes: I have a quantity of lard oil that I think contains salt or acid. How can I test it? A. If the oil contains pure acid, a scrap of blue litmus paper rubbed with it will indicate the fact by turning red. A notable amount of salt is readily detected by tasete. A little hot water will extract salt from the lard, and a drop of nitrate of silver solution (aqueous) added to the clear water from the oil will occasion a white curdy precipitate, if salt is present even in very small quantity.

(18) A. A. asks: 1. How many Bunsen cells of such size as could be made in a common glass tumbler would it take to furnish electricity enough for an electric light to light a room twenty feet square? A. About 100. 2. How many of capacity of 1 quart for glass jar? A. 50. 3. What is the size of jar most suitable for battery for electric light? A. One quart. 4. Would porous cells made of fine potter's clay of proper size and shape be suitable? A. Yes. 5. Is a glazed earthen jar as good as glass for outer jar? A. Yes. 6. Are common plant jars as good for porous cups as those made of finer and more compact clay. A. No.

(19) A. C. F. asks what size of steam pipe to use for an engine 8 inches x 10 inches stroke, running at 180 revolutions per minute at 60 lbs. pressure. A. A pipe 2 inches in diameter will answer.

(20) C. A. W. asks: Is the effect of the shock from an induction coil good or bad upon the body in good physical condition? A. Strong electrical shocks are injurious.

(21) J. C. F. asks: 1. In damping the diaphragm of phonograph described in SUPPLEMENT No. 133, do you simply cut small pieces of rubber and place on the diaphragm? A. Short pieces of rubber tubing are placed between the diaphragm and its support, and are allowed to exert a slight pressure on the diaphragm. 2. Will fine copper wire insulated with gutta-percha do for the coil in a telephone as well as silk covered? A. The gutta percha covering is generally too thick; silk covered is preferable.

(22) W. D. S. asks: 1. In the best kind of safety valves for steam boilers does the area for escaping steam gradually increase as the pressure increases? A. According to experiments made by the United States Boiler Inspectors, common safety valves, when properly proportioned, are as efficient as those which give an enlarged area for increased pressure. 2. Are the air compartments in ships' rooms done off for floating power alone, or are they sometimes used for storage? A. The compartments having doors are ordinarily used for storage. 3. Would an invention be valuable that would automatically close the doors between the air compartments without any machinery in case a hole was made in the vessel below the water line? A. We think it quite likely, if superior to the arrangements in use.

(23) W. A. M. writes: I have a bottle of pure bay oil, will you please inform me how I can make bay rum suitable for toilet purposes? A. 10 fluid drachms of oil of bay rum; 1 fluid drachm of oil of pimento; 2 fluid ounces of acetic ether; 3 gallons of alcohol 95 per cent; 2 1/2 gallons of water; mix, and after two weeks' repose, filter.

(24) G. C. asks: What is the best method of protecting the lungs against dust while sweeping? A. Breathe through a moistened sponge.

(25) E. G. Mc D. asks how to make marking fluid for the backs of Brussels carpets. A. An excellent ink for this purpose is prepared by triturating 4 parts of powdered soluble nigrosine in about 15 parts of hot water, and straining the hot solution repeatedly through fine silk or filtering through filter paper, using a hot funnel. See also inks in SCIENTIFIC AMERICAN SUPPLEMENT No. 157.

(26) Engineer asks which of the two is the largest—the Cincinnati water works, or the new water works about completed at Pittsburg, also their relative capacities. A. Perhaps correspondents from these localities will kindly send us particulars.—E.D.

(27) W. Z. B. asks: 1. Can water be forced into a boiler above the water line? It may not be advisable, but can it be done? A. Yes. 2. Our office is heated by coils of pipe which drain themselves completely, where they, and their outlets, are subject to no other pressure than that of the atmosphere. If both outlets are connected to the dome of a boiler carrying 60 lbs. of steam, placed below these outlets, will the pipes still drain themselves? A. Yes, if there is sufficient fall, and the pipes are properly arranged. 3. Our water works give a pressure of 125 lbs. to the inch. If a pipe was connected from the main to the dome of a boiler carrying 60 lbs., would water enter the boiler? A. Yes.

(28) W. asks: 1. Will steam or water deposit scale when not coming in contact with heated surfaces? A. Water may do so. 2. Will steam when not superheated cause oxidation of brass? A. To some slight extent.

(29) T. D. H. says: 1. I have a telegraph line about 300 feet, No. 14 copper wire, gas pipe grounded, and on it are two learners' instruments and two bells (box pattern). How many jars will I want of Lockwood or Watson batteries to work it? A. Four. 2. What is the comparative strength and usefulness on a line of these two batteries? A. There is not much difference. 3. If an office ground both line and local on one binding post, and thence by one wire to the ground, is there any danger of a return current if one be grounded and the other in use? A. No. 4. What will take knot and dust marks (from cracks) out of an engraving? A. Moisten the parts thoroughly with soft water, and press strongly between hot sheets of bibulous paper. When cool moisten with strong cold solution of fresh sodium hypochlorite, and when sufficiently clean, moisten again with a little sodium hyposulphite solution, and, after a time, absorb excess of moisture with clean blotting paper, and press between sheets of the same with hot irons until perfectly dry.