

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.

New Method of Graining, etc. J. J. Callow, Cleveland, O. Loud Speaking Telephones, \$5 a pair. Illus. circulars for stamp. Agents wanted. W. R. Brooks, Phelps, N. Y. 10 Horse Baxter Engine for sale cheap. Good as new; all improvements. E. J. Morgan, Bridgeport, Conn.

Agencies solicited for Pittsburg and vicinity. Address: G. A. Jackson, Washington Ave., 32d ward, Pittsburg, Pa.

Inventor's Institute, Cooper Union, New York City. Permanent free exhibition of new machines, inventions, and patents. See advertisement page 236.

The proprietors of the Boomer & Boschert Cider Press challenge the world to produce another press that will extract the same amount of cider from a given quantity of apples. This press is acknowledged the best made. Their New York Office, 15 Park Row.

Professor Huxley's recent interesting address before the International Medical Congress, London, on the Connection of the Biological Sciences with Medicine, is published in SCIENTIFIC AMERICAN SUPPLEMENT, No. 300. Price, 10 cents.

The Cable Street Railways of San Francisco, with fifteen engravings. By A. S. Halliday, M. E. A full description of the several street railways of San Francisco, with engravings of the cars, grappling apparatus, and other machinery; also description of all the mechanism, dimensions, grades, results of operations, etc., is given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 298. Price, 10 cents. For sale at this office and at news stands throughout the country. These railways have been worked in San Francisco since 1878 with success, having displaced horses for the propulsion of street cars.

Draughtsman's Sensitive Paper. T. H. McCollin, Phila., Pa.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil. Foot Lathes, Fret Saws, 6c. 90 pp. E. Brown, Lowell, Mass.

Common Sense Dry Kiln. Adapted to drying all of material where kiln, etc., drying houses are used. See p. 205

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

Alden Crushers. Westinghouse Mach. Co., Pittsb'g, Pa.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT 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.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Punching Presses & Shears for Metal-workers, Power Drill Presses, \$25 upward. Power & Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N. Y.

Improved Skinner Portable Engines. Erie, Pa.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Pure Oak Leather Belting. C. W. Arny & Son, Manufacturers, Philadelphia. Correspondence solicited.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

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

Peck's Patent Drop Press. See adv., page 204.

Wood-Working Machinery of Improved Design and Workmanly. Cordeman, Egan & Co., Cincinnati, O.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro. 234 Broadway, New York.

4 to 40 H. P. Steam Engines. See adv. p. 189.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 10 Cortlandt St., N. Y. Cope & Maxwell Mfg Co.'s Pump adv., page 189.

Corrugated Wrought Iron for Tires on Tractor Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsb'g, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 531 Jefferson St., Philadelphia, Pa.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y. For Mill Mach'y & Mill Furnishing, see illus. adv. p. 204.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 206.

Barrel, Key, Hogshead, Stave Mach'y. See adv. p. 222.

Saw Mill Machinery. Stearns Mfg. Co. See p. 205. Supplee Steam Engine. See adv. p. 204.

The American Electric Co. and Proprietors and Manufacturers of the Thomson Houston System of Electric Lighting of the Arc Style. New Britain, Conn.

See Bentel, Margedant & Co.'s adv., page 221.

Silica Paints (not mixed); all shades. 40 Bleecker St., N. Y. The None-such Turbine. See adv. p. 206.

Steam Hammers, Improved Hydraulic Jacks and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

50,000 Sawyers wanted. Your full address for Emerson'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. 221.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 221.

Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. L. S. Graves & Son, Rochester, N. Y.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Gould & Eberhardt's Machinists' Tools. See adv., p. 222. Safety Boilers. See Harrison Boiler Works adv., p. 222.

The Medart Pat. Wrought-Rim Pulley. See adv., p. 321.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 221.

Engines, 10 to 50 H. P., \$250 to \$500. See adv., p. 221.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 221.

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

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

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Av., Phil. Pa.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 220. Totten & Co., Pittsburg.

Combined Concentric and Eccentric Universal and Independent Jaw Chucks. The Pratt & Whitney Co., Hartford, Conn.

Notes & Queries

HINTS TO CORRESPONDENTS.

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

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 of the question.

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, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) J. A. asks for the best method of putting on tinware the appearance of crystals, such as is seen on window panes in frosty weather. I see a great many trunks ornamented that way now. I have tried acids, but do not succeed. I want to ornament a patented article that is made of tin, to make it more attractive. A. The *moir metallique*, or crystallized tin plates, are usually prepared from well annealed and well tinned charcoal iron plates, by rinsing the plates with dilute nitric or nitro-muriatic acid and then with water. The cleaned plates are dipped for a few moments into nitric acid or aqua-regia (nitric acid 1, muriatic acid 3), diluted with from one to three volumes of water and heated to about 180° Fah., and after a moment's exposure in this bath removed and rinsed in running water. This is repeated, if necessary, until the crystals are properly developed, when the plate is finally rinsed in hot water, which causes it to dry quickly without rubbing. The plates are then oiled or lacquered to preserve them. Plates which have been heavily rolled or too quickly chilled after tinning do not afford a good crystallized surface. Hot tannin or strong caustic soda solutions can also be used to develop the crystalline structure of tin plates.

(2) S. M. S. asks for the best process for bleaching sheepskin parchment white, or nearly so, without leaving streaks and spots or injuring the smoothness and durability of the parchment. A. Expose the pieces to strong sunlight under glass in a moist atmosphere until bleached.

(3) J. N. asks: Would California red wood do to make wine casks, and how could it be prepared that it would not stain the juice? Red wood is much cheaper than white oak staves for casks, and if a way could be devised that would not stain the grape juice, its use in wine-making would be very advantageous. A. If the wood were impregnated by soaking it for some time, with a strong, hot aqueous solution of alum, and then (after rinsing lightly) with a hot, slightly alkaline solution of soap, containing a little glue, followed by rinsing in water, so as to fix the color and fill the fibers with insoluble aluminum soap and gelatine tannate, it might be made to serve the purpose of wine-storage vessels very well.

(4) G. B. asks how to soften white lead that has stood four years so as to render it fit for use. A. Break up the hardened paint and triturate it in a mortar (or paint mill) with just enough hot linseed oil to soften it properly, then thin down with oil of turpentine.

(5) A. C. asks: 1. Should a frame house be painted soon after its erection, or allowed to remain for a time unpainted, exposed to the weather? I think, some time ago, you advised the latter course, but I have forgotten the reason you gave for it. A. It is not well to put paint on new woodwork at once, unless the latter has been previously thoroughly seasoned, which is very frequently not the case; and under any circumstance it is well to delay such painting until the new work has been exposed to sunshine and dry weather for a few days. 2. Likewise, should a cistern be covered or allowed to remain uncovered so that the air may get to it? A. Cover the cistern.

(6) J. F. K. C. asks if there is any cheap mode of inscribing on brass, besides engraving. Have seen something of the kind in the SCIENTIFIC AMERICAN. A. Use a fatty ink and a rubber stamp having a negative die. Print the design with this on the metal, let it dry somewhat, and etch away the uncovered parts with dilute nitric acid: water 3, acid 1. Clean off the ink with sand and benzine.

(7) E. R. asks how to prepare leaf tobacco with chemicals or otherwise for cigarette or pipe smoking. It has been packed down one year. I now break

up the leaves, then dry in the oven; but it smokes too strong. A. Try the following: Thoroughly wet the tobacco, then pack and put under strong hydraulic pressure, after which spread it out as soon as possible in thin layers to dry quickly in contact with cool dry air.

(8) C. A. S. asks: How much power will the new battery, described in SCIENTIFIC AMERICAN of September 3, develop in connection with an electro-motor? Or how many cells would be required to develop one horse power, constant use ten hours per day? Is there a better battery for this purpose? A. This is a matter of experiment we have not sufficient data at hand to make the required estimate. The Grove, Ladd, Bunsen, and similar forms of battery produce currents of greater electromotive force, but they require very much more space and attention, and cost more to maintain.

(9) F. H. G. asks: 1. What is the best way of preparing a solution for silverplating, and the one least liable to strip? A. The following is a good bath: Soft water, 1 gallon; cyanide of potassium, 8 ounces; nitrate of silver, 5¼ ounces. Dissolve the silver nitrate in a small quantity of soft water, and gradually add, with constant stirring, solution of cyanide of potassium until no further precipitate of silver cyanide forms (avoiding any excess of the precipitant). Throw the precipitate on a fine cotton cloth filter, and as the liquid runs through, wash the precipitate on the cloth with pure water. Mix and dissolve this washed precipitate with the water in which has previously been dissolved the cyanide of potassium. If the silver cyanide does not dissolve readily add more cyanide until it does. 2. Is it necessary to use pure silver both for making solution and for anodes? What effect does it have if the silver is not pure? A. Yes; if the silver used is impure the bath will be likewise, and it is impossible to obtain a regular deposit of pure silver from such a bath. 3. What battery is the best for silver plating? A. The Smee form is generally preferred for fine work. See article on Silver Deposits, page 81, vol. xlii.

(10) J. J. R. asks: 1. Can you inform me of anyway of silver plating iron or cast steel polished surfaces, without first depositing a copper surface or the usual process of scouring with lava dust? A. See article on Silver Plating, page 81, vol. xlii. 2. Is there not a solution or solutions that remove the saponified grease from the surface of the article to be plated which leaves it immediately ready to receive a deposit of silver? A. Iron and steel can only be satisfactorily freed from the last traces of oxide—after rinsing in hot water on coming from the lye dip—by scouring. If properly pickled and scoured in the first place the pieces will not require much after scouring.

(11) G. P. H. asks how to make a good quality of court plaster. A. Soak isinglass in a little warm water for seventy-four hours, then evaporate nearly all the water by gentle heat, dissolve the residue in a little proof spirits of wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now stretch a piece of silk or sarsenet on a wooden frame, and fix it tight with tacks or packthread. Melt the jelly, and apply it to the silk thinly and evenly with a badger hair brush. A second coating must be applied when the first has dried. When both are dry, apply over the whole surface two or three coatings of balsam of Peru. Plaster thus made is said to be very pliable and never breaks.

(12) E. Y. asks how to make a cement for glass that will resist acids. A. Take 10¼ lb. of pulverized stone and glass, and mix with it 4¾ lb. of sulphur. Subject the mixture to such a moderate degree of heat that the sulphur melts. Stir until the whole becomes homogeneous, and then run it into moulds. When required for use it is to be heated to 248°, at which temperature it melts, and may be employed in the usual manner. It resists the action of acids, never changes in the air, and is not affected in boiling water. At 230° it is said to be as hard as stone.

(13) X. asks how to mould ornaments for patterns for stoves, vases, etc. A. The following composition is commonly used: Soften 12 lb. of good glue in water enough to cover it, then heat until the glue is dissolved. Melt 7 lb. of resin, ½ lb. of pitch, and 2½ pints of linseed oil together. Stir the hot glue solution into this and add enough whiting to thicken. It should be mixed in small quantities and used at once; otherwise it will require steaming before it can be used.

(14) O. E. M. wants to know how to bleach straw. A. Straw goods are bleached by submitting them to the action of the vapor of burning sulphur—or better, to the vapor of burning bisulphide of carbon. The straw, which must be perfectly clean, must be well moistened with pure soft water before submitting to the sulphuric oxide. The bleaching is carried on in tight wooden sheds. Straw may be bleached by chlorinated lime, but the fiber is liable to be somewhat injured thereby. Moisten the goods thoroughly in a strong aqueous solution of the bleaching powder (de-fecated), and then pass them through a bath of sulphuric acid diluted with about 20 parts of soft water. Repeat if necessary, and finally rinse thoroughly in water containing a small quantity of sulphur or hyposulphite of soda.

(15) A. W. M. wants to know what is the best general antidote to poison. A. If a person swallows any poison whatever, or has fallen into convulsions from having overloaded the stomach, an instantaneous remedy most efficient and applicable in a large number of cases, is a heaping teaspoonful of common salt, and as much ground mustard, stirred rapidly in a teacupful of water, warm or cold, and swallowed instantly. It is scarcely down before it begins to come up, bringing with it the remaining contents of the stomach. And lest there be any remnant of the poison however small, let the white of an egg or a teaspoonful of strong coffee be swallowed as soon as the stomach is quiet; because these very common articles nullify a large number of virulent poisons.

(16) "Photo" asks for a good receipt for retouching varnish. A. In his recent work on retouching, M. Janssen, the *Photo Correspondent*, says, recommending the following varnish: Alcohol (sp. gr. 0.830), 60

parts; sandarac, 10 parts; camphor, 2 parts; Venetian turpentine, 4 parts; oil of lavender, 3 parts. This varnish may also be used for paper pictures. The retoucher should not set to work as soon as the negative has been varnished, as the film will not then be hard enough to bear the touch of a lead pencil. The varnished film is in the best condition for retouching when a day old.

(17) E. J. writes: I am overrun with rats and mice, and as yet have found no remedy. Can you give a receipt for an effective rat and mouse exterminator? A. Try the following: A mixture of two parts of well bruised common squills and three parts of finely chopped bacon is made into a stiff mass, with as much meal as may be required, and then baked into small cakes, which are put around for the rats to eat.

(18) H. E. K. asks for a cheap way (cheaper than by windmill) to raise half of the water from a spring that throws two and a half gallons of water a minute, up to the house five rods distance, ten feet high. A. We know of nothing that will answer your purpose. A hydraulic ram will raise only about one-fourth to one-sixth of the water expended.

(19) L. B. asks: 1. What is the horse power of a horizontal tubular boiler 10 feet long, 42 inches diameter, 36 3-inch tubes? A. Your boiler would be usually called 25 horse. 2. Can I get more power of an engine with a larger fly wheel than a smaller one? I have an engine, 8x12 inch cylinder, and have 5 foot fly wheel, weighs about 600 lb. Can I get more power out of the engine by putting on a larger wheel, and what size; or will it do as well to add another wheel of 600 lb. weight on the other side of the shaft? The engine makes about 140 revolutions in a minute. A. You cannot increase power by more fly wheel. You can only equalize speed. If the power is not uniform it might be well to add another wheel.

(20) P. R. writes: 1. Suppose a sash and its counterweight to weigh 100 lb. each, the pulley to support 200 lb. Then, will the tension on any part of the cord be 200 lb.? If not, please explain. A. The tension on each side of pulley will be 100 lb., and total weight on pulley 200 lb. 2. Why could not the cables of the East River Bridge be kept higher in the middle and consequently the bridge, as the greatest objection is because it is too low; or is it necessary to have a certain amount of sag in the cables? A. To do so would necessitate carrying up the towers to a greater height. The cables cannot be straightened without enormously increasing the strain.

(21) C. C. G. writes: Please inform me approximately the quantity of coal a 25 horse power engine, run to its full capacity, would use in twenty-four hours; also, how much water it would require? A. It depends much upon the character and condition of the engine and boilers. An average would be 100 to 130 lb. coal, and 750 to 950 lb. water per hour.

(22) T. J. M. asks: Why is it that an injector attached to a steam boiler of 12 horse capacity, and running under a pressure 50 lb., will not raise water for feed supply from a well 50 feet deep? Ours has so far failed and a competent (so regarded) engineer says 50 feet is the limit. If this be so what is our best resort to accomplish the work indicated? A. The very best form of injector will not raise (or lift) water reliably, one-half of 50 feet. If it would produce a vacuum, it could not be relied upon to lift water higher than a good pump, say 26 or 28 feet. We think your best way will be, to set a pump in the well about 22 to 25 feet above the surface of the water and lift the water into a tank for the injector.

(23) R. E. M. wants to know how to make a plaster cast from the human face. A. Place the subject upon his back, with the head raised to the normal position by a pillow of bran or sand; cover the parts intended to be cast with a film of olive or true almond oil, applied with a feather brush or lump of cotton; plug the ears with cotton wool, and insert two quills or pieces of glass tubing in the nostrils and secure the space around them with cotton. When all is ready mix the plaster of Paris with warm water to about the consistency of cream, and with this cover the face from the forehead downward to the lower border of the chin. The eyes should be firmly closed, but in such a manner as not to cause distortion by too violent compression. Then cover the parts of the chest and arms to be represented, carrying the plaster upwards, so as to join the cast of the face. Then (when properly set) carefully remove each, and soak or brush it with linseed oil boiled with a little sugar of lead or litharge. Instead of casting the face and chest in two separate pieces, it is preferable to make the casting in one piece, and to divide it into 4 or 5 sections before removing, by means of threads placed in position before the plaster is applied, and withdrawn when the latter has nearly set. The cast of the back of the head is usually taken by lowering it (well oiled) into a deep trencher partially filled with the liquid plaster, and the back of the neck with the subject face downward. When the mould is finished it is firmly tied together, the joints plugged with a little cotton wool, well oiled on the inside, and a sufficient quantity of tolerably fluid plaster poured in. When the outer portions of the model have nearly set the inner portions are scooped out, and the whole thoroughly dried before removing the mould. The model is trimmed with a sharp knife. If the eyes are not to be represented as closed they must be carved out from the mass.

(24) G. L. asks how to temper large curved dies for cutting iron and steel plate. A. Fill the holes with fireclay and wire to keep it in place. Heat evenly and slowly in a furnace. Lift the dies from the furnace with the face vertical and plunge vertically into water heated to about 50° and containing about ½ lb. salt per gallon. Hold them still at the bottom of the water until cooled.

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

C. H. H.—1. It is a ferruginous earth mixed with small fragments of broken glass—not metaliferous. 2. We could not undertake to say just what drugs the mixture is composed of, but we can recognize in it flour,