Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

For Sale—One 48" boring lathe. First class order. One Gould gear cutter. In good order. W. P. Davis, Rochester, N. Y.

Shingling gauge patent for sale. See page 428.

"U. S." metal polish. Indianapolis. Samples free.

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6 Spindle Turret Drill Presses. A.D. Quint, Hartford, Ct.

Portable and Stationary Cylinder Boring machines. Pedrick & Ayer, Philadelphia, Pa.

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Centrifugal Pumps. Capacity, 100 to 40,000 gals. per minute. All sizes in stock. Irvin Van Wie, Syracuse, N.Y.

Crandall's patent packing for steam, water, and ammonia. See adv. next week. Crandall Packing Co., Palmyra, N. Y.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, $4; Munn & Co., publishers, 361 Broadway, N. Y.

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For Sale at a Bargain—Exclusive right for State of Virginia on a patent lifting jack; also 500 jacks ready made. Must sell. For particulars address H. Crites, Gaston, W. Va.

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 This is for our information and not for publication.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.

(4439) R. E. H. asks: Can you through the Notes and Queries column of your paper tell me of any equitable rules for time allowance based on load water line for steam yacht races? A. The American Yacht Club uses the following rule for the larger class of steam yachts. The time allowance is the difference between the time actually made over the course and the computed time by the formula of: Speed in knots per hour =

$$2.7 \times \sqrt[3]{\text{length in feet on the water line}}.$$

If the computed time is less than the actual time, the least difference is the winner. If it is greater than the actual time, the greatest difference is the winner. For the small steam launches, the speed in knots per hour divided by the cube root of the length in feet on the water line $\left(\frac{\text{speed}}{\sqrt[3]{\text{length}}}\right)$ equals the merit of the race.

(4440) A. P. H. writes: Can you tell me what volume 100 cubic feet of carbon dioxide (CO_2) at atmospheric pressure and 60° Fah. temperature will occupy when compressed to a liquid? In other words, how do the volumes of gaseous CO_2 compare with the liquid CO_2? A. The specific gravity of liquid carbondioxide is at −10° C. 0·9951; at 0° C. 0·9470; at 20° C. 0·8266. The latter temperature corresponds to 68° Fah., at which the amount named would occupy the volume of 98,755 grains of water or about 390 inches; at 60° Fah. the volume would be approximately that of 95,609 grains of water or about 379 cubic inches.

(4441) K. N. asks: How many cubic feet or hundredweights of ice is needed to cool a space of 1,000 cubic feet of an ice box (lined throughout with 4 inches sawdust) to about 40° Fah.? A. The melting of 100 pounds of ice should be enough to cool the ice box to 40° from our summer temperature, if it is perfectly tight; but as ice boxes are generally made and used, a constant storage of from 300 to 400 pounds of ice is not too much.

(4442) F. B. W. asks: 1. What causes the so-called heat lightning? A. So-called heat lightning is simply the ordinary discharge of lightning at a great distance. What is seen is merely the reflection of the light from the lightning and the storm on account of its great distance. 2. Why is it not accompanied by thunder? 3. Is it considered dangerous? If not, why? A. No, for the reason just given.

(4443) H. M. R. asks for the components used for the production of the lead tree in a bottle. I may mention that there are men in London that peddle the powder in the streets at 1 penny per packet with the wire. A. The powder is lead acetate or sugar of lead; the wire is zinc.

(4444) F. W., Chicago, writes: Will you please suggest some way to me through the SCIENTIFIC AMERICAN of removing or lessening the dampness in my basement? It rusts my tools, spoils everything I put down there, and the unpleasant odor makes it very annoying. A. The only approved way of removing the nuisance of damp cellars in Chicago soil is to make a concrete floor with Portland cement, using gravel or sand with the cement at least 2 inches thick, and plaster the walls 2 to 3 feet high all around with Portland cement. Then cover floor and sides with a thin coat of asphalt put on hot. Then lay a floor so as to have a clear space underneath and arranged to connect with outer air through ventilators. Sides of basement to be furred off, lathed and plastered. You have parties in Chicago that do this work.

(4445) N. E. C. asks: What language contains the largest number of words? A. The Chinese language is supposed to have the largest number of words. The English language contains about 120,000 words, including technical words; the German language about 80,000 words.

NEW BOOKS AND PUBLICATIONS.

SEA SIDE AND WAY SIDE. By Julia McNair Wright. Boston: D. C. Heath & Co. 1892. Pp. viii, 361. Price 70 cents. No index.

This charming book is the fourth of the series of nature readers, of which we have already reviewed several in this paper. It begins with the formation of the earth, goes through the different geological eras, and then treats of modern natural history. The whole is comprised in 50 reading lessons, is excellently printed and with creditable illustrations as required. We believe a good work is done in providing for the young this class of reader, in order to direct their thoughts to the marvels of nature.

SAFE BUILDING. By Louis De Coppet Berg, F.A.I.A. Vol. II. Boston: Ticknor & Company. 1892. Pp. xv, 279, with additional tables. Price $5.

The first volume of this book has received already such encomiums and such wide circulation among the profession that the present work will meet of course with the same circulation, as it is essential to complete the book. It starts with chapter 8, and is devoted to iron structure, and in it the manufacture of iron and its quality receive very full consideration. Iron is departed from under a section devoted to trusses, where something is said of wooden trusses also, but the metal is pre-eminently the subject of this second volume. A very exhaustive general index, filling nearly 20 pages, is a most commendable feature.

JOHNSON'S TABLES. By J. B. Johnson. New York: John Wiley & Son. 1892. Pp. vii, 99. Price $1.25.

Stadia and earthwork tables, four-place logarithms, logarithmic traverse table, natural functions, map projections, etc., reprinted from Professor Johnson's work on the theory and practice of surveying, are the matter of the present volume, preceded by chapter 13 of the original work, upon the measurement of volumes. It is believed that the great use made by engineers of these tables and formulas justifies their separate reproduction, and we have no doubt the work will be found justified by the acceptance it will receive from the profession.

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