

of this heater is oval in plan, and a transverse arch rises centrally in the tank from its bottom, extending between the front and rear walls.

DISPLAY STAND. — Jefferson D. Goddard, Kansas City, Mo. This stand comprises a base and vertical standard carrying at its top a pennant, while midway is an irregular, box-like figure with open sides and vertical partitions, the central portions of the top and bottom of the box-like figure being higher than the side portions.

TRIMMING. — Friedrich Hassenpflug, New York City. According to this design, loop-like wings extend at angles one to the other, in groups, radiating from a common center.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE METALLURGY OF IRON AND STEEL. By Thomas Turner, Associate of the Royal School of Mines. Vol. I. The Metallurgy of Iron. London: Charles Griffin & Company, Limited, Philadelphia: J. B. Lippincott Company, 1895. Pp. 367. 8vo. 80 illustrations. Price \$5.

This is a volume of Griffin's Metallurgical Series, which is edited by Professor W. C. Roberts-Austen, C.B., F.R.S. The present work is one of a series of treatises on metallurgy written by associates of the Royal School of Mines. The history of the manufacture of iron and steel is treated more fully than is usual in metallurgical treatises, as is also the section dealing with foundry practice and with the reactions of the puddling furnace. The author has paid particular attention to these branches of the subject. A special chapter has been devoted to the corrosion of iron and steel, as this is a subject of great importance in connection with the permanence of modern structures. The special bibliographies are of great value, giving references not only to books, but to periodical literature as well. The work abounds with tables and other data, some of it heretofore unpublished, which cannot but prove of value to all who are engaged in manufacturing iron, and to the student of metallurgy as well.

TEXT BOOK OF THE PRINCIPLES OF PHYSICS. By Alfred Daniell, M.A., LL.B., etc. New York and London: Macmillan & Company, 1895. Pp. 782. 8vo. 257 illustrations. Price \$4.

This is the third edition of Daniell's Physics, a work which, since the publication of the first edition in 1884, has achieved a most enviable reputation. The work is a recognized standard wherever the English language is understood. It is withal one of the most readable works on physics among those not intended for popular use. The plan of the work is that of a gradual progression from the simpler to the more complex subjects. No preliminary knowledge of principles is assumed, and every effort is made to attain lucidity of expression. The aim of the author has not been to build up a mere compendium of physical facts, but rather to put the reader in possession of such principles as will enable him with small difficulty to apprehend and appreciate these facts. The present edition includes the sixth thousand, which speaks very well for a scientific book which does not appeal to a popular reader. The arrangement is admirable, and many of the facts printed in small type are of the greatest value. An excellent bibliography is provided.

IRRIGATION FARMING: A HANDBOOK FOR THE PRACTICAL APPLICATION OF WATER IN THE PRODUCTION OF CROPS. By Lute Wilcox. New York: Orange Judd Company, 1895. Pp. 312. 12mo. 95 illustrations. Price \$2.

Irrigation has become an important factor in modern agricultural pursuits, and it is becoming more or less essential in all parts of the country, so that the need of more specific knowledge regarding it has led the author to write the present book. By means of this work any one can set about constructing an irrigating plant of any given capacity and can proceed to irrigate his land intelligently and correctly. The book is primarily written for and adapted to the use of our Western farmers, but it will prove equally valuable to the farmers of the South and other sections of the country. The text is clear and concise and cannot but be of value to the farmer. The concluding portions of the book give an admirable review of the common law of irrigation and a glossary of irrigation terms.

A GUIDE TO SYSTEMATIC READINGS IN THE ENCYCLOPEDIA BRITANNICA. By James Baldwin, Ph.D. Chicago and New York: The Werner Company, 1895. Pp. 316. 8vo. Price \$2.

Although the Britannica has long been recognized as one of the greatest of reference books, and although its possessors may never have consulted it without complete satisfaction, its full value has seldom been recognized. It is usually regarded simply as a repository of general information to be kept at hand for consultation as occasion may demand. While this is the ordinary use of the Britannica, it may be utilized in such manner as to perform the office of a great educational agent. The present work shows how this may be done. The plan has been to direct each individual how to draw from this great storehouse of knowledge that which will cover with all desirable completeness the line of work in which he is most interested. This is done by an elaborate series of references which have been arranged according to the subject. The work is an admirable one and is worthy of great success.

PRIMER OF PHILOSOPHY. By Dr. Paul Carus. Chicago: The Open Court Publishing Company, 1895. Pp. 232. 12mo. Price 25 cents.

It is not expressly designed to give instructions to beginners in philosophy, but it is nevertheless available for that purpose. The uninitiated student will not be bewil-

dered or mystified, in perusing its pages, by unintelligible phrases. The subject is presented with great simplicity, so that the leading idea may be gathered by a glance at its contents. The most essential technical terms are explained, and the high practical importance of philosophy is never lost sight of. The point of view adopted by the author is new to the extent that it cannot be classified among the schools of recent thought. It represents rather a critical reconciliation of rival philosophies of the type of Kantian apriorism and John Stuart Mill's empiricism.

JUSTUS VON LIEBIG: HIS LIFE AND WORK, 1803-1873. By W. A. Shenstone, F.I.C. New York: Macmillan & Company, 1895. Pp. 219. 16mo. Portrait. Price \$1.25.

The name of Liebig is familiar to all who are in any way acquainted with the science of chemistry, but many will doubtless like to have had a clear idea of why chemists admire and esteem him. The author has found that the prevailing impression concerning Liebig was that he was a man who gained a large fortune by making extract of beef. He has, therefore, made it his object in writing this little book, not so much to dwell upon Liebig's private life as to tell what he was, what he did and why all chemists and those who are versed in the history of science admire and esteem him so greatly. The work is written in admirable style and gives details of his great discoveries in pure chemistry, fermentation and agricultural and physiological chemistry.

WASHINGTON; OR, THE REVOLUTION. A drama founded upon historic events of the war for American independence. Part I. By Ethan Allen. Chicago: F. T. Neely, 1895. Pp. 212. 12mo. Illustrated. Price 50 cents.

This drama is divided into two parts; each part consists of five acts. The chief aim of the author has been to secure to the reader a personal intimacy with the actor in the great struggle which made the United States of America.

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

SCIENTIFIC AMERICAN BUILDING EDITION. OCTOBER, 1895.—(No. 120.)

TABLE OF CONTENTS.

- 1. Plate in colors of a handsome cottage at Rochelle Park, New Rochelle, N. Y. Two perspective elevations and floor plans. Cost \$9,000 complete. Mr. H. S. Rapelye, architect, Mount Vernon, N. Y. A pleasing design for a suburban residence.
2. Cottage at Kennebunkport, Me., recently erected for B. S. Thompson, Esq. Perspective elevation and floor plans. A very attractive residence in the English style of architecture. Mr. Henry P. Clark, Boston, architect.
3. A cottage at Flatbush, N. Y., recently erected at a cost of \$4,000. Perspective elevation and floor plans. John J. Petit, architect, Brooklyn, N. Y. An attractive design.
4. An all shingled cottage at Mount Vernon, N. Y. Perspective elevation and floor plans. A neat design in the Colonial style. Mr. Louis H. Lucas, New York City, architect.
5. A suburban cottage at Flatbush, L. I., recently erected at a cost of \$8,000 complete. Perspective elevation and floor plans. Messrs. Rowe & Baker, New York City, architects. An attractive design in the Colonial style.
6. A dwelling at Glenwood, Yonkers, N. Y. Perspective elevation and floor plans. Messrs. D. & J. Jardine, architects, New York City. A most unique design.
7. Three perspective views and floor plans of a residence at New Rochelle, N. Y. Architects, Messrs. Stephenson & Greene, New York City. A well treated design.
8. A Colonial residence at Mountain Station, N. J. Two perspective elevations and floor plans. Mr. H. C. Pelton, architect, New York City.
9. A house at New Haven, Conn., recently erected at a cost of \$3,700 complete. Two perspective elevations and floor plans. A modern economical cottage design. Architects, Messrs. Stilson & Brown, New Haven, Conn.
10. A Colonial cottage at Bronxville, N. Y., recently completed at a cost of \$4,600. Perspective elevation and floor plan. Mr. W. H. Rahman, architect, New York City.
11. Miscellaneous Contents: Buff brick.—Tower tanks for water works, illustrated.—An old Baltimore firm.—Compo-Board instead of plaster.—Translucent fabric, a substitute for glass.—Ventilation and heating of school buildings.—Ornamental glass.—A light and strong lifting jack, illustrated.—An improved circular saw, illustrated.—An improved wood working machine, illustrated.—Stamped steel ceilings, side walls and wainscoting, illustrated.—Spring hinges.—Mallory's standard shutter worker and fly screen.—An improved nail set, illustrated.

The Scientific American Building Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Thirty-two large quarto pages, forming a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates and fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural Publication in the world. Sold by all newsdealers. MUNN & CO., PUBLISHERS, 361 Broadway, New York.

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 mining engines. J. S. Mundy, Newark, N. J. "U. S." metal polish. Indianapolis. Samples free. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Best Handle Mach'y. Trevor Mfg. Co., Lockport, N. Y. Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Light and Canal Sts., New York. Experienced roll turner desires position in any capacity. Reference given. M. E. F. 465 The Rookery, Chicago.

Emerson, Smith & Co., Ltd., Beaver Falls, Pa., will send Sawyer's Hand Book on Circulars and Band Saws free to any address.

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.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J.S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y.

Large machine shop, having water power, all new and latest tools, foundry, pattern shop, draughtsmen, mechanical engineers, skilled workmen, etc., will construct special or patented machinery promptly, satisfactorily, and reasonable. Address N. Y. P. O. box 1965.

A capable mechanical engineer wishes position as manager of some electric street railway interest. Is familiar with every detail of construction and can design and erect new work. Good references. Address Engineer care of Scientific American office, New York.

Send for new and complete catalogue of Scientific and other books for sale by Munn & Co., 361 Broadway, New York. Free on application.

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.

(6629) J. R. says: Will you kindly tell me through your valuable columns how to make a hair stain from walnuts? A. The simplest form is the expressed juice of the bark or shell of green walnuts. To preserve the juice, a little alcohol is commonly added to it with a few bruised cloves, and the whole digested together, with occasional agitation, for a week or fortnight, when the clear portion is decanted, and, if necessary, filtered. Sometimes a little common salt is added with the same intention. It should be kept in a cool place. The most convenient way of application is by means of a sponge.

(6630) G. W. H. says: Will you kindly publish the process of making beef, iron and wine? A. Liebig's extract of beef 1/2 ounce avoirdupois, ammonio-citrate of iron 256 grains, spirit of orange 1/2 fluid ounce, distilled water 1 1/2 fluid ounce, sherry wine sufficient to make 16 fluid ounces. Dissolve the ammonio-citrate of iron in the water, dissolve the extract of beef in the sherry wine, add the spirit of orange and mix the solutions.

(6631) J. E. S. asks: Does a wheel go around the axle? Does the outside of a wheel go around the hub? A. There is much misapprehension in the numerous phases of this class of questions. A wheel as a whole does not go around the axle, although all of its parts revolve around the axle when it is running. The hub turns with the rim, and although there is no change of relative position of parts of rim and hub, yet it may be truly said the rim goes around the hub, for every part of the rim is consecutively on every side of the hub.

(6632) H. E. H. asks how to estimate the force of a blow made by a steam hammer, when the end of piston serves as the hammer; also would there be much diminution of the force of the blow, if transmitted through another piece of metal held tightly against the object to be hammered? Is there any way by which the force of a blow from a hammer actuated by a spring can be determined? A. The force of a blow in a steam hammer, and other forces, are explained and the method of computation carried out with examples in SCIENTIFIC AMERICAN SUPPLEMENT, No. 862. There will be a considerable diminution of the force in transmitting a blow through another body, depending upon its weight and rigidity. Cast steel, when hardened, being the most rigid of the metals for transmitting a blow. The force of a blow from a hammer actuated by a spring may be known by the method of computation for a steam hammer; and the weight and the actual pressure of the spring, with the acquired velocity, being the elements for computation, as shown in the article on "Impact or the Force of Percussion," in the SCIENTIFIC AMERICAN SUPPLEMENT as above named.

(6633) G. M. asks for a rule used for calculating the contents of a barrel. A. To find the volume of a cask of any form. Add together 39 times the square of the bung diameter, 25 times the square of the head diameter, and 25 times the product of the diameters. Multiply the sum by the length, and divide by 26,470 for United States gallons.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

October 1, 1895,

AND EACH BEARING THAT DATE

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

Table listing various inventions and their patent numbers, including items like Air brake, Bicycle support, and various mechanical devices.