



Notes and 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 This is for our information and not for publication.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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. 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.

(10535) R. L. M. asks for a remedy for incrustations of boilers. A. Remedies that have been adopted with more or less success for boiler incrustation: 1. Potatoes, 1-50 weight of water, prevent adherence of scale. 2. Twelve parts salt, 2½ caustic soda, ½ extract of oak bark, ½ of potash. 3. Pieces of oak wood suspended in boiler and renewed monthly, prevent deposit. 4. Two ounces chloride of ammonia in boiler twice a week prevents incrustation and decomposes scale. 5. Coating of 3 parts black lead, 18 tallow, applied hot to the inside of a boiler every few weeks, prevents scale. 6. Thirteen pounds molasses fed occasionally into an 8-horse-power boiler prevented incrustation for six months. 7. Mahogany or oak sawdust in limited quantities. The tannic acid attacks the iron, and should therefore be used with caution. 8. Slippery elm bark has been used with some success. 9. Carbonate of soda. 10. Chloride of tin. 11. Spent tanners' bark. 12. Frequent blowing off. 13. Paraffin oil has been used with excellent results in locomotive boilers. 14. Marine boilers are sometimes protected from corrosion by a very thin wash of Portland cement inside.

(10536) D. N. asks how to straighten saws. A. You can straighten band saws in the following manner: Put the saw on to the machine and under tension, just as it is to be used. Use a steel straight edge 10 or 12 inches in length, to find the lumps or twists, which mark with chalk, so as to know where to hammer. Now hold the oval face of a millwright's or carpenter's hardwood mallet opposite the chalk marks and against the saw, and with a light oval-faced hand hammer knock out the lumps. Commence carefully, do not strike too hard. Examine your saw often with your straight edge to see how you get along, and you will soon be able to take out twists readily and get your saw perfectly true.

(10537) J. M. W. asks how to true grindstones. A. Drive at a moderate speed and true up with a rod of ½ inch or ¾ inch iron, or better, a piece of tube. To use it, keep turning the rod or tube, which should be held nearly at right angles, and turns as the edge grinds away. By thus turning it round a new edge is formed all the time that the stone is turned off true. The stone should be dry, not wet. Do not attempt to perform such an operation close to a lathe or other machine without thoroughly covering them up, as the dust flies everywhere and will cause serious damage.

(10538) W. F. I. asks for colors for druggists' show bottles. A. Amber—Dragon's blood, in coarse powder, 1 part; oil of vitriol, 4 parts. When thoroughly dissolved, dilute with cold distilled water till the required tint is obtained. Blue—1. Copper sulphate, 2 ounces; sulphuric acid, ½ ounce; water, 20 ounces. 2. A solution of soluble Prussian blue in oxalic acid and diluted to the right shade. 3. Solution of indigo in sulphuric acid, diluted with water. Crimson—1. Iodine and iodide of potash, of each 30 grains; hydrochloric acid, 1 drachm; water, 1 gallon. 2. Alkanet root, 1 ounce; oil of turpentine, 20 ounces. Green—1. Sulphate of copper, 1 drachm; bichromate of potash, 30 grains; strong liquor of ammonia, 2 ounces; water, 1 gallon. 2. Copper sulphate, 2 ounces; sodium chloride, 4 ounces; water, 1 pint. 3. Solution of verdigris (distilled) in acetic acid, diluted with water. 4. Dissolve blue vitriol in water, and add nitric acid until it turns green. 5. For dark green, chromium sulphate. Magenta—Acetate of rosaniline dissolved in water. Olive—Dissolve equal weights of iron sulphate and sulphuric acid in water and add copper nitrate, q. s. to strike the color. Orange—1. Dissolve bichromate of potash in water and add a little sulphuric acid. 2. Dissolve gamboge in liquor of potassa: dilute and add a little water. Pink—1. To a solution of cobalt nitrate or chloride in water add sesquicarbonate of ammonia, q. s. to dissolve the precipitate at first formed. 2. From madder (washed with cold water), 1 ounce; sesquicarbonate of ammonia, 1 ounce; water, 3 pints, 12 fluid ounces; digest with agitation, for twenty-four hours; then dilute with more water and filter. Purple—1. Sulphate of copper, 2 drachms; water, 2 ounces; French

gelatine, 1 drachm, boiling water, 2 ounces; solution of potassa, 2 pints. Dissolve the copper salt in the water, and the gelatine in the boiling water. Mix the two solutions and add the liquor of potassa. Shake the mixture a few times during ten hours, after which decant and dilute with water. 2. A solution of copper sulphate, 1 ounce in water, 1 quart, with the addition of 1½ ounces sesquicarbonate of ammonia. 3. To the last add a sufficient quantity of the first pink, above, to turn the color. 4. To an infusion of logwood, add carbonate of ammonia, q. s. 5. Lead acetate, 3 ounces; cochineal, 1 drachm; water, q. s. 6. Add sulphate of indigo, nearly neutralized with chalk, to an infusion of cochineal till it turns purple. Red—1. Solution of perchloride of iron, 10 drops; sulphocyanide of potassium, 10 grains; water, 1 gallon. 2. Dissolve carmine in ammonia and dilute with water. 3. Dissolve cochineal in a weak solution of ammonia; or in 4. sal ammoniac, and dilute with water. 5. Add 4 ounces sulphuric acid to 1 gallon water, and digest 8 ounces red rose leaves in the solution for twenty-four hours. 6. Dissolve madder lake in sesquicarbonate of ammonia, and dilute with water. Violet—Mix together solutions of nitrate of cobalt and sesquicarbonate of ammonia, adding a sufficiency of ammonio-sulphate of copper to strike the required color. Yellow—1. A solution of sesquioxide of iron (ferric oxide), ½ pound, in 1 quart hydrochloric acid, diluted with water. 2. To a strong decoction of French berries add a little alum. 3. A simple solution of potassium chromate or potassium bichromate. 4. A solution of equal parts of niter and potassium chromate. 5. A solution of potassium bichromate.

NEW BOOKS, ETC.

PHOTOGRAPHIC STUDIOS AND DARK ROOMS. With Numerous Engravings and Diagrams. By Paul N. Hasluck. Philadelphia: David McKay. 16mo.; cloth; 100 pages. Price, 50 cents.

A comprehensive digest of the information on the construction of photographic studios and dark rooms, that has appeared from time to time in the weekly journal *Work*. The subjects are conveniently arranged, and the instructions contain everything that is necessary for the complete equipment of a photographic establishment.

STAR REDUCTIONS. By W. Ernest Cooke. Perth, West Australia: Perth Observatory.

A description of a new method for the reduction of star places from apparent to mean positions and the opposite.

DISEASES OF SWINE. With Special Reference to the Preventive Measures of Disease. By Robert A. Craig. New York: The Orange Judd Company. Illustrated; 12mo.; cloth; 191 pages. Price, 75 cents.

There is great need for a short treatise on the diseases of hogs, since the literature on the subject is very scattered. Mr. Craig understands his subject thoroughly, and handles it in a simple and satisfactory manner.

PROFITABLE DAIRYING. A Practical Guide to Successful Dairy Management. By C. L. Peck. New York: Orange Judd Company. 12mo.; cloth; 174 pages; illustrated. Price, 75 cents.

A thoroughly practical work dealing with dairying from the modern intensive standpoint. The chapter devoted to "Dairy Breeds" is most interesting.

THE STEEL SQUARE AS A CALCULATING MACHINE. By Albert Fair. New York: The Industrial Publication Company. 12mo.; cloth; 81 pages; illustrated. Price, 50 cents.

The steel square is one of the most widely known tools in existence, yet few of its users are familiar with its possibilities in the broader sense. Mr. Fair's book contains directions on how to test the accuracy of the square, how to use it with the best results, and how to solve a number of difficult problems by its aid. The work is highly to be recommended, for it is only by having a thorough knowledge of his tools, as well as the experience in using them, that the workman can even hope to develop into the artisan.

THE TECHNICAL YEAR BOOK. 1907. Edited by Arthur C. Kelly and Charles Weekes. London: Percival Marshall & Co. 16mo.; pocket size; 399 pages. Price, \$2.

A very handy little volume of miscellaneous information; rather more interesting, perhaps, than useful as a pocket reference book. Its value in the United States is limited by the fact that much of the data is purely British in character, and does not apply here.

FOOD MATERIALS AND THEIR ADULTERATIONS. By Ellen H. Richards. Final edition revised and rewritten. Boston: Whitcomb & Barrows. 12mo.; cloth; 176 pages. Price, \$1.

The conditions which made the "Pure Food Law" a necessity could never have arisen had it not been for the ignorance and indifference of the buying public. Miss Richards's object is to overcome this indifference and to make a knowledge of foodstuffs and their values so general that the consumption of unwholesome

food will be a rare exception. Her book covers all the important aspects of the case clearly and broadly, making a treatise that is neither too simple nor too technical.

MECHANICAL ENGINEERING MATERIALS. Their Properties and Treatment in Construction. By Edward C. R. Marks. New and enlarged edition. Manchester, England: The Technical Publishing Company. 98 pages. Price, \$1.

A book midway between the average work on metallurgy and the average work on mechanical engineering. It gives in concise and handy form practical information on the characteristics and capabilities of the materials more generally used in mechanical engineering, so that an intelligent idea can readily be formed of what may be expected of them.

SQUABS FOR PROFIT. A Practical Treatise on the Raising of Squabs from the Egg to the Market. Being a Handbook for the Beginner and a Guide for the Experienced Breeder. By William E. Rice and William E. Cox. New York: The Orange Judd Company. Illustrated; 16mo.; cloth; 117 pages. Price, 50 cents.

Squab raising is far from the easy pastime it may appear to be upon first consideration. There are a thousand and one little details that one must attend to with the greatest attention to achieve success, and it is only after considerable experience that one can obtain continuously profitable results. The pitfalls that beset the beginner may be largely avoided by studying "Squabs for Profit," for it embodies the results of seven years' careful work as squab-raiser on the part of the author.

THE STEEL SQUARE AND ITS USES. In two volumes. Edited under the supervision of William A. Radford, assisted by Alfred E. Woods and William Reuther. New York: Industrial Publication Company. 8vo.; cloth; 500 pages; illustrated. Price, \$2.

A complete and systematic treatise on the steel square, in which the principles are given in plain language, so arranged as to be readily available for reference. The text is arranged in progressive chapters with a full list of the contents of each chapter at its head, and the helps and hints, the rules and examples are placed under appropriate sub-headings, with index commencement words printed in bold-faced type, so that the eye of the reader can catch the particular information wanted at once. Original illustrative diagrams to the number of over two hundred are contained throughout the text. The collection of miscellaneous rules and examples given in Volume II. is of great practical utility, as one example in each set is worked out. The work ends with a department of Questions and Answers. All in all, no more complete or more conveniently arranged work has yet appeared on this important subject.

WELLCOME'S PHOTOGRAPHIC EXPOSURE RECORD AND DIARY FOR 1907.

This little book, neatly and tastefully printed and bound, seems to us a very compact compendium of photographic knowledge, giving as it does excellent information on exposures at home and abroad, besides tables which give the speeds of over 200 plates and films. The book contains a diary for the year, memoranda pages, ruled pages for recording positive exposures and negative exposures formulated for toning by the gold, platinum, copper, and bisulphid methods, development by time, machine, tank, or stand methods, customs regulations, tables for focusing, a temperature chart, tables of weights and measures, and monthly light tables giving the relative value of the light at all hours of the day and throughout the year. Although the book has been evidently compiled for the use of English photographers, most of its information will be found available by the American photographer.

ÆTHER. A Theory of the Nature of Æther and of Its Place in the Universe. By Hugh Woods. London: The Electrician Printing and Publishing Company, Ltd. 8vo.; cloth; 100 pages. Price, \$2.

The spirit of modern science is made up of two apparently diametrically opposed influences—the one seeking to establish relations between sets of phenomena by experimental research, the other endeavoring to form foundations for this research by logical use of the imagination—if such an expression may be rightly used. Both branches are equally important, each one aiding the other, although when the facts are established the original hypothesis may be so altered as to be quite unrecognizable. Mr. Woods's work is of the hypothetical kind. He deals with forms that have never been proved to exist, namely, the basal forms of aggregation of matter, although he assumes nothing that is not universally accepted as being in accordance with the facts. The concept of "ether" is not new; Mr. Woods is not setting forth a doctrine that is startling in its wildness; he is showing the relationship among ideas that have been held for many years in separate, disjointed forms. As a whole, the work is of great value, for it is to such thinking that we must look for the solution of the seemingly unsolvable problem of the ether.

SYNOPSIS OF MINERAL CHARACTERS. Alphabetically arranged for Laboratory and Field Use. By Ralph W. Richards. New York: John Wiley & Sons. 16mo.; 99 pages; leather. Price, \$1.25 net.

An alphabetical list of minerals and their characteristics and of mineralogical terms. It is bound in such form as to make an excellent reference book for use with determination tables in field work.

A SHORT COURSE ON DIFFERENT EQUATIONS. By Donald Francis Campbell. New York: The Macmillan Company. 16mo.; cloth; 96 pages. Price, 90 cents.

Only to those who have a knowledge of the fundamentals of the calculus will Dr. Campbell's textbook prove serviceable. It is far too advanced for beginners, and of rather too limited a scope for the student who wishes a broad view of the subject. For the engineer, however, to meet whose needs it was written, it will prove a great saver of time and energy, since the subjects dealt with are only those whose principles are constantly met with in the practice of engineering.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending May 14, 1907.

AND EACH BEARING THAT DATE

(See note at end of list about copies of these patents.)

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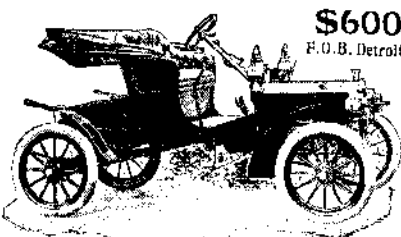
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Rail tie and fastening, W. J. Kest	853,554
Railway, aerial, W. J. Hogan	853,788
Railway grading machine, O. C. Mann	853,928
Railway rail, J. N. Akarman	853,249
Railway rail, W. G. MacLaughlin	853,815
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Railway signal, F. H. Wenzel	853,486
Railway signal fuse, F. Dutcher	853,777
Railway switch, Baxter & Carlyle	853,857
Railway tie, C. E. Will	853,390
Railway tie, J. G. Parkerson, Jr.	853,593
Railway tie, E. T. Forrester	853,629
Railway tie, C. C. Daniels	853,773
Railway track construction, W. Lee	853,308
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Saw, W. Vartmann	853,609
Saw, pneumatic leg, R. Fullerton	853,350
Saw set, J. V. Strombom	853,747
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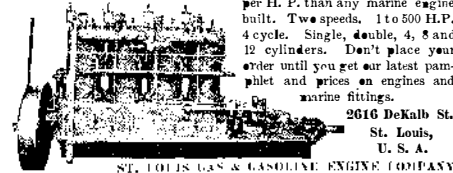
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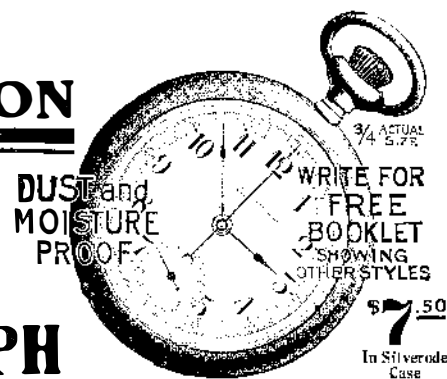
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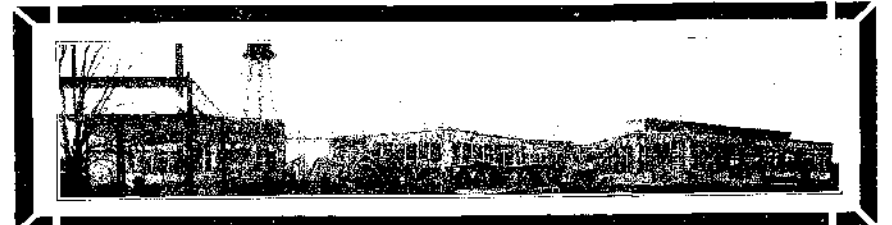
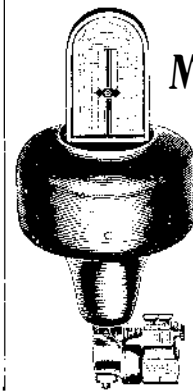
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