

Artificial Butter.

To the Editor of the Scientific American:

Owing to the receipt of much correspondence concerning my article on artificial butter, which appeared in the SCIENTIFIC AMERICAN SUPPLEMENT, N. Y., Nos. 48 and 49, I wish to state that I own no patent on the process. The only patent held is Mage's, which is owned by the United States Dairy Company, 6 New Churchstreet. All letters, therefore, should be forwarded to that address. The process I described in my article is simply an elaboration of that patented by Mage, and cannot be used without infringing on the United States Dairy Company's patent. HENRY A. MOTT, JR., E. M., PH. D. New York City.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

All the best recipes published in SCIENTIFIC AMERICAN for several years back, are in "Wrinkles and Recipes." Price \$1.50, postpaid. Book and SCIENTIFIC AMERICAN for 1877, for \$4.20. H. N. MUNN, Publisher, 37 Park Row.

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Notes & Queries

A. F. will find a recipe for a cement for china on p. 346, vol. 24.—N. T. will find directions for making silicate of soda on p. 225, vol. 23.—F. N. will find directions for getting rid of flesh worms on p. 233, vol. 31.—J. C. will find directions for making laundry bluing on p. 219, vol. 31.—H. T., J. K., B. L., J. H., T. W., J. D., W. R., and others who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) F. W. C. says: I wish to convey hot water 1,000 feet from the heater through an iron pipe. Must the return or circulation pipe be as large as the supply, in order to keep the water hot at the terminus of supply? A. Yes.

1. I notice that in the vacuum chamber of a cold water pump, the water does not fill the chamber. What is it above the water, air or vacuum? A. It is air, and the pump does not draw it off because it is at a higher level. 2. Will the vacuum gauge work as well attached to the bottom? A. The gauge may be placed in any desired position.

(2) F. McL. asks: Is there any instrument by the aid of which a person can see the interior of his own eye? A. We know of none.

(3) C. H. H. asks: In regard to the water wheels at Fairmount Water Works, Philadelphia, does the water, or part of it, after being forced up, run back and act as power to raise more water? A. No.

(4) R. S. says: I have a floor made of alternate strips of black walnut and ash. I have great trouble in keeping it clean; in fact, it never really looks clean except immediately after washing. I have oiled it several times with boiled linseed oil, but it collects and holds the dust too much wherever any one walks. Under pianofortes, etc., it retains its brightness and beauty. What is the best substance or oil for me to use? A. Procure a liquid wax at your house painters; this is often applied for this purpose.

(5) A. says: Given a cast iron tank bolted together watertight, and intended to hold pure water. With what shall the inside be painted or covered, in order to effectually prevent rust? The required preparation must be inexpensive and be applied in liquid form. Nothing that will contaminate the water or dissolve, even slowly, will answer, a perfectly waterproof and innocuous preparation is the desideratum. A. Asbestos paint would probably fill most of the conditions required.

(6) A. M. H. says: The four chimneys of my three story brick dwelling did not draw well. This I attributed to the surrounding trees and houses, both of which are considerably higher than my dwelling, and although I had the chimneys well cleaned out to satisfy myself that there was no obstruction in them, I found a good and sufficient remedy only in placing upon each an iron pipe 8 feet high by 7/8 inches in diameter. I had the pipes made of galvanized sheet iron and strongly fastened with 1/2 inch iron rods. But a little while ago, after a two years' use of the pipes, the whole four pipes were swept away by the wind and broken into pieces as if they were pasteboard. Upon examination the pipes appeared to have been almost entirely rusted or eaten away from the inside, while upon the outside they were but a little discolored with rust. Why did they first go from the inside, and is there not some kind of durable paint or covering, not too brittle, that will prevent this? A. The soot upon the inside of the pipes develops an acid which assists in corroding the iron. The only satisfactory remedy is the extension of the brick chimney itself to the height required, and securing the same with iron braces.

(7) J. H. L. says: I claim that water is elastic and can be compressed. A friend claims that water is not elastic. A. Water is slightly compressible.

(8) N. A. asks: Will a fan, such as is used to make blast for melting iron, make more blast by having eight arms or wings than if there are but four? A. It would not necessarily be more effective with eight arms. It would be quite possible to build a fan of four vanes which was more effective than one having eight, and vice versa, on account of other considerations.

(9) E. L. asks: Can we change our mill, now driven by three wheels with direct gear, by transmitting power from wheels to one main shaft with quarter twist, and from this shaft with quarter twist to spindles? If the wheels will drive steadily, without any reaction, shall we lose any power by the indirect transmission? A. We think there will be no difficulty in making this change. As, however, you will have two belts and shafts to drive, in addition to the other gearing, the useful effect of your engine will be somewhat diminished.

(10) W. A. C. asks: Do you know of any steam boiler in this country built expressly to use salt water, and if so, has it proved a success? A. All marine boilers may properly be classed under this head. Such boilers are successful as long as they are kept reasonably free from scale. For land boilers, those of the cylindrical form have many advantages, when salt water is to be used, as they can be easily and quickly cleaned.

(11) F. G. asks: How much power will it take to force an inch stream of water through iron pipe 75 rods up a gradual rise or 75 feet, and what kind of pump would you recommend? A. Your question is rather indefinite, for almost any amount of power might be required to force water through the pipe, according to the velocity. We never recommend special manufactures in these columns.

(12) R. S. M. says: I want to run a cotton gin and press at a distance of 200 feet from my mill. Which is best, a shaft on ground, or wire rope? A. Either plan will answer very well, and we advise you to employ the one that you can arrange most cheaply.

(13) G. & B. ask: Has the ocean tide ever been used as a motor for driving machinery, otherwise than by water wheels driven by currents, or by the aid of dams and floodgates? A. We have read of propositions to this effect, but do not know of any that have been carried into practice.

(14) J. F. J. asks: How is the level of the sea (I mean the point a surveyor takes in saying that such a place is so far above the level of the sea) obtained? A. Just by taking it. For instance, if the surveyor notes that, at mean low tide, a given reference mark is at a certain elevation above the surface of the water, that becomes fixed, and all elevations can then be referred to mean sea level at any time—without a direct observation—by referring them to the fixed mark, and making the necessary correction.

(15) D. S. says: I am getting a small vertical steam boiler made from No. 20 galvanized sheet iron, I intend to put it on top of a box stove over the pipe hole with a 6 inch flue (that being the size of the pipe). The size of the boiler is 14 x 24 inches, and there will be 4 inches space for water between flue and shell. How much pressure will such a boiler stand? Will the flue stand as much as the shell, or will it collapse? A. The flue is somewhat weaker than the shell. You can carry about 15 lbs. steam. 2. Is there not a way to find the pressure of steam with the safety valve? A. If you buy a safety valve from a reliable maker, you will find it graduated with tolerable accuracy, so that the fall can be adjusted without any calculation. It is not a bad plan, however, to verify the graduation. You will find the manner of doing this fully explained in "Wrinkles and Recipes."

(16) T. M. says: You give Dr. Ferrier's remedy for cold in the head. How often should it be used as snuff? A. If the ailment is really a cold, one application of the preparation will be all that is necessary. It is not advisable to use it constantly for every ache or where neuralgia is suspected.

(17) S. W. asks: Can you tell me how to separate gold from iron when the two are mixed? A. Dissolve the gold in warm aqua regia (1 part nitric to 3 parts hydrochloric acid), evaporate nearly to dryness, redissolve in water, and add an excess of strong aqueous solution of sulphate of iron. Boil the liquid and allow to stand in a warm place for an hour. Then decant the clear liquid, gather the precipitate on a filter, wash with hot water, dry, and fuse in a small black lead crucible with a small quantity of anhydrous carbonate of soda. If the directions are closely followed, this will give you a button of the pure metal.

(18) D. asks: What will give a new appearance to old zinc? A. The structure and properties of zinc do not alter by age. You can remove the superficial coating of oxide by means of a little dilute acid and the scratch brush.

(19) W. T. B. asks: Can you give me a recipe for dissolving gutta serena, which is not combustible, and will not cost more than sulphuret of carbon? A. We do not know of such a solvent.

(20) C. E. A. asks: Are wood ashes a benefit to the growth of currant bushes or trees? A. Yes, if not used in excess.

(21) J. P. H. L. says: I have some fine specimens of copper ore. Is there anything that I can put on them that will not change the colors and will prevent their turning green? A. Varnish them with a little purified shellac in alcohol.

(22) W. P. T. says: In answer to H. G. you say that the change of color in hair is due to the loss of the iron salts which are the basis of the dark color. Can the dark brown hair of a young person be prevented from turning white? A. The only remedy that we can suggest is the reinvigoration of the blood by the proper use of animal nourishment and iron tonics. Avoid alcoholic stimulants and do not deprive yourself of needful sleep.

(23) H. L. G. asks: In electroplating, does a current that vibrates do better work than one which does not? A. No.

(24) C. W. W. asks: Of what size and thickness should a boiler be for an engine of 2 1/2 inches diameter of cylinders, and 4 inches length of stroke? A. Make a vertical one, 20 or 24 inches in diameter, and 3 feet high.

(25) G. A. W. says: I wish to build a propeller launch. I am making an engine 5 x 6 inches; how big a boat will it run at 8 miles an hour? How large should the boiler be, and how large a screw will it require? A. You can have a boat 30 feet long, with a boiler 3 feet in diameter and 4 1/2 feet high. Propeller should be 30 inches in diameter and of 3 1/2 to 4 feet pitch.

(26) F. D. W. asks: Is the following proposition correct? "It is a principle of mechanics that a force acting at right angles to the direction in which a body is moving, does no work, although it may continually and continuously alter the direction in which the body moves. No power, no energy is required to deflect a bullet from its path, provided the deflecting force acts always at right angles to that path." A. It might be true, if the conditions stated were possible; but it is evident that, when the body is deflected, its motion will not be at right angles to the deflecting force.

(27) N. asks: What is a good pickle or dip for copper-plated zinc work, to be used before gilding? A. Use very dilute oil of vitriol.

(28) J. G. W. asks: If the true meridian may not be obtained from the sun? A. Not unless you have true time, and know how much the sun is slow or fast.

(29) J. J. G. asks: Does a side wheel steam-boat or propeller draw more water when running than when still? A. Frequently when the boat is in motion the bow is elevated and the stern depressed.

(30) F. C. R. asks: 1. What size of boiler will be large enough to furnish steam for an engine 2 x 4 inches? A. One 20 inches in diameter and 3 feet high. 2. How large a boat will such an engine run at 3 or 4

miles an hour? A. One 15 feet long. 3. What size and pitch of screw will be necessary? A. Use one 18 to 20 inches in diameter and of 3 feet pitch.

(31) H. W. says: In a recent issue of your paper I see that S. N. W. asks who first applied steam power to the propulsion of boats, and is the inventor of steam navigation. You reply "that the Marquis de Jouffroy of France built a steamship some years before Fulton." But Dionis Papin (born August 22, 1647) of Paris, being a Protestant, fled from France after the repeal of the Edict of Nantes and went to England, and from there to Germany, where he was professor at the University of Marburg from 1687 to 1707. During this time he made several inventions, of which the most prominent was the steamship which he built and set to work in Hesse Cassel, on the river Fulda. What has become of the ship is not known.

(32) W. B. F. says: 1. I have an engine of 8 inches bore by 3 1/2 inches stroke, and I would like to know what sized three-bladed propeller I should use, and what horse power of boiler will it take to run a boat with a 25 feet keel, and 8 feet beam, drawing 2 feet of water? A. Use a propeller 24 or 26 inches in diameter, and of 3 feet pitch; and a boiler 28 or 30 inches in diameter and 3 1/2 feet high. 2. What speed would be realized? A. Probably 4 or 5 miles an hour in smooth water. 3. Where could I obtain directions for building such a boat? A. See the directions for building various kinds of boats, in back numbers of the SCIENTIFIC AMERICAN SUPPLEMENT.

(33) G. W. A. says: 1. We are running a 12 x 20 inches engine with a 9 flue boiler 48 inches in diameter by 20 feet long. The flues are 6 inches in diameter, and the stack is 23 inches in diameter and 40 feet high. She seems to have draft enough, but we cannot keep steam on her. We run her at 100 or 120 revolutions per minute, driving two 50-saw gins and two 30-inch burrs. The valve is a common slide valve, set with both ends equal with 1-16 in. lead. What is the matter? A. From your account the boiler should steam well if it is clean. Examine it to see if there is much scale in it, and test the engine to see whether there are any serious leaks. 2. Will a 2 inch shaft 100 feet long run two 50-saw gins and one 80-saw gin? A. It would be better to use a larger shaft. 3. Which runs the lightest, belts or iron cogs for driving burrs? A. More of the power applied is generally utilized by belts than by common gear wheels.

(34) B. S. says: I have made an induction coil (Ruhmkorff's method), 6 inches long and 3 1/2 inches in diameter. I get a spark from the induced current about 1-16 inch in length and a very severe shock. I would like to put on condensers to increase the spark as much as possible. Please tell me the proper number of sheets of tinfoil to use, their shape and size, and also give directions for connecting them in the main circuit from the battery. A. Thirty or forty square feet of foil will be sufficient. The sheets may be of any size and shape. Connect the condenser up so as to bring its opposite sides on each side of the vibrating break, that is, with contact points of break between its two coatings.

(35) J. H. asks: 1. Does nickel-plating cost as much as silver plating? A. Yes. 2. Does it require to be burnished after plating? A. Yes. 3. Does it require a battery as strong as for silver? A. It requires stronger battery power. 4. What is the best work on nickel plating? A. "Electricity; its Theory, Sources, and Applications," gives all the necessary instructions for nickel plating.

(36) J. T. D. says: Three months ago, I could not hold both ends of the wires from a gravity battery of large size (150 cups); now I can hold them for almost any length of time without feeling much current till I have held it for three or four minutes, and then I do not feel enough to make me let them go. The battery was tested with a galvanometer and proved to be as strong as ever. A. Your hands are probably dry and offer very considerable resistance to the current. When the latter has been allowed to flow a short time it starts perspiration and thus reduces the resistance. It is not difficult to take a continuous current from a battery; one can do this easily and retain hold of the terminal, when frequent interruptions of the circuit would be too severe for the majority of persons.

(37) W. T. N. says: I made a battery of three copper plates, 7 x 8 inches, tacked to slats 3/4 inch wide; between these plates were placed two 7 x 8 zincs. The two zincs and the three coppers were then connected with copper slips, and to the combined zincs and the combined coppers were attached the positive and negative wires. The plates were then placed in a common two gallon pail, full of sulphate of copper solution, the slats resting on the edges of the pail. I supposed I had a battery of about 200 inches of zinc surface, and I thought that this ought to produce some signs of magnetization in a bundle of wires (3/4 inch in diameter) in a coil of 180 feet 25 wire, and 600 feet of 35. But it did not, nor would it decompose water. The only sign of electricity was the strong salty-bitter taste on placing the poles on the tongue. What was the trouble? A. One hundred feet of No 16 copper wire will give better results with such a battery than all your wire together. It will take two such batteries to decompose water, and the decomposition would probably stop in 20 or 30 minutes.

(38) A. C. L. says: I want to lay a small lead pipe to bring water into my buildings, from a spring 1,600 feet distant, through hard rock, digging nearly all the way. How can we lay the pipe without going deep as ordinarily, but yet protecting it against any danger of freezing. Our idea is to dig a ditch 2 feet deep, fill it with 6 inches of sawdust then lay the pipe, then fill in over that with 12 inches more of sawdust, and then with the dirt taken from the ditch. Will that answer? How is the best way to construct the well at the spring? A. To give absolute security against freezing in our climate it has been found necessary to lay water pipes five feet below the surface of the ground. In one case the pipes of a good sized city being laid at 3 feet in depth, the water froze and the pipes burst in many places, so that the ground had to be opened again and the pipes re-laid at 5 feet in depth. During some winters the frost penetrates the ground very little, but the pipe must be so laid as to be secure in the severest seasons. It is doubtful if the sawdust filling would save it.