2. Can I combine the different salts together so as to resemble the true waters, to bottle and charge in a fountain with carbonic acid gas? A. Yes. 3. How is the extract made that is used in ginger ale? A. It is composed of ginger extract with a little wild cherry, lemon, or other flavoring, and water.

(46) E. M. H. says: 1. Having a two horse power engine making 200 revolutions per minute, I wish to use it to pump where I want 30 lifts of the pump bucket per minute. The pulley on line shaft of engine is 9 inches in diameter. By running a belt from this 9 inch pulley on a 5 feet in diameter pulley, would it give the required number of lifts in the pump? A. Yes, if there is no slip. 2. There being a crank 9 inches long (on the same shaft that the 5 feet pulley is on) to which the rod of pump is fastened, what is now the power of the engine on the pump? Is not the power increased by thus decreasing the motion? A. You have not increased the motion, but the mechanical effect per stroke will be greater, in the proportion of the pulleys, neglecting friction.

(47) M. C. asks: What can I use to take coal tar off greenhouse pipes? A. We think a solution of potash will answer very well.

(48) S. C., of Mexico, asks: What advantages are there in the short-horned cattle over those of other classes, that make such great difference in their value? A. They give better milk, and their flesh is more valuable.

(49) O. M. M. asks how to make gold lacquer? A. To 1 gallon of methylated spirits of wine, add 10 ozs. seed lac and 4½ ozs. of red sanders; dissolve and strain.

(50) O. P. asks: What per cent of 1 horse power will it take to run a sewing machine, as it is run by any one sewing in the ordinary way? A. About 10 per cent.

(51) R. S. B. asks: What preparation can be used for painting the chimneys of steamships with red lead, so that the heat will not destroy the color as it does with common paint? A. We think it is difficult to make this color permanent, under the circumstances. Good varnish, ½ gallon; boiled linseed oil, ½ gallon; add red lead sufficient to bring to consistence of common paint.

(52) J. B. says: What is the best method of propelling a rowboat? A. By oars.

(53) I. N. D. asks: Will ripe tomatoes make strong vinegar? A. Probably not economically.

(54) J. W. D. McC. asks: Can copper be galvanized with gold? If so, what is the most simple but effectual method? A. A hot aqueous solution of the double cyanide of gold and potassium is used for the bath, with a battery of over two Smee cells for small work. Or the gold solution may be poured into a porous cup immersed in a quantity of salt water contained in a small copper cup. The whole is set on a fire until the gold solution has attained a temperature of about 110° Fah. A rod or plate of zinc is then placed in the salt bath, and the article to be plated, previously thoroughly cleaned, is immersed in the gold solution, and connected by means of a copper wire with the zinc. Under these conditions a deposit is soon obtained.

(55) W. T. R. asks: Can steam be introduced in a steam boiler from a pipe (1 inch) 400 feet long and used from boiler same as if made in boiler? We are using a rotary engine direct on to pipe. I want to put in a cylinder engine, but condensation is so great in the pipe it will knock out the cylinder head. I want the boiler in case supply from pipe fails us at any time. A. Yes. Instead of passing steam into the boiler before use, connect the engine directly to the pipe. You can easily attach a branch so that the boiler can be used when desired. Felt the pipe well, and provide a trap to carry off the condensed water.

(56) C. C. H. asks how "fraud" vinegar is made? A. It is probably a cheap, weak vinegar, the acidity of which has been strengthened by addition of a little oil of vitriol or acid lime sulphate. Vinegar of like properties has been made from pyroligneous acid—a product of the distillation of wood.

(57) M. M. asks how silk is dissolved with a liquid? A. Dissolve 16 parts (by weight) of copper sulphate in 144 to 160 parts of pure water, add 8 to 10 parts of glycerin (specific gravity 1·24) and mix by shaking. Into this, while cold, drop slowly a solution of caustic soda, while stirring, until the light blue precipitate at first formed is completely dissolved to a dark blue liquid. This fluid dissolves silk readily.

(58) C. G. C. says: I have a large, square, cut-glass inkstand, which is broken. Can you give me the composition of a cement with which I can repair it, and which will withstand the action of the ink? A. Use a strong solution of best gelatin in warm acetic acid. As ordinary inks contain tannic or gallic acid, the gelatin will only be rendered more insoluble if the ink comes in contact with it at the joint. The cement may be obtained at most druggists—one of the latest names under which it is known is "stratina."

(59) C. H. asks: Of what is belt lacing leather made? A. It is made of calf skins.

(60) Mc. Bros. ask: What is used for filling the letters of zinc signs? A. Use pitch 11 lbs., lampblack 1 lb., turpentine *q. s.* Mix with heat.

(61) S. R. R. asks: What does the foundation of the towers of the Brooklyn bridge rest upon? A. Upon bed rock in some places; gravel, boulders, etc., in others.

(62) J. P. F. says: I wish directions for melting brass in crucibles in an ordinary blacksmith's fire? Also directions for brazing iron or steel? A. Heat the crucible slowly with the contained brass; when melted, cover the surface with a layer of powdered charcoal. To braze, file the surfaces clean, and unite them carefully, and retain them in place by riveting or by winding with wire. Deposit spelter solder or soft brass where the union is to be made, heat carefully in a clear fire (charcoal is best) and flux with borax.

(63) C. M. asks: 1. What is the best method of making vinegar from grapes? A. Provide two wooden vats, made of oak. At a little distance from the bottom of each fix a wooden grate, on which place a layer of small grape twigs, leaves, and stems. Press the juice from the grapes. Fill one of the vats and half fill the other. As soon as fermentation begins in the half filled vat, fill it from the full one, and every day fill the one that has remained half full with a part of the contents of the other. By this daily transfer of half of the contents of one vat to the other, the vinous liquid is brought into contact with the air until acetification is completed. 2. Is there any inexpensive and effective method of preserving grapes for winter use? A. Yes, keep in a dry cool place. 3. If wood ashes are a good application to the soil of a grape vine, why would not a weak solution of commercial potash answer the same purpose? A. It would.

(64) E. W. D. asks: 1. For the period of the comets 1680, 1811, 1843, Donati's, Coggias, and 1556? A. 1680, 10,000 years; 1811, 3,065 years; 1843, 376 years; Donati's, 2,000 years; Coggia's, 10,000 years; 1556 was predicted for 1860. 2. If the form of the earth is due to its being thrown from the sun in a hot state? A. The sun in condensing from a nebulous mass left behind portions which condensed and formed planets, etc., these planets taking on a rotary motion before they fully solidified naturally become globular.

(65) R. & W. ask for a recipe for making best varnish for household furniture, and best process for polishing when done? A. Best African copal 4 lbs., drying oil 1 gallon, turpentine 1¾ gallons. Boil the gum and oil until it strings well. When somewhat cooled, add the turpentine. To make it dry quicker, dryers may be added during the cooling. To polish, after an even surface is produced by rubbing with powdered pumicestone applied with a woolen cloth, rub with rottenstone and oil, and finish by rubbing with the bare hand moistened with a few drops of oil.

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

G. W. E.—It is a combination of iron with sulphur—called pyrites. You can find something about it on p. 7, vol. 36.—C. F. C.—The package marked A. contains only quartz pebbles. Quartz is, when not contaminated, pure silicic acid—a combination of the element silicium with oxygen. B. is a calcium phosphate, chloride, and fluoride, called apatite. Unmarked specimen contains tennantite—a sulphide of copper, iron, and arsenic.—M. F. M.—No. 2 contains oxide of iron, alumina, lime, and silica. No. 2 is felspar. No. 3 is partially decomposed orthoclase, with oxides of iron and a little copper. No. 4 contains clay, mica, and oxides of iron. No. 5 is pyrites. No. 6 is felspathic rock, the coloration of which is due to iron oxides. No. 7 is partially degenerated syenite. No. 8 consists principally of lime carbonate. No. 9 is gypsum. No. 10 is hornblende with pyrites.—A. K.—It is iron pyrites.—R. L.—It is a quartzose rock, with bright specks of pyrites. It is not valuable.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Electrical Experiments. By F. J. M.
On Curving a Base Ball. By R. D. W.
On Remedy for Poison Oak. By H. F. A.
On Labor and Capital. By A. B. W.
On the Silver Mud Springs of Oregon. By B. S.

Also inquiries and answers from the following:

F. J. A.—D. C. H.—C. C. H.—W. T. & Co.—T. P.—C. R. M.—A. L.—I. A.—E. H.—A. P. A.—J. O. R.—I. M. D. McC.—C. E. T.

HINTS TO CORRESPONDENTS.

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 fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who deals in optical glasses? Who makes Bessemer steel wire? Who makes and sells miniature engines? Who makes a good composition for covering steam pipes?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

OFFICIAL.

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[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.

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10,131.—CASSIMERE.—D. D. Bowen, Adams, Mass.
10,132.—CARPETS.—J. H. Bromley, Philadelphia, Pa.
10,133.—HEATING STOVES.—R. A. Culter & D. C. Proctor, Peoria, Ill.
10,134.—GLASS SHADES.—W. W. Lyman, Meriden, Conn.
10,135 and 10,136.—CASSIMERES.—J. Perry, Dudley, Mass.
10,137.—CASINGS OF SODA WATER APPARATUS.—J. W. Tufts, Medford, Mass.

[A copy of any one of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]