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 asearly as Thursday morning to appear in next issue.

See Baker's Telephone adv., p. 44, last number.

The Berryman Feed Water Heater and Purifier and Feed Pump. I. B. Davis' Patent. See illus. adv., p. 44. Light and Fine Machinery and Tools to Order. Lathe catalogue for stamp. E. O. Chase, Newark, N. J.

Manufacturers of Drain Tile Machinery will please send address to C. G. Metzler, Columbus, Kan.

For Machinists and Apprentices.—The Student's Illustrated Guide to Practical Draughting. Sent on receipt of \$1. T.P.Pemberton, 142 Greenwich St. P.O.Box 3083, N.Y.

Our goods speak for themselves, and a trial will convince the most skeptical of their superiority over all others. Lehigh Valley Emery Wheel Co., Lehighton, Pa. Wanted. - A Second-hand Bicycle, about 46 in. wheel. Address, with price, Box 31, Phoenix, Arizona

Caution to Manufacturers and Others.—The attention of those interested is called to the fact that materials for covering hot air and steam pipes, boilers, etc., which purport to contain asbestos, should bear the name of H. W. Johns. 87 Maiden Lane, N. Y., who is the inventor and patentee of genuine asbestos materials, comprising paints, roofing, steam packing, millboard sheathings, etc.

Chemist's Pocket Book .-- For Chemical Manufacturers, Metallurgists, Dyers, Distillers, Brewers, Sugar Refiners, Photographers, etc. By Thomas Bayley. \$2, mail free. E. & F. N. Spon, 446 Broome St., New York.

Patent Wanted .- I want to buy whole or partinterest, or manufacture on royalty. Address H. C. Lyon, Nev

Manufacturers, Steam Boiler Owners, Towns aud Cities desiring pure water, send for circular to the Newark Filtering Co., Newark. N. J.

For Sale Cheap-6 Lathes, 2 Planers. 5 Upright Drills 1 Fowler Press. All on hand. York & Smith, Clevel'd, O. Malleable and Gray Iron Castings to order, by Capital City Malleable Iron Co., Albany, N. Y.

Electric Lights.-Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil. For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties. Lightning Screw Plates and Labor-saving Tools, p. 30. Send for Pamphlet of Compilation of Tests of Turbine

Water Wheels. Barber, Keiser & Co., Allentown, Pa. List of Machinists in United States and Canada, just compiled; price, \$10. A. C. Farley & Co., Philadelphia. Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N.J. Latest Improved Diamond Drills. Send for circular

to M. C. Bullock, 80 to 88 Market St., Chicago, Ill. Wood Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O. The Medart Pat. Wrought Rim Pulley. See adv., p. 44.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N. H. For Belt Studs, Belt Hooks, Belt Couplers, Belt Punches, Baxter Wrenches, write Greene, Tweed & Co., N.Y The Sweetland Chuck. See illus. adv., p. 450.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of pages, published by Jas. F. Hotchkiss, John St.. New York, mailed free to any address.

4 to 40 H. P. Steam Engines. See adv. p. 382.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCI-ENTIFIC AMERICAN SUPPLIEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York. Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 12.

Split Polleys at low prices, and of same strength and Yocom & Son's Shafting appearance as Whole Pulleys. Works, Drinker St., Philadelphia, Pa.

See Bentel, Margedant & Co.'s adv., page 46. Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited. Erie, Pa

gines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsb'g, Pa. the necessity of ventilation and the vital value of fresh Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss. Brooklyn, N. Y. PRESIDENT GARFIELD AND EDUCATION. of the question. Cope & Maxwell M'f'g Co.'s Pump adv., page 45.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 412.

Saw Mill Machinery. Stearns Mfg. Co. See p. 29. List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S.C.Forsaith & Co., Manchester, N.H., and N.Y.city. Supplee Steam Engine. See adv. p. 30.

Machine Knives for Wood-working Machin Binders, and Paper Mills. Also manufacturers of Solo man's Parallel Vise, Taylor, Stiles & Co., Riegelsville N.J.

Peck's Patent Drop Press. See adv., page 30. Diamond Tools. J. Dickinson, 64 Nassau St., N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. 50,000 Sawyers wanted. Yourfull address for Emer-

son's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa. Telegraph, Telephone, Elec. Light Supplies. See p. 46.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling. see Frisbie's ad. p. 45. Eagle Anvils, 10 cents per pound. Fully warranted.

Peerless Colors for Mortar. French, Richards & Co., 4:0 ('allowhiil St., Philadelphia, Pa.

Gear Wheels for Models (list free); Experimental Gould & Eberhardt's Machinists' Tools. See adv., p. 45. the prominent systems of electric lighting. Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. I. S. Graves & Son. Rochester, N. Y.

For Leather, Rubber, or Cotton Belting, Linen Hose or Rubber Hose, write Greene, Tweed & Co., N. Y. Safety Boilers. See Harrison Boiler Works adv., p. 44. publications devoted to photography has been of ser- F. W., Jr., page 425 (26), volumexlv.

Engines, 10 to 50 H. P., \$250 to \$500. See adv., p. 46. Metallic Letters and Figures to put on Foundry Patterns, all sizes. H. W. Knight, Seneca Falls, N. Y.

Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and EL MAL DEL PINTO. Por Gustavo Ruiz y home amusement. 116 page illustrated catalogue free. Sandoval, Medico de la Escuela de McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Barrel, Key, Hogshead, Stave Mach'y. See adv. p. 45. Upright Self-feeding Hand Drilling Machine. Excel-

lent construction. Pratt & Whitney Co., Hartford, Conn. Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p.45.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete and easily under-stood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance. Williamsport, Pa.

Improved Skinner Portable Engines. Erie, Pa.

The Porter-Allen High Speed Steam Engine. Southork Foundry & Mach. Co.,430 Washington Av., Phila. P. The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher. Schumm & Co., Philadelphia, Pa. Send for circular.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes un by horse power. See p. 45. Totten & Co., Pittsburg. Portable Power Drills. See Stow Shaft adv., p. 45.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 4.6

NEW BOOKS AND PUBLICATIONS.

SECOND ANNUAL REPORT OF THE STATE doctor recommends that greater attention be paid to BOARD OF HEALTH, LUNACY, AND CHARITY OF MASSACHUSETTS. 1880. Supplement containing Report and Paperson Public Health. Boston. 1881.

The general report is brief, the bulk of the volume eing given to special papers on the Pollution of Deer-BOLETIN DE LA SOCIEDAD DE GEOGRAFIA Y field River and Miller's River: the Separate System of Sewage; Intermittent Fever in Massachusetts; School, house Sanitation: and the Health of Towns, with special reference to the Epidemic at Adams and the Sanitary Condition of Holyoke.

MECHANICAL INDUSTRIES EXPLAINED. Alexander Watt. Edinburgh: W. & A. K. Johnston.

A scrappy sort of book for "the rising youth of both sexes," describing briefly a number of industrial processes, chiefly mechanical. The information is good so far as it goes, but the author's style, though less techmcal than in his "chemical industries," is not particularly well suited for juvenile reading.

DANGERS TO HEALTH: A PICTORIAL GUIDE TO DOMESTIC SANITARY DEFECTS. By T. Pridgin Teale. Philadelphia: Presley Blakiston.

A model book for its purpose. Indeed it is safe to say that an hour's study of its impressive and readily understood illustrations of sanitary defects in house drains, sewer connections, and the rest, will do more to open the eyes of householders, plumbers, and builders, to dangers to health through dishonest and ignorant work in sanitary appliances, than months of study of ordinary treatises on sanitary engineering and domestic economy. It is a book worthy of the widest circula-

PRACTICAL LESSONS IN ARCHITECTURAL DRAWING. 33 full page plates and 33 woodcuts. By Wm. B. Tuthill. New York: William T. Comstock.

Assuming some knowledge of architectural drawing on the part of the learner, the author shows, by examples in several classes of construction, how to make working drawings and write the specifications for buildings. The examples give plans, elevations, sections, and details of frame, brick, and stone buildings

A New System of Ventulation. By Henry A. Gouge. New York: D. Van Nostrand:

Describes the principles, methods, and results of Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Gouge's system of ventil ation, and contains a large Corrugated Wrought Iron for Tires on Traction En- amount of useful information and suggestion touching

> HIRAM COLLEGE MEMORIAL. By B. A. Hinsdale, President Hiram College. Boston: James R. Osgood & Co.

A memorial volume of special interest to those who knew Mr. Garfield as schoolmate, teacher, and towns

THE OPEN FIRE PLACE IN ALL AGES.

nam's volume published last year. The illustrations MENT referred to in these columns may be had at this tervening would there be any change in the result? A. have been increased to over 300, comprising many con- office. Price 10 cents each. tributions of specially fine and artistic work by modern architects as well as selections from the best work of for examination, should be careful to distinctly mark or tain extent protected thereby. earlier builders.

STEAM HEATING FOR BUILDINGS, OR HINTS TO STEAM FITTERS. By William J. Baldwin. New York: John Wiley &

A straightforward, plain, and practical handbook for the young steam fitter.

FOR 1882. London: Office of the Ironmonger.

The fourteenth issue of the diary carries, in addition to its record pages and usual freight of advertisements, a summary of the British ceusus of last year and an Work, etc. D. Gilbert & Son, 212 Chester St., Phila.. Pa. illustrated review (not altogether impartial) of some of on it, or will the oil prevent me? A. You may eucouu-

> THE PHOTOGRAPHIC AMATEUR. By J. Traill boiled in oil as proposed. Taylor. New York: Scoville Manufacturing Company.

The author's editorial experience in connection with

vice in the preparation of this mannal. He tells $\ensuremath{\mathbf{w}}\xspace \ensuremath{\mathsf{hat}}$ he has to say with commendable directness, and in terms which the amateur student of the art cannot fail to Pays well on small investment. - Stereopticons, Magic readily understand. Special attention is given to dry plate photography.

Sandoval, Medico de la Escuela de Mexico. Mexico. 1881.

In this very important contribution to medical science, which has been honored by a prize from the Mexican Academy of Medicine, the author gives a very exhaustive study of a peculiar skin disease, which, although usually regarded as confined to Mexico, is here stated to be also prevalent in several parts of Central and South America. The disease (mal del pinto, or "blue stain," as it has been called in English is a contagious one, and manifests itself in the form of white, blue, or red patches on the feet, hands, and face, forming pamful ulcerations, and giving the patient, as we should judge from the colored plates accompanying the memoir, a very unsightly appearance. In the more advanced stages the affection is accompanied by a sickening odor, the digestive faculty becomes impaired, the patient loses flesh and strength, and betakes himself to his bed, not to sleep, however, for extreme wakefulness is one of the symptoms of this stage. The cause of the endemic has not hitherto been well understood, but Dr. Ruiz in the work before us shows pretty conclu sively from his microscopic examinations that it belongs to the category of zymotic diseases, and is produced by a fungus which he names microsporum hidalgoense. The affection appears to have no limit to its duration, and is cured only after long treatment by in-ternal and topical remedies, leaving its traces then in the form of whitish cicatrices. As a prophylactic the matters of cleanliness, public and private, and that certain forms of vegetable food, such as maize (which he and believes harbors the fungus), should be strictly avoided. The memoir is finely illustrated, and is accompanied by a map showing the zone occupied by the diseas

ESTADISTICA. Mexico. 1881,

The number before us of the Mexican Geographical Society's Bulletin, comprising parts 7, 8, 9, 10, and 11 of vol. v., contains several papers of more than ordinary value and interest, chief among which may be mentioned an important archæological memoir by Sr. Jose Ma. Reyes, wherein is traced the history of the immigration of the Pueblos to the American continent, and especially to the territory now occupied by the Republic of Mexico. The paper is well illustrated, and gives evidence of great painstaking research on the part of its author. The other papers are: " A Synoptical View of the State of San Luis Potosi," with various historical, geographical, statistical, and governmental data, by Sr. Rafael del Castillo; and an elaborate "History of the Beneficiary Institutions in Mexico," by Sr. Juan de D. Peza.

by Professor Ira Remsen, of the Johns Hopkins University, Baltimore.

This ably-conducted journal, now in its third volume, has occupied a prominent place in the serial literature of chemistry from its very beginning. Each number contains original articles by prominent American and foreign chemists, reviews of works relating to chemical science, reports of progress in the various departments of chemistry, and items of general interest to chemists. The journal is a model of typographical excellence, and is published in numbers of from 64 to 80 pages, six numbers forming a volume, at the subscription price of



HINT'S TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the

Names and addresses of correspondents will not be given to inquirers.

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

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

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. J. Pickering Putnam. Boston.: James as we cannot be expected to spend time and lahor to obtain such information without remuneration.

Any numbers of the Scientific American

label their specimens so as to avoid error in their identification.

(1) E. C. B. asks: 1. Can I put anything on wood to prevent it from becoming water soaked without changing the natural color of the wood more than varnish would? If so, what and how done ? A. You can try the following process: Digest the wood THE IRONMONGER'S DIARY AND TEXT BOOK for twenty-four hours or more in a hot solution composed of 1 pound of soap (white soap) dissolved in 4 gallons of soft water, and then for several hours in a solution of 21/2 pounds of alum in 2 gallons of water. Finally rinse in running water and dry. 2. If I boil articles made of wood in linseed oil can I put a finish ter some difficulty in polishing wood that has been

> (2) J. C. S. writes: Will you please give me your opinion in regard to this new preservative "ozone," advertised in the papers? A. See answer to

(3) W. St. asks: Is there any apparatus by which pieces of mineral or other substance of pea size can be heated by a continuous stream of hot air to from 280° to350° Fah.? A. An apparatus for heating and employing hot air in the way proposed could be constructed without difficulty. It might resemble in some respects that employed in heating air for "hot blast" iron smelting furnaces. We think of no similar apparatus in use.

(4) E. C. B. asks: Please give me the cheapest process of japanning or blacking coppered wire like inclosed sample that has been injured by exposure. Can it be done by dipping, and without heating in an oven? A. The wire can be japanned in the way See "Japanning and Japans," in SUPPLE-MENT, No. 316.

(5) S. P. C. asks: Will you please state the difference, if any, between "galvanized," "mar-blized," and "granite" ware? Are these safe and wholesome to be use i for cooking purposes? A. Galvanized iron, so-called, is iron that has been coated with zinc by immersing the clear iron in the melted zinc. blized" and "granite" are technical names given to an iron ware that has been coated with a vitrified porcelain-like composition of certain earthy silicates—the vitrification being accomplished by heating the coated articles in a muffle furnace or kiln. These latter wares are, as now manufactured, unobjectionable. 'The galvanized ware is not fit for culinary purposes.

(6) R. A. C. asks: Has double refraction, as exhibited by Iceland spar, ever been explained? I am unable to find the explanation in any of the treatises on optics which I have seen. I can explain and demonstrate it in several ways. A. The cause of double re-fraction is not a mystery. You will find the matter explained on page 325, vol. xlv., "The Nature, Formation, and Uses of the Nicol Prism.'

(7) S. E. W. writes: I am running a circular saw mill with 22 horse power engine, 14 inches stroke making 16Grevolutions per minute. Would like to obtain more power by increasing size of pulley on mandrel. and speeding up engine sufficiently to keep up same relative speed of saw. Can I with safety increase speed of engine 20 to 25 revolutions per minute? Have already increased speed of engine about 20 revolutions, andwould like toadd about 20 to 25 more, making in all about 180 revolutions. A. Yes, if well balanced, and fly wheel not too large.

(8) L. D. writes: We have a boiler, 6 feet diameter, 12 feet long, with 132 3-inch flues; the grate surface is 4 feet long by 4 feet 6 inches wide, and 22 inches from boiler; bridge wall 12 inches from boiler; rear or back wall is 14 inches from end of boiler. We have a brick chimney, 85 feet high by 40 inches square inside, in which is a damper 24 feet up from floor, or about 10 feet above bridging, which we can close to any desired opening. Now, if we burn coal we burn about 5,500 lb. per day, and then we use only about one-thirdof the THE AMERICAN CHEMICAL JOURNAL. Edited power of engine; if we burn shavings from planing machines and sawdust from our factory, which is a sash, door, and blind factory, and a general woodworker, we can keep steam easier. Our fireman some way or another left the front doors open, and found the steam go up in hurry; he then fired a while that way, and found that he would burn a good less fuel by leaving the furnace doors open. He then told me about it, and I examined it and found it as he stated. Our engine is 20x30 slide valve; the air holes below grates are two, 141/2x18 each. Now please tell us what is wrong. A. There is nothing particularly wrong, though we think you would do better with either wood shavings or coal by reducing the throat of the flue at the back end of the boiler from 12 inches height to 8 inches. You do not get air enough to the gases of your fuel. Put a lining plate to your furnace door: then drill in the door about eight holes, 1 inch diameter, and thelining with as many five-sixteenths inch or three-eighths inch holes as you can well put in. It will not then be necessary to leave the door open.

> (9) D. D. D. writes: I am sinking a shaft through rock prospecting, and the water bothers me a great deal coming up through the holes we bore to blast with. Will you please inform me through your paper some cheap method of blasting so the water would not trouble? Can you inform me where I can get glycerine cartridges? A. Cartridges of dynamite or nitroglycerine are waterproof, and are generally employed for such purposes. See our advertising columns for addresses of manufacturers of these explosives.

(10) J. M. writes: 1. By putting iron and copper in contact, and allowing these metals to remain so, what effect would be produced on each? Would either corrode sooner, or otherwise? A. Under such conditions, if exposed to moisture, the metals form a galvanic pair, and the copper would in a measure be protected from corrosion at the expense of the iron; in other words, the iron would corrode faster than if not in contact with the copper 2. In the event of gine in-The zinc being the more positive of the series would be Correspondents sending samples of minerals, etc., more rapidly oxidized, the other metals being to a cer-

> (11) J. J. writes: Turtles may be kept for four or five months headed in a cask three parts filled with salt water if the bung is left out. About a quarter of the salt water should be drawn off and replaced by fresh salt water once every month or two, if in the tropics. One which was treated in this way in a 250gallon cask was pronounced by a turtle dealer in London to be as fine and fat a turtle as he had ever seen It realized one shilling and two pence per pound live weight.

> (12) C. H. L. asks: 1. What oil or substance could I use to mix with asphalt (Trinidad) to make a paint to be used cold, which could dry or evaporate, leaving the asphalt in nearly its natural state, so it would not run or soften under influence of sun's rays? Naphtha and turpentine are not satisfactory. Would resin oil answer? Am not familiar with its qualities. A. Common asphaltum contains moisture and volatile substances which must be eliminated before a good paint or varnish can be prepared with it. For the preparation of such a varnish see answer to E. H. L., page

293 (17), vol. xlv. Resin oil can be used in connection with the bitumen, but a diluent, such as turpentine or naphtha, will be necessary. 2. After painting a roof, say with asphalt or coal tar, what wash (cheap white preferred) could I use over the asphalt, etc., to absorb the sun's rays? Wish some article in powdered form (so to be handily transported) which can be mixed with water as reeded for use. A. As we understand you, fine chark or potter's clay could be used. 3. I also inclose sample of saturated felt or paper. Would like to know, if possible, with what substance the felt is saturated. A. The felt is saturated with crude coal tar from gas

- (13) N. L. writes: I made the induction coil described in the Scientific American Supplement, No. 160, and it proves very satisfactory. Now I want to know it it will give satisfaction to produce electric light? What kind of regulator can I use? Can I use the Brush electric light regulator, described in Supplement. No.162? How many of the copper and zinc batteries must I use? A. You cannot produce an electric light of any power with an induction coil. Use a dynamo machine or battery. For a description of these and of the best kinds of lamps for regulators, see Supplements, Nos. 157, 158, 159, 162, 222, 224, and 225. Also "Simple Electric Light Apparatus," in No. 149.
- (14) F. H. N. asks: 1. Where will I find complete directions for making a simple electric machine for electro plating and for electric light? A. See Sup-PLEMENT, No. 161. 2. I have a gravity battery, the cells of which are 5x7 inches. What kind of a solution should I put in them? A. Put in 11/2 lb. of sulphate of copper and fill the cell with water. 3. Could a tank be made of any very close grained hard wood for silver solution? A. No; wood of any kind gradually reacts on silver solutions and reduces them. See "Silver Plating," in Sup-PLEMENT, No. 810.
- (15) J. T. G. writes: My trouble is that my files rust after lying wrapped up in papers for some time. My method of putting them through after hardening is as follows: They are first put in dilute muriatic acid, then scrubbed with sand and water, then riused in clean running water and put in strong lime water, rinsed dried the lime is brushed out of the teeth and they are oiled with castor oil, sometimes extra lard oil, but they will rust no matter which oil we use, and they turn brown after coming out of the lime, or before getting to the lime, although they are put through as quick as possible. What I want to know; is muriatic ac d the best for cleaning files, and is there anything I can put in the lime that will destroy the acid and keep them clean and not liable to rust after being put through. Or can you give a better method of putting them through than the way I describe? Any information you can give, through your valuable paper, the Scientific Ameri-An, will be thankfully received by me. A. Rinse off theacid (muriatic) quickly in running water before putting in the lime water. Have the lime water boiling. The heated metal will dry spontaneously on removing it from this dip. Use lard, paraffine, or mineral sperm oils, or a mixture of these. If the oil is put on hot it will cover and keep the metal clean longer
- (16) G. B. writes: Is ozone made cheap enough to sell as an article of merchandise, and in what form is it best adapted to arrest all forms of decay? A. No: ozone or allotropic oxygen has only been observed as a gas. It has never been obtained in a concentrated form. The substance sold in the market as ozone appears to be sulphurous acid, or rather a preparation readily yielding that substance under favorable conditions.
- (17) J. G. D. asks for a receipt for making a glue joint for wood work that is insoluble in water A. You will find several good receipts for waterproof glue or cements under "Cements," in Supplement. No. 158. See also "Coments," in Supplement, No. 133.
- difference? A. Yes; and in hot weather, worse. 2. In large passenger steamers and merchant steamers what the eye of the saw will give size of the mandrel. are the hours? A. When running, the hours are, generally, for long voyages, four hours on duty and eight hours off. On shorter routes, the "watch" is generally the length of the sun. 3. What pay, and are they in the same standing as the crew or sailors? A. From \$30 to \$40 per month. Firemen generally rate above deck hands.
- (19) J. B. R. asks: Which is right: to blow the whistle, then start the machinery, in a manufactory, or start the engine first and then blow the whistle? A. Blow your whistle after your engine is in full operation. 2. A says that the diameter of a worm being larger or smaller increases or diminishes the speed of the worm gear the same as in spur gears or pulleys. B says it is not so. Which is correct? A. B is correct.
- (20) J. H. F. asks: Has any substitute pared would not stand the mechanical action of the flame as well as clear hard burned lime.
- (21) A. P. S. asks: Will you let me know if there is any way to mend a crack in the face of a radiator? A. 'Try the iron cement recommended on page 2510, Supplement No. 158.
- drying and sifting gravel for polishing sand. A. If softened by rolling and pounding it with mallet or rublarge quanties are to be operated upon, a revolving cylinder over a fire, like a coffee roaster, would be good for the drying process. To this cylinder, laid at an angle and to its lowest end, attach wire gauze or grating, with sections of different size mesh-the finest mesh next the drving cylinder-and under these sections place pans to catch what falls through.
- (23) H. A. S. asks: 1. At what speed should a No. 4 blower be driven for a twenty-six inch How far should it be placed from the cupola, and why?

 A. You may place it any convenient distance, say from

 Casting shovel blanks, mould for, E. Smith. 251,960 | Lamp, C. Röyle. 251,960 | Lamp, C. Röyle. 251,960 | Lamp, C. Röyle. 251,960 | Chain, drive; L. M. Rumsey 252,005 | Lamp, blow, R. T. Bishop. 251,974 | Chain, watch, G. W. Clampitt (r). 10,000 | Lamp, electric, S. L. Fox. 251,774

- cupola, but rather below it, so that in case of stopping for any cause, the gas shall not collect in the blower.
- (24) C. F. D. asks: 1. Is there any difference between one hundred pounds to square inch steam pressure and one hundred pounds cold water pressure? A. No. 2. If any difference, which tries the strength of boiler most? A. There is no difference, but it is generally admitted that the boiler is stronger at the temperature of the steam than when cold. 3. What is the difference, and why is there a difference? What cold water pressure should a boiler stand to be safe at 100 pounds steam? A. By government rule it should be tested to 150 pounds.
- (25) J. B. P. asks: What is the average net profit on tanning a hide, the hemlock bark costing about \$6 per cord? Of course, I know that sole, harness, kip. and calf require different amounts of bark. A. It is impossible to give definite information on this point, covering so great a business, extending all over the country. During the war, \$1 a hide was made in some instances on sole leather tanning, but for the last year or two the business of tanning all kinds of upper leather bas been a very close one, many ofd houses claiming that it has been done at a loss; while latterly. owing to the high price of hides, the best conducted sole-leather tanneries are making but the smallest margin of profit. The business is not one to embark in at any time with a view to speculative profits, in any locality, any more than is that of farming, and \$6 is above the average cost of hemlock bark, unless delivered
- (26) W. D. S. asks: 1. What is the highest working pressure it would be safe to carry on a boiler constructed of mercury flasks, as described in SCIEN-TIFIC AMERICAN SUPPLEMENT, No. 182. A. If properly connected, we think 200 pounds safely; but when complete they should be tested by water pressure to 50 per cent more than the greatest steam pressure you intend to use. 2. Could salt water be used in such a boiler? A. Not well. 3. Would I have topay twentywell in this and put before a fire to dry; the drying takes one minute to the one pound weight. After being eighteen feet long? A. Yes: you would have to undereighteen feet long? A. Yes; you would have to undergo the regular inspection.
 - (27) J. A. asks: Will you please inform me how to repair a bell that is cracked? Can I saw down the crack and fill with copper or brass, and make it hold and ring all right? It is a large bell, and is cracked about eight inches long. Please inform me what I can do with it. A. You cannot mend it as you propose. The only thing to be done is to drill a hole at the end of the crack, and cut down the crack to the hole with a saw, so that the edges of the crack will not touch ring, but it will not restore its original sound.
 - a boiler stand, 20 inches long by 8 inches diameter, made out of galvanized iron one-thirty-second of an inch fications not being printed, must be copied by hand. thick, without any flues? A. By government rule 115 pounds per square inch; but as galvanized iron of this thickness is generally inferior quality, would not advise more than 80 to 90 pounds.
 - (29) J. E. K. asks: 1. What size screw propeller shall I use for steam launch 16 feet long, 51/2 beam, engine 234? A. 18 to 22 inches diameter. 2. Will I have to pay the twenty-five dollars for license if I run the boat for my own use? A. Your boat must be regularly inspected and the fees paid, same as any other
- (30) A. P. J. writes: I am speeding up a circular saw, 20 inches in diameter, to be run by hand power and to saw cleft wood. I have a flywheel, 18 inches in diameter, weighing 80 pounds, to go on saw mandrel 3 feet long. How many revolutions shou.d the saw make, and what the size of mandrel? A. If (18) R. S. asks: 1. Is it as hard to fire on driven by power the saw might make 1.600to 1.800revosome ocean steamers as on a locomotive? What is the lutions per minute. If you drive at any such speed you want no flywheel on the saw mandrel. The size of
 - (31) R. W. D. asks (1) what the scale on the zinc in a Calland battery is: how can it be got rid of; and how often it should be removed. A. It is commonly composed of zinc, iron, and copper oxides. 2. What is the resistance of No. 32 (American) copper magnet wire per 1,000 feet? A. About 210 ohms. 3. In your answer to S. S. Mfg. Co. (4), page 11, current volume, should not ferrocyanide of potas., read ferricyanide of potas., or does the former act as well as the latter? A. Either will answer, but the ferrocyanide is preferred by many.
- (32) C. S. G. writes: I have a number of musk rat skins, and am desirous of finding a cheap and easy plan of tanning them with the fur on for making carriage robe. A. Wash the skins in water, and cleanse them thoroughly by scraping or rubbing. Then rul oxyhydrogen light? How would magnesite answer? wellintothe flesh side of the skin the following mixture: A. See answer to J. A. L. (2), No. 1, current volume. Alum, powdered, 21/2 pounds; salt and coarse wheat Magnesite ground, pressed, into form and calcined, can meal, each one pound; sour milk, q s. to form a thin be employed instead of lime, but the cylinder so pre- paste. When the skin will absorb no more of this preparation, spread a layer of the latter over it (on the flesh side), and fold up the skin with the flesh surfaces together and put it away in a cool place for a day. Repeat this pasting and rubbing each day for a week, washing out and half drying the skin every third day. Finally, thoroughly wash the skin in running water, drain; brush over it (flesh side) a strong solution of (22) C P. K, asks for the best method of alum in water, and hang it up to dry. The dry skin is bing and stretching it with a flexible tool. It is commonly finished by rubbing down the flesh side with pumice stove.
 - (33) A. B. writes: Please give me a recipe for coloring chip straw black. I have tried several receipts, but instead of the braid being a nice black it has a purple tint. What I want is jet black like the imported goods. This braid is used in the manufacture of ladies' hats. What good work on coloring and bleach-

15 to 60 feet. 3. Does it make any difference if the | into the boiling liquid for half an hour and then expose | Chair, C. Gallup blower is on the floor above the cupola and run the to the air for a like length of time, repeating this treatflues down? A. The blower should not be above the ment for several hours, or until, on riusing, the straw is found to have developed a suitable black. The color deepens considerably when the dyed straw is exposed moist for several hours to the air. See practical dyeing receipts in Supplements, Nos. 249, 207, 185, 228, 231,

- (34) W. J. W. asks how to bronze zinc fret work. A. Coat the metal with very thin gold size, and when nearly dry rub on a sufficient quantity of red bronze (bronze powder) dry, and burnish. Bronze powders of almost any shade are procurable in the mar-
- (35) F. B. L. asks: 1. What is the cause of the snapping and cracking in steam pipes? A. Condensation of steam in the pipes. 2. What books are there published devoted wholly or principally to steam fitting? A. See "Roper's Engineer's Hand Book." Also "Baldwin's Steam Heating."
- (36) A. S. writes: The statement has been made that the piston speed of engines, large and small, is now, or has been until lately, practically the same; this has been disputed. Will you please give the facts in the case, giving limits of speed of engines, say 8 inches by 16 inches, and 48 inches, by 96 inches or larger, and also state whether or not the tendency is to increase the piston speed in all engines up to 36 inch stroke overformer practice? A. The tendency of late years has been to increased speed. Formerly the average speed of piston was about 300 feet; it is now probably not less than 450 feet. Of course the speeds are generally suited to the work. Some run up to 700 feet and even more per minute.

COMMUNICATION RECEIVED. On the Ocean Packet Line. By J. W. N.

(OFFICIAL.)

INDEX OF INVENTIONS

Letters Patent of the United States were Granted in the Week Ending January 3, 1881,

AND EACH BEARING THAT DA'FE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents: each other in vibrating. This will enable the bell to In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, (28) C. H. asks: How much pressure will New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the speci-

3	Acids, removing flocculent matter from spent, F.	
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•	Album clasp, H. Landsberg	251,901
,	Amalgamator, W. Moller	251.914
L	Atomizer, R. Lockwood	251.720
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i	Bagasse rurnace, w. Littlejonn (r)	9,990
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3	Baling press, P. K. Dederick	
7	Battery. See Electric battery.	201,100
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