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.

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) T. H. S. writes: I have put up some rolled shafting, and some of it runs untrue. Can you inform me of any easy method of straightening it without taking it down? A. Only by using a portable press, such as used for bending or straightening railroad iron, or by drawing it with a hammer on the hollow side. The former mode is the best.

(2) S. E. R. asks: What capacity or what difference would there be in two boilers, one being 56 inches diameter, 18 feet long, the other 56 inches diameter, 12 feet long. How much larger is the 18 foot than the 12 foot—is it a half or a third? A. The 18 foot boiler, if properly proportioned, would be about 25 per cent more than the 12 foot, and should be more economical. It should have larger tubes than for 12 feet length.

(3) S. W. B. asks: What ought to be the size and length of flue, and the size, height, and distance from engine, of chimney, to secure proper draught for an engine rated at 20 horse power and supplied by two boilers, the furnaces of which are 5 feet 7 inches wide and 22½ inches high? A. 26 or 28 inches square and about 50 feet in height. 2. Will a difference of an inch or two in the level of the two boilers affect their working materially? A. No.

(4) G. G. asks: 1. What is the average weight of an English locomotive? A. 30 to 35 tons. 2. Which is the better adapted to attain the maximum amount of speed, the American or the English locomotive? A. American.

(5) J. W. S. asks: 1. What is the best regular time made on any railroad in the United States? A. From Jersey city to Philadelphia, 98 miles, in 1 hour 50 minutes. 2. What is the weight of the heaviest locomotive in the United States? A. About 40 tons.

(6) W. W. S. H. asks: 1. What is the rule for finding the horse power of a steam engine? A. You are referred to rule in SUPPLEMENT, No. 253. 2. Also the rule for ascertaining the pressure of steam in a boiler where there is no steam gauge? A. By measuring the safety valve and calculating the pressure from it.

(7) E. S. H. asks is glass as great a non-conductor of heat as any substance known. A. Glass is, relatively speaking, a good conductor of heat. Dry wool, feathers, dry saw dust, charcoal, confined air, etc., are much better non-conductors.

(8) A. G. O. asks (1) whether there is any perfectly pure and free-from-lead zinc (No. 20) made in this country, and where it is manufactured. A. Zinc manufactured by the New Jersey Zinc Company, near Franklin, is pure or nearly so. 2. What is the best process to detect lead in zinc? A. Dissolve a fragment of the metal in hot dilute hydrochloric acid, and pass hydrogen sulphide (gas) into the liquid until the latter smells strongly of the gas. If lead is present a black precipitate will be observed.

(9) P. G. R. writes: Can you give me a recipe for a good durable brown wash for fences? A. Try the following: White lime, ½ bushel; hydraulic cement, 3 pecks; umber and ocher, each 10 lb; Venetian red, 1 lb.; lampblack, ¼ lb. Slake the lime, shake up the lampblack with a little vinegar, mix well together, add the cement, and fill the barrel with water. Let it stand several hours, and stir frequently while putting on. A larger proportion of ocher will give it a darker shade. The wash covers well. Only one coat is needed. It is said that the coating will look well after five years' exposure to the weather without removing.

(10) E. S. N. writes: Within a month or so I heard in this vicinity of the action of certain boilers which might give some light on explosions similar to the one at Pottsville lately. An excellent boilermaker was telling about his going into a mill for which he furnished the boilers, and on looking under the boilers found them all red hot for eight or ten feet back from the front. He called the manager and told him his boilers were empty. "Oh, no," he said, "they are that way quite frequently; it's all right." The boilers are 5 inch shell, four inch tubes, 16 feet long, fired with sawdust for all the steam they can make. We then both called to mind an experiment made by an engineer in a flouring mill here. He carried a pipe through the front head of boiler, within an inch of the bottom, running in three or four feet, and provided with a valve outside of boiler; quite frequently when firing hard, clear, dry steam would issue from said valve when opened, showing that no water was in contact with bottom of boiler. This was a tubular 7-foot or 8-foot shell. This may not be anything new to many, but was to me. A. It is not uncommon for badly proportioned boilers, with bad circulation and under hard firing, for the water to lift temporarily from the metal; but it is dangerous, and, in the case you mention, may occur once too many times.

(11) W. B. H. writes: A note in your paper of the last issue by W. L., No. 12, on page 183, referring to the cement or whitewash used on the White House at Washington, has induced me to ask you to answer two or three questions through your valuable paper. They are as follows: 1. Would the application of one, two, or more coats of that cement stop the leaking of a tin roof so put on as to leak badly? A. The coating will hardly answer the purpose. 2. Will you give a statement of the materials of which it is composed, and the proportion of each, and how made, whether by heating, boiling, or cold; and how applied, whether hot or cold. A. See "A Durable Whitewash," page 52, current volume. 3. If that will not answer, can you tell me what will stop the leaks without a new roof? A. Give the roof one or more good coats, when dry, of good roofing paint—red ocher ground in oil.

(12) F. C. H. asks: Can an "American" locomotive, consuming from 50 to 60 lb. coal per hour, require from 350 to 500 lb. of water per mile, as stated in last issue—twenty-five times as much as a stationary engine? A. It depends upon the efficiency of the boiler. Boilers evaporate 6 to 9 lb. water per pound of coal, and if the train is so heavy as to require 50 lb. coal, per mile—then 50×8=400 lb. water. Light trains of course require less coal and water—some not more than one half the above.

(13) J. A. W. writes: 1. I blow my boiler out clean once a week. Is it best to let it dry over night and put cold water in the next day, or put water, at 100°, in from tank immediately after blowing off? A. Let the boiler cool. 2. Is there any method of preventing a safety valve from sticking other than frequent trials? A. A safety valve should be examined and cleaned frequently. Some forms are more apt to stick than others.

(14) G. H. H. asks: 1. At what part of the stroke does the steam cut off in a link motion locomotive engine, when she is said to work on full stroke? A. Usually about seven-eighths the stroke. 2. Does it take the same quantity of fuel to convert a given quantity of water into steam in a boiler under a high pressure, say, at 100 lb. to square inch, as it does at the atmospheric pressure? A. Approximately, but not exactly.

(15) E. N. M. writes: I notice that there have been a great many rotary steam engines invented, but at the same time there are but very few used. What are some of the most important objections to the use of that class of engine? A. The principal objection is, that they cannot be kept tight. Another is that the working steam expansively cannot be readily secured, and they are not economical.

(16) J. M. C. asks: Can you give me a formula for a cement to be placed under the patch, covering a rent in a large boiler? It must be watertight and not affected by heat. A. A mixture of white and red lead, with very fine iron borings, the whole made into a stiff putty with linseed oil.

(17) G. G. asks: Is there any way to remove iron rust from cloth? A. If the cloth is uncolored moisten the stained parts with hydrochloric acid diluted with about three volumes of water and warmed. Thoroughly rinse the cloth in plenty of cold water afterwards. It is nearly impossible to remove such stains from some colored fabrics.

(18) J. S. asks for an effectual remedy for the extermination of red ants. They abound in dry sandy localities, and during the summer months become a terror to housekeepers. I have tried all remedies that I know of, but all fail in accomplishing permanent results. A. The judicious use of a small quantity of oil of turpentine will often drive away the pests. It may be injected into cracks and crevices in closets and elsewhere from an ordinary sewing machine oil can.

(19) S. C. asks: Can you tell me what to do to kill the borers in pine flooring? The floor is fifty years old and perfectly sound until about two years ago, when the borers got in from pine wood stored under the house. A. Try turpentine as directed in answer to J. S., this page.

(20) J. H. W. writes: I tried to marble on paper per instructions in SCIENTIFIC AMERICAN SUPPLEMENT, but the colors sank to the bottom. What is the cause? I used Venetian red and lampblack. I burnt the lampblack to free it from grease. I cannot see where my error is. A. The colors must be ground very fine with the vehicle and floated on to the water carefully—not mixed with it. The marbling must be done immediately after the floating is accomplished. 2. Will a helix or electro-magnet increase the force of the current from a battery? A. As we understand your question, no. 3. In using a battery for medical purposes, is an electro-magnet of any benefit? Is a helix of any benefit? Which is better? A. Your question is rather indefinite. An intermittent current of sufficient tension for medical use can be obtained from either a magneto electric machine or induction apparatus when properly constructed, the electricity from both sources possessing similar qualities. The induction apparatus is more easily managed, and is for that reason usually preferred.

(21) J. G. W. asks as to the composition of rollers for a printing press. A. Best white glue and concentrated glycerine, equal parts. Soften the glue by soaking it over night in enough cold water to just cover it. Strain off excess of water, heat the glycerine over a salt water bath, add the glue, and stir until the glue is all dissolved. Continue the heat for several hours to expel as much of the water as possible. Let the composition get cold, and remelt it several times before at last pouring into the well oiled brass cylinder mould. Give the composition plenty of time to cool and harden before removing it from the mould.

(22) C. S. M. asks if young trees about six inches in diameter can be moved. If so, what is the right time to do it and the best way? A. Easily. Move in winter, when the earth is frozen about the roots. Move as large a block of earth with the roots as can be handled.

(23) W. T. B. asks for a receipt for taking copying ink stains out of linen shirt bosoms and white duck vests, etc. A. Make a strong solution of good bleaching powder (chlorinated lime) in cold water and apply to the stains; then apply a strong aqueous solution of oxalic acid (cold). Repeat if necessary until the stains disappear, then rinse thoroughly in cold water.

(24) W. L. asks: 1. In the preservation of eggs, mentioned in the SCIENTIFIC AMERICAN, No. 1, July, 1881, will the eggs keep as long in the lime pickle as they would if packed in powdered charcoal after being dipped in paraffine? A. The charcoal is the best. 2. How should the pickle be made? A. Add lime and salt in about the proportion of half a pound each for every bucket of water. 3. Would there be any risk in keeping eggs by this process for a year or more? A. If the eggs are well covered with paraffine as directed there will be little danger provided they are stored in a cool place where the temperature does not change much. 4. Would they keep as well in a room well ventilated as they would if put in a cellar? A. The cellar is best. 5. Where can an incubator be bought? A. See column of Business and Personal and Hints to Correspondents. 6. How can an artificial mother for chickens be made? A. See Incubator and Incubation, in SUPPLEMENTS Nos. 26 and 64.

(25) C. P. asks how to make the yeast, and the quantity to put to each gallon of hop beer. A. See Summer Beverages, in SUPPLEMENT, No. 192.

(26) C. T. F. asks: Can you inform me how I can get a light of glass that will stand the heat? I want to put the glass in an iron box in which I am to place articles which I am going to subject to about 300°. A. Good lime soda glass will stand a temperature of 300° Fah. very well without softening. It will not break under the conditions if the precaution is taken to heat it gradually and uniformly at first.

(27) H. A. F. writes: I have at my fisheries a large lot of fish offal and fish not merchantable which I would like to convert into guano or fertilizer in some cheap way. A. Pass the refuse through a mincing machine and expose it in layers about three inches deep in a kiln heated to about 300° Fah., until properly dried. It is sometimes mixed with three times its weight of dry earth and sprinkled with dilute oil of vitriol before drying.

(28) J. T. asks for the best polish for flax or hemp twines, that is, what composition mixed in starch will give a twine a glossy appearance? A. Try the following: To 1 lb. starch add (at blood heat) blood albumen, 2 oz.; water-glass (sirupy), 3 oz.; curd soap, ¼ oz., (dissolved in warm water). Beat together and let it stand forty-eight hours or more before applying.

(29) C. G. says, in answer to W. W. C., page 26 (24), current volume: "If he will lick over the writing with a moist tongue, the writing, after the paper has become dry, cannot be effaced even with India-rubber. The process is not very nice but is very effectual."

(30) G. R. S. writes: In your issue of August 20, 1881, you describe an improved hectograph. Will you oblige me by explaining how the negative (after once using the pad) can be erased, so as to allow the gelatine to be used a second time? A. Remelt the pad, skim off any floating matters, and let it cool again before using.

(31) C. G. asks: 1. Is there any book published on working and tempering steel, as practiced in the die maker's trade? A. There is no single work especially devoted to this subject. The information is scattered through various cyclopedias and works on mechanics. There is great need of a really practical work on working and tempering steel. We can suggest no better way for you to get the information you desire than to obtain it from practical men who have had long experience in the business. 2. If there is, where can it be obtained, and the price? A. Such books as are published can be obtained from booksellers who advertise in our columns. 3. What is the best protection for a steel worker to wear over his eyes? Where can it be bought? A. Probably a pair of good goggles with rather thick glasses would answer your purpose. These may be purchased from any optician in this city.

(32) W. H. L. asks: 1. Will you please tell me if there is any way to remove the stain made by bichromate of potassa, after it has been exposed to sunlight? A. If the substance will bear it use a solution of 1 oz. caustic potassa dissolved in 3 oz. of water, and after rinsing, a small quantity of strong warm acetic acid. 2. Is there any good method of removing freckles? If so, please give it. A. We know of no very satisfactory remedy other than bathing the skin frequently with fresh cream and protecting it from strong sunlight and wind. 3. What is the accepted theory in regard to a vacuum above our atmosphere? Is it considered a perfect vacuum? A. Probably not. 4. I have heard or read that a perfect vacuum is an insulator to heat. If so, how do we get the sun's heat? A. Heat and light pass unimpeded through vacua, that is, space practically devoid of air, aqueous vapor, or other ponderable substance. 5. Will electricity pass through a perfect vacuum? I know it will pass through the vacuum made by air pumps. A. No.

(33) D. C. B. asks: 1. Would you please inform me through SCIENTIFIC AMERICAN what ingredients and proportion of same compose hectograph described August 20, page 116 of SCIENTIFIC AMERICAN? A. Soften 1 oz. of fine gelatine by soaking it over night in a small quantity of soft cold water. Press out excess of water in a cloth, and dissolve the gelatine in about 8 oz. of concentrated glycerine by heating over a hot water bath for an hour or so. See article on copying pads,