

## NEW BOOKS, ETC.

**NEW YORK AIR BRAKE CATECHISM.** By Robert H. Blackall. New York: The Norman W. Henley Publishing Company, 1904. 12mo.; pp. 250. Price, \$1.25.

This book is intended principally for the railroad brakeman and locomotive engineer. It is written very clearly and concisely, and is illustrated with numerous diagrams that show all the essential parts of the braking apparatus of a modern train. The book contains a line cut of the complete New York Automatic Air-Brake as applied to locomotive, tender, and passenger car. This cut shows at a glance all the different hose and valve connections, and the valves and other apparatus are shown in section. The volume forms an indispensable handbook for all railroad men.

**CRUSHED STONE AND ITS USES.** By W. J. Jackman. Chicago: Producers Supply Company, 1904. 8vo.; pp. 110.

This little volume, which is distributed gratuitously by the publishers, contains practical information on the various uses of crushed stone and concrete made with it. The articles in the book are by prominent engineering experts, and from these articles the main points deduced are that concrete made with crushed limestone, screenings, and good cement is the ideal material for every form of construction in which economy and permanency are desired; that this kind of concrete is the only building material which may be considered completely fireproof; that the substitution of limestone screenings for sand results in a stronger and more durable and homogeneous concrete product, together with less expense; and that this item of cheapness and first cost, besides the durability of the material, insures a marked economy in subsequent expenditures for maintenance. Besides the articles on the uses of concrete for various purposes, such as the building of roadways, bridges, seawalls, sewers, tunnels, stairways, and outside building construction, the book contains tests showing the tensile strength, etc., of different mixtures of the substance.

**THE THEORY OF THE LEAD ACCUMULATOR (STORAGE BATTERY).** By Dr. Friedrich Doblezalek. New York: John Wiley & Sons, 1904. 12mo.; pp. 241; 30 figures. Price, \$2.50.

This work, which has been translated from the German by Carl L. von Ende, Ph.D., of Goettingen, Instructor in Chemistry of the State University of Iowa, goes into the chemical properties of the lead accumulator in a very thorough manner. The author first discusses the various theories—such as the chemical, thermodynamical, and osmotic—of the origin of current. The variation of electromotive force and of the electrode potential with acid concentration is also discussed, and chapters are devoted besides to the temperature coefficient, the influence of external pressure, the internal resistance, and the methods of measurement of the same. The changes in the cells during formation, the variations in capacity, and the changes in the cell during use, as well as its behavior during charging and discharging, its reversibility, and influence of external pressure, are all gone into with great minuteness. The book will be found most valuable to the storage battery manufacturer and chemist.

**A TEXTBOOK ON PHYSICS. HEAT.** By J. H. Poynting, Sc.D., F.R.S., and J. J. Thomson, M.A., F.R.S., Hon.Sc.D. Philadelphia: J. B. Lippincott Company, 1904. 8vo.; pp. 354; 193 illustrations. Price, \$4.25.

This is the third volume of an excellent series. The first two volumes dealt with the properties of matter and sound, and the present one deals with heat. The book is intended chiefly for the use of students who lay most stress on the experimental part of physics. Only the phenomena which are of special importance are described, and the mathematical methods used are very elementary. The book deals with all the familiar manifestations of heat, such as conductivity, heat circulation and convection in liquids and gases, the expansion of solids, liquids, and gases with the rise of temperature, the forms of energy with its conservation, the mechanical equivalent of heat, the change of state on account of heat, radiation and temperature, and the thermodynamics of the former. The book is well illustrated with numerous diagrams, and is one of the best experimental textbooks on this subject which has come to hand.

**MODEL LIBRARY. Vol. 1.** By Norman H. Schneider. New York: Spohn & Chamberlain, 1905. 12mo.; pp. 282. Price, \$1.

This book is a practical work for the use of the amateur electrician. It is made up of four separate pamphlets dealing with the Study of Electricity for Beginners; Electric Bells, Annunciators, and Burglar Alarms, and How to Install Them; How to Make and Use Dry Batteries; and Electric Circuits and Diagrams. The book is very simple in character, yet it goes into all the essential details of the subjects treated. In the part on Electric Bells full directions are given, which will enable the amateur to install such bells and annunciators of various kinds. The part on Dry Batteries gives full directions for making not only the usual dry battery with a carbon core, but also a lead-zinc dry cell, which furnishes two volts

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**E**XPERIMENTAL SCIENCE is so well known to many of our readers that it is hardly necessary now to give a description of this work. Mr. Hopkins decided some months ago that it would be necessary to prepare a new edition of this work in order that the many wonderful discoveries of modern times might be fully described in its pages. Since the last edition was published, wonderful developments in wireless telegraphy, for example, have been made. It was necessary, therefore, that a good deal of new matter should be added to the work in order to make it thoroughly up-to-date, and with this object in view some 200 pages have been added. On account of the increased size of the work it has been necessary to divide it into two volumes, handsomely bound in buckram. It may be interesting to note the following additions that have been made to these volumes:

Volume I contains in addition to a large number of simple, well illustrated experiments, a full description of a  $\frac{1}{4}$  H. P. electric motor made expressly for illustration in this edition of "EXPERIMENTAL SCIENCE." It is an ENCLOSED SELF-REGULATING electric motor for a 110 volt circuit. It can be operated by a current from a 110 volt lamp-socket, yielding a full  $\frac{1}{4}$  H. P., or it may be used as a dynamo, furnishing a current capable of operating three 16-candle power, 110 volt incandescent lamps. The construction of the machine is perfect enough to admit of enlarging or reducing its size if desired.

Volume II contains much on the general subject of electricity, besides new articles of great importance. Among these the subject of alternate current machinery is treated. Wireless Telegraphy and Telephony receive attention. Electrical Measuring Instruments, The Electric Clock, The Telegraphone. Experiments in High Voltage, The Nernst Lamp, and Measuring the Heat

of the Stars are all thoroughly illustrated and described.

The unprecedented sale of this work shows conclusively that it is the book of the age for teachers, students, experimenters and all others who desire a general knowledge of Physics or Natural Philosophy.

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**COMPETITIVE TEST OF TABULATING MACHINERY.** Beginning June 10, 1905, the Director of the Census will proceed to have a practical test made of electrical and mechanical devices for tabulating purposes, with a view to contracting for the use of such tabulating apparatus for the work of the Bureau of the Census for the fiscal year beginning July 1, 1905. All parties owning or controlling any such devices are invited to participate in this competition, the rules and regulations governing which may be obtained upon application to S. N. D. North, Director of the Census, Department of Commerce and Labor, Washington, D.C.

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and can be used chiefly for experimental purposes. The part on Electrical Circuits and Diagrams is made up almost entirely of diagrams of wiring for various purposes, such as bells, automobiles, dynamos, gas lighting, motors, storage batteries, street railways, telephones, telegraphs, wireless telegraphy, and testing. The book will be found a useful addition to the library of any amateur electrician.

**A TEXTBOOK ON STEAM AND STEAM ENGINES, INCLUDING TURBINES AND BOILERS.** By Andrew Jamieson, M.Inst. C.E. Philadelphia: J. B. Lippincott Company, 1904. 8vo.; pp. 780; numerous illustrations and diagrams. Price, \$3.

The present, or fourteenth, edition of this well-known work has been brought thoroughly up to date by the addition of two lectures on steam turbines for land and marine purposes, and the rewriting of several others. The latest kinds of pyrometers and calorimeters, with their applications, have been dealt with, special attention being given to the fundamental principles of heat and thermo-dynamics. Both ideal and actual conditions of wet, dry, and superheated steam have received particular attention. The latest form of indicator, together with numerous diagrams of simple, compound, triple, and quadruple-expansion reciprocating engines, have been illustrated and discussed. The connection between work done in the cylinder and energy given out by the crankshaft has been explained, step by step; and has been illustrated with carefully calculated and plotted crank-effort diagrams for a recent quadruple-expansion, five-crank engine. Other lectures are devoted to the various forms of Corliss engine valve-gear; to high-speed, quick-revolution, compound and triple-expansion, electric light and power engines; and to the best automatic systems of lubrication. The most economical quadruple-expansion marine engines, together with their boilers, and appliances for induced draft, superheating, jacketing, and draining—which led to their unsurpassed economy of less than a pound of coal per indicated horse-power hour—will be found fully illustrated. The cause of and remedies for corrosion in marine condensers and boilers have been thoroughly discussed.

A series of questions at the end of each lecture makes the book valuable to the student for review purposes.

**SOLAR HEAT. ITS PRACTICAL APPLICATIONS.** By Charles Henry Pope, A.B. Boston: Charles H. Pope, 1903. 16mo.; pp. 160. Price, \$1.

This is an interesting little volume on solar heat by the author of "Solar Engineering." It gives full details of the various sun motors that have been constructed, and the amount of power that has been obtained from them. It is a popular book of interest to all, and we heartily recommend it to our readers.

## INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

May 9, 1905

AND EACH BEARING THAT DATE  
[See note at end of list about copies of these patents.]

Acid and its salts, producing tartaric, C. Ellis	789,269
Adding machine, W. F. Gatewood	789,688
Advertising clock, Arp & Jensen	789,584
Advertising device, D. Walker	789,304
Agricultural apparatus, motor driven, Cook & Kurtz	789,528
Alkaline fluosilicates, making, J. A. Reich	789,671
Alloys, electrolytically refining copper nickel, A. G. Betts	789,523
Amusement machine, W. H. Strickler	789,243
Armature punchings to the spiders, fastening, H. G. Reist	789,454
Ash dump, automatic, C. Dorffel	789,593
Automobile, B. E. Hervey	789,608
Awning, F. Thoms	789,639
Axle box, vehicle, J. Thompson	789,393
Bacteriological oven or incubator, C. E. Skinner	789,237
Bag fastener, D. G. McClay	789,331
Baling press, G. E. Rider	789,235
Baling press, W. D. Kelley	789,577
Battery plate, storage, C. H. Whiting	789,514
Battery plates, protective sheath or envelop for storage, A. Meygret	789,557
Beam presser, H. Parsons	789,448
Bed, W. Lewis	789,328
Bedstead, extension, A. Rudnitzky	789,173
Beer cooling device, J. Douglass	789,584
Bill hook, W. Hornich, Jr.	789,218
Billiard cue tip fastener, H. Seelinger	789,676
Binder, temporary, E. C. Suckert	789,185
Binding material and making same, L. Grote	789,607
Binding post, E. J. King	789,433
Binding post, L. Steinberger	789,574
Blasting composition, M. Bielefeldt	789,252
Boiler. See Flash boiler.	
Boiler or the like furnace, steam, A. S. Goldie	789,605
Boiler tube cleaner, H. F. Weinland	789,192
Boiler tube stopper, H. T. Mason	789,620
Boiler tubes to the tube sheets, means for attaching, L. L. McCallough	789,622
Book manufacturing, H. H. Norington	789,290
Bookcase, sectional, F. W. Tobey	789,579
Bottle, George & Norris	789,320
Bottle, etc., carrier or holder, H. W. Beers	789,137
Bottle, non-refillable, L. N. Everett	789,213
Bottle, non-refillable, B. Somerville	789,638
Bowling alley pin setter, mechanical, Thompson & Olson	789,394
Box cover detachable, E. S. Savage	789,509
Brake operating means, L. C. Kohler	789,551
Brewing apparatus, soy, T. Suzuki	789,289
Brick kiln, M. S. Steyer	789,577
Bridge, bascule, W. J. Watson	789,398
Brush, A. L. Sonn	789,178
Brush, blacking, S. W. Emory	789,318
Burglar alarm and lock, combined, W. P. Johnson	789,546
Burial casket, C. E. Myers	789,503
Burial garment, G. Buesing	789,354
Butter cutting and measuring implement, T. Taillefer	789,197
Butter wire, Kelley & Skerry	789,612
Cabinet, M. Kovacevic	789,327