

Business and Personal.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$1. Munn & Co., publishers, 361 Broadway, N. Y.

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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 This is for our information and not for publication.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. 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.

(7156) J. W. C. asks: 1. Is it necessary to amalgamate the zincs of a Crofoot gravity battery? A. It is not necessary and is not usually done. 2. How can the sulphate of copper solution be kept down? I am very careful in starting a cell, filling up with clean water and dropping in crystals of sulphate of copper, but the solution does not settle, and in a few hours, even without current, the zinc becomes coated with the mud of the copper—and with a current is much worse, the coating getting very thick and hanging down like icicles. A. Using the battery for work is supposed to keep the copper solution down. Apparently you do not use a sufficient excess of copper sulphate. Certainly, with an excess of crystals and by occasional renewing of the upper layers of the liquid, the taking of a current from the battery should tend to obviate, not produce, the difficulty. If you let the battery run too long, the increase in specific gravity of the zinc sulphate solution will bring about the difficulty complained of. 3. Method of calculating the gear of a bicycle. A. Divide number of teeth on front sprocket wheel by number on rear sprocket wheel and multiply the diameter of the driving wheel thereby.

(7157) W. R. T. writes: I have the use of 64 gravity cells 6x8 for fifteen hours each day. 1. Can I fully charge three chloride accumulators, type "D," consisting of 5 plates, size 6x6 inches, in that time? A. You will probably not get over one-tenth of a charge out of the gravity batteries running for the period of time which you mention. 2. How should the gravity cells be connected? A. A good arrangement would be 16 in series and 4 in parallel. 3. How many 3 candle power lamps, 6 volts and under, can be run from these three storage batteries at one time? A. Twelve to eighteen at good incandescence. 4. Would it injure the storage batteries to leave them connected in circuit while the gravity cells are in use on a Morse circuit? A. It would not injure the batteries. It would, of course, exhaust them proportionately to the service and might give too strong a current for the apparatus.

NEW BOOKS, ETC.

PROBLEMS AND QUESTIONS IN PHYSICS. By Charles P. Matthews, M.E., and John Shearer. New York: The Macmillan Company. London: Macmillan & Company, Ltd. 1897. Pp. vii, 243. Price \$1.60.

Modern physics has received a new momentum from the application to it of the theory of dimensions. While this has given it a new meaning, it does not do to make a merely mathematical science of so subjective a branch as physics. The subjective treatment of physics by the older school has done much to retard the proper advancement of the science. In the present work the author starts with the theory of dimensions and elucidates most excellently the starting point of physics. The work in the book is largely comprised of problems, and it seems a very admirable production. Yet from a somewhat hasty

examination of it we are inclined to think that the author would have done better had he been more expansive in his introductory portion. Thus it seems to be assumed that the person using the book will understand thoroughly what force, energy and work are, but we certainly would like to have seen these subjects more fully treated. Perhaps it is simply because the work has impressed us so favorably that we make this criticism, because we think that an adequate treatment of the subjects of force, work and energy would have been most acceptable from so eminent an author.

MECHANICS OF VENTILATION. By George W. Rafter. Revised Second Edition. New York: D. Van Nostrand Company. 1896. Pp. 143. Price 50 cents.

In this little book, which by the appearance of its second edition indicates its popularity, we find a well known member of the familiar green colored Van Nos. Grand Science Series. Its reaching a second edition goes to show its utility. Without going into abstruse mathematics, it gives full systems for use for testing and calculating ventilation apparatus of different descriptions.

TABLES FOR THE DETERMINATION OF MINERALS BY PHYSICAL PROPERTIES. Ascertainable with the aid of a few field instruments. Based on the system of Prof. Dr. Albin Welsbach. By Persifer Frazer. Fourth edition, to which one hundred and thirty-five additional species have been added. Philadelphia: J. B. Lippincott Company. 1897. Pp. xi, 163. Price \$1.50.

The accomplished mineralogist, in 99 cases out of 100, determines minerals by their appearances pure and simple. We have before reviewed a similar book from an American source. In the present work the author makes a less exacting differentiation. The divisions are three, based on luster and streak: The first, metallic luster, is arranged in five subdivisions, based on color; two divisions of metallic and non-metallic luster include six divisions for colored streaks. Three divisions, all of non-metallic luster and white or light gray streaks, are divided by their sectility and hardness. Beyond this each mineral has to be individually determined. The usual methods are applied for determination. A supplement of nearly fifty pages which is appended simply gives minerals in alphabetical order, abandoning all attempt at classification.

The Garden and Forest, a weekly publication conducted by Charles S. Sargent, Professor of Arboriculture in Harvard College, is a paper which every one desirous of being well informed in matters relating to horticulture, landscape art and forestry should take. The bound volume covering the numbers for the year 1896 constitutes a handsome quarto of 530 pages, embellished with many beautiful and original illustrations, and the reading matter treats of a wide variety of subjects, and is all of high quality.

TO INVENTORS.

An experience of nearly fifty 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 unequal 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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Selling device, electric, Davidson & Armstrong..... 580,933
Sewing and cutting machine, buttonhole, F. W. Ostrom..... 581,031
Sewing machine, W. H. Currier..... 580,849
Sewing machine feed mechanism, J. A. Jones..... 581,082
Sewing machine quilting attachment, J. W. Clayton..... 581,063
Sewing machine, shoe, G. E. Milner..... 580,880
Sewing machine thread controller, B. W. Goodell..... 581,110
Shade, window, G. W. Everett..... 581,250
Shoe, last, etc., mechanism for preparing, J. Kennedy..... 581,165
Shears. See Iron shears.
Shoe, Jordan & Kelly..... 581,122
Shutter, ventilated, C. H. Pease..... 580,990
Shive box or shoe, L. C. Holt..... 581,118
Sign apparatus, illuminated, J. H. Richardson..... 581,011
Sign hanger, Vanderslice & McLaren..... 580,912
Silver and gold, treating ores containing, H. Hirsching..... 581,160
Sled, logging, W. H. Morrison..... 580,883
Smoothing iron, J. Feldmeyer..... 581,248
Snake, G. R. McCawley..... 581,250
Spike, C. W. King..... 581,074
Spiking bar, R. G. Ward..... 580,998
Springing rings, making, W. H. Buxton..... 580,845
Spring motor, reversible, J. J. Chick..... 581,103
Sprinkler. See Lawn sprinkler.
Square, combination center, U. Townsend..... 580,910
Stacker, hay, E. J. Thurber..... 580,964
Steam boiler, R. Joy..... 580,867
Steamer, E. R. Garrett..... 580,857
Stereotype plate holder, Sultzer & Sheel..... 581,046
Sterilizer, W. A. Castle..... 581,148
Stone cutter, D. Kilpatrick..... 580,886
Stone wetting device, F. A. Schimpf..... 580,980
Stopper. See Bottle stopper.
Street sweeper, I. W. Conslieya..... 581,196
String instrument, J. A. Weser..... 580,956
Surgical use, electric light and head gear for, L. Nevin..... 581,129
Swinging gate, C. Dewesse..... 580,850
Switch. See railway switch.

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