side which gives the least light must be much greater than that of the side which gives the brighter light. 2. Is a silk watch chain any protection to a watch from its being magnetized when being carried in the pocket? The first person claims that he wears a silk watch chain while working about a machine (which by the way is a 150-kilowatt rotary converter, 550 volts direct current) so that if it should hit the field casting, his watch would not receive the magnetism by its traversing the chain as it would if it were gold. I claim that the material of the chain would not affect the watch becoming magnetized, but if brought near enough to the machine, the watch would receive the magnetism, even if it were in the pocket. I have always read that magnetism had no insulator; according to this, I believe the silk chain to be no protection from magnetism. Will you please state your opinion of this? A. Your friend and yourself seem to be a little mixed in reference to magnetism, silk watch chains, etc. You are right that magnetism passes through space. It has no insulator, excepting iron. It does not traverse a wire at all. It whirls around a wire in which a current of electricity is flowing, and causes the current to move a magnetic needle, and thus makes voltmeters and ammeters possible. Silk on the other hand is an insulator of electricity, not of magnetism. Electricity cannot get off a wire covered with silk. Gold is a conductor of electricity, and if a gold watch chain touched any uninsulated metal which was carrying a current, a man who might touch the chain in that position would receive a shock. If such a chain should touch the field casting only, nothing could happen, since the field casting is not carrying a current of electricity, but is only magnetized.

NEW BOOKS, ETC.

TURBINES. By W. H. Stuart Garnett. London: George Bell & Sons, York House, 1906. 8vo.; pp. 283. Price, $2.75.

As the author himself states, the book is intended primarily to give a popular account of the history, construction, and operation of the turbine, and particularly of the various steam turbines which are so properly attracting general public interest at the present time. While the book is excellent from this standpoint, it is naturally not of great value to the student or the expert. Both the water and the steam turbine are treated in this volume. The discussion of each is prefaced with a capital historical sketch of the process of its development. Theory is hardly touched upon, the discussion being almost wholly descriptive. It will undoubtedly prove useful and interesting to that numerous class of people who take an intelligent interest in things mechanical, without any desire of actually becoming masters of any particular branch.

CONTINUOUS CURRENT ARMATURES. By C. Kinzbrunner, A.M.I.E.E. New York: D. Van Nostrand Company, 1906. 12mo.; pp. 80. Price, $1.50.

This book is substantially a translation of the work of Prof. Arnold on the same subject, in which, however, the text was considerably shortened by omitting the discussions of all those windings which are seldom employed for standard machines, though they are practically possible of construction. While Prof. Arnold's method of treating the subject has been closely followed, the descriptions have been restricted to the commonly employed drum windings alone. However, the rules are so given that an intelligent student of the text can undoubtedly design any winding, even though it be not actually included in the discussion. The language of the book is such as to make it of great value for popular student reading, so that notwithstanding that the text is mainly intended for students and designers, the artisan of ordinary intelligence will also be able to comprehend the principles set forth.

POLARISATIONSMIKROSKOPS. Von Dr. Ernst Weinschenk. Freiburg im Breisgau: Herdersche Verlagshandlung, 1906. 8vo.; pp. 147. Price, $1.25.

The second edition of Dr. Weinschenk's excellent book is merely intended to bring the work thoroughly up to date, and to include a discussion of the latest advances in the use of the instrument. Few other changes were necessary. The first edition, issued in 1901, was an excellent book to use in connection with investigations in which the polarization microscope was employed. The art of using this instrument is of comparatively recent growth, but within the last four or five years the development has been exceptionally rapid and extensive, so that this second edition is very timely.

ALTERNATING CURRENT WINDINGS. By C. Kinzbrunner, A.M.I.E.E. New York: D. Van Nostrand Company, 1906. 8vo.; pp. 80. Price, $1.50.

As in "Continuous Current Armatures," only those windings are discussed in this book which are commonly used in practice, and special attention has been devoted to discussing the principles underlying the alternating-current windings in such a manner that even the workman will be able to understand them.

THE WHEAT PROBLEM. By Sir William Crookes, F.R.S. London: Chemical News Office, 1905. 12mo.; pp. 506. Price, $1.40.

The present volume arises out of the comments provoked by the address which the author delivered before the members of the British Association in September, 1898. To put the matter briefly, the author stated that under the present conditions of heedless culture, a scarcity of wheat is within appreciable distance; that wheat-growing land all over the world is becoming exhausted, and that at some future time no available wheat land will be left. The author urged that nature's resources, properly utilized, are ample. He urged that a moderate dressing of chemical manure would pull up the average yield from 12.7 bushels to 20 bushels an acre—thus postponing the day of dearth "to so distant a period that we and our sons and grandsons may legitimately live without undue solicitude for the future." Sir William Crookes's address caused world-wide comment. The book is now in its second edition.

A HISTORY OF ARCHITECTURAL DEVELOPMENT. Vol. I. By F. M. Simpson. London and New York: Longmans, Green & Co., 1905. 8vo.; pp. 260. Price, $5.

This is the first of three volumes which aim to trace the development of architecture through the planning, construction, materials, and principles of design of the buildings described, and to try and indicate the broad lessons which may be learned from them. The half-tones and drawings are excellent, and serve admirably to elucidate the text. The typography is excellent. This book will prove a very welcome addition to the library of all students of architecture, and will also be of value to the professional architect.

THE BOOK OF THE ROTHAMSTED EXPERIMENTS. By A. D. Hall, M. A. Oxon. New York: E. P. Dutton & Co., 1905. 8vo.; pp. 294. Price, $3.50 net.

The Rothamsted agricultural experiments were the basis of modern scientific agriculture, and they are classical. For over sixty years the work of Lawes and Gilbert has been recognized as of the utmost importance from an economical point of view. The great object of the Rothamsted experiments is to obtain knowledge that is true everywhere, and to arrive at principles of general application, leaving the farmer himself, through his more immediate advisers, to adapt and translate them into money. Agricultural science involves some of the most complex and difficult problems the world is ever likely to have to solve. The present volume will prove of value, not only to the scientist, but for any man concerned with the management of land, whether farmer or market gardener, landowner or agent, who wants to learn something of the processes going on in the growing crop and in the soil, as they have been elucidated by the most complete set of field experiments the world has yet seen. The book will prove of great value to students.

HOUSEBOATS AND HOUSEBOATING. Edited by Albert Bradlee Hunt. New York: Forest and Stream Publishing Company, 1905. 4to.; pp. 216. Price, $3.

Houseboating is one of the most delightful ways of living that can be thought of. The present volume goes thoroughly into the subject, illustrating each boat and giving plans of the same. The subject is roughly divided as follows: "Houseboating in America," "Houseboating in England," "The Sailing Houseboat," "Steam Power for Houseboats," "Gasolene Power for Houseboats," "The Stationary Houseboat," "Interior Fitting and Furnishing," and "The Inside Route to Florida." It is a most admirable book.

THE COMPETENT LIFE. By Thomas D. West. Cleveland: Cleveland Printing and Publishing Company, 1905. 16mo.; pp. 268. Price, $1.25.

This work is presented to the public as a message on the betterment of labor, and comes from a journeyman to operatives, from an employer to managers, a man to men. The essays are the fruit of much experience and thought concerning the vital question of efficiency, its necessity, and methods of attainment, and is presented with the light and intelligence which two-score years of active service can give. There is much material for thought in the volume.

EMINENT ENGINEERS. By Dwight Goddard. New York: Derry-Collard Company, 1906. 12mo.; pp. 280. Price, $1.50.

This book is composed of brief biographies of American and European engineers. Mr. Goddard has spent a large amount of time in the selection of the engineers to be represented, as well as the matter concerning them. All unnecessary details have been omitted, and only the facts of general interest have been given. Many of the portraits are rare, and were obtained from interesting sources, all of which goes to make the book of great value to everyone who is at all interested in the progress of mechanics.

THE SCHOOL HOUSE: ITS HEATING AND VENTILATION. By Joseph A. Moore. Boston: Published by the author, 1905. 8vo.; pp. 204. Price, $2.

The author has been engaged for the last eighteen years in the inspection of public buildings in Massachusetts, and in supervising the construction of and testing the various methods of heating and ventilation, especially in school

houses. He presents to those interested in our public schools some suggestions as to the construction and the heating and ventilation of such buildings. The class of buildings selected are those of small or moderate size, of which many are erected each year. The book is well illustrated by common-sense plans and diagrams.

THE STATICALLY-INDETERMINATE STRESSES IN FRAMES COMMONLY USED FOR BRIDGES. By Isami Hiroi, C.E., Dr. Eng. New York: D. Van Nostrand Company, 1905. 12mo.; pp. 174. Price, $2.

The present work is the outgrowth of a series of lectures given to the students of civil engineering in the Tokio Imperial University. It contains the solution of those problems most commonly met in the practice of a bridge engineer, the aim of the author being to save the time and labor of those intent on a more rational design of the class of the structures treated, than is generally followed, by furnishing them with the necessary formulas, for which rough approximation or even guesswork frequently forms a substitute. It is a very painstaking work.

ELEMENTS OF DESCRIPTIVE GEOMETRY. By C. E. Ferris. New York: American Book Company, n. d. 8vo.; pp. 127. Price, $1.25.

Inquiry among the leading draftsmen shows that nearly all their work is done in the third quadrant or angle. It seems reasonable, therefore, to teach the subject of Descriptive Geometry in our technical schools as it will be used by our graduates. Many years of experience teaching this subject proves to the author that the student may learn to think with this problem below the horizontal and behind the vertical and perpendicular planes, just as well as above and in front of those planes. The author has produced an excellent text-book along these lines.

THE INFLUENCE OF MOLECULAR CONSTITUTION UPON THE INTERNAL FRICTION OF GASES. By Frederick Malling Pedersen, E.E., Sc.D. New York: D. Van Nostrand Company, 1906. Pp. 59. Price, 50 cents.

LECTURES ON THE METHOD OF SCIENCE. Edited by T. B. Strong. Oxford: At the Clarendon Press, 1906. 8vo.; pp. 249. Price, $2.50.

AVOGADRO AND DALTON. THE STANDING IN CHEMISTRY OF THEIR HYPOTHESES. By Andrew N. Meldrum, D.Sc. With a Preface by Francis R. Japp, M.A., LL.D., F.R.S. Edinburgh: James Thin, 1906. 8vo.; pp. 113.

HOUSE HINTS FOR THOSE WHO BUILD, BUY, OR RENT. Philadelphia: House Hints Publishing Company, 1906. 18mo.; pamphlet. Price, 25 cents.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending July 3, 1906.

AND EACH BEARING THAT DATE

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

Abdominal support or binder, M. A. Watson 825,165
Acid, making sulfuric, W. M. Johnson.. 825,057
Adding machine, C. W. Gooch 825,205
Advertising device, J. B. Daniels..... 825,195
Air brake mechanism, J. Dillander..... 824,712
Alcohol, making wood, H. O. Chute..... 824,906
Amusement apparatus, J. Jurgens..... 825,130
Anvil attachment, Heer & Gamber..... 825,126
Armature, F. M. Vogel..... 825,252
Ash and garbage can, C. Van Heesen.... 824,891
Automobile, H. Lemp 825,276
Automobiles, adjusting means for the clutch mechanisms of, D. F. Graham. 825,206
Axle, H. M. Butler..... 825,108
Axle bearings, oil-retaining device for, H. B. Eareckson 824,918
Baby yard, B. H. Lee 825,137
Bait, artificial, E. L. Lull..... 825,140
Bait, artificial, J. T. Mitchell 825,232
Barrel, L. V. Rathbun 824,950
Battery plate, secondary, W. L. Silvey... 824,828
Bearing, ball, A. Riebe.....824,819, 824,820
Bearing, ball, R. Conrad 824,847
Bed and sofa, combined, D. D. Dailey.. 825,194
Bed, folding, S. R. Moore 824,734
Bed, invalid, N. Clement..... 824,846
Belt for brake wheels, D. Thomas 825,089
Belt holder, H. Salisbury 824,745
Belt shifter, W. E. Dillard 825,265
Binder, magazine, C. Chivers 825,112
Blackboard, C. Fricke 824,781
Block mold, Foster & Lang..... 824,855
Blood vessels, means for tying, Frentzen & Schoemaker 825,121
Boiler. See Steam boiler.
Boiler, J. H. Meissner 824,801
Boiler cleaning apparatus, W. O. Nordstrom 824,947
Boiler tube cleaners, etc., turbine motor for, H. F. Weinland 825,094
Bolster and making the same, body and truck, E. I. Dodds 825,025
Bolster, body and truck, E. I. Dodds, 825,024, 825,032
Bolster construction, E. I. Dodds 825,022
Book holder, M. H. P. Catlin..... 825,262
Book holder or reading desk, Power & Gosling 825,072
Books, memorandum attachment for, J. Appleton 825,174
Bottle, A. A. Boschelli 824,706
Bottle, indicating, E. Atkinson 824,838
Bottle, medicine, L. Peretti 824,738
Bottle, non-refillable, Davis & Jamesen.. 825,263
Bottle stopper, J. M. Cumming 824,913
Bottles, apparatus for siphoning liquids from, G. W. Ansley 825,173
Brake, R. W. Bainbridge 825,176
Brick and artificial stone, machine for making, G. Wettlaufer 825,166
Brick kiln, J. Elcock 824,919
Bucket support, J. F. Silver 825,248
Cabinet, F. Wolf 825,098
Cabinet, kitchen, W. C. Horner..824,864, 824,865
Cable grip, R. H. Keays 824,724
Cable or wire hanger, R. C. McKiliget..... 825,236
Cables, method and apparatus for hanging aerial, R. S. Peirce..... 825,070
Caissons, air lock for, Mattson & Torrance, 824,876, 824,877
Calcium carbid, producing, J. M. Morehead 825,234
Calculating machine, A. E. Kenyon 824,795
Camera support and walking stick, umbrella, etc., combined, G. S. Russell. 825,006
Car body bolster, railway, O. W. Meissner. 824,802
Car body, metallic, E. I. Dodds 825,040
Car bolster, E. I. Dodds.....825,031, 825,033
Car bolster and making the same, E. I. Dodds 825,026, 825,027
Car bolster, metallic, E. I. Dodds. 825,030, 825,034
Car construction, metallic, E. I. Dodds.. 825,019
Car coupling repairing device, Cross & Peterson 824,912
Car door-operating mechanism, gondola, E. I. Dodds 825,020
Car draft rigging, J. M. Ames 824,698
Car fender, B. B. Jenkins 824,986
Car, freight, Hart & Neikirk..... 824,926
Car loading apparatus, automatic, W. J. Selleck 824,826
Car side or center sill, Dunbar & Dodds.. 825,043
Car sill construction, railway, E. I. Dodds 825,021
Car sill, railway, Dunbar & Dodds 825,042
Car, sleeping, W. B. Prouty 824,815
Car stake, E. I. Dodds.....825,028, 825,029
Cars and other vehicles, speed-indicator for motor, R. M. Ruck 825,075
Cars, plate and stake structure for gondola, E. I. Dodds 825,036
Carving machine, F. H. Richards..... 824,818
Case. See Show case.
Cash register, F. C. Osborn 824,881
Caskets into inclosing boxes, apparatus for placing, E. F. Gilbert 825,046
Caster, Merrick & Miller 824,733
Catamenial sack, C. M. Greenwald..... 825,122
Cement block lifter, E. H. Samuelson... 824,822
Centering device, E. L. Cook 824,975
Chair, J. Gilson 824,714
Checkrein holder, H. A. Mikkelson..... 825,146
Cheese cutter, computing, B. W. Sabin.. 824,744
Chuck, drill, O. M. Mowat..... 824,735
Circuit breaker, S. Waterbury 825,092
Circuit breaking mechanism, W. S. Mayer.. 825,144
Clamp, A. Anderson 825,171
Clasp, E. L. Fesler 824,713
Clearing house machine, J. H. Erickson.... 824,920
Closure and making same, M. Engels..... 825,115
Clothes gripper, K. M. Dunbar..... 824,915
Clutch, friction, E. A. Muller 824,805
Coal drill support, W. H. Clarkson 825,113
Cock, non-scalding shower bath, Hoelscher & Clifford 825,214
Coil forming apparatus, G. E. Stevens... 825,249
Coin actuated mechanism, J. W. Whitlock. 825,167
Coin counting machine, Johnson & Sulfer. 824,794
Coin holder, E. J. Brandt 824,842
Coke oven, W. Klonne 825,221
Combing machines, stop-motion especially adapted for, W. Henry 824,787
Combustion, regulating, P. Larsen..... 824,728
Compress heating appliance, K. R. Leupold 825,138
Concrete block making machine, W. H. Fulcher 824,924
Concrete block making machine, C. O. Brandell 825,107
Concrete construction, Henry & Madden.. 825,052
Concrete forms, beam clamp and support for reinforced, W. H. Dillon 825,284
Concrete wall house construction, E. E. Schachner 824,823
Condenser, J. Stumpf 825,281
Condenser and water purifier, W. McIntyre 824,880
Conduit, flexible, Lutz & Sibley..... 825,227
Conveyor, shiftable, J. E. Camp..... 825,110
Cooker, feed, W. Fetzer 825,118
Copper and other metals, treating, J. A. Yunck 825,100
Copper matte, treating nickel, W. M. Johnson 825,056
Core box cutter, F. E. Thomes..... 824,962
Cork extractor, H. W. Noyes..... 824,807
Corn cutting device, S. Hulls 825,218
Corn grader, C. Hunnicutt 824,720
Creosote compounder, R. Berendes..... 824,901
Cue, G. D. Wing 825,096
Cue tip, C. W. Borsdorf 825,105
Cultivator and harrow, combined, W. Gillett 825,047
Cultivator attachment, W. T. Teeter.... 824,961
Current meter, I. Abbott 825,101
Current meter, T. G. Palmer 825,154
Curtain fixture, C. E. Dunn.....824,916, 824,917
Curtain fixture, C. L. Hopkins....824,929, 824,930
Cutting machine, A. E. Pollock 824,948
Dental stoppings and other similar purposes, antiseptic and perfumed block for, L. Eilertsen 825,268
Dispensing device, T. Kurrell 825,136
Distilling apparatus, wood, E. G. Jewett.. 824,872
Door check, G. E. Hassmann 825,210
Door lock, M. A. Fillmore 824,984
Doors, support for fitting, J. Brooks..... 824,777
Dough divider, F. Streich..... 824,959
Dovetailing machine, L. C. Wetzel 824,894
Drawing board, E. Werner 824,960
Drill coupling, G. Huntley 824,721
Drill press, F. M. Stambaugh 824,829
Drill spindles, feed mechanism for, R. G. Henry 825,273
Duplicating or printing machines and the like, frame for use with rotary, S. Brown 825,186
Dynamo motor, E. W. Fahl..... 824,922
Ear drum, A. O. Leonard 824,993
Earpiece, E. L. Aiken 824,773
Easel, C. R. Hoag 825,053
Egg breaker and separator, E. F. Schneider 824,748
Electric furnace, rotary, W. M. Johnson... 825,058
Electric machine, dynamo, M. C. A. Latour 825,222
Electric switch, C. S. Van Nuis 825,091
Electric time switch, J. M. Chappel..... 825,111
Electric time switch, C. E. Mentzer 825,230
Electric tool, P. Schiemann 824,953
Electric transmission, R. C. Sayer 825,245
Electrical conduits, dowel pin for, R. S. Peirce 825,069
Electrical fittings, J. Dugdill 825,199
Elevator. See Grain elevator.
Elevator openings, automatic closure for, A. Wind 824,967
Elevators, means for attaching and driving, C. Bradford 824,840
Embroidering machine, V. Kobler..... 824,725
Engine driving mechanism, paper refining, E. C. Crocker 824,910
Engines driving blast and like apparatus, means for regulating explosion, H. Richter 824,743
Enseam trimming machine, J. W. Reilley.. 825,278
Envelop, M. M. Cohn 824,908
Excavating apparatus, G. H. Dunlop..... 825,200
Excavating machine, P. Poulson 824,740
Excavator, C. L. Payne 825,005
Explosive engine, M. C. Kessler 824,936
Eye testing instrument, W. A. Bates.... 824,900
Eye glasses, E. B. Meyrowitz 824,944
Fabric roll protector, M. C. Obnemus.... 825,239
Face protector, W. C. Allen 825,170
Feed mechanism, changeable speed, A. M. Drake 824,914
Fence, A. T. Kelliher 824,874
Fence anchor, Rousseau & Lambert..... 825,158
Fence post, J. W. Rector 824,816
Fence staple, wire, U. Durand..... 824,849
Fender, R. S. Watson 824,765
File box, letter, C. McPike 825,068
File holder, J. R. Lawrence 824,992
File, letter, C. McPike 825,067
Filter manufacturing apparatus, G. M. Kneuper 825,274
Fire alarm system, auxiliary, G. F. Milliken 824,804
Fire hydrant drain, G. J. Williams..... 824,770
Fireproof window, Mullins & Hare..... 825,002
Fish bait or lure, B. O. Rhodes..... 824,817
Fishing tackle, weedless, H. L. Phelps... 824,739
Flanging machine, L. N. McCarter..... 825,235
Floating structures, steady foundation for, W. E. Murray 825,149
Flue stopper, A. Piche 825,240
Fluid pressure brake, Hicks & Hill..... 824,718
Fluid pressure brake, W. H. Sauvage.... 825,077
Fly paper holder, sticky, G. & G. C. G. Laube 825,275
Folding box, A. Florence 825,044
Folding machine, C. A. Sturtevant..... 824,754
Freight carrier, gravity, Mathews & Lister 824,943
Furnaces, automatic draft-regulating apparatus for boiler, A. Schaffer..... 824,824