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R. can mold rubber by the process described on p. 363, vol. 30.—F. will find a description of harness oil on p. 234, vol. 30.

(1) E. H. asks: 1. What was the name of the first steamship that crossed the Atlantic Ocean from west to east? A. The Savannah, in 1818.

(2) J. P. L. asks: How can I tint tracing cloth so that the tinted places will not wrinkle? A. Common tracing cloth will wrinkle at the first touch of moisture.

(3) J. A. K. asks: How can I cement amber? A. Take 4 ozs. orange shellac and 3 ozs. strongest rectified alcohol.

(4) G. F. asks: If a man takes a pistol loaded with ball, and shoots straight up in the air, standing so that the bullet should happen to hit him, would it not kill him? A. We think not.

(5) F. H. asks: Which is the hardest, 14, 16, or 18 carat gold? A. 14 carat is the hardest of the three.

How long are the days on the equator? A. The days and nights at the equator, meaning by day, the time the sun is above the horizon, are equal.

(6) E. asks: 1. Can copper be tempered? If so, to what degree, and what is the process? A. It can be hardened by hammering or rolling.

(7) N. N. asks: What action will frost have on cast iron pipe 1/2 inch in thickness, about 20 inches under the street paving?

1. I am about to build some sprinkling tubs of 900 gallons capacity. Can you give me an idea of the best shape to make them, to get the widest spread of water? A. It makes little difference about the shape of the tub.

(8) E. H. asks: What is the radius of the sharpest curve that a train can safely turn? Is there any difference whether the train be long or short? Is there any difference whether it be an arc of 10° or the whole circle? A. We doubt whether any one can answer these questions.

(9) F. W. asks: How can I cut a design in iron, as on a watch case? A. The designs on watch cases are usually cut by a tool, either by hand or machine.

(10) W. D. asks: What kind of cement is generally used between French millstone blocks when they are put together? A. A mixture of alum, the dust of the stones, and water, or molasses.

(11) M. V. O. says: A question has arisen as to how the lead of the valve of a locomotive is affected by raising or lowering the link.

(12) W. S. W. asks: How can I set the valves of a locomotive? Can it be done without taking off the steam chest covers? A. It would require a treatise to answer your question.

(13) R. C. asks: What are the ingredients and what their proportion for enameling iron pots, sauce pans, etc.? A. A paste is made by fusing together 100 parts by weight of calcined ground flints, and 50 parts calcined borax.

(14) P. W. D. says: My friend says that the same power that will run a circular saw through a log with a feed of 1/2 inch to revolution, will start the saw when standing in the middle of the log, with the same feed choking the teeth of the saw.

(15) L. G. asks: What chemical preparation will purify or improve strong and rancid butter? I noticed recently an account of experiments (by Sonstadt) with iodate of calcium, which kept butter for three weeks, and rancid butter was improved by it.

(16) J. M. R. asks: 1. Would a shot gun barrel manufactured of decarbonized steel be apt to burst? A. We do not think it would be perfectly safe.

(17) L. S. C. says: In a recent issue you state that a large circular saw requires more driving power than a small one, which is apparent, the number of revolutions per minute being the same with both saws.

(18) E. E. K. asks: 1. Would a receptacle having an internal hydraulic pressure sufficient to show an external moisture cause the cast iron receptacle to break? A. Not necessarily.

(19) P. & W. ask: 1. How are burglar alarms applied to the doors and windows of a dwelling house? A. Strips of metal are attached to the doors and windows, and to the frames, in

such a manner that the raising of a window or the opening of the door will close a circuit and ring a bell.

(20) R. asks: How can india rubber be hardened? A. Take 30 parts sulphur, and 70 parts pure rubber cut fine, mix thoroughly, put into a mold; keep under pressure of about 12 lbs. to the inch in a heat of 315° Fah. for 2 hours.

(21) G. C. P. Jr. asks: How can I make printer's ink? A. Take balsam capivi 9 ozs., lamp-black 3 ozs., indigo and Prussian blue together 1 1/2 ozs., Indian red 3/4 oz., yellow turpentine soap (dry) 3 ozs. Grind to an impalpable smoothness.

(22) W. H. H. asks: Can you give me a recipe for a baking powder containing ammonia? A. Take tartaric acid 1/4 lb., alum 1/2 lb., bicarbonate of soda 3/4 lb., farina 1 lb.; powder them all, dry, mix, and add 3 ozs. sesquicarbonate of ammonia in powder.

(23) J. J. asks: How can I solder brass? A. Mix copper and zinc in equal proportions, cover the surfaces to be joined with a paste of borax and water, put in the alloy in powder, lute together, and hold in a flame till the solder melts.

(24) C. A. R. asks: How can I soften old putty on window frames? A. Pass a red hot iron over it, near the surface of the putty.

(25) F. M. H. asks: What materials are used in making a nickel solution for plating? A. Dissolve the nickel in nitric acid; add cyanide of potassium to precipitate the metal.

(26) W. H. F. asks: 1. Given the resistance of a line, how shall I determine the electromotive force necessary to operate it? A. You require about one volt for each 80 ohms.

(27) A. M. says: I would often make use of the electric light if the Grove and Bunsen batteries were not so troublesome.

(28) C. C. asks: 1. In electrotyping, must the wood blocks or engravings be oiled before taking a wax impression? A. No. Brush them over with black lead.

(29) C. E. C. asks: What are the best treatments on electroplating? A. "Elements of Electro-Metallurgy," by Alfred Smee; "A Manual of Electro-Metallurgy," by James Napier; Walker's "Electrotype Manipulation;" Sturgeon's "Art of Electrotyping;" and How's "Manual of Electro-Metallurgy."

(30) E. T. T. says: A friend and myself have a couple of telegraph instruments, with a large wire between them.

(31) J. N. G. asks: How many Callaud cells would be required to work three relays on a small copper wire of half a mile long, wire No. 17? A. Four.

(32) E. A. F. T. asks: 1. Will an engine, 1 1/2 inches bore x 3 inches stroke, with a conical boiler 18 inches high and 8 inches across at top, and 12 inches at bottom, of 1/2 inch iron, be large enough to run a 6 inch swinging lathe for ordinary work, or an 18 inch grindstone? A. Yes.