## Notes & Queries

### HINTS TO CORRESPONDENTS.

**Name and Address** must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

**References** to former articles or answers should give date of paper and page or number of question.

**Inquiries** not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or mail, each must take his turn.

**Special Information** requests on matters of personal rather than general interest, and requests for **Prompt Answers by Letter**, should be accompanied with remittance of $1 to $5, according to the subject, as we cannot be expected to perform such service without remuneration.

**Scientific American Supplements** referred to may be had at the office. Price 10 cents each.

**Minerals** sent for examination should be distinctly marked or labeled.

(1) P. C. A.—Of what is pewter composed? I want a metal cheap, capable of making fine castings, of being run in steel moulds, not subject to rust, or that may be galvanized. A. Pewter is four parts tin and one part lead. The metal that answers your requirements is zinc (spelter). It will not rust, and does not require galvanizing. Very fine castings can be made from it. It flows easily. The metal mould should be warm

(2) B. F. C. wants a good recipe for making soldering fluid for soft soldering jewelry; something that will not rust his tools. A. Dissolve sheet zinc in muriatic acid until the acid will take up no more zinc. Turn off the clear liquid and dilute it with alcohol instead of water. When diluted with water it must retain acid enough to rust, but with alcohol the dilution can go on until the acid is not perceptible to the tongue.

(3) P. J. D. says he wants to blue the "tops" of skates, probably the sheet of steel on which the foot rests. All bluing is done, after polishing, simply by heating. The polished article is laid in a bath of hot sand or ashes until it turns blue. Then let it cool in the air or cool it in water. If the article is of steel and has been hardened, the bluing will bring it to a spring temper—that of saw blades and case knives and wood firmer chisels. You can harden the bottom edge of skate runners, without springing or cracking, by heating them in the red hot lead bath and chilling in water. The edge, only, of the skate runner needs to be made red hot.

(4) J. W. P. asks: 1. What is the greatest engine piston speed recorded? A. In locomotive practice the piston speed will sometimes run from 1,400 to 1,600 feet per minute, though we do not know of any record of the absolute highest speed. 2. I see an old idea revived in Europe for propelling boats by forcing water through a tunnel parallel to the keel, or rather forcing boat over water in tunnel. Is it practicable? If not, why? A. This idea has been tried by many, and so far has failed to prove as economical as the other accepted methods of boat propulsion.

(5) C. R. B.—The best way to tin old copper utensils is to thoroughly clean them with sand and oxalic acid, and tin with a large copper soldering iron, using muriate of zinc and salammoniac (soldering fluid) for flowing the tin. It can also be done by heating the vessel and flushing melted tin over the surface, first sprinkling the surface with powdered resin. You may succeed in this after a few trials.

(6) E. A. C. writes: I wish to construct an apparatus to level between points a few feet apart (say 12 feet or less) where a common level cannot be used on account of intermediate obstructions. To do this I propose to use two glass hollow tubes ¼ inch diameter, say 3 inches or 4 inches long, each one to set in stand of metal, and each to have a scale marked on same; then connect the two stands by rubber tube, and fill with some liquid. Now, what I wish to know is, what liquid can I use that will show level on its surface in the tube, and not concave like water? Mercury would do, I suppose, only, being so heavy, it would be bad to handle in a rubber tube 10 feet or 10 feet long. Can you suggest anything? A. The device you describe is already in use. Use water with glass large enough to contain a little float. The capillary edge of the water is sufficiently accurate for most purposes.

(7) C. D. V. says: Admitting the fact that a base ball can be made to curve by causing it to take a revolving motion, why does not a rifle ball curve shot out of a grooved barrel? A. All round balls shot from rifled guns do curve to the right or left, according as they revolve to the right or left. But elongated balls or bolts of a length of 2 or 3 diameters are now principally used with rifled guns, and these projectiles go straight.

(8) W. R. H.—Can you tell me how I can retin copper cooking vessels? A. Make the copper chemically clean by washing with a saturated solution of zinc in muriatic acid, the acid to be weakened with water to half strength after the dissolving of the zinc. Heat the copper vessel and pour in a small quantity of metal, of tin one, lead one, and shake or tip the vessel until the tinning runs over the parts. Or, "wipe" the melted tin over the bare places with a cotton canvas pad.

(9) O. W. K. asks how, in japanning small articles like buttons, back hooks, eyelets, etc., they are kept from sticking together while baking? A. By stringing upon fine wire stretched.

(10) E. P. McC.—A man is never too old to learn a trade. Every trade has its living grade. Success depends entirely upon industry and mental application. If you have given no thought until the age of 20 as to your future employment and aim in life, it is a matter of deep regret, and you should flee to the first industrial opening, resolved that you will be contented to work until you have accomplished a trade or calling.

(11) E. L. H. asks for some rule by which to figure the weight of counterbalances for the drivers (leading and trailing) of a locomotive. A. The weight of counterweights should be equal to the weight of the moving parts at the same distance from the center, or in proportion inversely as the center of gyration of the counterweight is further from the center of the wheel than the crank pin. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 368, on Balancing of Machinery.

(12) W. T. P. asks the amount of pressure to square inch a copper holder eight inches in diameter and twenty-nine inches long will stand. Holder is made of one-sixteenth inch brazier's copper with heads of three thirty-seconds inch in thickness, well riveted and swear, soldered in. A. If properly made and with raised heads, should be safe at 250 pounds pressure.

(13) J. McI.—Steam pipes in contact with wood with the ordinary use of steam do not ignite or set fire to the wood. Superheated steam caused by low water in the boiler has caused the pipes near boilers to set fire to wood work in contact. There have been a few cases where mysterious fires have been attributed to spontaneous combustion from dust, paper, rags, wool, or cotton lying in contact with steam pipes. The "insurance interest" requires that all steam pipes shall be three-fourths of an inch or more clear of wood.

(14) E. E. C.—For processes of galvanizing iron see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 265, 176,161. Zinc and galvanized iron are in common use for watercoolers; they are not as good or healthy as porcelain or brown stone ware. Nevertheless we use them constantly as linings in our water coolers without experiencing any poisonous effects. If water stands for a day in zinc, it acquires a disagreeable taste from the absorption of a small portion of zinc. Water remaining in galvanized pipes over night should be discharged in the morning, it being so impregnated with zinc as to be unfit for drinking or cooking.

(15) M. N. asks: Is there any method for removing the tin from what is known as tin plate that will pay commercially? A. The makers of colors for dyeing use the tin scrap in the vicinity of New York by boiling the scrap in nitric and hydrochloric acids, precipitating the coloring matter. There are chemical establishments that make this a part of their business.

(16) E. A. S. asks: 1. What length of oar (spoon shaped) do I need to obtain greatest speed out of a boat 15 feet long, 2 feet 4 inches wide, and 1 foot 2 inches deep, weighing about 50 pounds; also what length and breadth of blade? A. Oar of ash, 8 feet, blade 20 inches by 6 inches wide. 2. The above boat being made of one-quarter inch poplar, what is the best way of treating the wood to keep it from absorbing water and rotting? Would soaking it in raw linseed oil, then putting a coat of "filler" on and finishing in hard oil, answer my purpose? A. Use boiled linseed oil with a filler coat, rub down, and oil varnish.

(17) A. F. S. asks the rule for determining the size and focal length of the small mirror used in the Gregorian reflecting telescope when the focal length of large mirror is known. The small mirror is to remain stationary, and focusing to be done by rack and pinion. A. Make small mirror one and a half times the diameter of the field glass of the eye piece and one-tenth shorter focus than the large mirror. See works on optics.

(18) J. D. F., M.D., writes: In SCIENTIFIC AMERICAN SUPPLEMENT, No. 339, is an article on peroxide of hydrogen. In preparing the hair on a living person for bleaching with peroxide of hydrogen, how is it possible to digest the hair for twelve hours in ammonia and water, at a certain temperature too? Can you not state more clearly the process of bleaching hair on the head of a living person? A. In the article referred to, it is explicitly stated that "hot liquids or drying in drying chambers is excluded." When the hair is bleached on living persons, therefore, the process consists in simply applying the mixture of peroxide, to which about 10 per cent of ammonium hydroxide at 26° B. is added.

(19) J. H. says: I have a steam yacht thirty-four feet long, seven feet beam, draws thirty inches water, ordinary inverted link motion engine 5 inches by 5 inches, plenty of steam, can carry to 95 pounds pressure. What diameter pitch and number of blades should a wheel have to give the best results for speed and economy? A. Wheel about 28 inches diameter and 38 inches to 40 inches pitch; 3 blades.

(20) A. H. McC. asks how to bend the ribs for a small steam yacht. A. The ribs must be steamed or soaked in hot water till they are quite flexible, then bent and kept in their shape till dry. 2. How the boards are attached to the ribs? A. The plank can be fastened to the ribs by copper rivets, or by nails driven through from outside and riveted; put a forelock under the head and over the point.

(21) C. F. T. writes: I want something to add to a mixture composed of shellac dissolved in borax and water to prevent its drying too rapidly. I have tried glycerine, but it thickens or rather congeals it. A. The addition of more water is the only remedy we can suggest. Almost everything else which would tend to make it dry slowly would also have the effect of preventing its drying at all, or else act as the glycerine did.

(22) E. P.—According to the act of March 3, 1883, antiquities are admitted into this country free of duty. An antiquity however is something that was produced or manufactured prior to the 15th century. Artistic copies are likewise admitted free of duty when the same are for a private collection or for some public institution.

(23) F. L. S. asks how the operation of washing emery so as to render it suitable for lens grinding is performed. A. Emery of all grades to a fineness of 120 can be purchased of emery dealers. For fine grinding or finishing, the finest flour may be gently stirred in a large pitcher, at the same time allow a small stream of water, size of a straw, to run in and overflow at the spout into a wash basin, and from the wash basin upon the opposite side of the pitcher spout. By careful management you may obtain emery of almost any fineness in the wash bowl. One pound is enough for a charge.

(24) W. M. C. writes: In a 12 inch iron pipe running full of water (fresh) at 10 feet per second, 40,000 feet long, what will be the total amount of friction in pounds? A. The head due to friction alone is 304 feet, or 132 pounds pressure. The head required for the rate of discharge through 40,000 feet of 12 inch pipe is 1,600 feet.

(25) C. J. M. asks: What amount of cement is needed to cover 3,300 square feet of surface? What kind, and how thick should it be spread? The soil is about 2 parts clay, 1 sand, which run together during beating rain. Wishing to use tank or reservoir for irrigation, I must raise the banks about four feet above surface level. A. About 200 barrels. Make a mixture of 2 parts sand, 1 part cement, stiff enough to beat firm with a large faced ram or block. If the backing is firm, 3 or 4 inches deep will be sufficient. Finish with a thin wash of pure cement.

(26) P. P. asks the price of sumac delivered in New York. He means the leaves. A. New York is not a market for sumac leaves. Only the ground sumac is sold here, the domestic product being principally ground at Richmond, Fredericksburg, and Petersburg, Va. Ground Virginia is now selling at $60 to $75 a ton.

(27) J. A. B.—Notwithstanding all the old prejudices in regard to the matter, there is nothing to show that planting when the moon is fulling or waning, or at any portion of the signs of the zodiac, has anything to do with the growth of plants, any more than that certain stars have any effect on the destinies of those born thereunder. Numerous experiments in the planting of quick growing plants, at regular and short intervals, have shown their growth not at all dependent on the stage of the moon at the time of planting.

(28) E. S. asks at what depth the most valuable or the best paying gold ore is found. A. Metallic gold is generally found in superficial deposits. When it is in combination with pyrite, it may be found at any depth. See Professor J. S. Newberry's paper on the "Genesis and Distribution of Gold," SCIENTIFIC AMERICAN SUPPLEMENT, No. 329.

(29) W. H. E.—What is the process of making cast iron malleable? A. The castings are made from "white hard" iron, very hard and brittle. They are packed in cast iron boxes with forge scales and powdered salammoniac, placed in oven and kept at a red heat for from six to eight days, depending on the size of castings; then gradually cooled.

(30) Boys.—We would discourage the use of a pretentious Latin name for your workshop, and would prefer to recommend the use of a title that would be expressive of the work, such as Mechanical Inventing Company or Iron Experimental Workshop.

(31) Dentist writes: An alloy composed of 19 grains tin, 19 grains copper, and the remainder of the ounce gold, when a sufficient quantity of mercury is mixed with it, becomes a plastic mass. Will the application of heat, or absorbing the surplus mercury, make this plastic mass hard and solid again, or what will do it and what will be its color? A. The hardening of your proposed amalgam by heat would require a temperature sufficient to evaporate the mercury, about 600° Fah. This could be readily done in ordinary mechanical work, but for filling for teeth it will be impracticable. Any agent that would absorb the mercury would only act upon the surface. We think that this method would not give satisfaction. The principle upon which amalgams for the filling of teeth are made is the mixing of the mercury quickly with a powdered metal that will absorb or make a chemical union of the two metals within a proper time to meet the necessities of this kind of dental surgery. Heretofore silver has been found to fill the bill. It would be very desirable to do this with a gold amalgam, and as pure gold does not make a permanent amalgam with mercury (to our knowledge), some of its alloys may be possible. We think, however, that you will find in the silver and copper alloys with gold a better amalgam than with tin. A trial with jeweler's red gold, which you may obtain from any manufacturing jeweler in your town, will no doubt give you a passable color for the amalgam. In order to obtain a fine full color for the amalgam, we fear that an excess of copper will have to be used which is objectionable in a sanitary sense.

(32) J. O. M. asks how to make a reliable composition to be applied on narrow strips of stout paper at intervals for cigar and taper lighter; the strips are rolled up and put in a box, and by a movement in the box when the lid is raised the strip is pushed up by a small friction clutch and the composition is ignited. A. According to Prof. Prescott who analyzed several compositions, it was found that they consisted of black sulphide of antimony, potassium chlorate, and potassium nitrate; another composition was simply potassium chlorate and sodium hypophosphite. The mixture is made in varying proportion, generally with a greater preponderance of the chlorate, and combined with liquid glue.

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

E. L. M.—The specimen is selenite, a variety of gypsum or calcium ulphate. Its principal use is as a fertilizer, also as plaster of Paris for making cornices, etc.

## INDEX OF INVENTIONS

**For which Letters Patent of the United States were Granted**

**August 19, 1884,**

**AND EACH BEARING THAT DATE.**

[See note at end of list about copies of these patents.]

Addressing machine, Dennis, Jr., & York ..... 303,922
Air brake, W. N. Willis ..... 303,777
Alarm. See Burglar alarm.
Amalgamating pan, J. A. Bidwell ..... 303,693
Apple coring and slicing machine, G. G. Stegman 303,679
Arch, combination fireproof, H. G. Isaacs ..... 303,856
Awning, White & Stevens ..... 303,685
Ax handle, H. H. Trenor ..... 303,767
Axle box, C. H. Smith ..... 303,954
Axle, car, J. M. Garverick ..... 303,684
Bag. See Paper bag.
Bag and satchel frames, side catch for, R. Flocke 303,716
Baling press, D. B. Hendricks ..... 303,847
Baling press, Q. J. Hoke ..... 303,733
Bar. See Drawn bar. Grate bar.
Bathing cabinet, electric, L. Von Dolcke ..... 303,959
Billiard table leveler, J. W. Blundon ..... 303,696
Blacking machine, boot or shoe, L. Guzman ..... 303,637
Block. See Paper cutter block.
Blower, air, J. L. Noll ..... 303,878
Boat wheel, J. F. Cunningham ..... 303,819
Boiler. See Locomotive or steamboat boiler. Steam boiler.
Boiler explosions, preventing, G. E. Hall ..... 303,841
Boilers, safety device for hot water, W. A. Tracy 303,765
Bolt. See Safety bolt.
Bolting chest, cut-off for, J. Todd ..... 303,763, 303,764
Bolting meal, etc., machine for, G. & A. Raymond ..... 303,665
Boot and shoe cleaner, C. W. Harris ..... 303,845
Boot or shoe heel support, F. D. Taylor ..... 303,682
Boot or shoe lasting machine, H. P. Aldrich ..... 303,604
Boots, lasts or former for rubber, D. McNamee ... 303,940
Boots or shoes, machine for forming rubber soles for, W. Cable ..... 303,804
Bottle and jar stopper, E. P. Hand ..... 303,727
Box. See Axle box. Journal box. Paper box.
Box and tub fastener, R. S. Willard ..... 303,775
Box partitions, machine for making, G. L. Jaeger 303,935
Brace, J. W. Johnson ..... 303,643
Braid rolls, automatic feeder for, E. Allen ..... 303,605
Brake. See Air brake. Car brake. Wagon brake.
Brick machine, S. P. Crafts ..... 303,709
Brick manufacture, J. L. Durrough ..... 303,925
Bridle, L. S. Longcor ..... 303,869
Bridle, A. Roeber ..... 303,751
Brush for cleaning chimneys, A. Oelschleger ..... 303,890
Buckle, A. H. Mantey ..... 303,873
Buckle protector for harness, A. L. Whitney ..... 303,686
Buggy, side spring, H. W. Hamelle ..... 303,931
Burglar alarm, E. Baumbach ..... 303,792
Bushing for sheaves, W. F. Wellman ..... 303,770
Button fastener, J. H. Lange ..... 303,648
Button fastener blank, E. D. Steele ..... 303,678
Button or fastener for boots, shoes, etc., spring, I. J. Saunders ..... 303,669
Button, separable, R. M. Heller ..... 303,731
Buttons, attaching, G. W. Prentice ..... 303,664
Buttons, mechanism for setting spring, I. J. Saunders ..... 303,668
Caisson for use in building subaqueous structures, portable, H. Flad ..... 303,830
Calk coverer, P. C. Lewis ..... 303,650
Canals, etc., lock and lock gate for, L. Coiseau ..... 303,807
Cant hook, G. W. Lord ..... 303,870
Cant hook band, J. Watson ..... 303,688
Car brake, J. F. Mailinckrodt ..... 303,740
Car brake, J. Stephenson ..... 303,892
Car coupling, L. A. Branchaud ..... 303,698
Car coupling, F. R. Wilkins ..... 303,687
Car door, grain, R. J. Wilson ..... 303,960
Car, dumping, Sears & Mathews ..... 303,757
Car, railway, J. F. Batchelor ..... 303,791
Car roof, J. W. West ..... 303,684
Car ventilator, J. M. Fennerty ..... 303,631
Car wheel, S. Broadbent ..... 303,700
Car wheel, S. P. Raber ..... 303,750
Car wheel grinding and turning machine, W. P. Barclay ..... 303,609
Carburetor, G. Froh ..... 303,927
Cards, self-acting reader for Jacquard, R. W. Sutleffe ..... 303,681
Carpet stretcher, T. P. Butterfield ..... 303,619
Carriage, J. F. Hurtig ..... 303,933
Carriage spring, A. A. Stimson ..... 303,680
Carriage trimming, J. P. Hagan ..... 303,840
Carrier. See Pneumatic carrier.
Case. See Physician's buggy case.
Castings, apparatus for the manufacture of small, S. Johnston ..... 303,645
Castings, mould for the manufacture of chilled car wheels and similar, G. W. A. Wiesing ..... 303,773
Chair. See Opera chair.
Charm, watch chain, J. H. Knapp ..... 303,864
Checks, draughts, receipts, etc., device for cutting off, C. M. Moody ..... 303,658
Chest for tools, etc., J. F. Zimmerman ..... 303,783
Chimney cap, R. H. Craigbill ..... 303,623
Chimney cowl, A. S. Capper ..... 303,918
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Clasp. See Watch clasp.
Clasp, H. Binley ..... 303,798
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Clothes and towel drier, J. J. Bisel ..... 303,695
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Comb. See Curry comb.
Combing machines, stop motion for wool, E. Lodge ..... 303,937
Cooling liquids in bottles, apparatus for, J. Cramer ..... 303,815
Cordage, machine for the manufacture of, J. W. Morton ..... 303,943
Corn cutting machine, J. O. West ..... 303,771
Coupling. See Car coupling. Faucet coupling. Thill coupling. Vehicle spring coupling.