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.

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. B. asks: Can you tell us of a good hair wash to strengthen the hair and scalp, after such a dangerous disease as typhoid fever? A. See Professor Wilson's paper on treatment of the hair, SCIENTIFIC AMERICAN SUPPLEMENT, No. 102.

(2) W. H. C. asks: 1. Does it take more battery power to ring an electric bell than to work a telegraph machine, and why, magnets of same resistance? A. No. 2. Why will an electric bell not work through a telephone, and *vice versa*? A. Because the introduction of either into the circuit increases the resistance beyond that which the battery is capable of overcoming.

(3) E. S. writes: 1. I have a lot of printed postal cards, and would like to wash the print off. How can it be done? A. We know of no practicable method. 2. Which is the most powerful known explosive, and how does it compare with powder? A. Probably the socalled chloride of nitrogen (described in most works on chemistry). For practical purposes, trinitroglycerine or Nobel's explosive gelatine—six to seven times as effective as common blasting powder. 3. What is the chemical composition of the saliva of rabid animals? A. Not determined, we believe. 4. Who invented the Gatling gun? A. Dr. R. J. Gatling, of Hartford, Conn. 5. With what kind of an instrument did the British give each other signals at long distances in the late Zulu war? A. With the heliograph.

(4) L. P. S. writes: I have several very rusty steel bits (for horses) which I wish to silver plate. I have a battery and every necessary for silver plating, but rust troubles me. How can I remove cheaply and quickly? Dip in warm muriatic acid for a moment and then scour with clean sand and water. Pickel in dilute sulphuric acid, rinse, and suspend in the plating bath without touching. 2. Also a large mirror which looks as if it was dusty, but it is on the inside. Please tell how to brighten it up. A. Resilvering will be necessary. See p. 1670, No. 105, SCIENTIFIC AMERICAN SUPPLEMENT.

(5) C. L. asks (1) how stove cement is made? A. Moisten iron filings with strong aqueous solution of salammoniac (ammonium chloride). A little sulphur is sometimes added, to make the cement harden quicker, but it is better without. 2. Which is the best two horse engine in market? A. We cannot undertake to decide between rival manufacturers. 3. What material would you use for cleaning white shirts made dirty through wear, and which resist washing and bleaching? A. Soak in a 10 per cent solution of chloride of lime (calcium hypochlorite), then in water containing about three per cent of sulphuric acid, and finally rinse well in cold water.

(6) F. C. F. wishes to know (1) the horse power of an engine, cylinder 6x14, 60 lbs. of steam, and making 120 revolutions per minute. A. See p. 267 (4), current volume. 2. What is the rule to find the area of a piston? A. Square the diameter and multiply by 07854. 3. What kind of paint is best to put on a tin roof that has been painted once with common paint, and water is used from the roof? A. A good asphaltum varnish answers very well.

(7) F. G. asks: Is there any truth in the assertion that anthracite coal loses its heating qualities after being exposed to the air for a length of time? A. No.

(8) V. & B. ask what to impregnate wood with to render it incombustible. A. The following is one of the best: commercial tungstate of soda, 1 lb.; phosphate of soda, ¼ lb.; water, 2 gallons; dissolve. Apply boiling hot if possible.

(9) E. L. N. asks how to make a black printing ink, which shall be a heavy black, and of a bright color after printing. A. Small quantities of a superfine ink may be prepared as follows: Balsam of copaivi, 9 ounces; lampblack, 3 ounces; indigo and Prussian blue, 1¼ ounce; Indian red, ¾ ounce; yellow turpentine soap, dry, 3 ounces; grind upon a marble slab with a wooden muller until a pefectly smooth ink is obtained.

(10) J. E. L. asks (1) whether he can make a paper canoe by covering a light, strong wooden frame work with a single piece of common card board ⅛ inch thick and afterwards waterproofing the whole. A. Possibly; but we think it would not be serviceable. 2. What inexpensive substance can be used for the waterproofing? A. See answer to F. C. R. This page.

(11) F. C. R. writes: I am building a canvas boat, and would like to know what they use to waterproof canvas. A. The oiled waterproof is usually prepared by saturating the dry fabric with a varnish prepared about as follows: Boiled linseed oil, 100 parts; wax, 15 parts; litharge, 3; oil of turpentine, *q.s.* The oil is heated so as to readily melt the wax, which, together with the litharge, is then thoroughly incorporated with it and the mixture thinned down sufficiently with turpentine.

(12) B. A. asks for the process for making chloride calcium. A. Dissolve marble dust, chalk, or lime, in hydrochloric (muriatic) acid, filter, concentrate the solution by heating it in an open porcelain lined pan, and collect the salt which separates on cooling. This should be strongly heated (with constant stirring) to fusion in a clean iron pan to expel the remaining water.

(13) C. L. D. asks: 1. Is there any means of melting India rubber and have it retain its original elastic property? Is there any means of applying it to wood and have it retain said property? A. No. Native gum caoutchouc (unvulcanized rubber) is soluble in bisulphide of carbon containing about six per cent of absolute alcohol. This solution on evaporating leaves the rubber in its original condition. 2. Is the slipping of belts affected by the distance the power stands from machine, and if so how? A. An increase in the length of a belt increases its weight between the pulleys; this of course increases the pressure and friction on the pulleys.

(14) B. F. S. asks: Can a photograph be taken on any other substance than glass or tin? Can a picture be thrown upon some kind of material that can be lithographed from, without the process of drawing? A. Thereare several carbon and chromated gelatin processes—such as that Woodbury—that accomplish this. You will find several of them described in the SCIENTIFIC AMERICAN and SUPPLEMENT. Consult also Vogel's "Chemistry of Light and Photography."

(15) A. M. asks: 1. How can I make a good telephone, or where can I find descriptions? A. See the SCIENTIFIC AMERICAN SUPPLEMENT, No. 142. 2. How can I keep copper ores from tarnishing without spoiling their general character, and if any lacquer is to be used, what is the best receipt? A. A thin coating of an alcoholic solution of bleached shellac will sometimes suffice.

(16) W. V. R. writes: I have a large pile of cinders, taken from a cupola after melting which contains a large per cent of iron. Can I, after cleaning or scouring, melt them without mixing with other iron? I have been told I could do so by using a flux of lime stone or oyster shells. This I do not understand. Can you inform me how to use the flux and in what proportions, etc., to charge the cupola, which is 22 inches diameter, in order to melt 1,500 or 2,000 lbs. of the scrap at a melt? A. The slag can be fused as suggested; but in order to determine the proportion of flux necessary the per cent of iron in the slag must be known. Unless the per cent of iron in the slag is very large it is very doubtful if it can be economically extracted.

(17) C. H. B. asks: 1. Is phosphorus very dangerous to handle? A. It may be handled with impunity under water—in the air it is inflamed by very slight friction at ordinary temperatures when dry. 2. Will it show light in the dark, and how far can it be seen? A. Exposed to the air and moisture it exhibits (through slow oxidation) a faint, phosphorescent light. In utter darkness this light is faintly visible 100 yards distant; at much greater distances with difficulty or not at all. 3. What other substance that will show light without flame? A. You might substitute a small spiral of platinum wire heated to incandescence by the passage of an electric current.

(18) F. S. asks (1) if the year 1900 is a leap year. A. No, since it is not divided by 400. 2. Explain all about leap years. A. The earth makes the circuit of the sun in 365 days 5 hours and 48 minutes 49·062 seconds. This is called the solar year. The civil year is ordinarily 365 days, the excess (5h. 48m. 49·062s.) amounting in 4 years to very nearly a day. Accordingly each 4th year is given 366 days. But this counts a little too much, the excess amounting in a century to nearly a day. So, instead of calling the even hundred years leap years, they are made ordinary years of 365 days. This approximate correction involves an error of a little over one fourth of a day every century, which is nearly set right by counting each 400th year as a leap year. By these leap years and intercalated days (every 4th year except the hundreds not divisible by 400) the civil and solar years are closely reconciled, the object being to make the seasons permanently accord with the calendar. By making a further correction of one day every 4000th year, counting each 4000th year as not a leap year—the error is so small that 21,600 years must elapse before it will amount to a full day.

(19) E. S. W. asks: 1. How can I rid a house of cockroaches? A. A mixture, composed of 1 part of powdered borax and 2 parts of powdered sugar sprinkled upon the floor where they frequent, will soon eradicate them. 2. How can I find the side of the greatest square contained in a given circle? A. (*a*) If you mean the square exactly equal in area to the circle, it cannot be done. The square root of the area of the circle will give the side of a square approximately equal to the circle. Or multiply half the diameter of the circle by 3·14159. (*b*) If you mean the greatest square that can be drawn within the given circle, draw two diameters at right angles to each other and connect by a straight line any two adjacent extremities of such diameter. The last line will be the side of the required square. Or, take the square root of twice the square of half the diameter. 3. What is cyanide potassium? A. Cyanide of potassium is a compound of cyanogen and potassium (KCy). It forms colorless cubic or octahedral crystals, deliquescent in the air, and exceedingly soluble in water. Its solution always has an alkaline reaction, and when exposed to the air exhales the odor of hydrocyanic (prussic) acid. The salt is anhydrous, and is nearly as poisonous as hydrocyanic acid itself.

(20) W. H. C. asks: 1. What quantity of soft iron wire should be used in the center of an induction coil ½ the size of that described in SUPPLEMENT No. 160? A. Make the binder of wires about ¼ inch in diameter. 2. Why is wire better than one iron rod? A. A bundle of wires acquires and loses magnetism more rapidly than a solid rod of the same diameter.

(21) J. S. asks: How are carbon points that are used in electric lights made? A. By mixing finely pulverized gas carbon with a little coking coal, and baking the mixture under pressure for several hours or days.

(22) A. D. asks: Will you be kind enough to inform me if there is any cure for premature gray hair? I am a young lady of 25 years, and my hair is rapidly turning gray. My hair is thick, and far below my waist in length, but it is losing its dark color. Is there anything that could be taken internally to supply the coloring matter and restore the scalp to a healthy condition? A. Consult SCIENTIFIC AMERICAN, vol. 38, page 283 (12). The hair can be restored to a jet black, but probably only by artificial means, which are decidedly injurious to health. See lecture "Hygiene of the Hair," Professor Erasmus Wilson, SCIENTIFIC AMERICAN SUPPLEMENT No. 102.

(23) H. F. asks: Is there a book that contains all that is new relative to the telephone, microphone, phonograph, phonometer, etc.? A. Prescott's "Speaking Telephone, Electric Light, and other Novelties," contains much on these subjects. You will also find these instruments described in the SCIENTIFIC AMERICAN SUPPLEMENT.

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

T. S. B.—It is spiegeleisen (mirror iron), produced by smelting, in a blast furnace with charcoal, a spathic iron ore containing a large percentage of manganese—used in the Bessemer process of making steel.—W. W. S.—The supposed animated horse hair is a species of the genus gordius, frequently found in still water. Linnæus calls it gordius aquaticus.—P. B.—It is magnetite inclosing granules of apatite or phosphate of lime.—G. L. R. A.—If the pots are to be used for melting fine glass, a clay containing less oxide of iron will be requisite.—B.—The sand contains enough iron to unfit it for fine glass.—J. M. H.—The gravel in large box consists chiefly of quartz mica, hornblende, and feldspar, derived from the disintegration of a synaitic granite. The sample in small box contains much graphite.—D. M.—A dolerite containing crystallized lime carbonate and iron sulphide—pyrite.—J. W. C.—Quartz containing illmenite—titaniferous iron, and a trace of copper. The quartz is not auriferous.—W. J. B.—No. 1. Haytorite—a quartz pseudomorph after datholite. No. 2. It is composed chiefly of silica and aluminum silicate, with traces of lime phosphate and sulphate.—H. T.—It is galena (lead sulphide), a valuable ore of lead.

COMMUNICATIONS RECEIVED.

On Crank Shafts. By R. G.
On Electric Light Telegraph. By F. P.
On Curious Application of Fluorescence. By P. P.
On Silver Powder. By J. C. W.
The Grand Discovery of the Ages. By D.
On the Metric System. By J. G.
On Brorsen's Comet. By T. J. L.
On Planets. By P. & J. S.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

April 29, 1879,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city.

Advertising case, J. R. Carney 214,810
Air and gas compressor, W. F. Garrison 214,769
Anchor shoe, E. F. Robbins 214,792