Business and Personal.

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To Engine Builders—See Adv't in this paper.

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The Baxter Engine—A 48 Page Pamphlet, containing detail drawings of all parts and full particulars, now ready, and will be mailed gratis. W. D. Russell, 18 Park Place, New York.

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Notes & Queries

D. L. M. (steam pressure in caldron), does does not send sufficient data.—J. S. F. and others are informed that there is no such instrument as a rod that will indicate the locality of coal in the earth.—H. M. T will find a recipe for cement for leather on p. 119, vol. 28.—A. will find directions for pickling cucumbers on p. 155, vol. 31.—C. A. B. will find a recipe for a white metal on p. 363, vol. 31.—J. W. H. will find a recipe for cement for china and glass on p. 379, vol. 32.—M. will find full descriptions of friction gears on pp. 227, etc, vol. 26.—J. S. S. can polish his gun barrel by following the directions on p. 11, vol. 32.—W. W. S. will find directions for cementing leather to iron on p. 347, vol. 30.—J. C. P. will find directions for calculating the teeth of compound gears on p. 187, vol. 29.—E. H. can fasten emery to a belt with good glue.—G. B. S will find full directions for constructing friction gears on p. 227, etc., vol. 26.—J. C. W. can calculate the amount of friction of water in a pipe by the formula given on p. 48, vol. 29.—M. G. will find that a treatment of catarrh was described on p. 85, vol. 32.—J. S. W. can cement cloth to wood with marine glue. See p. 43, vol. 32.—J. S S. can waterproof leather by the method described on p. 155, vol. 26, and paper by that detailed on p. 146, vol. 31.—E. W. C. can put a black enamel on his iron castings by following the directions given on p. 208, vol. 26.—T. D. B. can fasten emery to wood by the method described on p. 203, vol. 32.—G. B. M. can clean fly specks off gilt moldings by the process detailed on p. 27, vol. 31.—J. V. R. will find full directions for making induction coils on p. 219, vol. 32.—J. E S. can copper cast iron by following the directions on p. 90, vol. 31.—A. McK. will find a description of meerschaum on p. 11, vol 32.—G. C. U. and others will find an explanation of an iceboat sailing faster than the wind on p. 331, vol. 33.—S. B. will find full directions for polishing magnifying glasses on p. 363, vol. 31.—F. C. will find answers to all his questions on electroplating in No 34, p. 284, vol. 33.—J. V. B. P. will find directions for hardening files on p. 212, vol. 26.—W. E. and G. W. McB. will find a recipe for liquid glue on p. 90, vol. 32.—J. F. C. and others are informed that the force of a falling blow is discussed on p. 90, vol. 32.—H. G. B. will find a recipe for bronzing on iron on p. 283, vol. 31.—W. W. S. can cut glass bottles by following the directions on p. 399, vol. 24.—H. J. B. can remove fruit stains by the method described on p. 283, vol. 31.—E. J. C. will find a description of a straw-burning engine on p. 214, vol. 30.—W. H. C. will find a detailed account of the sand blast on p. 296, vol. 25.—N. T. H. will find directions for etching on glass on p. 409, vol. 31.—N. will find directions for gilding picture frames on p. 347, vol. 31.—C. W. S. can preserve his skates from rust by the method detailed on p. 283, vol. 31.—E. J. O. will find directions for making artificial stone on p. 350, vol. 25.—H. B. B. will find directions for making rubber printing stamps on p. 156, vol. 31.—W. E. will find directions for crystalizing the surface of tin on p. 304, vol. 31.—P. H. H. will find a good recipe for shoe blacking on p. 283, vol. 31.—J. L. K. can galvanize iron articles by the process described on p. 59, vol. 24.

(1) F. F. asks: Is there any way to prevent lamp chimneys from breaking by heat, or by cold in daytime, when the lamp is not burning? A. If the chimneys be properly annealed, they will not easily break, if ordinary care be taken not to spatter them with cold water when very hot.

(2) S. T. R. asks: Will you please state what is the simplest test for the presence of free carbonic oxide in the atmosphere of rooms in a dwelling? A. There is no simple method of doing this satisfactorily, owing to the solubility of all the combinations into which it enters. A solution of the bichloride of copper in hydrochloric acid, or of a salt of the dioxide of copper in ammonia, gradually absorbs carbonic oxide if agitated with it.

(3) J. A. R. asks: How can I make liquid gold and silver, to be used for writing on paper? A. Procure a book of leaf gold, take out the leaves gently and grind them in a mortar with a piece of honey about the size of a hazel nut, until it is thoroughly intermixed with the gold; then add a little water and rework it; put the whole into a phial and shake well. Let it remain an hour or two, and the gold will deposit at the bottom of the phial. Pour off the liquor, and add weak prepared gum in its stead, sufficiently to make it flow freely from the pen. When required for use, shake it occasionally.

(4) G. H. asks: Is there any marking ink sold which does not contain silver salts? The laundry washing removes all marking by $AgNO_3$ ink, probably using KCN. Some kinds of indelible printing ink are not affected. Can you give the ingredients for any such ink, to be used with a pen? A. Make a solution of genuine asphalt in alcohol. This is one of the best indelible inks known. You may find it, already prepared for sale, under the name of indelible carbon ink. Aniline black also gives very good results.

(5) W. F. W. says: 1. We have at our works three steam boilers, 26 feet long by 36 inches diameter, with 2 flues in each of 14 inches diameter. Furnace is 11 feet wide and grate bars 4 feet long. Boilers are set 15 inches from surface of bars; smoke stack is 42 inches in diameter. We require 80 lbs. of steam to do the work, and it requires skillful firing and constant hard work to make the steam. By this forcing of fires, a waste of fuel occurs. We use river water, and wash out the boilers once a week, and we find a deposit of scale in each, about two quarts in quantity, collected in a circle 8 or 10 inches in diameter, 40 inches from front of boiler. It is in the same place every week. Would the use of grate bars 12 or 15 inches longer overcome the necessity of forcing the fires, and give more heat? A. It is probable that your best plan would be to put in another boiler. Before doing this, however, we advise you to have your boilers tested, so as to ascertain whether they are as efficient as they should be. 2. Is it the intense heat on the front sheets that causes the scale to collect in a circle in the same place? A. The reason suggested for the formation of scale in particular spots is very plausible.

(6) J. S. E. says: We tried preserving eggs by coating them with paraffin, but the warm paraffin was chilled the instant it touched the egg, and it seems impossible to apply it. How can it be done? A. Send us a copy of the directions that you made use of.

(7) J. N. P. says: On a three story house was suspended a scaffold, the weight of which was not over 150 lbs.; the rigging of the scaffold was made of ⅜ inch rods, and chains, the links of which were also made from ⅜ rods. An accident occurred when there were two men on the scaffold, weighing probably 150 lbs. each. The scaffold was one of a pair which were swung together, with a bridge between. At the time of the accident one man was near one end of the bridge, and the other about the middle of the bridge, which was about 12 or 15 feet long. All at once, without any warning, one of the rods pulled in two, and the scaffold fell; the strain was from end to end (tensile); the end of the broken rod showed no fracture, and it was not splintered, but had more of the appearance of coarse cast iron; the crystals were very distinct. The iron was bought for the best Swedish wrought iron. 1. Do you think the rods were overloaded? The rigging has been in use about four years, and has been used in all kinds of weather. A. From your account, we infer that the accident was caused by a defect in the iron. 2. What do you think would be a safe load for a scaffold fitted with such rods? The total weight of the bridge was not over 75 lbs. A. Each rod, if made of good material, should be capable of sustaining with safety about 1,000 lbs.

(8) C. D. asks: Please give the formula for producing the white finish upon thermometer and barometer tubes. A. The white enamel sometimes seen is made by fusing together hard flint glass and white arsenic, in the proportion of 10 parts of the former to 1 part of the latter. In some cases, calcined bone or ivory is used in place of the arsenic. The proportions in this case are the same as in the former.

(9) T. D. H. asks: How can I make a good barometer? A. Obtain a good strong glass tube, about 34 inches long and having as smooth and even a bore as possible. Close one end by means of a spirit lamp and blowpipe, or Bunsen burner, and fill the tube with pure clean dry mercury, being careful to exclude all bubbles of air. Then place your finger over the open end of the tube and carefully invert it into a small vessel, partially filled with mercury. Be careful not to remove your finger until the end of the tube which it covers is safely below the surface of the mercury in the reservoir. When the tube is thus inverted the contents will fall until the hight of the column is about 30 inches above the level of the mercury in the little reservoir below. In the barometer the mercury never rises above 31 inches, and rarely falls below 27. The scale is therefore applied only to that part of the tube which lies between these limits. This scale may be adjusted properly by comparison with some standard instrument.

(10) M. O. asks: Of what metal shall I make an inkstand which will not corrode or spoil the ink? A. You fail to state what kind of ink. Ink varies greatly in composition. As a general rule, the metals (gold, platinum, etc., excepted) could not well be employed for this purpose, as in many cases they would contanimate the ink. Try bone, ivory, horn, or some kind of close-grained, hard wood.

(11) C. W. H. says: Herewith is a rubber band which has the appearance of having been subject to heat sufficient to destroy its elasticity, and almost to char it. In 1870, I placed this band around a bundle of letters, and put the bundle away. From that time it has not been disturbed. I find this band in its present condition, while the letters on the outside of the bundle next to the band, as well as all papers lying next to it, are discolored and have the appearance of being scorched. There was nothing else in the drawer in all that time, except clean bundles of letters. Can you account for it? A. The specimens forwarded prove to have undergone oxidation, but it would be surprising if the results noted could be traced to this. The degree of heat necessary to have scorched the paper, as stated, would have caused a partial decomposition of the rubber, leaving it in a viscous condition, which is not the case.

(12) J. B. asks: How can I carbonize, decarbonize, and extract phosphorus from iron, when melting it on a small scale? A. Fuse with a small quantity of cubic niter and calcium chloride.

(13) J. S. B. asks: Can you inform me of the process for a detonating compound composed of chlorate of potash and amorphous phosphorus, and the nature of the explosive conditions under which it explodes, etc.? A. Glue, or gum, or any similar substance is first dissolved in a small quantity of water to the consistence of a thin sirup, with which, having been heated to 122° Fah., the phosphorus (amorphous in powder) is incorporated, by gradually adding it and keeping the mixture stirred so as to form an emulsion, to which is next added the chlorate of potassa, having been previously well pulverized. The amount of phosphorus should be in the proportion of $\frac{1}{10}$ or $\frac{1}{12}$. A drop of this mixture, if allowed to dry, detonates violently on the slightest friction as well as by contact with flame.

(14) A. B. B. asks: How can I remove grease spots from paper? A. Warm the paper and cover it on both sides with dry, finely ground pipe clay, and place it under a slight pressure for a few hours Then dust off the clay, and remove the fine dust that still adheres by means of a good piece of india rubber.

Can carbonic acid gas be collected and liquefied from tubs of fermenting grain, as in distilleries? A. Yes, but we do not think it would repay you for your trouble.

(15) H. & W. ask: We wish to dissolve some bleached shellac, and have tried alcohol, spirits of turpentine, and potash, but all have failed. Can you tell us what will do it? A. If the substance in question is really shellac, alcohol will dissolve it readily. Shellac is also soluble in a hot solution of borax in water.

(16) E. S. C. says: I am building a side wheel boat, 18 feet long and of 5 feet beam. The engine cylinder is 3 inches by 6 inches. Please give proper dimensions for paddle wheels to run at the rate of 7 miles per hour. How fast should they revolve? Is it best to speed back with cog gear or belt? A. It is not probable that you can realize the speed you mention. We would recommend wheels about 3 feet in diameter, making 30 to 35 revolutions a minute. You can use friction gearing to advantage.

(17) P. asks: What buoyancy in sea water will a globe of glass containing 100 lbs. weight of atmospheric air have when immersed to a given depth? In other words, if a utensil containing 100 lbs. of air is submerged in water, how much weight will it carry or hold up without sinking? How many cubic inches of space contains 100 lbs. of air? What is the weight of air by the gallon? A. You do not send sufficient data; but we will give you what you need to work out the example. The weight of one cubic foot of air, at ordinary temperature and pressure, is 0·076391 lbs.

(18) W. T. A. says: I am using two return flue boilers 28 feet long and 3 feet 4 inches in diameter, and a new high pressure Corliss engine. I burn wood and have plenty of draft. The water is full of lime, which stops my gages up and precipitates in large quantities throughout the boilers and engine. If I use a heater, exhausting from the engine into it and then allowing the steam to escape at the other end of the heater, would it purify the water at all, and help me out of my trouble? A. The use of a good heater would probably prove of advantage in your case. It would be well for you to blow off some of the water in the boiler once or twice a day.

(19) W. B. asks: What sized wheel is proper for a side wheel steamboat 80 feet long, of 15 feet beam, and 4 feet deep? Should the whele bouse be perfectly round, or does it want to slant out at the bottom? A. Make the wheel as large as convenient. It will answer very well to use a round wheel house, leaving some clear space below.

(20) W. B. G. says: I am using several water wheels, which I think will be sufficiently described by calling them center vent turbine wheels. If I gear them so that, to do the same work as now, they would have to make more revolutions, do I thereby increase their power? I also use more water. In other words, does the amount of water vented bear any relation to the speed of the wheel, and can a small wheel be made to do the duty of a larger one by simply increasing its speed relative to the work to be done? A. Generally, any particular wheel has a certain velocity at which it gives the greatest efficiency.

(21) C. J. H. asks: How can I insulate copper wire for an induction coil? A. Cover the wire with silk. The longer the wire, the greater the shock. One thousand feet will give a good shock.

(22) N. B. A. asks: Please give me a recipe for an ink which, although it is of a reddish color when first applied to the paper, in a few moments turns black or purplish black. I think it is called chromium ink. A. Dissolve 3 ozs. solid extract of logwood in 3 gallons hot water; to this add ½ oz. bichromate of potassa, also dissolved in a little hot water. The ink, when cool, is ready for use.

(23) F. O. asks: 1. With what can I fasten leather to wood? The cement must not be soluble. A. Melt together equal parts of pitch and gutta percha. Apply hot. 2. Will kid leather submerged in kerosene be destroyed? A. We think not. 3. Will felt withstand the action of kerosene? A. It will.

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