

quired for a heavy load. So of motors. That is all there is to it. You must not hitch a single cell to a motor which ought to have a team of ten cells to make it move. Many do not realize this very simple point.

NEW BOOKS, ETC.

MARINE ENGINES AND BOILERS. THEIR DESIGN AND CONSTRUCTION. By Dr. G. Bauer and Leslie S. Robertson. New York: The Norman W. Henley Publishing Company, 1905. Medium 8vo., pp. 772; 550 illustrations; numerous tables. Price, \$9 net.

This valuable work is a translation of the original book compiled by Dr. G. Bauer, the Engineer-in-Chief of the Vulcan Works, Stettin. It was translated from the second German edition by E. M. Donkin and S. Bryan Donkin, associate members of the Institute of Civil Engineers, and is edited by Leslie S. Robertson, member of the Institute of Civil Engineers and secretary to the Engineering Standards Committee. The fact that the original German work was written by the chief engineer of the famous Vulcan Works, Stettin, is in itself a guarantee that this book is in all respects thoroughly up-to-date, and that it embodies all the information which is necessary for the design and construction of the highest types of marine engines and boilers. It may be said without fear of contradiction, that the motive power which Dr. Bauer has placed in the fast German liners that have been turned out of late years from the Stettin Works, represents the very best practice in marine engineering of the present day. German textbooks have a well-earned reputation. They are clearly written; thoroughly systematic; theoretically sound; and they all have a characteristic breadth, thoroughness, and detail; while the character of their plans, drawings, tables, and statistics is almost invariably above reproach. The present work embodies, in a marked form, all of these characteristics. The illustrations are careful reproductions from actual working drawings, with some well-executed photographic views of completed engines and boilers. Among the latter we note the engines of the Japanese armored cruiser "Yakumo," the quadruple-expansion engines of the "Deutschland," and of the "Kaiser Wilhelm II.," and many other specimens of high-class marine work. Part I. is devoted to Main Engines, and in Section V. of this part, relating to details of main engines, there are no less than 178 illustrations. Part II. is devoted to pumps; Part III. to shafting, resistance of ships, and propellers, in Section III. of which, devoted to the screw propeller, there are 35 illustrations; Part IV. treats exhaustively of pipes and their connections; Part V. of steam boilers; Part VI. of measuring instruments; Part VII. is devoted to various details; and Part VIII. contains a very complete arrangement of various tables. Among the many text-books that come to the Editor's desk for review, we have rarely seen one that calls for such unqualified commendation as this.

OFFICIAL CATALOGUE OF THE EXHIBITION OF THE GERMAN EMPIRE AT THE INTERNATIONAL EXPOSITION, ST. LOUIS, 1904. Edited by the Imperial Commissioner. Berlin: George Stilke. 8vo.; pp. 538.

This handsome volume is at once a characteristic memento of the St. Louis Exposition and a forcible object lesson on the æsthetic side of the printer's art. Incidentally, in its embellishments, it calls to mind that "new art," which received such striking illustration throughout the whole of the German exposition at St. Louis. The letterpress throughout is strikingly bold and wonderfully harmonious, and on every page of it there is evidence of the most careful consideration of the composition. The work is no mere bald catalogue of exhibits; for under each department there is given an amount of information as to the history and practice of each art that renders this work almost a cyclopædia of the modern German industries.

PLANK-FRAME BARN CONSTRUCTION. By John L. Shawver. New York: David Williams Company, 1904. 12mo.; pp. 35. Price, 50 cents.

This book is the compilation of articles that appeared in "Carpentry and Building." Its author has had a great deal of experience in the construction of plank-frame barns—barns which have been growing in popularity in various sections of the country, particularly in the West. In the present small volume he points out the advantages of this form of barn construction, and shows that a saving of time, labor, and material may be had by employing it.

THE AUTOMOBILE HANDBOOK. By L. Elliott Brookes. Chicago: Frederick J. Drake & Co., 1905. 16mo.; pp. 320. Price, \$1.50.

This is one of the most practical handbooks for the motor-car user which we have yet seen. The subjects described are arranged in alphabetical order, and are very concise. Information concerning all types of automobiles is contained in its pages, and this information is supplemented with very good line drawings of a simple character. The book also contains a considerable number of useful tables, and formulas for calculating horse-power and for making brake tests of motors are included in the book. The work will be found a very handy pocket volume by every automobilist.

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TYPE STUDIES FROM UNITED STATES GEOGRAPHY. By Charles A. McMurray, Ph.D. New York: The Macmillan Company, 1904. 8vo.; pp. 288; 99 illustrations. Price, 50 cents.

This book contains a series of simple type studies of the United States, intended to introduce children to the geography of our country. The book can be used as auxiliary to the regular textbook, in the fourth, fifth, and sixth grades. It describes various interesting geographical and engineering features of the United States, such as the large rivers, the highest mountains, the great lakes, the prairies, the pine forests and lumbering, coal mines, irrigation, salmon fisheries, etc.; and all these descriptions are photographically illustrated.

THE TIMBERS OF COMMERCE AND THEIR IDENTIFICATION. By Herbert Stone, F.L.S., F.R.C.I. London: William Rider & Sons, Ltd., 1904. 8vo.; pp. 311; 186 photo-micrographs. Price, \$3.

This book describes briefly all the commercial timbers met with in England and her colonies, as well as a few others which are likely to be heard of in the future. All the genera mentioned are illustrated by photomicrographs, showing a cross section three times the actual size, or as it would be seen by an ordinary hand magnifying glass. In some cases a single illustration serves for more than one genus; but wherever two or more distinct types of the same genus are described, separate illustrations have been provided, and the specific name is then quoted. Wherever possible, the photographs have been so taken that the medullary rays run in the same direction, the pith side downward. The photographs are actual silver prints from the negatives, and hence are much sharper and display considerably more detail than were they reproduced from half-tone cuts. The book should be very useful to all who have to do with woods for any purpose.

AUSTRALIAN MINING AND METALLURGY. By Donald Clark, B.C.E. Melbourne: Critchley Parker, 1904. 8vo.; pp. 620. Price, \$8.50.

This book is the first exhaustive work on the subject to be published in Australia. The information contained in it is thoroughly up-to-date and reliable. All the great Australian mines are dealt with in detail, besides being fully descriptive of geological conformation, general resources, the methods employed in mining, and the metallurgical process adopted in treatment and extraction. The text embraces a critical examination and commentary upon working detail and means to ends, which cannot fail to be highly instructive to the most advanced mining men, and of special value to students. The work is divided into sections according to the different States, and western Australia, because of its importance, is described with great detail; but the mines of Tasmania, Queensland, Victoria, and New South Wales are also discussed very thoroughly. The book is illustrated with numerous photographs and drawings.

INDEX OF INVENTIONS

For which Letters Patent of the
United States were Issued
for the Week Ending
May 16, 1905

AND EACH BEARING THAT DATE

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

Acetylene generator, F. Holly	789,856
Acid, making dialkyl barbituric, M. Engelmann	789,802
Acids, making C-C-dialkylbarbituric, E. Preiswerk	790,263
Acids, making diethyl-barbituric, A. Elnhorn	790,116
Advertising coat and hat rack, W. J. Cooper	790,190
Air brake automatic setter, W. H. Brooks	790,102
Air brake lock, D. L. Mabry	790,144
Amalgamator, J. J. Peacock	790,000
Amusement apparatus, A. F. Turpin	789,946
Anchor, folding earth, G. H. Miller	789,990
Antiseptic mouthpiece for telephones or the like, W. Wright	790,241
Apple cutting machinery, J. A. Warner	789,825
Arch, hollow tile, H. L. Hinton	789,729
Auger, earth, G. H. Miller	789,991
Awning, J. A. Charlton	789,899
Baggage, J. J. Smith	789,764
Balance, P. H. Wynne	789,781
Baling machine, R. F. McKaig	790,071
Baling press, W. A. Bookout	790,249
Barrel ventilator and cooler, T. Pulman	790,153
Basin, wash, P. Hoey	789,736
Basket, fruit, F. Benoit	789,834
Bath tub, E. H. Sloman	790,229
Battery relief valve, storage, D. P. Perry	789,877
Bearing for axle journals, lubricating, Monroe & Hallinan	790,220
Bed and couch, combination, C. L. Fenner	789,903
Bed corner fastening, J. Nelsen	789,869
Bed spring, A. Anderson	789,896
Bed spring, adjustable, Hhrichs & Chada	789,728
Bedstead, W. Charlton	789,963
Bedstead table attachment, H. A. Mason	790,217
Belt, J. M. Walton	789,893
Belts, roller guide for drive, H. J. McMurray	790,222
Bench clamp, W. W. Cook	790,188
Bicycle for looping the loop, double, K. Lange	790,063
Bird cage, A. B. Hendryx	790,053
Bit. See Bridge bit.	
Bit brace, folding, C. W. Stites	790,086
Blasting cartridge packing, T. F. Durham	789,967
Boiler fire box, steam, Kirkland & Allan	789,919
Boiler furnace, E. C. Fisher	789,722
Boiler tube cutter, C. F. Laufer	790,212
Book, account, J. H. Rand	790,002
Bottle disk extractor and holder, J. F. Curtis	790,192
Bottle, non-refillable, B. Prouty	789,757
Bottle, non-refillable, H. J. Gumbinsky	790,049