## RECENTLY PATENTED INVENTIONS.

### Mechanical.

DRIVE GEAR MECHANISM FOR BICYCLES, ETC.—Stephen Kaltonik, Punxsutawney, Pa. This invention has for its object the propulsion of bicycles, tricycles, etc. A driving gear is supplied, including spring-actuated means which will assist in propelling the machine and permit the rider to rest while passing over level grades. By another device the vibrating weight pressure of the rider on the seat spring bar will assist in propelling the machine. The auxiliary spring-driving mechanism will be of assistance in climbing hills and is arranged to prevent a retrograde movement.

VEHICLE WHEEL.—F. and T. F. Mendenhall, Moorepark, Mich. The object of this invention is to produce a wheel which has the usual spokes and fellies and in addition certain devices by which the length of the spokes may be regulated and the felly sections spread. All rattling and looseness may be obviated by adjusting the spokes and fellies by the devices provided. The adjusting mechanism is protected so that it will not become clogged with dirt and dust and also adds to the strength of the wheel.

CLOTHES RACK.—Theodore M. Anderson, New Whatcom, Washington. This novel clothes rack consists of a post secured at its lower extremity by a bracket fixed to a wall; the upper extremity is secured to the ceiling. To this post is fastened a carrier moving vertically. This carrier is provided with arms, the number of which can be varied at will. When not in use the whole apparatus, except the ceiling socket and bracket, may be removed.

CAN OPENER.—Charles F. Keller, Danville, Cal. This invention is for readily opening a can without danger of injury to the hands. An eccentric raises the can until the top of it is engaged by the top of the opener, which is secured to an arm which is connected to the base by an upright. The cutting is done by a rotating knife, motion to which is imparted from a crank by the medium of bevel wheels. The action of the knife not only cuts the top, but forces the edges of the metal upward, forming an upwardly projecting burr. After the knife has completed or nearly completed its revolution, the eccentric is turned backward, releasing the can.

### Miscellaneous.

HEATER.—Charles B. Wanamaker, of Allentown, Pa., assignor of one-half to W. H. Hunsicker, of the same place. This invention consists of a heating chamber, a water chamber surrounding it, and a coil of pipe around a magazine tube. The return water is received in the bottom of a casing from which it passes to the upper part and into the coil, where it is rapidly heated. From thence it passes off through the outflow pipes. Various arrangements are provided to obtain the maximum effect of the combustion of gases.

STOVE PIPE ATTACHMENT.—Wellington Wilson, Bay City, Michigan. This invention relates to means for attaching stove pipes to chimneys, also which may serve to hold in place the usual slip collar on the stove pipe that closes the marginal portion of the opening in the chimney wall through which the stove pipe enters. The device prevents the pipe from being put too far into the chimney. The new attachment consists of heavy wire with one end coiled to engage the stove pipe at the chimney end. The end of this wire is bent to secure the pipe against the chimney. The other end of the wire is provided with an anchor for securing it to the pipe, and a portion of it is bent so as to hold the collar in place.

## NEW BOOKS AND PUBLICATIONS.

THE ROMANCE OF SCIENCE SERIES. Our Secret Friends and Foes. By Percy Faraday Frankland. London: Society for Promoting Christian Knowledge. New York: E. & J. B. Young & Co. 1894. Pp. vii, 204. Price $1.20. No index.

In the modern days of bacteria, this book appears to be particularly timely. It describes the methods of micro-organism analysis and the numerous and curious experiments which have been performed by bacteriologists. Disease and its prevention naturally enter into the scope of the work, which is one of the Romance of Science Series, other numbers of which we have already had to praise. The eminence of Frankland's name is enough to give this work its standing.

A LABORATORY MANUAL IN ELEMENTARY BIOLOGY. An inductive study in animal and plant morphology. By Emanuel R. Boyer. Boston: D. C. Heath & Co. 1894. Pp. xxii, 235. Price 80 cents. With index.

We have of late reviewed many books treating of inductive education, especially as applied to physics. Here we have the same style of work applied to biology, the pupil being made by his own exertions to carry out the course. There is very little question that with the great mass of people this is the best method of education, and will have the most valuable effect in teaching observation and in opening their eyes to the world directly surrounding them. We have little doubt that the elementary treatment of the subject was really exacted by the uses for which the book is designed.

MANUAL OF MILITARY FIELD ENGINEERING FOR THE USE OF OFFICERS AND TROOPS OF THE LINE. Prepared at the United States Infantry and Cavalry School by the Department of Engineering. Captain William D. Beach, Third Cavalry, Instructor. Fort Leavenworth, Kansas. 1894. Pp. 283. Price $1.75. With index.

This is an official government work on military engineering published by the Fort Leavenworth School, a station where officers in the regular service prosecute the studies which they have begun at West Point. The matter is quite interesting to many not connected with the army, but in civilian engineering practice. It has an excellent index.

CENTRAL STATION BOOKKEEPING AND SUGGESTED FORMS. With an Appendix for Street Railways. By Horatio A. Foster. New York: The W. J. Johnston Company, Limited. 1894. Pp. 139. Price $2.50. No index.

There is no doubt that such a work as the present one, describing how an accurate system of books can be kept at central stations and how profit and loss can be closely determined, will be found acceptable by electrical station superintendents. The power to impart the status of the business, above all, is now requisite, when there is such a tendency in municipalities to undertake electric works. This system of bookkeeping will show this exact status from the aspect of dividends, and cannot but be of value in order to enable municipalities to form correct ideas as to the money value of these institutions, so that they may not be carried off by false ideas as to profitableness.

THE UNTEMPERED WIND. By Joanna E. Wood. New York: J. Selwin Tait & Sons. Pp. 314. Price, cloth $1; paper 50 cents.

ELECTRICITY AT THE COLUMBIAN EXPOSITION. By J. P. Barrett. Chicago. 1894. Pp. xv, 501. No index.

Mr. Barrett, Chief of the Department of Electricity at the Columbian Exposition, in this report describes the general line of exhibits there presented. It contains numerous illustrations and is altogether an extremely acceptable presentation of what was there shown. Curiously enough an index is wanting, something which, in a book of this character, one would suppose to be a matter of course. Some of the illustrations showing the electric light effects at the Fair are most beautiful and effective. A portrait of Mr. Barrett seated at his writing desk forms the frontispiece.

PRACTICAL APPLICATION OF THE INDICATOR WITH REFERENCE TO THE ADJUSTMENT OF VALVE GEAR ON ALL STYLES OF ENGINES. By Lewis M. Ellison. Chicago. 1894. Pp. 197. Price $2. With index.

Works on the indicator are always welcome. The present volume attacks the subject from a peculiarly practical aspect. It goes into what should be done to cause an engine to work correctly, showing what constitutes a good and a bad indicator card, and how errors in the working of an engine are disclosed and how they can be remedied. A really good index would be an addition to the work, but the two age table of contents given under that name does not deal adequately with the subject.

BIBLE, SCIENCE, AND FAITH. By the Rev. J. A. Zahm. Baltimore: John Murphy & Co. 1894. Pp. 316. Price $1.25. No index.

Professor Zahm is well known to physicists by his work on sound and music, certainly one of the best monographs on this topic which has yet appeared in the English language. In the present work he applies himself to showing the accord of the Bible with science. The book cannot be reviewed adequately here, but may be, from the authority of the author and from its make up in general, recommended to our readers. It contains no index, but perhaps the nature of the subject is such as to render an index hardly a requisite.

KITCHEN BOILER CONNECTIONS. A selection of practical letters and articles relating to water backs and range boilers, compiled from the Metal Worker. New York: David Williams. 1894. Pp. 129. Price $1. With index.

The Metal Worker produces in this volume a number of queries with answers thereto, which have appeared in that paper. It will be seen that any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber. It contains a table of contents and an index.

THE LIFE AND INVENTIONS OF THOMAS ALVA EDISON. By W. K. L. Dickson and Antonia Dickson. New York and Boston: Thomas Crowell & Co. Pp. xvi, 362. Price $4.50. No index.

This work leaves nothing to be desired from the point of view of make up, the paper, typography and illustrations all being most elegant. The matter is largely made up of articles which have already appeared in Cassier's Magazine and in the Century Magazine. It is entirely in the popular style, in all its treatment of topics, one of the points being distinctively the praising of Mr. Edison's achievements. His portrait in various positions, and portraits of his wife and children, and scenes at his private residence, are also embodied in the work, so that it reveals much of his private life. Among the illustrations, some of the most interesting are those obtained by Mr. Ricalton in Asia.

A DICTIONARY OF ELECTRICAL WORDS, TERMS AND PHRASES. By Edwin J. Houston. Third edition. With appendix. Greatly enlarged. New York: The W. J. Johnston Company, Limited. 1894. Pp. vi, 667. Price $5. No index.

In Mr. Houston's new electrical dictionary we have found the matter of the last preceding edition with an appendix of upward of one hundred pages added to it. This brings it pretty well up to date. The same system of cross references is carried through the appendix that is used in the original work. This, of course, involves a large amount of repetition, which, however, is unavoidable from the plan of the work. It embodies no index. Our review of the last edition will therefore cover the present, for the additional matter involves the only change of importance.

WILSON'S CYCLOPEDIC PHOTOGRAPHY. A complete handbook of the terms, processes, formulæ and appliances available in photography, arranged in cyclopedic form for ready reference. By Edward L. Wilson. New York: Edward L. Wilson. 1894. Pp. 480. Price $4. No index.

The present work, although, to quote the preface, "kind indulgence must be asked for the numerous errors," will doubtless prove very useful to photographers. The different topics are given in dictionary form, from a few words to several pages being devoted to each one. Illustrations are used where required. In many parts the work would be greatly benefited by revision.

ANNUAL REPORT OF THE CHIEF OF ORDNANCE TO THE SECRETARY OF WAR. For the fiscal year ended June 30, 1893. Washington: Government Printing Office. 1893. Pp. 739.

This report, in view of its illustrations, of the interest now being taken in arms of war, and on account of the really popular nature of the treatment of some of the subjects, will be found of much greater interest than is generally the case with federal publications. It is needless to say that to army officers and gun manufacturers the work will be absolutely a sine qua non.

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## 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.
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**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.

(6302) P. H. W. asks: How much and what size of wire to use on a small dynamo, to get 110 volts and 8 amperes, on field and armature, also whether to connect it up in shuut or series. Does putting more and smaller wire on the armature increase the voltage or current and what is the cause? A. These are matters of calculation. Sloane's "Arithmetic of Electricity," $1 by mail, gives examples. Smaller wire on the armature increases voltage by causing more lines of force to be cut per unit of time. It decreases the amperage by increasing the resistance. 2. In your paper you once said, if a 1 horse power machine was doubled in all its lineal measurements, it would have just 64 times more power. Is this correct? A. The relative power of dynamos and motors varies approximately with the sixth power of the size. Some authorities however take the fifth power $(2)^5=64$.

(6303) W. F. says: Since June 21 to November 1 the days have shortened 4 hours 5 minutes, namely, 2 hours 2 minutes in the A. M. and 2 hours 48 minutes in the P. M. Why is it not equal? A. The position of the sun in relation to mean or clock time is continually changing throughout the year, caused by the elliptic form of the earth's orbit and the position of the sun in one of its foci. Thus the sun comes to the noon mark behind the clock time from December 24 to April 15 amounting to 15 minutes about February 10. From April 15 to June 15, it is ahead of clock time, amounting to 4 minutes about May 13. From June 15 it falls behind clock time, reaching 6 minutes on July 28, and again coinciding with the clock on August 31. Then again ahead of clock time, reaching the maximum of 16¼ minutes about October 27, receding to meet the clock on December 24. The sun's time equation compensates the difference in the clock time of rising and setting of the sun throughout the year.

(6304) F. R. B. writes: I have lately made a fish pond and would like to know if there is any way of giving fish air during winter time besides cutting a hole in the ice? A. A small hole only is needed in the ice, through which a pipe may be inserted and air blown under the ice as often as required by a bellows or air pump. With a hand-driven air pump the tube can be thrust down to the bottom and the water thoroughly aerated.