

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. Complaint we often hear from other countries. 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 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.

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

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

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J. 24 x 48 in. Wright's Automatic Engine, with 16 foot band wheel, 30 in. face, for sale. Price low. Atlas Works, Indianapolis, Ind.

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

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

The Valves and Hydrants manufactured by Chapman Valve Manufacturing Company, Boston, Mass., received the highest award at the recent Massachusetts Charitable Mechanics Exhibition. Circular and price list on application.

The new "Otto" Silent Gas Engine is simple in construction, easy of management, and the cheapest motor known for intermittent work. Schleicher, Schumm & Co., Philadelphia, Pa.

Inventors' Models. John Ruthren, Cincinnati, O.

Mechanical draughtsman wanted. A steady situation for an experienced and capable man. Address by letter, only, giving particulars, E. V., 353 W. 92d St., N. Y.

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.

Complete sets of Castings for 2 in. cylinder engines; cylinder bored and turned and slides bored; small castings brass. Price \$5. Photo for three stamps. Address J. W. Westwick, Galena, Ill.

The great advantage of the genuine Asbestos Coverings for Steam Pipes, Boilers, etc., over any other forms of non-conducting coverings, aside from their superior effectiveness, is that they are manufactured in convenient form ready for use, and can be easily applied without the aid of skilled labor. The H. W. Johns Manufacturing Company, 87 Maiden Lane, N. Y., are the sole manufacturers.

Alcott's Turbine received the Centennial Medal.

The Lawrence Engine is the best. See ad. page 397.

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

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

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

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

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

Eagle Anvils, 9 cents per pound. Fully warranted.

Steam, Water, and Gas Valves made by the Chapman Valve Manufacturing Company, Boston, Mass., are warranted to keep tight. Send for revised price list.

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.

Cornice Machines; prices reduced, Calvin Carr, Cleveland, O.

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

Rider Compression Pumping Engines; especially adapted for country residences. Deep well pumping a specialty. Circulars. Cammeyer & Sayer, 93 Liberty St., N. Y.

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

A first class Mechanical Draughtsman desires a permanent situation in general machine or steam engine works. Address T. P. Pemberton, room 30, 37 Park Row, New York.

See ad. for 2d hand Yacht and other Engines.

Interstate and International Mechanical Exchange, 20 E. 13th St., N. Y., U.S.A. An equitable purchasing and selling agency. New and serviceable wood and iron-working machinery and mechanical supplies. Send for explanatory circular. A. S. Gear, Manager. \$75,000 worth of new and second-hand machinery wanted immediately. Give full description and lowest cash price.

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

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

Latest and best Books on Steam Engineering. Send stamp for catalogue. F. Keppy, Bridgeport, Conn.

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

A party wanted, with \$3,000, to manufacture one of the best new scroll saws, already perfected and selling. N. Stafford 66 Fulton St., N. Y.

Engine Lathes, 8 ft. bed, 19 in. swing, on hand and finishing; price low. F. C. & A. E. Rowland, N. Haven, Ct.

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. Forsyth & Co., Manchester, N. H.

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.

Brick Presses for Fire and Red Brick. Factory, 309 S. 5th St., Philadelphia, Pa. S. P. Miller & Son.

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

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. English Agency, 18 Caroline St., Birmingham.

Gate Fire Hydrants made by the Chapman Valve Manufacturing Company, Boston, Mass., are perfectly tight, open easily, no water hammer or strain on pipes, and warranted to give perfect satisfaction.

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.

For Apparatus for Electric Light Experiment, address Jerome Redding & Co., 30 Hanover St., Boston, Mass.

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. Forsyth & 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.

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.

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. Pittsburg Steel Casting Company, Pittsburg, Pa.

Warranted best and cheapest Planers, Jointers, Universal Woodworkers, Band and Scroll Saws, etc. manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

NEW BOOKS AND PUBLICATIONS.

NEOPHONOGRAPHY: a System of Short, Swift, Scientific and Easy English Writing. By James Richardson. New York: Harroun & Bierstadt. 50 cents.

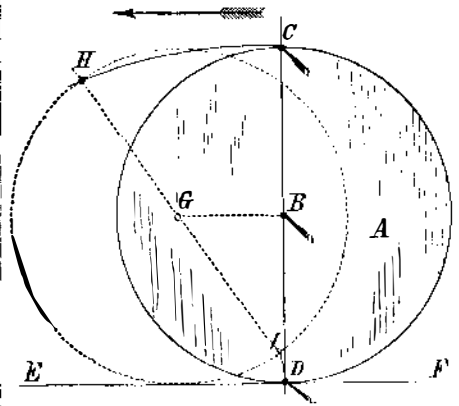
Another of the multitudinous attempts to provide an acceptable substitute for our common long-hand writing. It differs from the usual, however, in being strictly alphabetic, no compound or contracted characters, omissions, or other stenographic devices being admitted. The writing is cursive, singularly direct in its flow, and evidently easy to read. The author claims that it is correspondingly easy to write.



(1) L. M.—To restore a lens blurred by hydrofluoric acid, take a sealing wax impression of a portion of the face of the lens, stretch over the wax a piece of silk, apply a paste of fine putty powder (putty powder and water) to the face of the pad thus made, and rub the pad rapidly over the face of the lens with a gyratory motion until the surface of the lens is re-polished.

(2) J. R. E., S. H. R., and others.—Regarded merely as a rotating body, all parts of the periphery of a carriage wheel move around its axis with the same velocity. Regarding the carriage wheel as a rolling body, the upper portion moves forward faster than the portion which touches the ground. Any point in the wheel will describe a cycloid curve as the wheel rolls on a plane surface. Our correspondents can satisfy themselves as to the proper solution of the problem in the following way: Take a disk, A, of thin wood or pasteboard, and secure at the center a pencil, B, and at

the periphery at diametrically opposite points the pencils, C, D. Put the disk on a plane surface, with its edge, against the straight edge, E F, and the three pencils in a line, forming a right angle with the straight edge. Now roll the disk forward in the direction indicated by the arrow. The pencil, B, which represents the axle



will move from B to G in a right line, the upper one, C, will describe the curve, C H, and the pencil, D, will make the curve, D I.

(3) S. H. R. asks: 1. Does a small electrical machine (pocket size), such as is made for medical purposes, furnish electricity of sufficient intensity to experiment with the microphone? A. Yes. 2. Can the electric light be produced from a galvanic battery? A. Yes, by using several cells.

(4) C. D. K. asks: 1. What kind of moulds would give the best and smoothest castings of a mixture of tin, zinc, and bismuth? A. If the alloy contains little zinc well dried moulds of plaster of Paris or of papier mache covered with a film of oil will doubtless give satisfaction. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 17, "Casting Medals, Medallions, etc." 2. Would it stick to copper? A. Probably.

What is the process of canning sweet corn? A. The following is the method in use by many of the large canning establishments. The corn, after removing from the cob, is filled into the clean cans so as to leave no air spaces. These are placed in a large oven or other airtight vessel, and subjected to hot steam under pressure. The harder the corn the longer the exposure required to thus cure it; it is said that in some cases as much as eight hours is requisite, but usually much less than this. A large vessel of boiling water, in which the cans are immersed, may be used instead of the steam oven, but is not so effective. On removal from the oven or water bath, as the case may be, each can (they must be filled to the cover with fruit) has the cap with a very small hole tapped in its center immediately soldered on. As soon thereafter as the can stops blowing, as the escape of steam and air through the vent is termed, the hole is quickly soldered. This must be done before the air begins to enter. Other fruit is cured and canned in like manner—tomatoes rarely require longer than 15 to 20 minutes' steam curing. Where the pits are left in fruit a longer time is requisite to completely destroy all fermentative germs.

(5) N. B. D. asks (1) if the spools of an ordinary telegraph sounder can be utilized for making a telephone, or are the spools of a relay more suitable? A. The relay spools will be best. 2. The telephone line will be less than half a mile in length. Will small copper wire do for the main line? A. Yes.

(6) G. F. D. asks: 1. What is the cheapest method for producing ozone in large quantities, so that it may be applied as an oxidizing agent? A. Coat the inside of a long glass tube with tin foil, and pass over this a second wider tube coated with tin foil on its outer surfaces. Between these two tubes pass a current of dry oxygen, and connect the inner and outer tin foil coatings with the terminal wires of an active induction coil. Ten to fifteen per cent of the oxygen may thus be converted into ozone. 2. What paint or varnish would be suitable for insulating wire for electrical experiments? A. Shellac dissolved to the consistency of molasses in alcohol, asphaltum varnish, melted sealing wax or paraffin, and benzol solutions of gutta percha and caoutchouc are occasionally used. 3. How is the instrument made for measuring the resistance of an electric current in ohms? A. It consists of a series of coils of measured resistance.

(7) P. McF. asks how to keep cider sweet all winter. A. Add from 0.125 to 0.25 oz. of sulphite of lime (calcium sulphite) for each gallon of the cider. It should be dissolved in a little of the cider before adding it to the barrel. Then roll the barrel.

(8) H. M. D. asks for the best way to make gelatin or glue moulds for plaster casts. A. Glue is softened by digesting it in cold water and then melted in the water bath. This affords a very thick paste, to which pure glycerin is added in the same quantity by weight as that of the dry glue taken. The mass is then further heated and stirred for some time in order to evaporate the excess of water. This mixture does not adhere to well oiled moulds, and is very elastic when cold.

How are autumn leaves preserved? A. The fresh leaves are spread and pressed into a suitable dish with alternate layers of fine, thoroughly dry sand, as hot as the hand can bear. When the sand has cooled they may be removed, smoothed under a hot iron, dipped for a few moments in clear French spirit varnish, and allowed to dry in the air. By many melted white wax or paraffin is preferred to the varnish. These latter must not be too hot. The dried leaves are dipped in the melted wax, drawn several times over the edge of the vessel to remove excess, and hung up until the film of wax has thoroughly cooled and hardened.

(9) "Watch Hand" asks how to anneal watch hands that have to be swaged three times after each annealing. A. Place the hands in charcoal dust in a cast iron box. Close and lute the box, bring it to a red heat, and allow it to cool very slowly.

(10) F. D. asks what acid to use to lessen the harsh effect of borax in soap without destroying its qualities. A. The addition of a little glycerin to the soap will render it less harsh if the saponification has been properly conducted. Acids are not employed in the way you suggest.

(11) C. F. L. asks: 1. What are the most approved methods of using petroleum under steam boilers? A. Most of the processes are patented, and by inserting a notice in the "Business and Personal" column you may open communication with the inventors. 2. Can steam be practically superheated for combining with oil, by running it through a coil of 3/4 inch pipe 10 or 15 feet long, placed in the firebox? Would any danger attend the use of such a pipe in a hot blast? A. This is perfectly practicable, but the arrangement may not prove very durable. It will not be specially dangerous if means are provided for shutting off the apparatus promptly when required.

(12) H. A. L. writes: I wish to heat four barrels of water, sometimes less; which is best, a large kettle set in brick with a grate, or a small boiler 3 feet long by 15 inches diameter, with six two inch flues? Would such a boiler with 20 or 30 two inch flues, set as described, run a 4 x 5 cylinder at 300 turns, steam at 80 lbs.? A. The boiler would be preferable, and would answer for the engine.

(13) G. P. M. writes: There is a fluid instantaneous ink eraser on the market. Of what is it composed? A. The fluid eraser referred to is probably a strong, cold aqueous or acetic acid solution of calcium or potassium hypochlorite—bleaching powder or eau de Javelle.

Can I make a patented article if I make and use it myself? A. See "Rights of Investigators," p. 128, current volume of the SCIENTIFIC AMERICAN.

Can I electroplate with a Calland battery? A. Yes; two or three cells will suffice for small work.

Is there a cheap process by which I can obtain tolerably fair copies of my own handwriting, and how is it done? A. Write with a 20 per cent aqueous solution of glycerin, sprinkle the writing with excess of finely powdered gum arabic, dust off excess, and dry in a warm place for some time. From this a cast may be taken in fusible metal. Another method is to coat a smooth metal plate with a film of wax, through which with a fine steel point to the metal below the characters are etched. The lines and surface are then blackened, and a copper electrotype taken in the usual manner. Still another way is to write upon a prepared block of chalk with lithographer's ink or a preparation of glue and sugar or molasses, after which the parts unprotected by the ink are etched out somewhat with a dilute acid and the block hardened by immersing it for a time in strong water glass solution.

What is used in, and what is the process of zincography? A. It is similar to lithography—a plate of zinc being used in place of the stone.

Does the SCIENTIFIC AMERICAN, Export Edition, contain "Notes and Queries" also? A. Yes.

(14) A. J. F. suggests the use of drums for turning angles in thread telephone lines. At each angle he places a drum having two heads. The thread is severed and the ends pass through the drum heads and are knotted.

(15) F. P. H. asks for a method of making cider. A. See p. 315 (8), current volume.

(16) N. E. S. writes: The Second Avenue Railroad Company have been experimenting with a car to run by compressed air instead of steam; the cars to be charged from a stationary reservoir, into which the air has been forced at a high pressure by a stationary engine. It is claimed, by some persons, that the stationary engine has not enough power to draw as many cars as it can supply with air and keep running; but I claim that it has. Who is right? A. We agree with you, as we understand your meaning.

(17) A. H. G. asks how to dissolve amber to be used as a varnish. A. Amber, 10 parts (by weight); melt in a suitable vessel over a moderate fire, and add boiled linseed oil, 20 to 30 parts. The caldron in which this operation takes place should not be more than two thirds filled; and the mixture of oil and resin kept boiling for 10 minutes. The vessel is then removed from the fire (into the open air), allowed to cool down to about 280° Fah., and from 25 to 30 parts of oil of turpentine gradually added. See also Meredith's process, p. 35, current volume, SCIENTIFIC AMERICAN.

(18) C. H. asks (1) how to make oxygen gas in a cheap and simple way for experiments. A. Mix dry potassium chlorate with about one fourth its weight of pure black oxide of manganese, and heat the mixture in a copper retort over the flame of a spirit or gas lamp. The retort should not be more than one quarter full. The gas should be passed through water to free it from traces of chlorine, etc. 2. Is there any danger of explosion from the above gas when it comes in contact with a flame, that is, when no other gas is mixed with it? A. No.

(19) W. S. R. asks for a good recipe for red and blue stencil ink. A. Shellac, 4 parts; borax, 1 part; dissolve by boiling in a small quantity of water, and dilute with hot water to the consistency of very thin sirup. To this add a sufficient quantity logwood or Brazilwood extract, or the soluble coal tar reds. For blue add to the lac solution soluble Prussian blue, or blue carmine.

(20) D. H. A. writes: A paper mill in this place is supplied with turbines. The tail race is 3 feet higher than it need be. Which will add most to the power of the wheel, to deepen the tail race and lower the wheels, or to deepen the tail race, let wheels remain where they are, airtight tubes being fitted to the wheels and extending to the water in tail race? A. As we understand the statement, we think that the increase of power would be about the same in either case.

(21) G. B. G. asks: 1. What is the composition of bright dipping acid for brass? A. Ordinary nitric acid diluted with one or two volumes of water. The work must first be cleansed from all traces of grease or oil by hot soda solution or scouring. 2. What is the mixture into which the article is dipped which gives it