

**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.

Drawings and Engravings of Machinery a specialty. Pemberton & Scott, draughtsmen, 37 Park Row, Room 30.

Alcott's Turbine received the Centennial Medal.

Wanted.—Second Hand Screw or Lever Press for die work 6 in. space, die 20 in. long. Address "Norman," New York city.

For Sale—36" x 48 Horizontal High Pressure Condensed Engine; very cheap. At Shearman's, 132 N. 3d St., Philadelphia.

For Sale—State Rights of Mathews' Monitor Windmill. Address D. Bennett Bancroft, Almont, Mich.

Four Horse Power Engine and Boiler, N. Y. Safety Steam Power Co.'s make; good as new; for sale at a bargain. H. M. Quackenbush, Herkimer, N. Y.

Wanted, Business.—Will buy Inventions or Manufacture on Royalty. R. K. Teller, Unadilla (N. Y.) Machine Works.

Address all orders for the Eclipse Engines, described in Sci. Am. of April 6, 1878, to Charles Sperry, Westbrook, Conn. Send for circulars.

Blower Wanted.—Second-hand Noiseless Fan to feed Boiler. Frank Haynes, Box 2739, Boston, Mass.

Manufacturers' special interest to address Bentel, Margedant & Co., Hamilton, Ohio, for the best and latest improved Wood Cutting Machinery.

Makers of Steel Thimbles will please send their address to Henry Kennedy, Fairview, Erie Co., Pa.

Wanted.—Woolen Mill Superintendent; one thoroughly conversant with the manufacture of all classes of woolen and worsted fabrics. Address, giving references as to character, ability, and experience, and expectations as to salary, P. O. Box 1926, N. Y.

For Sale—60" Boring Lathe, \$100; 18' x 9 ft. Lathe, \$185; 8 ft. Planer, \$350. At Shearman's, 132 N. 3d St., Philadelphia.

\$10,000.—A manufacturing company having room and power to spare, desire to find some additional staple article to make affording good profit, and that can be extended into a large business. Part of the necessary capital furnished if desired. Address P. O. Drawer 417, Bridgeport, Conn.

Cornish Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boiler Makers. Robt. Wetherill & Co., Chester, Pa.

24 inch Second-hand Planer, and 12 inch Jointer, or Buzz Planer, both in first-class order, for sale by Bentel, Margedant & Co., Hamilton, Ohio.

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

Wrenches.—The Lipsy "Reliable" is strongest and best. Six inch sample by mail 60 cents. Roper Caloric Engine Manufacturing Co., 91 Washington St., N. Y.

Carriage Axles, Springs, Bolts. Wanted full particulars and prices of machines used in the manufacture of above. Address Selby & Co., Longmore St., Birmingham, England.

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

Friction Clutches warranted to drive Circular Log Saws direct on the arbor, and Upright Mill Spindles, which can be stopped instantly; Safety Elevators, and Hoisting Machinery. D. Frisbie & Co., New Haven, Ct.

Union Eyelet Company, Providence, R. I., Manufacturers of Patented Novelties on royalty or otherwise.

For the best Bone Mill and Mineral Crushing Machines—five sizes, great variety of work—address Baugh & Sons, Philadelphia, Pa.

More than twelve thousand crank shafts made by Chester Steel Castings Co. now running; 8 years' constant use proves them stronger and more durable than wrought iron. See advertisement, page 270.

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

Machine Cut Brass Gear Wheels for Models, etc. (New List.) D. Gilbert & Son, 212 Chester St., Phila., Pa.

Boilers & Engines cheap. Lovegrove & Co., Phila., Pa.

Weldless Cold-drawn Steel Boiler and Hydraulic Tubes. Leng & Ogden, 212 Pearl St., N. Y.

Skinner Portable Engine, Improved, 2 1/2 to 10 H. P. Skinner & Wood, Erie, Pa.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

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

Walrath's Improved Portable Engines best in market; 3 to 8 H. P. Peter Walrath, Chittenango, N. Y.

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

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page.

Painters' Rapid Graining Process. J. J. Callow, Cleveland, O.

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

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue.

Power & Foot Presses, Ferracite Co., Bridgeton, N. J.

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

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

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

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

Talley's Hydraulic Engine (see description and cut March 9, 1878), as a simple, cheap, effective and economical power, is unsurpassed, and is meeting with great success. Economy Hydraulic Engine Co., Kansas City, Mo. Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass. Bound Volumes of the Scientific American.—I have on hand bound volumes of the Scientific American, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 270. John Edwards, P. O. Box 773, N. Y.

**NEW BOOKS AND PUBLICATIONS.**

**DIE SAHARA, ODER VON OASE ZU OASE.** Von Dr. Josef Chavanne. A. Hartleben's Verlag in Wien, Pesth und Leipzig. 1878. Lieferung I. & II.

Two widely separated portions of the earth are at present, more prominently than all others, engaging the attention of explorers—the Arctic regions, and the mysterious interior of that dusky continent, Africa. To a portion of the latter country, full of importance and interest both from its extent and remarkable natural characters, the author has devoted his book entitled "The Sahara, or From Oasis to Oasis." There is, perhaps, no region of the globe about which more erroneous ideas popularly exist than regarding the Sahara. The notion usually held is precisely that of the old Roman geographers, who picture it as a boundless plain over which the wind continuously and sportively chases clouds of sand. The truth is, however, that we find here conjoined the sharpest contrasts of landscape character. Every gradation of landscape form is represented—Alpine scenery in no wise inferior to that of Switzerland, wild, deep, rocky valleys, large and extended mountains with snow-crowned summits, areas of luxuriant vegetation, a wealth of water which manifests itself under the form of lakes and rivers; then, a few hours farther on, almost imperceptibly, we reach bare, waterless plains, destitute of organic life and dotted with sandy dunes. A long residence and travels of many months in the northwestern part of the Desert have encouraged the author to sketch, in a popular, easily understood, and somewhat extended form, a picture of the Sahara in its entirety which shall be true to nature. It is not his intention to give a description which shall meet the demands of the exact sciences—the book is rather designed to present to the gaze of the general reader a correct view of the natural characteristics of every part of the Sahara, and the life, manners, and customs of its inhabitants. Where words alone fail to give a correct idea of a landscape, a type of the people, scenes of domestic life, or forms of vegetation, illustrations will be added to the text. The complete work will contain seven colored plates, sixty-four text illustrations, and a map of the Sahara. The entire work will be issued in 18 parts, of about 32 pages each, the first two of which have just reached us.

**UNCLAIMED MONEY. A Handy Book for Heirs at Law, Next of Kin, and Persons in Search of a Clew to Unclaimed Money.** By Edward Preston. London: Reeves & Turner.

The author, who has made a specialty of the subject treated of in this little work, has here brought together a large amount of curious, interesting, and valuable information on unclaimed money, eccentric wills, and such kindred topics. Although evidently prepared more especially to meet the wants of the English people, it may not prove less valuable to some of our own countrymen, particularly those who are connected by ties of consanguinity with the "mother country," and who may perhaps, for that reason, have "great expectations" from that quarter.

**ARGUMENTS BEFORE THE COMMITTEE ON PATENTS OF THE HOUSE OF REPRESENTATIVES, in February and March, 1878; pp. 355.** Washington City: Thos. McGill & Co.

We have here the arguments of Messrs. J. H. Raymond, G. H. Christy, C. C. Coffin, H. D. Hyde, J. J. Storror, George Payson, C. S. Whitman, A. H. Walker, Elisha Foote, Chauncey Smith, and S. A. Hurlbut, for and against the bill to amend the patent laws, now before the House of Representatives. As we shall review at considerable length elsewhere the facts and arguments presented by these gentlemen, we need say no more here than that the volume contains very much of interest to all who have the industrial progress and prosperity of our country at heart.

Messrs. W. Holberton & Co., of 117 Fulton street, this city, have issued a new and enlarged edition of their catalogue and handbook for sportsmen, which we can fully recommend to all desiring guns, fishing tackle, camp outfits, sportsmen's clothing, sporting books, etc., as an excellent manual showing the best and most approved articles of the kind. Mr. Holberton is an experienced fisherman, and his advice may be relied upon when selection of goods is left to him, and at the same time his knowledge enables him to offer a stock of all that is new and useful of the latest improvements in sporting tackle. The catalogue is finely illustrated and contains several excellent practical papers on angling, shooting, and camping. Its price is 15 cents.



**D. C.**—By the application of the following rule you can solve the examples: Horse power=(area of piston in square inches)×(speed of piston in feet per minute)÷(mean pressure of steam during stroke in lbs. per square inch)÷33,000.—J. L. & Co.—Your best plan, before making a change, is to have your engine and boiler tested, since it is possible that the engine is wasteful, so that the boiler may be large enough.—J. W. S.—We could not do justice to the subject in these columns. If you have no opportunity to visit a rope-walk, consult some good encyclopedia.—S. B. and J. S. A.—See answer No. 67, SCIENTIFIC AMERICAN, April 20, 1878, and pp. 191 and 219, current volume.—C. E. T.—You will find the information desired in full on p. 38, vol. 36, of SCIENTIFIC AMERICAN. We have not much faith in such instruments.—A. S. C.—See SUPPLEMENT, No. 109, p. 1738.—T. J. F.—See p. 408, SCIENTIFIC AMERICAN, June 30, 1877.—G. I. W.—You do not send sufficient data for the air pump, but you can calculate approximately how much steam your engine will use per minute, and then make an air pump of sufficient capacity to deliver from 35 to 40 times as much weight of water.—T. C.—It is difficult to give a simple explanation, free from analysis, that is satisfactory, and the subject would require too much space for these columns. You will find a popular description in Johnson's Cyclopaedia.—J. D. W.—Any kind of hide that is thick enough can be made to answer. The best qualities of lace leather derive many of their advantages from the careful treatment to which they have been subjected. We are not positive about the sample.—J. G. R.—You should make your wishes known through the "Business and Personal" column.—J. J. J.—It is probable that the circulation will be imperfect through the arrangement described, unless the pipes are quite large.—S. E. W.—If you will address a manufacturer you may obtain information on the points referred to in your letter.—J. J. W.—Consult Nugent's "Treatise on Optics."—R. K. F.—The problem is one of those quibbles which can never be put to rest. It was discussed at length in the SCIENTIFIC AMERICAN, vol. 27, No. 21, p. 330, and other issues.—W. H. D.—See answers Nos. 19 and 22, p. 155, SCIENTIFIC AMERICAN, of March 9, 1878.—H. P. C.—The premises on which your questions are put are incorrect. It is impossible to straighten the rope.—W. B. P.—See SUPPLEMENT, No. 20, p. 315.—"Cincinnati."—It appears to us that the building would be safer without lightning rods than it would be with rods put up in the way described.—C. E. O.—It may be that your magnet is not sufficiently powerful. It should hold about 1 oz. of iron. Use finer magnet wire, and wind it directly on the magnet wrapped with one layer of writing paper. See answers 19, 15, and 22, p. 155, SCIENTIFIC AMERICAN of March 9, 1878.—C. W. B.—It will be necessary to send sample of the water containing the animals referred to before we can answer you.—J. C. H.—There are a number of devices of the kind referred to in your letter. You can probably obtain addresses by inserting a notice in the "Business and Personal" column.

(1) E. W. asks: 1. What is meerscham? A. Meerscham (sepiolite) is a hydrous silicate of magnesia—silica 60.8, magnesia 27.1, water 12.1—100. 2. Where does it come from? A. It is found in Spain and several countries at the head of the Mediterranean.

(2) C. E. L. writes: I notice in the SCIENTIFIC AMERICAN of April 6, 1878, p. 209, an account of the performance of certain telephone circuits not connected in any way with the wires over which the concert music was being transmitted. There was one incident that the papers had no account of, that took place on the wire of Dr. Speare, which is worked with Morse instruments and does not approach nearer than 15 feet to the Western Union wires. He received the whole concert on an ordinary Morse sander by placing a cylinder of cardboard over one of the coils, upon which he placed an ordinary ferrotype picture. The Doctor says he is frequently able to hear the Morse work from the Western Union wires in the same manner.

(3) J. F. M. writes: The water at this place contains a large amount of lime. How can I prevent scale forming in the boiler? A. You should use a feed water heater with sediment collector, and frequently blow off.

(4) F. M. C. asks: What will take the scale out of a steam boiler? The one I refer to is an upright of about 6 horse power. A. Without knowing the nature of the scale, it is impossible to recommend any specific remedy. By allowing the water in the boiler to become cool, after the fire has been hauled, and then letting it out, the scale is frequently so much softened that it can be brushed or washed off.

(5) M. E. J. asks: What effort, in foot lbs., does it require to draw a 14 inch plow, cutting 6 inches deep, through ordinary ground? A. For any special case, this could only be determined by experiment. What will make a cheap black paint to dip harrow teeth in? A. We think tar thinned with turpentine would answer very well.

What book will assist me in making drawings of models? A. Professor Warren's works are highly spoken of. See also the series of articles by Professor MacCord in the SCIENTIFIC AMERICAN SUPPLEMENT.

(6) H. K. writes: 1. In Barnes' "History of the United States," at the close of the description of the Atlantic cable, it is said that a message had been sent by a battery made of a percussion cap. Please explain. A. We believe the cap was filled with acidulated water, and in it was suspended a shred of zinc, thus forming a battery, in which the positive pole was the copper gun cap, and the shred of zinc was the negative pole. 2. Is moist earth a better conductor of electricity than water? A. That will depend on the kind of earth. 3. How is the Trouvé moist battery constructed? A. See SCIENTIFIC AMERICAN, November 24, 1877, p. 323.

(7) G. H. O. writes: I am making an electric machine, and a short time ago purchased a sheet of vulcanized rubber about 1/4 inch thick and 15 inches in diameter for the plate. This was cut round, and promised to do well. But it has commenced to curl up, and I cannot straighten it out. What is the cause of this, and is there any remedy for it? A. It may be that the rubber plate is not hard enough, or that it has been exposed to undue heat, and sagged out of form by its own weight; however, you can straighten it again by placing it on a flat sheet of metal, held on the surface of boiling water. The rubber plate will become softened by the heat of the boiling water, and when it lies flat on the metal plate, the latter should be removed from the surface of the water and allowed to cool slowly, with the rubber plate on it.

(8) E. F. G. writes: In the SCIENTIFIC AMERICAN of April 6, 1878, p. 214, under the caption "How some mysterious boiler explosions may occur," it is stated that some theorists have put forward the idea that the steam had turned to gas. Can that be possible? A. Yes; by decomposition of the steam into its elements, hydrogen and oxygen, by chemical or electrical means. The statement in the case referred to, however, was mentioned as an absurdity.

(9) J. C. asks: What is the simplest method of melting brass for small castings? A. In a plumbago crucible in a blacksmith's forge.

(10) E. W. M. asks: What is the way to apply diamond powder to the edge of a soft iron lap? The lap is to be used in cutting glass. A. With a brush and olive oil.

(11) S. S. C. asks: Is any greater injury done to the bottoms of boilers, and also to grate bars, by the use of coke as fuel than by the use of coal? A. Generally, no.

(12) J. H. A. asks: Will not a given amount of water (say 36 cubic inches) raise more water to a given height (say 40 feet) if applied on a breast bucket wheel 10 feet diameter under an 8 foot head, driving a force pump, than it would if applied to a hydraulic ram? A. The wheel will probably give as much as twice the efficiency of the ram. 2. Is not a suction and force pump better (for that height) than a force pump alone? A. We doubt whether one has any especial advantage over the other. 3. Does it require more power to force a stream of water, say 3/4 inch, through a large pipe, say 12 inches in diameter, than through a 3/4 inch pipe? A. Quite the contrary.

(13) A. J. B. writes: I have a small horizontal engine with cylinder 3 x 6 inches, running at 300 revolutions per minute, mounted on a horizontal boiler of the locomotive pattern, 16 inches in diameter by 4 feet long, with 11 2-inch tubes. 1. Is the boiler of sufficient capacity for the engine? A. We think so. 2. What shall I use to feed the boiler, an injector or a pump? A. An injector will answer very well. 3. What material is best for painting the engine? A. Black varnish made from petroleum can be used. 4. Will not this engine, with 70 lbs. of steam, and cutting off at 1/2 stroke, give fully 2 horse power? A. It probably will. In reference to other inquiries address the manufacturers.

(14) G. W. H. asks: If a ball were dropped from the surface toward the center of the earth, through a hole passing through the earth, would it pass beyond the center or stop when it reached its center? A. It would pass beyond, and return.

(15) J. W. A. asks: How many lbs. can a good engine raise 1 foot from the ground if fed with 1 bushel of coal? What is the amount of power stored up in that quantity of coal? A. Good engines require from 2 1/2 to 3 lbs. of coal for each horse power developed per hour, or perform 1,980,000 foot lbs. of work, with the above amount of coal.

It is said that the temperature of an Esquimaux snow hut is sometimes raised to 90° Fah., partly by the heat from the bodies of its inmates, and partly by two or three lamps burning. If so, why does the hut not melt down? A. The statement can scarcely refer to the walls of the hut.

(16) T. W. G. writes: I am making a collection of coins, and would like a recipe for keeping them bright when exposed to the air. A. Thinned pale anisé varnish is often used; dry and warm the coin and dip quickly. Photographers' unsensitized collodion also answers well if the coin is not handled.

(17) S. W. writes: I have read of a plan of felling trees by cutting through them with a platinum wire heated red hot by a battery. Please inform me further. A. The battery must be of sufficient power to readily heat the platinum wire to a very bright red heat; if the platinum wire is thin, less battery power is required to do the same work, but the thin wire, when heated, is easily broken.

What is the best brain food? A. That which is found to have the best effect on the system generally.

(18) J. W. P. asks: What is the system of laying out a steam cylinder? I would like to know how much space it takes for 1 horse power. A. It will depend on the pressure of steam and piston speed. Thus, calling A the area of the piston in square inches, P the mean pressure in the cylinder in lbs. per square inch, and S the piston speed in feet per minute,

$$\text{Horse power} = \frac{A \times S \times P}{33,000}$$

From this equation the proportions of cylinder for a given case can be determined.

(19) C. S. asks: Will you please define in plain language precisely what is the meaning of the phrase, "limit of elasticity" or "elastic limit" so frequently used in discussions on the strength and qualities of iron? A. As ordinarily used, the expression means the tensile force, in lbs. per square inch, that a material can bear without receiving an injurious set.

(20) A. G. C. asks: What substance is used with plumbago for coating the hulls of yachts, and what is the mode of applying? I do not mean a temporary coat to last just for a race, but a permanent coating. A. We are not aware of any mode of applying a permanent plumbago coating. It is usually put on with tallow, and only intended for special work.

What book gives information on rigging boats, names of ropes, in fact general information on the subject? A. Consult Luce's or Alston's "Seamanship."

(21) A. L. H. asks: Are locomotive engineers obliged to have papers? A. The regulations in regard to this matter vary on different roads, and you should make inquiries of the officials. We believe there are no State laws requiring locomotive runners to be licensed.

(22) E. B. J. writes: I have tried plaster moulds to run metal to make a medal. It does not produce sharp impressions. How can I make a copper mould? A. By cutting it out with die sinkers' tools.

(23) G. D. M. writes: Please advise me as to the best pipe for conveying water to house from well 250 feet distant. We laid new iron pipe 1 inch in diameter last July, and have never yet been able to use the water owing to flakes of rust and fine particles which appear in the water no matter how long it is allowed to run. The pipe is not exposed to the air, but in the well is covered with rust a quarter of an inch in thickness. The stones of the well near the surface of the water are also covered with a yellowish rusty looking slime. A. Use lead pipe lined with tin.