Mr. H. P. Feister, the well known mechanical engineer, has resigned the superintendence of the machine works of Messrs. Rex & Bockius, of Philadelphia, and assumed the superintendence and general management of the Franklin Machine Works. R. S. Menamin proprietor, 517 to 521 Minor street, Philadelphia. Mr. Feister still continues designing and constructing special machinery for various purposes.

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) M. Z. asks: Can you please tell me through your valuable paper the greatest number of tons that ever an ocean steamship carried, and what is the name of the same? A. The Great Eastern had the greatest tonnage capacity, but we do not know the greatest tonnage she has actually carried.

(2) A. R. M. asks for a simple method of testing and assaying silver ores. A. Charge into a six-ounce crucible (a Battersea F answers very well) one ounce each of the ore and dry bicarbonate of soda, two ounces of litharge (free from silver), half an ounce of argal, and cover with a quarter of an inch of dry salt. Heat the crucible until the contents are in a quiet state of fusion; remove from the fire, cool, break, and clean the lead button by pounding on an anvil. If the button weighs more than, say, half an ounce, scorify it down in a scorifying dish in an open muffle. Heat 1¼ inch bone ash cupel in the muffle, drop into it the button, and keep up the temperature of the muffle to a bright red heat until all the lead has been scorified off and absorbed by the cupel, and the small bead of gold or silver (if the ore contains any) becomes well rounded and clear. The ore must be finely powdered, and the whole of it passed through an eighty-mesh sieve.

(3) A. G. wants to know how to recover silver from old solutions. A. Precipitate the warm solution by addition to it of common salt; allow it to settle, decant the clear liquid, and throw the precipitate together with several scraps of zinc, into warm dilute sulphuric acid. When the chloride is all reduced, pick out the remainder of the zinc, decant and press out the liquid from the precipitate, dry, mix it with a little borax, glass, and powdered resin in a small clay crucible, and heat to complete fusion. Cool and break the crucible; the silver will be found as a button in the bottom. With a small crucible, a good fire in an ordinary cooking stove will answer for the fusion.

(4) E. J. S. asks how to silver plate iron and steel. A. Dissolve 12 oz. cyanide of potassium and 1 oz. (troy) of chloride of silver in 1 gallon soft water; filter, and suspend in this bath the chemically clean work and a plate of pure silver, exposing a surface somewhat larger than that of the work. Connect the work with the negative or zinc pole of a small Daniell or Smee battery of two or three cells by means of a stout copper wire, and join the silver plate in a similar manner with the positive pole of the battery. The work may be prepared for the bath by boiling it in a strong aqueous solution of caustic potassa or soda to remove traces of oil, rinsing in running water and scouring with a brush and pumice powder moistened with strong cyanide of potassium solution; then quickly rinsing again, and without fingering, placing in the bath, and in circuit. A somewhat weaker (in silver) bath, called the "whitening" bath, and a stronger battery, is generally used to whiten or throw on the first film of silver. The proportions for this are: Cyanide of potassium, 1 lb.; chloride of silver, a quarter of an ounce (troy). If the silver runs on dark, use a weaker battery, or break the current so as to give alternate intervals of rest. Thirty minutes ordinarily suffices when a battery of three or four Smee cells, plates 1x4 inches, are used. In the whitening process an additional cell or more is employed. Iron takes silver better after having received a light deposit of copper. The metal must be freed from oxide by pickling in dilute acid and scouring with sand. For coppering a slightly acid bath of the sulphate and a strong battery may be used.

(5) N. W. writes: In building a dry room to dry lumber, is it best to admit the dry air in at the top, and take the moist air out at the bottom of the room, or *vice versa*? Is not the moist air the heaviest, and will it not consequently fall? A. Admit the dry air at the bottom. The levity of the moist air will be sufficient to carry it off with a proper flue or chimney.

(6) J. H. asks: What is the best apparatus in use for heating 20 or 30 gallons of water quickly, by gas or oil? A. We think a coil of iron pipe in a furnace alongside your tank, with the water circulating through the coil into the tank.

(7) C. E. B. asks for a cheap preparation that could be applied to strawboard in form of a bath that would prevent dew and rain from injuring berry boxes made of it. A. A dilute solution of shellac in alcohol is the best coating we think of. See article on waterproofing in No. 6, current volume.

(8) A. S. P. asks: What space would a cubic foot of gas (atmospheric pressure) occupy at six atmospheres, and formula for finding above? A. Approximately, the space occupied is inversely as the pressure; or one cubic foot at one atmosphere would occupy one-sixth of a cubic foot at six atmospheres.

(9) E. M. J. asks how to make tracing cloth. A. Wagner's tracing cloth is said to be prepared as follows: Boiled bleached linseed oil, 20 lb.; lead shavings, 1 lb.; zinc oxide, 5 lb.; Venetian turpentine, half a lb.; boil for several hours, then strain, and dissolve in the strained composition 5 lb. white gum copal. Remove from the fire, and when partly cooled add purified oil of turpentine sufficient to bring to the proper consistence. Moisten the cloth thoroughly in benzole, and then give it a flowing coat of the varnish.

(10) A. L. asks: 1. Is asbestos packing for stuffing boxes in general use in the United States? A. Yes. 2. Who are the principal manufacturers? A. See our advertising columns. 3. I am told the raw material comes from Canada. Could you give me the name of the place? A. It comes from mines or quarries on the north side of the Ottawa River.

(11) W. H. F. asks what kind of wood is used in a piano into which the screws for receiving the wires are inserted? Is it one piece, or several layers glued together? Must the screws have a deep cut or a fine one? Which is the best wood for this purpose? A. Use maple wood, with a veneering of the same about three-eighths of an inch thick, glued to the front face, and having the grain at right angle with the back. Your cheapest plan for the screws is to buy them at any piano hardware store ready made.

(12) H. asks: 1. In making the secondary of an intensity coil out of 7 oz. of No. 34 (B & S) gauge silk insulated copper wire, insulated from and wound over a primary, 7 inches long, of No. 14 wire, about what length of spark could I get, using a battery power of six carbon cells? A. Your primary wire is rather coarse. You should use three layers of No. 16. If the coil is properly made and provided with a condenser, you should get a spark one inch long. 2. Could I continue to wind one pound of the fine wire, without changing any of the other conditions of the coil, and get a larger spark? Or what changes would I be obliged to make in the other parts of the coil to meet the added half-pound of induction wire? A. You might increase the quantity of secondary wire with advantage. 3. In making an intensity coil for a large spark, would I have to employ coarser wires and very much increased battery power? A. Yes.

(13) G. E. M. asks how much difference the expansion and contraction of a steel railroad rail makes in its length when in use during an average year in this latitude. A. For difference of extremes in temperature of 130° Fah., will be about one-eighth of an inch in 12 feet, or on a 36 foot bar say three-eighths of an inch.

(14) J. M. K. writes: 1. It is claimed by some that lightning strikes wire fences very easily; if it is so, would not putting in ground wire (connected with all wires and running down into the ground) make a sure remedy? A. A ground wire connected with all of the wires, with its lower end buried in earth that is continually moist, and surrounded by coke or tin scraps to increase its underground conducting surface, would carry off the current. 2. How far should the ground wires be apart? A. About 500 feet. 3. Is copper better for the conducting rods in lightning rods than iron? A. Yes, but iron is cheaper, and if a larger conductor of iron be used, it is just as efficient. 4. Some parts of my portable boiler and engine are run over with waste oil (lard oil) which is burned hard, and I would like to have it removed, as the paint underneath is not spoiled. Can you tell me how to remove it? A. We know of no way of removing the oil without removing the paint underneath it. Better take it all off, and repaint. Make a strong lye, and apply it freely with a swab. It will soften the oil, so that it may be readily removed. 5. Do you think acoustic telephones are good for one to one and a half miles? A. Under favorable circumstances, yes.

(15) W. E. T. asks: 1. What kind of iron is suitable for making the cores of magnets? My manual says soft iron. Does that mean common or refined iron? If not, where can I procure the right kind? A. Common refined iron answers very well if thoroughly annealed. Heat it red hot and bury it in ashes, allowing it to remain until cool. 2. How many feet of wire do I want to make a common magnet, and about what number? A. It depends upon the size of the magnet and the purpose for which it is to be used. For a small magnet for experimental purposes, a core wound with No. 22 wire answers very well. 3. Would silk-covered wire be better than uncovered? A. Yes, it should be silk or cotton covered. 4. How many thicknesses of wire would answer around the cores? A. The thickness of the wire coil may generally be equal to the diameter of the iron core.

(16) J. H. J. asks (1) for directions for making a Leclanche battery. A. Place in a porous cell a rod or plate of carbon, and fill the cell with coarsely powdered black oxide of maganese and clean coke or retort carbon. Seal the cell, leaving two holes for the air to escape when the battery is set up; place the porous cell in a jar containing a saturated solution of sal ammoniac, and place in the sal ammoniac solution a rod of amalgamated zinc. 2. Will Fuller's mercury bichromate battery do for gold or silver plating? A. No: it is not intended for continuous work. See Batteries, in SUPPLEMENT, Nos. 157, 158, and 159.

(17) F. K. asks for the compositions of red brass. A. Red brass—89 parts of copper, 11 parts of zinc. Red bronze—86 parts of copper, 11 parts of zinc, 3 parts of tin.

(18) N. O. M. asks: Is there any resistance to overcome in a dynamo electric machine except that caused by friction? A. Friction is an inconsiderable element in the resistance of a dynamo electric machine. The resistance due to the attractive power of the field magnet exerted on the armature is enormous, and it takes a great deal of power to revolve the armature when the circuit of the machine is closed.

(19) J. D. asks: 1. What is the best polish to use in polishing the inside of gun barrels with? A. Emery flour, with a very little oil, is about as good as anything. 2. What is the best oil to use to prevent gun barrels from rusting? A. Pure sperm, or sperm mixed (by aid of heat) with about three per cent of paraffine wax. 3. What is the best polish for a walnut gun stock? A. Good clear shellac varnish rubbed on with a rag very slightly oiled.

(20) D. N. M. asks: 1. Will the stain recommended for fishing rods, in answer to J. B. A. (4), No. 8, anwer for worn gun stocks? Is the preparation solid or liquid? The stocks are white wood; I want them brown. A. The preparation is liquid, and can be advantageously used for the purpose mentioned. 2. I have found a sort of jelly fish, or *radiata*, in the Ohio, attached to a water-soaked log. The outside is covered with fern-like spines, very clear and about half an inch long. Are these of any value? A. The animal described is common and not valuable.

(21) In answer to the query of S. S., p. 172 (11), current volume about treating over-salted hams, etc., D. N. M. says: "Immerse the hams for about fifteen hours in cold sweetmilk, rinse with water, and sweeten with sugar or sugar curing. Ham or bacon left in milk over night is much improved in taste." C. E. B. says: "Soak the meat twenty-four hours in cold water, then put the pieces down in a barrel, with a weight on top to keep them down, and pour over them a pickle prepared from: Water, 6 gallons; brown sugar, 2 lb.; saltpeter, 4 oz.—boiled together and cooled. Pickle in this four to six days, then take out and smoke."

(22) F. F. J. asks: Can you inform me what substance I can apply to a wooden surface probably best in the form of paint, which, when dry, shall afford a light-colored surface which will allow a pencil mark to be made upon it, and then easily erased by moisture? A. We know of no colorless substance or composition that will satisfactorily answer the requirements. A white tablet surface varnish is prepared by mixing very finely ground clear quartz or glass, with a dilute alcoholic solution of pale shellac. It may be applied as a paint, and dries quickly. A sirupy solution of water glass can be made to take the place of the shellac varnish in the above receipt, but it dries slowly.

(23) J. V. asks: 1. For a covering for steam pipes. A. Hair felt, wool felt, or wool carpets, new or old, make good covering. There are many fancy and patent coverings, but you could not probably get them readily. 2. Also, for scale preventive for boilers. A. We cannot say what you should use without knowing the character of the scale or the water.

(24) N. H. writes: 1. I am thinking of building a steam buggy, and wish to have your opinion on it. I propose to have two horizontal iron tubes about 7 inches diameter for the foundation or reach, one to be a reservoir for water, the other for petroleum, the boiler to be between them, with furnace underneath; the engine (2x3) to be fastened on top of boiler, and all suspended on springs from hind axle, which will be above, and driven by belt or flexible shaft from engine. The buggy will be longer and have lower front wheels than ordinary. 1. Will crude petroleum do for fuel? A. Yes, it can be used successfully. 2. Will it have to be blown in in fine spray? A. The best mode must be determined by experiment. 3. Can a furnace be made to consume the smoke while running? A. Yes, partially. 4. Has any person made a practical steam buggy; if not, is there any reason why one could not be made as suggested. A. Not that we are aware of. We do not know of a successful attempt. The weight of the complete vehicle is a great objection.

(25) J. W. G. writes: I have a three story flouring mill that I wish to warm with the exhaust steam from my engine. Can I do it by running a continuous eight inch galvanized iron pipe through the mill, and would it do for the condensed water to flow back to the heater on the bottom of this pipe? The building is 40x50 feet, 11 foot stones. How many square feet of heating surface would I need? The engine is 16x24, 75 revolutions, slide valve. A. Yes; you can heat the mill in that way. You should apply to some party who is engaged in putting up steam heating apparatus for best arrangement of pipes. To do this properly requires a personal examination of the building and its surroundings.

(26) L. H. asks for a mixture that will, by plunging in, temper a heavy piece of steel of irregular form to the temper of a cold chisel. Said piece will crack when plunged in hot water. A. Try an oil or tallow bath as a first dip, then water.

(27) E. R. asks: 1. In the Holtz machines illustrated in SUPPLEMENT, Nos. 278, 279, are there four paper inductors cut, two being pasted at each aperture in stationary plate on opposite sides of glass? A. There are four inductors, two at each aperture, on opposite sides of the glass. 2. Is the gilt paper pasted on them or on the glass? A. It is pasted on the paper inductors.