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 unequaled 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.

Magic Lanterns and Stereopticons of all prices. Views illustrating every subject for public exhibitions. Profitable business for a man with a small capital. Also lanterns for college and home amusement. 74 page catalogue free. McAllister, Mf. Optician, 49 Nassau St., N.Y.

Alcott's Turbine received the Centennial Medal.

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

Florey & Smith, San Francisco, make a specialty of introducing useful inventions in the Pacific States.

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

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

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

Who wrote it?—The question is, who wrote "The Little Belle of Bloomingdale," the realistic story of New York Revolutionary life now running in the *Christian Union*, of New York? We are told it is by one of the most eminent of American writers, and that we have six months to guess it in.

The Genuine Asbestos Steam Pipe and Boiler Coverings are the most durable, effective, and economical of any in use. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York, are the sole manufacturers.

Situation wanted by a Mech. Eng. and Draughtsman. 15 years experience in designing and care of mining machinery, sewing machine tools, and the Corliss engine. Address H. N., No. 131 Vinton St., Providence, R. I.

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

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

Steam, Water, Gas, Valves, Hydrants. Prices reduced. Send for catalogue. Chapman Valve M'f. Co., Boston.

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

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.

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.

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

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

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.

Fine Gray Iron Castings a specialty, also Wire Workers' Pickets and Rosetts in stock. A. Winterburn's Foundry, 16 De Witt St., Albany, N. Y.

Books for Engineers and Machinists. Catalogues free. E. & F. N. Spon, 446 Broome 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.

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.

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

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See advertisement

Wheel Press, Cotton Press, Pipe Line, and Test Mercury Gauges. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

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

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J.

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

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

For Sale.—A 6 x 6 Upright Yacht Engine, 6 H. P. Wm. F. Codd, Nantucket, Mass.

The most useful improvement for the mannfacture of Paper is the recently patented Hot Air Drier of C. S. Clark of this city; taking the paper from the bundle, can finish 3,000 rolls per day, ready for the wall, without handling. W. S. Garrabrant, Agt., 155 W. 29th St., N.Y.

Chapman Valves and Hydrants received the highest award at Mass. Mechanics Fair. Chapman Valve Manuf. Co., Boston, Mass.

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

Machine Diamonds. J. Dickinson, 64 Nassau St., N.Y.

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

The Lawrence Engine is the best. See ad. page 365.

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

Eagle Anvils, 9 cents per pound. Fully warranted.

Kreider, Campbell & Co., 1030 Germantown Ave., Phila., Pa., contractors for mills for all kinds of grinding.

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

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable; and easily worked. Tensile strength not less than 65,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

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

NEW BOOKS AND PUBLICATIONS.

GROWTH OF THE STEAM ENGINE. By Prof. Robt. H. Thurston, A.M., C.E., Stevens Institute. New York: D. Appleton & Co., 12mo. pp. 490.

In this volume of the International Scientific series Professor Thurston has traced the history of the gradual development of the philosophy and construction of the steam engine, from the simple machine of Hero (B. C. 200) down to the steam engine of to-day. The work is intended for popular reading, and is well illustrated.

THE SOUTH PASS JETTIES. By E. L. Corthell, Resident Engineer. Transactions of the American Society of Civil Engineers. 1878.

In this essay, read before the tenth annual convention of the American Society of Civil Engineers last June, Mr. Corthell has given a sketch of the progress of the improvement of the mouth of the Mississippi, with incidental notes and memoranda. The information he gives will be found of interest and value to engineers who have to deal with such problems.

SLIDE VALVE GEARS. By Hugo Bilgram, M.E. Philadelphia: Claxton, Remsen & Haffelfinger. pp. 125. $1.

In this brief essay Mr. Bilgram offers a new graphical method for analyzing the action of slide valves moved by eccentrics, link motions, and cut-off gears. It is offered as an easy means for properly designing valves and valve gears, and for establishing the comparative merits of their various constructions. His method is a modification of Zeuner's diagram, calling for no knowledge of mathematics beyond elementary geometry.

THE RELATIVE PROPORTIONS OF THE STEAM ENGINE. By William D. Marks. Philadelphia: J. B. Lippincott & Co. 12mo. pp. 161.

In this course of lectures to the students of dynamical engineering in the University of Pennsylvania, Professor Marks has undertaken to give, in a simple and practical form, rules and formulæ for the determination of the relative proportions of the component parts of the steam engine.

CASTING AND FOUNDING. By N. E. Spretson. New York: E. & F. N. Spon. 8vo. pp. 412. Eighty-two plates

The author's object has been to furnish a practical treatise on casting and founding, including descriptions of modern machinery employed in the art. Little space has been given to chemical or metallurgical theories. The work is well illustrated and has a good index.

TRIGONOMETRICAL LEVELING. By August Faul, C.E. Baltimore: Cushings & Bailey. 8vo. pp. 46.

This short treatise on leveling by vertical angles, and the measurement of distances by telescope and rod, is supplemented by a valuable set of tables of heights for all angles from zero to 22½°, in minutes, and for any distance.

THE STEPPING STONE TO ARCHITECTURE. By Thomas Mitchell. New York: A. J. Bicknell & Co. 32mo. pp. 83. 60 cents.

This little catechism of architecture is intended to explain in simple language the principles and progress of the art from the earliest times. Its illustrations are from Gwilt's "Encyclopedia of Architecture."

FLOWER OBJECT LESSONS. From the French of M. Emm. Le Maout. New York: W. J. Read. 1873.

Properly used this little book may be of use to primary teachers; it will hardly bear comparison, however, with the elementary works of Gray, Youmans, and Wood. There is no gain, we are inclined to think, in an excessive avoidance of technical terms. A child will learn to use and understand the word stamen, for example, quite as readily as powder wand.

SOUND. By Prof. Alfred Marshall Mayer. New York: D. Appleton & Co.

This is a companion volume to Professor Mayer's excellent little work on Light, and presents the same features. By means of a series of simple and inexpensive experiments that any bright boy can make, a thorough, though necessarily limited, knowledge of sound and its principal phenomena and laws, is pleasantly sketched. It is a guide book for experimental study, and is accordingly scientific in its spirit, as well as in its facts, and calculated to develop the habit of scientific thinking on the part of the student.

LESSONS IN ELEMENTARY CHEMISTRY. By Henry E. Roscoe, B.A., F.R.S. London and New York: Macmillan & Co. 1878.

This is a new edition of Professor Roscoe's admirable little book. The combining weights of the elements are calculated from the results of Stas's experiments, oxygen being taken at 15·96 instead of 16, as in the previous edition.

Journal of the Cincinnati Society of Natural History. No. 2. 1878.

This flourishing society, located in a city which has given its name to a highly fossiliferous group of rocks belonging to the lower silurian system, is peculiarly and favorably situated for palæontological studies—studies which, judging from the journal before us, are being pushed with great vigor. Mr. Wetherby contributes a classified list of fossils from the Cincinnati group; Mr. Ulrich makes observations on fossil annelids, and describes new species from the Cincinnati group; Mr. Miller describes eleven new species from the same formation; Mr. Moore gives the annual precipitation of rain for forty-two years; and the society's proceedings occupy the rest of the number. Two plates, illustrating new fossils, accompany the text.

Notes & Queries

S. G.—"Land and Marine Engines and Boilers," Burgh.—E. H. M.—The universal square may be used as a try-square, T-square as a graduated rule, for laying out a miter, and for finding the center of a circle.—W. H. J.—Consult our advertising columns.—E. B. should address a manufacturer of hydraulic rams.

(1) C. Q. asks: At what height above a boiler shall I place a water reservoir so that the boiler may be supplied with water from the reservoir by the force of gravitation alone? A. The pressure is about 0·433 lb. per square inch for each foot of difference of level, between water lines in boiler and reservoir respectively.

(2) J. F. A. asks how phloroglucin is made. A. Phloroglucin ($C_6H_6O_3$) is produced by heating phloretin, quercetin, dragon's blood, gamboge, kino, etc., with caustic potassa. Rhombic crystals, with two molecules of water of crystallization, of sweet taste.

What is the latest work on gasometry? A. The latest work on gasometry is *Gasometrische Methoden*, by Robert Bunsen, 2 Auf., 1877.

Is there a work on the barometer and its application to chemical analyses? A. We have not seen such a work.

(3) W. F. M. asks what to size chromos or oil prints with before varnishing. A. You may use a thin solution of fine glue, isinglass, or starch.

(4) W. W. asks: 1. How to make a marking ink for marking linen, cotton, etc., that requires no warm iron, heating, or preparation after being written? A. Dissolve shellac in a little water by boiling it with about one sixth part of borax, and add to this solution a sufficient quantity of soluble nigrosin to produce the proper color. 2. How can I make aniline black in solution that will keep for any length of time without decomposing? A. Add to the solution a little alum or borax.

(5) D. J. M. writes: In your issue of November 2, 1878, you say the decimal system of numeration is not the best system. Will you please tell what system you think better, and why? A. The duodecimal, since the unit is divisible into more convenient fractions.

(6) P. T. A. asks: 1. Can you give a recipe for welding horn? A. Pieces of horn may be joined by heating the edges until they are quite soft, and pressing them together till they are cold. 2. Also a recipe for staining horn? A. To stain horn red, soak in very dilute nitric acid for a few minutes, and apply a strong infusion of cochineal in aqua ammonia. Green, steep in a solution of 2 parts of verdigris and 1 of sal ammoniac. Blue, stain green, and then steep for a short time in hot soda solution; or steep them for a short time in a weak solution of sulphate of indigo containing a little cream of tartar. Yellow, steep them in solution of lead acetate, and then, after drying, in solution of bichromate of potash. Purple, use a strong aqueous solution of gold chloride. Black, use nitrate of silver and expose to sunlight. Brown, immerse in aqueous solution of potassium ferrocyanide, dry, and treat with a hot dilute solution of copper sulphate.

(7) M. asks why a small driving wheel is used on a locomotive instead of a large one to draw the heavy freight trains? A. With the smaller drivers the piston of the engine has a greater leverage over the load.

(8) J. H. C. asks whether the electrical light produced through the medium of platinum wire or charcoal points is attended with intense heat at the points of illumination. A. Yes, the heat is very intense, capable of fusing or volatilizing almost every known substance.

(9) J. F. B. asks: When it is twelve o'clock noon at Greenwich (say Sunday), what time is it, and what day, at the same instant 180° east or 180° west of that place? A. As no civilized people live along that line the question is of no practical importance, and no rule has been established with regard to what the actual date is. Mariners sailing east drop a day from their reckoning, those sailing west add a day, on crossing that line, to make their date correspond with those of the people they next come in contact with.

(10) A. H. asks: 1. Are the best horseshoe magnets cast or forged into shape? A. Forged. 2. What kind of steel makes the most powerful magnets—spring, tool, machine, Stubs, or cast steel? A. When tempered so as to be as hard as good tool steel tempered to a dark straw color, either will do. 3. Can I magnetize my magnets as effectually with an electro-magnet as with methods described in No. 142, SCIENTIFIC AMERICAN SUPPLEMENT, in article entitled "How to make a Working Telephone"? A. No.

(11) B. L. writes: We have an ordinary single action pump, 3 inches bore and 6 inches stroke, raising water 31 feet: from well to pump is 10 feet, and from pump to tank 21 feet, both measured vertically. The suction and discharge pipes are both one inch diameter. If the pipes are increased to 1¼ inch diameter what per cent of power will be saved, speed of pump 30 strokes per minute? A. We do not think there would be much gain.

Is there a paper published in this country similar to the *Textile Manufacturer*? A. We think not.

(12) S. P. L. writes: If at a given time all the inhabitants of the earth, with all animals, locomotives, steamers, etc., take up a line of march due east, what will be the effect on the motion of the earth on its axis? A. As the total mass of everything movable on the face of the earth is infinitely small compared with the mass of the earth, we think there would not be the slightest disturbance.

(13) W. M. M. asks: Is there such a thing as a perfect vacuum? A. No; but the Torricellian vacuum is practically perfect. Every mercurial barometer presents an example of it.

(14) B. F. K.—The moist pile is not adapted to the electric light. Better use 10 or 15 cells of Bunsen battery. For a primary coil use two layers of No. 16 wire, on this wind several thicknesses of paper previously soaked in melted paraffin, and on the paraffin paper wind the first layer of your No. 32 wire. Put paraffin paper between the layers of the fine wire. You cannot get a satisfactory light from an induction coil.

(15) R. W. asks: In pumping water into the top of a steam boiler, can it be done without putting the feed pipe down into the water in the boiler? A. You may do it, but it would be disadvantageous, as it would condense more or less of the steam.

(16) G. S. L. writes: Two hydraulic rams, constructed precisely alike, are in operation at the same time, taking their water from the same source of supply, and discharging at the same elevation. The head of water is the same in both cases (5 feet), but ram No. 1 is located directly beneath the source of supply, while No. 2 is distant 100 feet down a hill (but only 5 feet below the source of supply). Now, will either of these rams raise more water than the other, and will either make more strokes per minute than the other? Will the long column of water, being heavier, acquire more momentum, and can it perform more work, than the short perpendicular column in ram No. 1? A. We think that the best results will be obtained from the long column.

(17) G. S. asks: 1. At what point should the fire line be in relation to the water line of a plain cylindrical boiler? A. Not lower than midway. 2. Would it injure the boiler to have the gas work all around it? A. No.

(18) W. C. E. asks how academy or mill board, which is used by artists, is made. A. Size pasteboard, and when dry apply a thick coat of paint with a palette knife. If a rough surface is desired, paint two sheets of board, put them face together while green, then pull them apart immediately.

(19) J. H. asks how to make carburet of sulphur. A. A porcelain tube filled with pieces of charcoal which have been recently heated to redness in a covered crucible, is fixed across a furnace in a slightly inclined position. Into the lower extremity a tolerably wide tube is secured by the aid of a cork; this tube bends downward, and passes nearly to the bottom of a bottle filled with fragments of ice and a little water. The porcelain tube being heated to a bright redness, fragments of sulphur are thrown into the open end, which is immediately afterwards stopped by a cork. The sulphide of carbon formed passes over, is condensed by the ice, and collects at the bottom of the vessel. This is collected and freed from sulphur by redistillation at a very gentle heat in a retort connected with a good condenser. For preparation on a large scale, a tubulated earthen retort is filled with charcoal, and the sulphur is dropped in through a porcelain tube passing through the tubulure and reaching nearly to the bottom.

(20) J. B. asks how to make canvas waterproof and pliable. A. Without altering its appearance or pliability canvas may be made water repellent by saturating it with a boiling solution of soap, pressing out excess of this, and then submitting it for a short time to the action of a hot bath of alum, aluminum sulphate or acetate, or lead acetate.

(21) E. H. asks for directions for filling the grain and polishing black walnut mouldings. A. Apply several good coats of alcoholic shellac varnish, and when dry rub down with a little pumice powder moistened with water. Then apply a flowing coat of French spirit copal varnish.

(22) E. S. asks to what extent power can be conveyed by electricity. In other words, is or would it be possible to convey sufficient power, by means of an electric current, from the Falls of Niagara to Hamilton, Ont., to turn a mill? A. About 50 per cent of the power may be sent over short distances. As the diameter of the conductor must increase with the distance, it would be practically impossible to transmit power by this means through the distance named.

(23) C. S. R. says: I am making a paper canoe, and want a waterproof glue to paste strips of thin paper together with. How can I make it at a small cost? A. Try the following: Clear pitch, 20 parts; boiled oil, 30 parts; litharge, 3 parts; mix thoroughly while hot. Applied hot in very small quantity, using a rubber.

I have a telephone of my own make, cigar boxes with a parchment disk, working over 200 feet of common twine. Could the twine be replaced by fine brass wire to resist the weather better? A. Wire may be used, but it generally gives unsatisfactory results. The cord may be protected from the action of the weather by saturating it with strong, hot solution of soap, and, after pressing out the excess, boiling it in a strong solution of aluminum or lead acetate.

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(24) G. F. P. asks: 1. Will steel castings answer for large horseshoe magnets? A. We do not know that steel castings have been tried for this purpose. We think, however, that they would answer. 2. How large a horseshoe magnet shall I use for a magneto call bell engine on a telephone line 1,000 feet long? A. Use an 8 inch. 3. I think of having the permanent magnet to revolve in front of the electro-magnet, instead of the reverse, as is usually done. Will this be attended with any disadvantage? A. Jarring works injury to permanent magnets. 4. In the modified form of Bell telephone with compound magnet ending in a soft iron core, how is the core attached, and how long is it? A. The flattened end of the core is clamped between the magnets. It should be about 2 inches long.

(25) G. F. B. asks for a simple way by which to determine the resistance of the rheostat, described in SCIENTIFIC AMERICAN of November 9, 1878. A. Use a galvanometer.

(26) H. J. R.—The pressure of water is about 0·433 lb. per square inch per foot of depth.

(27) W. L. L. asks: 1. Are not the climatic zones constantly but slowly changing their position on the surface of the earth, and if so, in what direction do they move? A. Has been asserted; evidence insufficient. 2. Can you explain why it is, at least navigators say so, that there is a greater field of ice and more dense at the South pole than that of the North? A. The southern hemisphere does contain more ice; attributed to greater land masses and higher elevations about the South pole. 3. When the earth is nearest the sun in December, what part of the globe's surface receives the most direct solar rays? A. South torrid zone. 4. When and by whom was this planet of ours named earth? A. Earth is an English word from the early Saxon. There is no means of telling how old the word is.

(28) J. B. D. asks: Will a cannon ball shot directly up acquire as great a velocity in falling as is imparted to it by the force of the powder; in other words, that it will strike the ground with the same velocity and force that it leaves the gun? A. If the shot were fired in a vacuum it would have equal velocities of ascension and descension. The resistance of the air impedes the shot.

(29) D. H. E. asks (1) how to proportion gin running gear. The mule track is 30 feet in diameter, cast iron segments 9 feet diameter, pinion 18 inches, and gin pulley 9 iuches in diameter. What size shall the band wheel be to drive the gin 150 revolutions per minute, and let mules travel 3 miles per hour? A. About 6 feet 9 inches. 2. Is there any difference in the power required, speed of gin being the same, to have a large cog wheel and small band wheel or a large band and small cog wheel? A. There is no essential difference, as we understand you.

(30) J. M. asks for the easiest way to magnetize small steel bars. A. Place the steel bar within a helix of copper wire through which passes the current from several Bunsen or bichromate cells for a minute or two; then interrupt the current and remove the magnet. Full directions in SCIENTIFIC AMERICAN SUPPLEMENT No. 142, in "How to make a Telephone."

(31) J. H. K. asks: What kind of metal is best to work in cream with, on churn dashers for example? A. Well tinned iron is good, but wood for many reasons is preferable to metal of any kind.

(32) W. H. S. asks what material to use in making flexible tubes for conveying air which is hot enough to render a room uncomfortable. A. Canvas tubes, saturated with strong aqueous solution of sodium tungstate and dried might fulfill the requirements, as we understand them.

(33) J. H. D. writes: We regulate the pressure of the street gas between the main and meter. Would it not be advantageous to the consumer to have a regulating lock? Just inside of the meter allow full pressure on the meter (a dry one) from the company's gasometer. Is gas compressible? If so, would it not pack slightly in the meter under the gasometer pressure? A. The density of gas is influenced both by pressure and temperature. Little if any advantage would result from the arrangement proposed, under ordinary circumstances.

(34) W. S. W., Jr., and others, who ask how to detect gold in sulphurets, etc. A. See Plattner's "Manual of Qualitative and Quantitative Analysis with the Blowpipe," pp. 318, 320, and 422. In practice, the most satisfactory method of detecting very small quantities of gold in such ores is as follows: Reduce the whole of a sample of several ounces of the ore, by grinding, to an impalpable powder, that will pass readily through an 80 mesh sieve; mix about a drachm of the well mixed powder with ten times its weight of pure lead and one or two fragments of borax glass the size of peas, place in a scorifier and expose in a closed muffle to bright red heat until the lead is all fused and the ore floats on top; then open the muffle and let a current of air pass slowly over the red hot scorifier and its fused contents until the ore has been absorbed and the fused metal has disappeared beneath a covering of litharge; then remove, cool, break, remove and clean the lead button, and place it carefully in a heated cupel weighing somewhat more than the bead; when the lead has melted the muffle is opened and air allowed to pass over the fluid mass until the lead has all been converted into litharge, and the litharge absorbed by the cupel, leaving the gold and silver behind; if the bead is white, silver is present; add about twice the weight of the bead of pure silver, fuse together with the blowpipe flame on a charcoal support, flatten while hot on an anvil, and heat for some time to boiling with pure nitric acid, which dissolves the silver, leaving the gold, if any were present in the ore, as a brownish black mass, which shows the characteristic luster when pressed with a knife blade, and when brought into contact with a drop of aqua regia, and then with a crystal of stannous chloride developes a purplish-red, violet, or brownish-red coloration—purple of Cassius.

(35) L. J. O. and others.—We intend publishing at an early date in the SCIENTIFIC AMERICAN SUPPLEMENT a description of a telephone call.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

G. H.—No. 1 is chiefly quartz and iron sulphide. No. 2. The fragment contains a little gray copper. No. 3 is a variety of bituminous coal. No. 4 is iron sulphide with a little copper. Nos. 5 and 6 are principally iron sulphide. No. 7 contains lead sulphide. Some of this may contain silver.—F. F.—The white pebbles are quartz; the rest are jasper. Of little value.

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:

A Voltaic Pile. By M. G.

HINTS TO CORRESPONDENTS.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Many of our correspondents make inquiries which cannot properly be answered in these columns. Such inquiries, if signed by initials only, are liable to be cast into the waste basket.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

October 8, 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.

Auger bits, manufacture of, J. Swan ... 208,862
Awning, metallic, E. O. Pohl ... 208,692
Axle nut, vehicle, I. B. Boyce ... 208,667
Axles, preventing loss of nuts from, I. B. Boyce 208,669
Barley and malt drier, G. S. Reuter ... 208,849
Basin, catch, B. Kottmann ... 208,827
Bath, portable shower, D. Deshon ... 208,720
Bathing apparatus, medical, J. De Beer ... 208,666
Bed bottom, spring, H. Tucker ... 208,867
Bedstead guard, F. Diescher ... 208,721
Bee hive, W. C. Riffe ... 208,851
Bee hive, D. T. Tripp ... 208,772
Blind slat retainer, T. O'Regan ... 208,691
Boiler, cylindrical steam, W. Tucker ... 208,868
Boilers, removing dirt, etc., from steam, A. Collins 208,794
Book cover, detachable, E. F. Newkirk ... 208,689
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