Notes & Queries

O. C. W. will find directions for utilizing old tin cans on p. 319, vol. 31.—G. A. B. and W. M. will find directions for bluing steel on p. 123, vol. 31.—S. M. T. can transfer engravings to glass by the process described on p. 123, vol. 30.—W. F. McL. will find a good recipe for making black ink on p. 203, vol. 29.—L. L. L. will find directions for soldering iron and brass on p. 251, vol. 28.—F. S. can exterminate moths from carpets by the process described on p. 388, vol. 29.—J. S. will find directions for making gun cotton on p. 282, vol. 31. Celluloid is described on p. 23, vol. 33.—T. M. W. will find directions for silvering mirrors on pp. 267, 331, vol. 31.—S. C. can mount chromos, etc., by following the directions on p. 91, vol. 32.—A. S. can waterproof his leather boots by using the recipe given on p. 155, vol. 26.—B. A. C. will find a recipe for a depilatory on p. 362, vol. 32.—G. will find a good recipe for stove polish on p. 219, vol. 31.

(1) A. McC. asks: What is the best speed for the bucket of an overshot water wheel? Our wheel runs at the rate of 10 feet per second. Some millwrights claim that if we reduce the speed one half we will get double the power out of the same water. Are they right? A. We could not answer positively without more data; but in general, the speed of the periphery of an overshot wheel is not more than 5 or 6 feet per second.

(2) T. J. C. asks: What is the best way of joining logs together, to form a boom? A. For ordinary cases, chains answer very well, if the logs are kept in position by piles, driven in pairs, at intervals.

(3) S. C. B. says: I intend using a permanent tread power. Is there any disadvantage in placing it on a level, requiring the horse to work in harness instead of on an inclination? My own views are that the horse will work more easily on the level, which distributes the labor upon his legs nearly equally, whereas the other plan overtaxes the hind ones. A. Probably the matter can only be settled definitely by experiment. Some inclination is generally considered advisable, so as to allow part of the weight of the animal to act against the resistance. We imagine some of our readers can furnish useful hints on this subject; and if so, we would be glad to hear from them. The tread power is not ordinarily as efficient as the lever power, in which the horse walks in a circle of large diameter; and for a permanent power, it is better to call in the aid of steam.

(4) H. H. A. asks: What kind of oil should be used as a base to mix with powdered slate to paint a roof with? A. Linseed oil is the best to use, and the expense for one roof would not be very great.

(5) H. C. E. says: 1. I have a boat, 21 feet long by 7 feet 6 inches beam, drawing 12 or 15 inches of water. I built an engine 3x5 inches, with a link motion. Is the engine large enough for the boat? A. Yes. 2. I have a ½ inch feed pipe and ¾ inch exhaust. Is the exhaust too small for the engine? A. It will answer very well. 3. What size of propeller should I use? A. Of 18 or 20 inches diameter, 2½ feet pitch. 4. What size of boiler is required? A. About 2½ feet diameter, 4 feet high. 5. What is meant by the pitch of a propeller? A. It is the distance it would move the boat, at each revolution, if it worked in an unyielding medium, like a screw in a nut.

(6) C. A. A. asks: Is it any benefit to a rubber band to oil it? A. Quite the contrary.

What is the best way to treat posts to make them last? A. It is recommended to dip them into tar.

Are small vertical engines, with cast iron flues, as safe as those with wrought iron tubes? A. We do not understand what you mean by the flues of an engine; but if you refer to the boiler, the wrought iron tubes are preferable.

(7) E. F. asks: Is there anyway of setting glass in skylights? A. To make a good skylight, use iron bars and adopt a steep pitch; 45° is none too steep. Purchase your putty or cement of the patent vault light manufacturers of this city. If you wish to repair a skylight, use the same kind of cement but you cannot depend upon wooden bars.

(8) S. H. D. asks: How can I take a copper counter die from a brass die? A. Take a plaster of Paris cast from the die, and use it as a mold, melting two per cent of spelter with the copper to fluxit.

(9) A. L. C. asks: What percentage of sea water is salt? A. Ordinary sea water contains about 3 per cent, by weight, of salt.

It is said that Pythagoras knew how to predict an eclipse by means of the saros. What is a saros? A. It was an ancient astronomical period, the length of which is a subject of debate.

I want to build a model ship 6 feet long. Can you give me some rules that will assist me in shaping the hull? A. Get a drawing of the lines of some well designed ship, and work from that.

(10) J. M. H. asks: By what process can finely ground flint glass be incorporated with Babbitt or other metal for lining boxes, for heavy machinery running at high speed? The object is to prevent the heating and rapid wear of the journals. A. We know of no process, and we think that the mixture would cause the bearings to abrade.

(11) G. E. P. says: Some time ago you discussed the proposition that the top of a wheel of a wagon in motion moved faster than the bottom. Is there any formula for computing how much faster the top moved than the bottom, or than the hub? A. At the highest point the velocity is twice as great as at the center, and at the lowest point the velocity is zero.

(12) A. H. asks: In making bell metal (about 77 copper to 23 tin) I have been in the habit of employing a flux composed almost entirely of lime. Over 5 per cent of the metal is burnt up; and the slag will sometimes be an inch thick in the bottom of the reverberatory furnace. Is there a flux which will effectually separate the metal from all impurities? A. Use a little borax or sal ammoniac.

(13) C. A. B. asks: What will remove, from the walls of a brick building, the oozings or collection of saltpeter? A. It is probably not saltpeter, for if it were the rain would remove it, it being very soluble in water. If it is an insoluble salt of lime, try a little dilute muriatic acid, and then wash well with water.

(14) G. F. says: 1. I have a six horse horizontal engine; it makes a slight thump which I am unable to locate. The center of the driving shaft is ¼ inch higher than the center of the cylinder; would that cause a thump? A. The shaft being out of line is most probably the cause of the thump 2. I am running a line shaft at 120 per minute, and an engine at 75. Could I economize by putting a larger pulley on shaft and running the engine at 100 per minute, using same pressure? A. The proposed increase of revolutions will prove economical, providing the wearing surfaces and the proportions of the various parts are large enough to sustain it. The thump would, however, increase with the speed.

(15) R. R. Z. asks: What will dissolve hair and wool mixed with small pieces of bone? I wish to retain the ammonia. I want to use it in a drill as a fertilizer. A. Ammonia can be obtained from bones, etc., only by a process of destructive distillation. It does not exist, in any quantity, in the bones themselves, but is formed when they are decomposed, in airtight vessels, by a high temperature.

(16) W. H. M. and M. L. L. say: We want to bore a well in low land, where salt water flows and penetrates in the earth to the depth of 15 feet. Will galvanized tubing prevent the salt water from mingling with the fresh without the joints being screwed or soldered together? A. If you strike a spring of fresh water, the tubing you speak of will answer very well.

(17) S. G. asks: How can I extract the oil from kip pieces without injury to the leather, which is to be used for heels for shoes? A. Try bisulphide of carbon.

(18) A. says: The supply pipe from the boilers to a horizontal engine is 75 feet long and 14 inches diameter. It connects to the steam chest by an 8 inch pipe, 15 feet long. The cylinder is 40 inches in diameter, and of 46 inches stroke; it has a waste pipe from each head, that runs along to a flywheel pit, and then, by a quarter turn, down 15 feet into 2 feet of water. The engine worked water while working a heavy train of rolls. Parties here say she drew the water from the flywheel pit through the waste pipe. I say not, as there was 60 lbs. steam pressure to work against. Which is right? A. You are right, according to the account; the other parties may be right if the engine was a condensing one.

(19) B. F. G. asks: Is there anything that will dissolve shellac besides alcohol? A. Shellac dissolves in a hot solution of borax in water.

(20) W. C. asks: 1. What is the stream line theory? Allusion was made to a new theory averring the non-resistance of water or any perfect fluid to bodies moving through it, by Professor Froude, in a lecture which you printed about three weeks ago. That singular theory was called the theory of stream lines; but it was only alluded to. Will you explain what it is? A. It may be briefly expressed, in the Professor's own words, as follows: "A submerged body traveling at steady speed through a stationary ocean of perfect fluid will experience no resistance."

How deep in the water can a dredge operate? A. It might not be safe to fix a precise limit, as it is generally found that, when dredging ought to be done, machinery can be designed to do it.

(21) A. B. says: I heated equal parts of manganese peroxide and potassic chlorate in a test tube, which I drew to a point, but I could not produce an oxygen flame. What was the reason? A. Oxygen, by itself, is not inflammable. Try a piece of wood splint with a spark on the end; the oxygen will cause it to burn very brilliantly.

(22) T. C. asks: How can rosin be purified for violinists' use? A. Treat the powdered rosin with a mixture of 6 parts cold alcohol and 1 of ether; dissolve the residue in boiling alcohol, and evaporate this solution to dryness over a water bath. If the residue be now melted, it yields, on cooling, a colorless substance as clear as crystal.

(23) H. D. M. says: I assert that as high a rate of speed as 70 miles an hour had been made on an English railroad. A friend says that 45 or 50 is the highest speed ever made. Which is right? A. A speed of 70 miles an hour has frequently been made in England for short distances. Some of the trains are timed to run at nearly 60 miles an hour. Similar speeds are occasionally made in this country.

(24) M. S. J. asks: What liquids can I use to dissolve white chalk, so as not to destroy any of the properties of the chalk, but leave it in a liquid state? A. You cannot dissolve chalk and leave its properties unaffected. Rub up precipitated chalk with a little gum water.

(25) J. P. S. says: As I am about to build a burial vault, can you give me some information as to how the inside of the vault should be built, and whether it should be shelved or not? A. A burial vault is usually built into the side of a bank of earth, in such manner as to have the floor thereof one step or so above the ground in front. A medium size would be 12 by 18 feet on the exterior, with the narrow end for front. Make the interior hight 10½ feet and cover with a semi-circular arch. Construct the receptacles for coffins at the back end of the vault; these may be about 20 inches high, 28 inches wide, and 8 feet in depth. Make the bottoms or shelves of these receptacles of planed blue stone or slate slabs, 2½ inches thick, placing the first slab upon the floor of the vault, showing its thickness above the floor; build the upright partition walls of brick in cement, and 4 inches thick. Make the slabs wide enough to serve for two compartments each, there being four in the width of the vault. This will give you four tiers of four receptacles each, and two in the upper curve of the crown, making eighteen in all. The front ends of the partitions should be faced with the blue stone or slate, into which facing cut a groove, and insert a closing slab of marble or other stone to close each opening. Pave the space in front of the cells as a vestibule with stone—which may be fine marble tiling, if so required. The entrance door may be closed with either an iron gate or marble slab, so inserted as to be easily taken out. The exterior may be faced with granite and the walls coped with the same; but the top needs only to be cemented so as to shed the water, covered with mold, and laid with grass sod.

(26) C. D. B. says: I have a compound composed of the following ingredients: Venice turpentine, sweet oil, lard, and beeswax. What cheap substance, that will not injure the skin, can I add to destroy the smell of the turpentine? A. You will have to counteract the objectionable odor by the addition of some agreeable perfume.

(27) E. D. S. asks: Is there any substance that will serve better than good sponge for filtering a $\frac{1}{16}$ inch stream of water? The chamber for filter will be 2x3x4 inches, and I wish to arrest merely the floating particles. A. Try a carbon filter.

(28) G. C. asks: Would the Cornish or double beat valve be suitable for an engine with 30 inch cylinder and 42 inch stroke, making 65 revolutions per minute with a pressure of 80 lbs.? The reason for wanting to adopt it is that the engine has frequently to be worked by hand, with full head of steam. A. If the Cornish valve can be applied, it will be suitable.

(29) A. T. B. says: We make steam in our boilers for the purpose of evaporating brine, using a pressure of 50 or 60 lbs. to the inch. Would the same fuel make more salt if no pressure were carried in the boilers? A. If there be no pressure in the boilers, the heat will not exceed 212°, and only hot water could be conveyed away from the boilers. If steam is to be circulated to any distance from a boiler, there must be a pressure to move the steam through the pipes.

(30) F. F. T. asks: Which would be the most economical as regards fuel, to run an engine at 110 or at 160 revolutions per minute? A. Generally, the higher speed is the most economical.

(31) D. M. M. asks: How can I re-japan stands of sewing machines, without baking them? A. Take asphaltum 48 lbs., fuse, and add boiled oil 10 gallons, red lead and litharge each 7 lbs., dried and powdered white copperas 3 lbs.; boil for 2 hours, then add of dark gum amber, fused, 8 lbs., hot linseed oil 2 gallons. Boil till the mixture is pasty, then thin with oil of turpentine 30 gallons.

(32) E. H. says: I. I want to build a 20 horse power water wheel, and to have the buckets attached to some flexible material like those of a corn elevator. What would be the best material to fasten the buckets to? A. An endless chain. 2. How can I calculate the horse power obtained? A. In the absence of any given conditions, we cannot tell you how to calculate the power except from the duty obtained from the device when in practical operation.