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Notes & Queries

HINTS TO CORRESPONDENTS.

Names 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 This is for our information, and not for publication.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 in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. **Books** referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) W. K. writes: The question came up a few days ago here, How far would one million silver dollars reach, they being laid down side by side, touching each other? This we found would be 23 miles 118 yards and 2 feet. Then the question was asked, How large a circle would the one million dollars make, laid the same as above? Some claim it cannot be worked out accurately. Bringing them into a circle, they will lose some of the above length. The question we ask you to decide is how much of the above length would they lose? A. The coins will form a circle whose perimeter will be slightly less than the length of the straight line, in the ratio of the chord of 180° (or 360°

diameter) to the chord of 180°— $\frac{1,000,000}{1,000,000}$. This is most easily solved by the rule of the square of the hypotenuse, taking the diameter of the circle as the hypotenuse, one millionth part of the semi-perimeter as altitude, and the third side to be solved as the chord. This only involves the error of assuming an arc of 1296" to coincide with its sine, which error is infinitesimal for all ordinary dimensions. Then, solving the triangle, we find the perimeter of the circle of dollars would be to the straight line of dollars in the ratio of 999,999,999,995,609 to 1,000,000,000,000,000, or about $\frac{6}{1,000,000}$ of the diameter of a silver dollar.

(2) E. S.—Turpentine varnish is simply clear, pale resin dissolved in oil of turpentine.

(3) E. F. F. asks: How can I clean a fine chromo which has become dirty and fly specked, also what kind of varnish shall I use to varnish it? A. Keep a wet towel lying on its face till the dirt is thoroughly softened, say 3 or 4 days, occasionally rubbing off carefully with a sponge; then rub with clear nut or linseed oil.

(4) M. B. B. asks: 1. Is the daily use of soap injurious to the skin, as is often said? A. No; but to not thoroughly rinse and dry the hands makes the skin rough. 2. What kind of soap is the most healthy? A. The purest is the best, and white castile is generally recommended by the doctors. 3. Is there anything to remove freckles? A. It is often quite difficult to remove freckles. The following has been recommended 1 drachm each of white precipitate and subnitrate of potash in one ounce of glycerine ointment. This is to be applied in a thin layer every other night for from four to six weeks.

(5) M. L. asks: What will take the dirt off book leaves without injuring the printing? A. Besides the ordinary use of bread crumbs, for the removal of stains, a solution of oxalic acid, citric acid, or tartaric acid may be used; these acids do not attack printing ink, but will remove marginal notes in writing ink, etc.

(6) J. T. asks why objects appear inverted on the ground glass of a photographic camera. A. Because the rays of light from the bottom of the object pass in straight lines through the lens, crossing its axis, and continue upward until they reach the upper side of the ground glass. The rays from the top of the object pass downward, and strike the bottom of the ground glass. See Ganot's Physics for further explanation.—To clean brass, use oxalic acid and water.—Goodman & Wightman, Boston, Mass., will make small engines for you.

(7) J. L. O. asks: 1. Which President of the United States first issued a Thanksgiving proclamation, and in which year? A. George Washington, in 1789. 2. After once issued by the President, was it any following year omitted? If so, which, and by whom? A. The second Thanksgiving proclamation was issued in 1795, by George Washington. 3. Was a Thanksgiving proclamation made by any governor before same was issued by any President? And if so, by whom? A. Occasional Thanksgiving days were appointed by the Dutch governors of the New Netherlands in 1644, 1645, 1655, and 1664; and by the English governors of New York in 1755 and 1760. Regular annual recommendations of a thanksgiving day were prevalent in the New England States from a very early period,

but the custom did not extend throughout the Union until within the last thirty years.

(8) G. Z. asks (1) how to kill or keep roaches away? A. Use borax or Persian insect powder. These must be renewed frequently, as they deteriorate by exposure to the air, and lose their power. 2. How to remove printer's ink from a tin can? A. Use benzine or caustic soda.

(9) W. W. W. asks if there is any preparation which, applied to windows, will prevent their frosting. A. Covering the glass with a thin coat of glycerine is the simplest method; where there are objections to this, make a double window, with a ventilating chamber between the glass walls.

(10) C. H. asks for a recipe for making javelle water. A. Add carbonate of potash to a solution of chloride of lime, with agitation as long as a precipitate forms, the liquid being afterward decanted or filtered.

(11) S. G. D. asks for a method of tinning brass, and if there is a way to tin a brass shell on the inside and nickel-plate same on outside. A. See the article on the "Tin Plating Process," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 310, under the title of "Electro-Metallurgy."

(12) B. W. B. asks: Which plan is the most efficient for heating workshops—steam pipes around the walls at the floor, or steam pipes overhead just under the ceiling? A. In workshops and factories where the side walls are clear for the reception of pipes, the wall coils near the floor are the most efficient, and generally preferred for equal distribution of heat. There are many workshops and factories in which the wall spaces are occupied with machinery, benches, or goods. In such the hanging system is much in vogue, and is considered very efficient.

(13) R. B. asks (1) how to take grease stains out of paper. A. Oil stains may be removed from paper by applying pipe clay, powdered and mixed with water to the thickness of cream; leave it on for four hours. 2. I have some bronze, and would like to know how to make some glue to use on anything I want to bronze. A. Ordinarily, a coating of common sizing will do, but it depends largely upon the article you desire to have bronzed. We would advise you to consult Spons' "Workshop Receipts," first series, which we can send you for two dollars.

(14) "Information."—A structure along or over a marsh is often more correctly styled a causeway than a bridge. The Tay Bridge, Scotland, is 3,600 yards long. A railroad bridge over the Volga is 134 miles long. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 256. The Garabit in France is 413 feet high. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 391. The Kinzua viaduct is 301 feet high. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 369. The St. Gothard tunnel 48,840 feet long. The Mt. Cenis tunnel 37,840 feet long.

(15) P. H. R. asks: 1. Where is a good school to study mining engineering? A. There are schools of mining engineering in Ann Arbor, Michigan; Golden, Colorado; Rolla, Missouri; and in New York city. 2. What is the proper preparatory course to pursue? A. This information can be best acquired from the catalogues of the institutions referred to. One essential requirement is a thorough knowledge of mathematics. 3. A receipt for a tooth paste that does not contain pumice stone. A. Take ordinary charcoal and beat it up with pure honey; or powdered willow charcoal 1 part, cinchona bark and sugar of milk in powder each 4 parts; add transparent soap in powder 1 part. Mix in a mortar, sift through bolting cloth, and perfume.

(16) J. F. asks: What is the process for etching on steel shears? A. Etching upon cutlery is done by printing the design or lettering with a rubber stamp, using as ink a wax composed of equal parts asphalt, Burgundy pitch, and beeswax, melted and thoroughly mixed. Place some of the wax upon a smooth plate of iron, warmed so as to just melt the wax. Use a small pad to distribute the wax evenly, as in printing. Warm the cutlery just enough to receive the print without spreading. Charge the rubber stamp and print the device, or paint all parts of the piece not required to be etched with a varnish of asphalt and turpentine. In either case, when dry, dip for a few seconds in a bath of 1 part nitric acid, 4 parts of water. Then dip in boiling hot water, wipe dry, and remove the traces of wax and varnish with turpentine. The rubber stamp may be made for bright letters or device on etched ground. The rubber-stamp makers can make the stamp. Any special device will have to be engraved, from which the rubber stamp can be made.

(17) C. A. A. asks as to the connections between an engine and boiler. The boiler is 80 feet from engine, and the question is as to the best way to make the connection, whether by steam pipe laid in a box underground or by a pipe (well covered) overhead. A. It matters not whether steam pipe is placed above or below, as long as the most direct connection is made, and in a way to take care of the expansion and contraction of the pipe. The water condensing in the pipe or foam from the boiler will not run back while the engine is running. When not running, the overhead pipe, if properly inclined, will return the water of condensation to the boiler. There is no exception to the necessity of a drip pipe close to the engine valve for clearing the pipe of all water before starting, whether it is above or below. In all events, the most convenient way with a proper drip discharge near the engine is the best, and with thorough felting of the pipe is the most economical. A wrapping of sheet asbestos covered with one inch hair felting and canvas, painted, loses but very little heat.

(18) H. R. T. asks: 1. What is the greatest distance the telephone described in SUPPLEMENT, No. 142, will work? A. The magneto telephone described in SUPPLEMENT, No. 142, will, if on an isolated line, work over 3 or 4 miles of wire. 2. How many square feet of surface (cast iron plate) will it take to ground the wire? A. It depends on the moisture in the ground. A plate one or two feet square, and bedded

in charcoal in damp soil, is enough. 3. How much pressure will best wrought iron pipe with malleable fittings stand (air), and how much steam? Is there any difference in steam pressure and air pressure? A. Allow a strength of 500 pounds to the square inch for butt-welded pipe of best description, for either air or steam pressure. Steam is no more disastrous in exploding a pipe than air, except for its heat.

(19) G. S. W. asks: 1. Would you please inform me how to make hard alloy that can be easily melted on an ordinary fire and that would be suitable to make small model? A. A hard alloy suitable for casting is made of 80 pounds lead and 20 pounds antimony. 2. Also is the wire part of No. 16 covered electric wire the same size as No. 16 uncovered wire? A. The wire part of No. 16 wire is of the same size, whether covered or uncovered.

(20) H. S. S. inquires what talcum venetum and glass gall (sandiver) are. A. The first, probably Venetian talc, which is the same thing as soapstone or French chalk. Sandiver is skimmed off the surface of glass while in fusion.

(21) F. P. asks how to make cider brandy. A. Ordinary brandy is distilled from grape wine. If you distill cider instead of wine, you have cider brandy. Caramel or burned sugar can be added to color.

(22) H. A. W. writes: 1. A house is infested with red ants. How can they be removed? Powdered borax and Cayenne pepper have been used without effect. A. A strong solution of carbolic acid and water poured into holes kills the ants it touches. Lime and chalk are also recommended. 2. What will prevent grass from growing between the bricks in a side yard? A. Use common salt in the crevices.

(23) E. W. asks a receipt to make a cement that will stand considerable heat after it is cooled. A. Mix a handful of quicklime in 4 ounces of linseed oil; boil to a good thickness; then spread on thin plates in the shade, and it will become exceedingly hard, but may be easily dissolved over the fire, and used as ordinary glue.

(24) W. B. asks for receipt for flour paste that will not sour under a reasonable time. A. Mix smoothly flour and water till a thin batter is formed; put in a pinch of pulverized alum, and pour in boiling water until a thick paste is formed. Let it boil a minute or two; add a few drops of carbolic acid or oil of cloves. Put in a wide necked bottle. The oil of cloves acts as a germicide, and prevents the growth of mould.

(25) J. K. wants to know how to make prints from the plate sold with the "Ready Photographer." A. After the negative is developed, fixed, and dried, place it film side upward in a photographic printing frame and put in contact with the plate a piece of ready sensitized sensitive silver paper. Then expose to the sun until the picture is printed out. The paper is removed, toned, and fixed. Duplicates can be made to any amount. The frame, paper, and other materials can be had from any photographers' supply house.

(26) C. J. H. asks how to make a dye for coloring hair—one that will be black as soon as the operation is complete, without waiting several hours for the sun to produce the change. A. An instantaneous hair dye, contained in two bottles, consists of the following: a. To 1 ounce pyrogallol acid add 1 quarter ounce of tannin, dissolved in two ounces of alcohol. Add 1 quart of soft water. b. To 1 ounce of crystallized nitrate of silver, dissolved in one ounce concentrated aqua ammonia and one ounce soft water, add one-half ounce gum arabic and 14 ounces soft water. Keep the mixtures in the dark. The hair must be thoroughly cleansed of all grease, then every part dampened with mixture a, all surplus moisture being removed, so there will be no dripping, when the mixture b must be applied with great care, and so as not to touch the skin.

(27) J. M. B. asks a receipt for making the "Elixir of Calisaya" that is sold in the drug stores. A. Take of quinine sulphate 72 grains, cinchonine sulphate 24 grains, quindine sulphate 20 grains, cinchonidine sulphate 12 grains, elixir of orange 128 fluid ounces, and of caramel a sufficient quantity to color. Triturate the mixed sulphates with 1 pint of the elixir, pour the mixture into a glass flask, and heat in a water bath until the solution is effected. While still hot, add the remainder of the elixir and caramel; when cold, filter.

(28) B. B. asks (1) how to dye or stain white and faded stag horn or buck horn to black. A. 0.14 ounce of silver is dissolved in 2.1 ounces nitric acid (aqua fortis). This solution must be applied several times to the article to be stained, but it is absolutely necessary that one coat should be dry before another is applied. 2. To a dark red color necessary for coloring knife handles? A. Take 17.5 ounces red Brazil wood, and boil for 1 hour in 4.4 milk of lime, and filter through a cloth. The articles to be stained are boiled for an hour in a solution of 1 ounce alum to 17 ounces water. They are then placed in the dye, and allowed to remain until the desired color is produced.

(29) G. C. asks how to make orange wine. A. The English pharmacopoeial name is vinum aurantii, and it is made by the fermentation of a saccharine solution to which the fresh peel of the bitter orange has been added. It contains about 12 per cent of alcohol, and is but slightly acid to test paper.

(30) R. L. asks (1) a receipt for making common black blasting powder. A. Ordinary blasting powder consists of 15 parts of carbon, 20 parts of sulphur, and 65 parts of saltpeter. 2. Is blasting powder best adapted for splitting timber and stumps? A. Various preparations of nitro-glycerine are used for this purpose.

(31) A. B. C. asks for a quick method of cleaning and brightening the brass fixtures of a railway coach. A. Brass may be cleaned with sweet oil and tripoli, powdered bath brick, rotten stone, or red brick dust, rubbed on with flannel and polished with

leather. A solution of oxalic acid rubbed over tarnished brass with a cotton rag soon removes the tarnish, rendering the metal bright. The acid must be washed off with water, and the brass must be rubbed off with powdered whiting and soft leather.

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

H. D. S.—The mineral is a limestone of no value.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

November 23, 1886,

AND EACH BEARING THAT DATE.

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

Acid, apparatus for making sulphuric, J. Hughes.	353,222
Air brake coupler, automatic, J. T. Melson.	352,927
Air ship, M. P. Appling.	353,183
Annealing metals, J. A. Tatro.	353,094
Ash pit frame and door, Horne & Danz, 2d.	353,221
Ax, J. Q. Everson.	352,972
Axle box, car, R. McDowell.	353,979
Axle lubricator, W. C. Lussom.	353,229
Bait box, E. W. Deland.	353,022
Baling press, S. J. Webb.	353,101, 353,102
Basket, convertible wire, A. S. Greenwood.	353,131
Battery. See Electric battery.	
Bedstead, J. F. Draper.	353,125
Bedstead, invalid, H. Winter.	352,941
Bell, electric, Tucker & Huebel.	353,274
Bells, striker for electric, Tucker & Markland.	353,273
Billiard bridge or support, Braddock & Wittell.	353,013
Blast furnaces, cinder car for, P. L. Weimer.	353,009
Board. See Centerboard. Electrical switch board.	
Boiler tubes, machine for manufacturing, W. Arnold.	352,987
Bolt. See Door bolt.	
Bottle case, J. Davis.	353,021
Box. See Axle box. Bait box. Packing box.	
Box fastener, J. E. Briggs.	353,014
Bracelet, T. Granberry.	352,917
Brake. See Power brake. Sled brake.	
Brazing machine, G. S. Black.	352,245
Brick machine, W. Thaison.	353,086
Brush for finishing boots and shoes, rotary, B. F. Quinby.	353,088
Bucket, dinner, E. E. Lederle.	353,147
Buckle, harness, Sutton & Terry.	352,959
Buggy top, C. A. Behlen.	353,195
Bung or plug, L. Butler.	353,202
Burglar alarms, window spring for electric, Parker & Geary.	352,269
Burner. See Gas burner. Hydrocarbon burner.	
Button, changeable, L. D. Radzinsky.	353,039
Buttonhole marker, A. Huffer.	353,064
Cable road grip, S. H. Terry.	353,178
Cable supporting sheaves, mechanism for operating, J. H. Robertson.	353,005
Call apparatus, individual, L. S. Glover.	352,948
Cans, float for transportation, W. A. Carpenter.	352,910
Can top and cover, F. A. Robbins.	353,160
Car coupling, J. J. Bogard.	353,118
Car coupling, J. Davies.	353,208
Car coupling, E. Latham.	353,146
Car coupling, F. L. Mark.	353,150
Car heater, street, T. Wiseman.	353,108
Cars, brake pawl for railway, G. H. Griggs.	353,259
Cars by compressed air, propulsion of, Thompson & Jones.	352,985
Cargoes, discharging, J. Reid.	353,083
Carpet fabric, ingrain, H. Hardwick.	353,135
Carpet stretcher, C. R. Gincley.	353,063
Cartridge shells, machine for drawing, R. White.	353,190
Case. See Bottle case. Eyeglass case. Packing case. Shot case.	
Catafalque and bier combined, portable, G. A. Firnstein.	352,915
Centerboard, shifting ballast, G. W. Schermerhorn.	352,934
Chain, conveyer, J. M. Dodge.	353,256
Chain link, ornamental, J. Bushee.	353,015
Chain making machine, J. E. Sherman.	353,087
Charcoal, kiln for the manufacture of, H. M. Pierce.	352,931
Check receiver, J. Casey.	353,051
Check rower, G. D. Haworth.	353,136
Churn dasher, W. H. Hanson.	352,991
Cigarette machine, A. De Zayas y Moreno.	353,054
Clamp. See Fence clamp.	
Clip. See Hame clip.	
Cloth, machine for singeing, Banks & Brierley.	353,194
Coating wood, cordage, etc., compound for, T. P. Boscher.	352,945
Coke breaker, B. J. Allen.	353,011
Combination lock, H. W. Trognitz.	352,218
Combining machine, J. Jefferson et al.	353,224
Conductor's register, C. S. Morris.	353,078
Cord and rope, machine for making, M. S. Palmer.	353,086
Core rod, G. P. Reno.	353,159
Corn sheller, A. H. Patch.	353,080
Corset, E. J. Swartwout.	353,237
Corset, nursing, J. C. Tallman.	353,093
Cotton picker stem, W. G. Sears.	353,085, 353,167
Coupling. See Car coupling. Pipe coupling.	
Thill coupling.	
Cuff supporter, lady's, F. M. Sears.	353,166
Cultivator, N. P. & J. W. Lehr.	353,148
Cultivator, W. S. Pates.	353,000
Cultivator, J. M. Sutton.	352,958
Cultivator, cotton, Dykes & Woods.	353,212