

NEW BOOKS AND PUBLICATIONS.

A TEXT BOOK ON ROOFS AND BRIDGES. Part I. Stresses in Simple Trusses. By Mansfield Merriman. New York: John Wiley & Sons. Pp. 118. Price \$2.50.

The author, a professor of civil engineering in the Lehigh, Pa., University, presents in this volume a synopsis of one of four parts of the course of instruction followed in that institution. The book is more especially for the use of students intending to take a thorough course in civil engineering, and each alternate leaf throughout the book has been left blank for convenience in recording solutions of problems.

THE AMAZON PROVINCES OF PERU AS A FIELD FOR EUROPEAN EMIGRATION. By H. Guillaume, F.R.G.S. London: Wyman & Sons. 1888. Pp. xvi, 309. Price \$2.00.

This work, dedicated to one of the rival aspirants to the governing of Peru, General Andres Avelino Caceres, is the work of the Peruvian Consul-General at Southampton. It treats at considerable length of the ethnology, natural history, topography, and other features of the region lying on the eastern slope of the Andes, and is designed to encourage emigration thereto. The work is well and characteristically illustrated, with various views. Its frontispiece is a portrait of Caceres, whose star has lately been in the ascendant. The work presents a clear and striking picture of the country and its prospects, both as a mineral-producing territory and from other points of view.

MECHANICAL DRAWING. By Linus Faunce. Boston: W. J. Schofield. 1887. Pp. 136. Price \$1.25.

This excellent little work, designed for the use of the students of the Massachusetts Institute of Technology, may be safely recommended to all students of this branch of science. It abounds in practical notes, and deals largely with the solution of problems in geometrical graphics. Shadows and projection are likewise treated at considerable length, and make, the whole a compact yet full treatise on its important subject.

A COURSE OF LECTURES ON ELECTRICITY. By George Forbes. London: Longmans, Green & Co. 1888. Pp. vii, 163. Price \$1.50.

This attractive and excellent little work is a welcome addition to the somewhat numerous list of works on the elements of electrical science. Many of the illustrations are naturally old time productions, the acquaintances of past years, but the main tone of the text is quite in accord with the last developments of the day. The treatment is popular and attractive. Mathematics, to many the great bugbear of the science of to-day, are omitted, and experimental demonstrations are made to take their place. We recommend the work to our readers, believing it adapted to fill creditably its place in electrical literature.

STEAM BOILER EXPLOSIONS, IN THEORY AND PRACTICE. By R. H. Thurston, M.A., Doc. Eng. New York: John Wiley & Sons. 1887. Pp. vii, 173. Price \$1.50.

The name of the author carries with it the best guarantee of the value of this book. It is well illustrated, and treats of the subject from every standpoint. The theory is considered and a series of conclusions reached that are based largely on the well known Stevens experiments at Sandy Hook. His eighth conclusion contains the gist of the matter, and is a capital commentary on the sensible and practical way in which the writer deals with his material: "That all explosions are certainly due to simple and preventable causes, and nearly all to simple ignorance or carelessness, on the part of either designer, constructor, proprietor, or attendants." Next, the author disposes in a few words of the prevention of explosions, stating it to be a matter of the utmost simplicity. The work should be studied by all engineers, especially by the working staff, who are so fond of indulging in theories that are utterly unproved, and in making a mystery of the causes that bring about the rupture of iron plates.

THE VOSBURG TUNNEL: A DESCRIPTION OF ITS CONSTRUCTION. Illustrated. By Leo von Rosenberg. New York. 1887. Pp. 56. Price \$1.

This elegantly printed monograph details the methods of construction adopted in the construction of the Vosburg tunnel on the Lehigh Valley Railroad. To Mr. Von Rosenberg had been entrusted the making of a complete series of drawings of the tunnel work. He has now published, with special permission of the Lehigh Valley Railroad Company, a collection of these drawings, and in the 56 pages of text has fully explained them, and has given practical points and figures and statistics. The whole thus acquires character as an exponent of modern successful tunnel practice, and should be found in every railroad engineer's library.

ZWICKER'S INSTRUCTOR FOR PROCURING STATIONARY AND STEAM ENGINEER'S LICENSE. By Philip Henry Zwicker. St. Louis, Mo. 1887. Pp. 84. Price \$2.

This work, in a series of questions and answers, aims to give the instruction indicated by its title. It will be found useful reading for aspirants to a knowledge of practical engineering.

POROUS EARTHENWARES. Facsimile of United States Letters Patent issued to Charles Carroll Gilman. 1887.

This book comprises facsimile reproductions of thirty-three patents granted to Mr. Gilman. No comments are given, but each patent is allowed to speak for itself. The publication presents a novel and interesting appearance. It is a characteristic way of illustrating the life work of an inventor.

Any of the above books may be purchased through this office. Send for new catalogue just published. Address MUNN & Co., 361 Broadway, New York.

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. D.—In casehardening gun trimmings and locks the articles should be packed in a wrought or cast iron box with a cover so arranged as to allow of the use of clay to lute it as nearly tight as possible. To produce the mottled appearance, use bone black or burnt bones pulverized, which give a gray color to the metal, and burnt leather pulverized, which gives a blue color. Mix the two materials loosely as you pack the articles to produce the mottled appearance. When packed and the cover luted, the box is to be heated to a low red in a furnace or forge fire, and kept at this temperature from $\frac{3}{4}$ to $1\frac{1}{2}$ hours, according to the depth of casehardening required. Then raise the box to a cherry red heat for a few minutes, long enough to allow the hardening heat to penetrate to the center of the box, when it can be opened, the pieces picked out and dipped in water at ordinary shop temperature and quickly dried, or if there are many pieces the box can be tipped and the contents dropped into the hardening tub.

(2) F. C. H. asks: 1. What is meant by "boxing the compass," also by boxing it backward? A. To box the compass is to call the 32 points of the compass by their proper names toward the right hand as you look at the compass card, or from north by the east. As for example, N., N. by E., N. N. E., N. E., N. E. by E., E. N. E., E. by N., E., and so on. Boxing backward is reversing the order. 2. How can I find out the desired horse power to run a certain machine? And when I have the horse power, how shall I find the size of cylinders I need (these being two) for an oscillating engine? A. Find the power required for any given machine with a dynamometer. They are for sale by the engineering trade. You cannot compute the size of the cylinder directly from the required horse power. Steam pressure, speed, mean pressure from cut-off, and relative length of stroke and diameter of cylinder, all have to be considered in arriving at the required result. You will find the nominal sizes of cylinders for given powers of engines tabulated in the circulars of dealers.

(3) W. J. B. asks: What can I put into a cement I now make to keep it from becoming neutralized? It is made by boiling acetic acid, then mixing into it gelatine until it becomes thick. It makes a very good cement, but after it is made awhile it loses its sticking properties and gets like oil. A. You probably don't keep it tightly corked. The best liquid glue is said to be made from the following receipt: Take a wide-mouthed bottle and dissolve in it 8 ounces best glue in $\frac{1}{2}$ pint water, by setting it in a vessel of water and heating until dissolved. Then add slowly $2\frac{1}{2}$ ounces strong nitric acid 36° Baume, stirring all the while. Effervescence takes place with generation of fumes. When all the acid has been added, the liquid is allowed to cool. Keep it well corked.

(4) J. T. W. asks concerning some preparations which will preserve "string netting." I have inclosed my chicken yards with a 4 ply string net, and as the climate here is wet, I am afraid it will soon rot. A. Dissolve 1 pound of sulphate of zinc in 40 gallons of water, and then add 1 pound of sal soda. After these ingredients are dissolved, add 2 ounces tartaric acid. The net should be soaked in this solution for 24 hours and then dried without wringing.

(5) J. H. U. desires a prescription for earache. A. Consult a physician. It is dangerous to treat such troubles without competent advice. 2. A receipt for paste which would make labels stick fast to tin boxes. A. Use starch paste with which a little Venice turpentine has been incorporated, while it was warm.

(6) C. M. desires the receipt and quantities for making 50 gallons of javelle water. A. Javelle water is best made by passing gaseous chlorine into a solution of 1 part of carbonate of potash in 10 parts of water until the gas ceases to be absorbed. It may also be made by adding a solution of 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 off. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 314.

(7) D. L. W. asks: What will kill the smell of turpentine without affecting its strength? A. Try filtering through bone charcoal, but we doubt whether anything will prove effectual.

(8) J. P. B. recommends the following as an excellent blacking for brass or wood work: Take a little bit of good black printer's ink (with a very little turpentine to moisten it enough) and blacken any kind of wood or metal. When it gets hard, it will adhere firmly, and dries flat.

(9) A. L. B. asks for a lacquer for a brass instrument that has become somewhat tarnished, it must be of a lemon or orange tint. A. Take 1 part of finely broken shellac to 4 parts strong alcohol, let it stand in a warm place with plenty of shaking for about 24 hours, one-fifth to one-tenth part of mastic may be added. If it needs filtering, it must be done, but through coarse filtering paper. A little gamboge for yellow, or dragon's blood for red must be added. Apply the var-

nish to the hot metal, which must be absolutely clean and untouched by the fingers. Apply the brush with strokes parallel to the streaks of the metal.

(10) J. E. McK.—Wood begins to be dangerously hot at 300° F. Drying rooms should never reach this limit, 150° to 215° F. should dry barrel stock very fast, and 215° should be the limit of heat in the lumber room. Excessive heat cracks the lumber.

(11) L. C. D.—Picture frame maker's putty is made of whiting, glue, and water, worked very stiff. The mould is oiled. If you wish it to dry slow, put a few drops of glycerine in the back of putty.

(12) E. B. asks how to set a carriage axle or a wagon axle. A. Make the bottom side of the bearings or skains a straight line, and give a slight set forward, so that the distance between the front of the rims of two wheels will be $\frac{1}{4}$ to 1 inch less than between the backs.

(13) P. J. H. asks the names of the different sections of a globe valve. A. Body, seat, bonnet, stuffing box, nut or gland, spindle, valve disk, valve nut, wheel.

(14) J. C. P. asks: 1. How many candle power does the inexpensive arc lamp described in the SCIENTIFIC AMERICAN, vol. 56, page 374, give? A. From 40 candles upward. It needs constant personal attention. 2. How many cells of the simple plunge battery of vol. 57, page 116, would it take to light the arc lamp for three hours every night? A. From 30 cells upward. 3. Of the simple plunge battery, does one tumbler mean one cell? A. Yes. 4. How many cells of the single fluid battery, vol. 57, page 390, of the gallon size will it take to light the arc lamp? A. From 20 cells upward.

(15) A. W. S. asks: 1. Could the eight light dynamo given in No. 17 of the SCIENTIFIC AMERICAN of 1887 be changed to a motor by winding the armature and field magnet with a different size of wire? If so, what size of wire would have to be used, and how many pounds for each? A. The dynamo referred to makes a good motor without any alteration. 2. What size of wire would have to be used for a motor, on same floor, only half size, or one-fourth the power? A. You should preserve about the same proportions throughout all the parts of the machine, including the wire.

(16) C. H. U.—There are three trees popularly called "umbrella tree." The one which you inquire about appears to be, from your description, a variety of the *Melia azadirach*, which forms a dense round head, flattish underneath, which, viewed from a distance, somewhat resembles an open umbrella. The two other umbrella trees are species of magnolia.

(17) W. S. A. asks what a candle power is, or what is the basis; upon what is a candle power based? A. A candle power is the light given by a sperm candle burning 120 grains per hour. It is an extremely crude standard, but by the adoption of a known type of candle has acquired some accuracy.

(18) E. H. writes: We have a cross belt in our shop that is heavily charged with electricity. How can the circuit be completed, so that it will give a person a shock? This belt will draw sparks from a person's finger tips at a distance of from 3 to 4 inches, and the only effect felt is a sharp stinging at the point from which the sparks issue. The other day a party came in and held his fingers up to the belt, and if we touched him in that position, we would receive a shock, but this only answered for this one person, and would not do for any one else, and, in fact, when he came in a day later, it would not do it again with him. Can you through your columns give us any information in relation to the phenomena? A. To get a shock by means of your belt, charge a Leyden jar with it by holding the knob in its vicinity. Possibly the clothing of the person who gave a shock had something to do with the phenomenon.

(19) S. K. M. asks: 1. How should Holtz machine be altered to use Topler's plan? A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 291. 2. How is luminous paint made? A. See articles on this subject in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249 and 497. 3. How is ink for type writer ribbons applied? A. Lay out the ribbon in such lengths as may be convenient, and apply the ink after agitation by means of a soft brush, rubbing it well into the interstices of the ribbon with a stiff tooth brush. Hardly any ink should remain on the surface.

(20) J. W. desires (1) a cement suitable for cast iron. A. Mix powdered cast iron bore chips, 60 parts, salammoniac 2 parts, flowers of sulphur 1 part, and stir the mixture into a stiff paste by adding water. The cement must be used while fresh. 2. Is there a positive cure for freckles that will remove them without injury to the skin? A. There is no positive cure, but you might try $\frac{1}{2}$ drachm ammonium chloride and 2 drachms lavender, in half a pint of distilled water. This mixture may do some good. Apply to the face two or three times a day with a sponge.

(21) F. C. H. asks (1) how to clean velvet collars on overcoats. A. See SCIENTIFIC AMERICAN SUPPLEMENT No. 158. 2. How to take off the traces of a sheet iron stove done by the scratching of matches? A. Use stove polish. 3. Could the simple telephone described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 142, be used for a transmitter, and could I use No. 20 cotton covered wire for the line? For a short line could I connect one wire with the water pipe? A. Yes; but you had better use a closed metallic circuit.

(22) F. E. D. desires a recipe for skeletonizing and bleaching leaves. A. See "How to Prepare Skeleton Leaves and Grasses," contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 270.

(23) W. P. P. asks how to remove the copper from electric light carbons. A. Use nitric acid.

(24) M. N. O. asks how to remove India ink marks that have been pricked in a person's arm or hand. A. It is impossible to take them out completely. Their intensity may be modified by several times pricking them over with milk.

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.

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