sections adapted to fold toward each other to also form a screen top or roof for the bed.

Machines and Mechanical Devices.

COPYING-PRESS.—A. L. Sneed, Clarks, La. The object in view of this inventor is to produce a simple and compact structure wherein provision is made for the application of powerful pressure through a platen upon the work, the construction being such that very little effort is required on the part of the operator and the adjustment of the platen may be secured very quickly. It is more especially designed for press-copying letters, manuscripts, and the like.

HONEY-EXTRACTOR. C. W. Metcalf, San Diego, Cal. This invention relates to improvements in machines for separating honey from the comb by centrifugal action, an object being to provide a machine for this purpose of simple construction and having a novel means for limiting the outward swing of the honey carrying baskets.

FRICTION-BRAKE. G. A. Ensign, Defiance, Ohio. In this patent the object of the invention is the provision of a new and improved friction brake for use on shafts and other driven parts, to bring the said parts automatically and quickly to a standstill at the desired time. It is a division of the application for Letters Patent of the United States for a mortising machine, formerly filed by Mr. Ensign.

COTTON GIN.—E. R. Barber, Valdosta, Ga. This invention relates to a gin in which the seed cotton is fed to a rotating drum having peculiarly constructed teeth serving to take up the cotton and pass it to a rapidly-rotating beater, by which the seeds are removed, after which the gin passes it to specially-arranged rocking rollers having cards thereon, the cards of one roller acting to remove the lint cotton from the drum and the cards of the other acting to remove the cotton from the first roller and to discharge the cotton from the machine.

ROCK-DRILL.—F. L. Whitehead, Butte, Mont. The invention has reference to improvements in drills of the type in which the drill is moved in its operating direction by hammer-blows; and one of the objects is to so construct the device as to utilize a portion of the driving force of the hammer to turn the drill and keep the cutting edge at a certain distance from the bottom of the hole.

THEATRICAL APPLIANCE. Belle La Verde, New York, N. Y. The object of this invention is to provide a new and improved theatrical appliance for heightening the attractiveness of theatrical performances and which is designed for use on parts of the scenery on the stage, moving objects, etc., more especially, however, on the costumes of actors, dancers, and other persons appearing in spectacular plays.

ELEVATOR. E. C. Northrup, San Jose, Cal. In this case the inventor refers particularly to improvements in devices for elevating boxes of oranges or other fruit and dumping the fruit into a chute leading to a grader, an object being to provide an elevator so arranged as to be practically automatic in its operation of dumping the fruit and carrying off the empty boxes.

BORING-MACHINE. F. C. Zeek, Muncie, Ind. The invention specifically appertains to a mechanism designed especially for use in boring holes in the joists of ceilings or floors for the passage of concealed electric wires. In carrying out the present invention Mr. Zeek has in view the provision of a mechanism embodying the essential features of durability and convenience, especially the latter, inasmuch as his machine may be placed so as to bore quickly and properly a plurality of openings or holes in joists spaced apart at varying distances.

GUARD BOARD.—J. L. Gallechez, Deferiet, N. Y. In this patent the inventor has reference to a guard board for the couch-rolls of a paper making machine. The object of the improvement is to provide a guard board which may be made to engage the couch roll more uniformly than heretofore without, however, subjecting the roll to unnecessarily destructive pressure.

MACHINE FOR PRODUCING CRIMPED OR CORRUGATED METAL STRIPS. W. P. Grafton, 82 Elliscombe road, Old Charlton, Kent, England. The mechanism closes together corrugations of a corrugated sheet or strip to bring the strip to the desired crimped form, the machine comprising pairs of rolls for [illegible] pairs of retarding rolls for [illegible] ing the corrugations made by the corrugating rolls, pairs of propelment-rolls for forcing the strip against retarding rolls, pairs of accelerating rolls for opening out previously closed corrugations to extent required in final product, takers-off for the strip in passage, means for cutting strips into narrower strips before entering corrugating rolls, and means for automatically severing portions of uniform length from final product as it passes from the machine.

ELEVATOR APPARATUS. J. B. Honor, New Orleans, La. In this case the invention has reference to apparatus for elevating and transferring various materials, it being more particularly applicable to the coaling of vessels and the delivery of crushed rock and earth, and the improvement enables the transfer of material to be accomplished very expeditiously.

COFFEE DRIER.—E. Penagos, Bucaramanga, Colombia. This invention appertains particularly to an apparatus designed for drying coffee beans and the like. In this instance Mr. Penagos has particularly in view as an object the provision of an apparatus through which the coffee may be passed continuously and subjected to a number of heatings, thus insuring a thorough drying or curing of the beans.

ADDING-MACHINE.—R. Corbin, Plattsburg, N. Y. The invention relates to a construction of machine capable of being held in one hand and conveniently and readily operated by pencil or styles held in the other to add a column of figures and show correct aggregate or to effect reversal of mechanism, thereby, for example, [illegible] the various dials quickly and accurately to normal positions, at which time the zero on each of the dials will be presented to properly-disposed openings in the casing of the device, at which openings the numerals are likewise presented which indicate the sum of addition.

Pertaining to Vehicles.

RUNNER ATTACHMENT FOR VEHICLE WHEELS.—G. F. Meyer, Green Island, N. Y. In this instance the object is to produce a thoroughly practical device which is adapted for ready application to vehicle wheels of different widths, which will not mar the wheel when applied thereto, and which is provided with means for securing it in position upon the wheel in such a way as to prevent any rattling of the attachment upon the wheel. The invention relates to runner attachments for wheels of the type in which a runner attachment is designed for application to each wheel to convert the vehicle into a sleigh.

SAFETY DEVICE FOR ELECTRICALLY-PROPELLED VEHICLES. J. H. Spencer, New York, N. Y. The object in view of the inventor is to provide an improved safety device for such vehicles as automobiles, trolley-cars, and the like, whereby the motor and the source of electricity are instantly disconnected in case of an accident to bring the motor, and consequently the vehicle, to a stop and insure the safety of the occupants.

SLED. C. E. Burnham, Dekalb Junction, N. Y. Mr. Burnham's invention is an improvement in sleds, and particularly in that class of sleds ordinarily known as "bob sleds." The opposite runners work entirely independently, and the beam may support the load on a level as desired. The construction is simple, can be cheaply made, easily applied, will be durable when applied, and can be repaired at slight cost if necessary.

HORSE-RELEASING DEVICE.—W. E. Bolsta, Ortonville, Minn. This invention refers to a device for releasing horses or other draft-animals from vehicles or the like, and is designed to be capable of rapid and easy operation for the purpose of preventing accidents. An additional brake may be used and it can be applied to any vehicle. The handle when in normal position, will be a convenient rest for reins.

Prime Movers and Their Accessories.

GAS-COMPRESSOR.—C. Flohr, Berlin, Germany. Mr. Flohr's invention relates to improvements described in United States Patent No. 669,110; and the objects are, first, to replace the single-acting pump referred to in the patent by a double-acting pump serving as a gas-compressor; second, to replace the means mentioned therein for locking and releasing the suction valve cone by one or two rocking return disk valves placed in a separate channel which connects the two cylinder ends of the double-acting pump, and third, to provide means for connecting the one or two rocking return disk valves with the float.

ROTARY MOTOR. M. M. Conger, Linneus, Mo. This improved motor embodies a rotary piston provided with valves which are pressed outward by the steam and during a portion of their travel act against inclined surfaces on the case, giving turbine action, the outward thrust against the inclines serving by force of reaction to move the piston forward. Direct action of motive agent is utilized against the piston valves, and when valves reach farthest projection beyond periphery of the body of piston steam is admitted to their outer faces to balance pressure and reduce to minimum the work to be done by motive agent in forcing the valves inward.

Railways and Their Accessories.

AUTOMATIC CAR DISCHARGE VALVE. W. A. Harris and B. S. H. Harris, Greenville, S. C. In this patent the invention is an improvement in automatic car discharge valves intended and adapted especially for use in train signaling apparatus, and particularly in signaling apparatus wherein the signal is caused to sound by a slight reduction of pressure in the train-line.

SPARK ARRESTER FOR LOCOMOTIVE OR OTHER BOILERS. J. C. Rewring, Sydney, New South Wales, Australia. This invention affords greater facilities for preventing escape of sparks and live cinders from locomotives and other chimneys and provides arrangements whereby the draft may be controlled to suit the requirements of any class of fuel or work, the apparatus occupying but a small portion of space in the smoke box or "combustion chamber" and easily removable for cleaning tubes, etc., and capable of adjustment so that the portion designated the "spark-cage" may be located to suit the needs of any boiler or class of fuel.

Note.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**

MUNN & CO.

Inquiry No. 5921.—For manufacturers of sand lime bricks.

Inquiry No. 5922.—For manufacturers of solid celluloid for enameling purposes (to put on wood).

Inquiry No. 5923. For the address of the Fisher Hydraulic Press Co. for cement building blocks; also the address of "Normandin" hand tamp system.

Inquiry No. 5924.—Wanted, to purchase steam turbine outfits like those used on locomotives for head lighting purposes.

Inquiry No. 5925. For manufacturers of amateur printing presses.

Inquiry No. 5926.—For manufacturers of armor bullet-proof cloth.

Inquiry No. 5927.—For manufacturers of spirit from Indian corn.

Inquiry No. 5928.—For firm handling a machine or apparatus to scrub and clean large floors.

Inquiry No. 5929.—For parties who manufacture or handle machinery for separating the fiber and pulp of the Agava plant.

Inquiry No. 5930.—For good, practical dry storage battery to take the place of ⅛ h. p. 120 volt motor, either direct or alternating current.

Inquiry No. 5931.—For some one handling experimental apparatus for wireless telegraph, such as is used for lecture purposes.

Inquiry No. 5932.—For an apparatus by means of which floors may be cleaned and varnished, instead of using manual labor.

Inquiry No. 5933. For dealers in necktie makers' supplies.

Inquiry No. 5934.—For parties who deal in album clasps and trimmings, and walking canes and umbrella mountings.

Inquiry No. 5935.—For manufacturers of gasoline buses, freight and delivery wagons.

Inquiry No. 5936. For manufacturers or sellers [illegible]

Inquiry No. 5937.—For firms who manufacture [illegible] machinery for mining and preparing slate for the market.

Inquiry No. 5938. For firms manufacturing machinery for the extraction of cocoanut oil.

Inquiry No. 5939. For parties manufacturing automatic pipe bending machines for bending long pipes as well as short return bends.

Inquiry No. 5940.—For a machine that will pulverize charcoal.

Inquiry No. 5941. For manufacturers of wagon hubs, spokes and rims.

Inquiry No. 5942.—For the address of J. Baum Safe and Lock Co.

Inquiry No. 5943.—For manufacturers of woven wire fence.

Inquiry No. 5944.—For parties manufacturing [illegible] such as are used in churches and Sunday schools for dividing a large room.

Inquiry No. 5945.—For manufacturers of automatic ventilators and oil heaters.

Inquiry No. 5946.—For machinery for making 2 x 4 x 8 inch concrete brick (sand and cement).

Inquiry No. 5947.—For manufacturers of corn huskers.

Inquiry No. 5948.—For address of agent or manufacturers of a contrivance for conveying rural mail from route to residence.

Inquiry No. 5949. For manufacturers of carbonic anhydride refrigerating machinery.

Inquiry No. 5950. For manufacturers of machinery for hulling cocoanuts to extract the oil and work the fiber of same.

Notes and 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.

(9447) W. J. M. asks: 1. Is it safe to run two double covered annunciator wires in the partitions of a house along with the gas pipes, for electric gas lighting? A. Electrical wires should not be run side by side in contact for any purpose. Insulation is liable to be impaired and current lost even if the current is not of a character to set fire. Especially is this true if the wires are held by staples. Two wires should never be put under the same staple. 2. Is there any danger of short-circuiting and thus setting fire to the house? A. Not with wires carrying current from a low voltage battery. If the current is that of a lighting circuit the rules of the Fire Underwriters forbid including two wires in the same fastening, and specify the distance by which they must be separated. 3. How large a coil would be required for lighting one burner at a time? A. A spark coil for gas lighting may be made by taking iron wires 10 inches long and forming them into a bundle 1 inch in diameter, first straightening them very carefully. Fit a spool head of hard wood on each end to hold the copper wire of the coil, and cover the iron core by two or three layers of brown paper to insulate the core from the coil. Two or three pounds of No. 16 or No. 14 cotton covered copper magnet wire may now be wound on the core. The ends of this should be brought out through holes in the head of the spool, and the coil is finished. A covering of pasteboard may be put over the outside as a protection and a finish. 4. What voltage and amperage would the same require and would two gravity cells answer the purpose? A. Three or four dry cells will be sufficient for gas lighting. Three LeClanché cells may be used if more convient. 5. Is a constant current required when you simply turn on the gas and it lights as with the Advance burners? A. A constant current battery is not used for gas lighting, but an open circuit cell is to be preferred. 6. What is the best way to connect coil, burner, and battery for the best results? A. The coil, burner, and battery are to be connected in series; it matters not about the order. The only important thing to be observed is to connect the cells of the battery in series, since as high a voltage as possibly should be had.

(9448) R. R. S. asks: 1. Are there any electric lamps that use an alternating current, and if so, how is it worked? A. The alternating current is now in more general use for lighting than is the direct current. The same incandescent lamp can be used on either current, if the required voltage is the same for both currents. The alternating current is, however, usually at 52 or 104 volts, while the direct curent is ordinarily at 110 or thereabout. An arc lamp is especially constructed for the alternating current. Its two carbons consume at the same rate, while the carbons in a direct current arc lamp consume at different rates, the positive carbon wasting about twice as rapidly as the negative carbon. 2. Would there be any danger from lightning with a mast such as would be used in wireless telegraph experiments? A. There would be the same risk from lightning with a tall mast for wireless telegraphy as for any other purpose. Such a mast should be protected by a lightning rod. The apparatus should be and always is provided with lightning arresters.

(9449) A. J. G. says: 1. What commercial metal will radiate heat the most rapidly? A. Cast iron with a dark surface is the most radiant of heat of the simple metals. 2. Can an alloy be made that will be more efficient? A. There is no alloy known that is more efficient in radiating power than iron. 3. Is there any chemical composition that can be lowered in temperature by agitation? A. We know of no chemical compounds that become colder by agitation alone. Agitation that produces chemical changes may lower temperature. 4. How long will it continue to so do before it will be necessary to renew it? A. Time unknown. 5. Will it attack metals? If so, what metals? A. Not known. 6. Can you give me the formula for a hard copper plating bath same as used on leaded glass windows to strengthen them? A. Use a saturated solution of sulphate of copper and deposit by battery. 7. In order to muffle the exhaust of a gasoline engine what is necessary, to

(*Continued on page 168.*)

baffle it, stagger it, or what, to accomplish the best results without back pressure? A. Any form of exhaust chamber in which the force of the exhaust is divided and gradually expanded will deaden the sound. 8. What is the scientific reason for the noise at the end of an exhaust pipe of a gasoline engine? A. The noise of an exhaust is caused by its impact against the outer air. 9. Is there anything gained in radiating surface by having projecting ribs on gasoline engine cylinders? A. Anything that expands the air surface contact with the cylinder is a gain to air cooled cylinders. The ribs accomplish the desired extension of air-cooling surface.

(9450) W. A. K. asks: What books for instruction would you recommend to one who understands only the rudiments of electrical science and wishes to perfect himself in the art? A. The books required for the study of electricity depend entirely upon how you would study. If you would become an educated electrical engineer go to Columbia University and take the course. If that is impossible, you may be able to take a correspondence course at some of the correspondence schools. (The International Schools, at Scranton, Penn., are very large and can furnish you a good opportunity if you are determined to do good work.) It is hardly possible by study by oneself to become an electrician. Contact with machinery, instruments, and men doing the actual work are necessary. There is so much which is not in any book which must be known. You say you wish to "perfect yourself in the art." If that has its usual meaning that you wish simply to learn how to do electrical work, the best way to learn that is to obtain a position in an electrical shop and learn the art of making the apparatus: or in a construction company and learn the art of installing machinery, the line, etc.: or in a station and learn how to operate it. There are many lines of learning from which you must choose one, according to your means, and possibilities, of which you do not give us any indications. Lastly, if what you wish to learn is electrical science, you can then begin with books and study either with or without a teacher, though far better with a teacher. You might start with "Swoope's Elementary Lessons," price $2.00, go on into "Hawkins and Wallis' Dynamo," price $3.00; take next "Thompson's Dynamo Electric Machinery," price $7.50, and his other books; follow with "Crocker's Electric Lighting," 2 vols., price $6.00; after this might come the transmission of power, electric railways, etc. There are books enough to last for many years of study for the man studiously inclined.

(9451) C. H. McC. says: Can you tell me where I can find a description of the apparatus used by Tesla to generate the high tension currents with which he was experimenting a few years ago? I believe he called his machine an "oscillator." If there are any Supplements describing these experiments please let me know the numbers. A. We have published a description of the high frequency coil in our Supplement No. 1087, which are will send for ten cents. The United States Electrical Supply Company, Mt. Vernon, N. Y., make the apparatus, both for generating the electricity and for the experiments, thus furnishing a complete outfit which can be relied upon to do the work. These outfits are very highly spoken of.

(9452) O. H. says: Will you kindly inform me what is the best protection against lightning for telephones, viz.: to protect the ringer, coil, and building? Would you advise "dead ends" or ground connection when the 'phone is disconnected from the main wire? Is the lightning arrester now in use absolute protection? A. Lightning arresters, which will be furnished by the telephone company, are the best protection for telephones from lightning. There can be no such thing as "absolute protection" from lightning. Reasonable protection is all that can be had. The usual lightning arrester works through a grounded wire to the earth. We know of nothing better. Comparatively few instruments are now burned out by lightning.

(9453) H. M. says: You will very greatly oblige me by kindly answering the following questions concerning "The Tesla Thomson High Frequency Coil" as described in Scientific American Supplement No. 1087: 1. Should wire known as magnet wire be used on the primary? on the secondary? A. It is better to use covered or magnet wire as it is commonly called, in winding all induction coils, even when insulated with oil. 2. What kind of insulation should the secondary of the high tension trans. have? Will single cotton covered do? A. High frequency coils are ordinarily insulated with oil. Double cotton covered wire is to be preferred to single covered wire when large differences of potential are to be produced. 3. How many pounds of wire are required for each coil of wire on the high tension transformers? How many pounds will be required for the secondary of the high frequency coil? A. We have not the weight of wire at hand for the coils you intend to make. It is more common to specify the number of turns of wire. You can transform turns to pounds approximately by calculating the length of one turn in the middle layers of the coil and multiplying by the total number of turns. A table for copper wire will give you the number of feet per pound for any size of wire. 4. Will the increase in length of spark warrant an oil insulation? A. It is not probable that the coil will stand the strain except by oil insulation. Even then the insulation may be punctured frequently, but as soon as the oil closes in again the insulation is restored.

NEW BOOKS, ETC.

The Planetary System. A Study of Its Structure and Growth. By Frank Bursley Taylor. Fort Wayne, Indiana: Frank Bursley Taylor; London: C. D. Cazenove & Son, 1903. 12mo.; pp. 278; illustrated. Price $1.50.

Our author first challenges Newton's theory of the moon's stability, on the ground that, if correct, it should serve as a basis for generalization, and should yield a law for the stability of inner satellites. This it has failed to do. The author then advances a new theory of stability which, he claims, does yield such a general law. The application of this theory accounts for the origin of the asteroids, the separation of the planets into two groups with the asteroids between, the position of the superior planets next outside of the asteroids, the greater masses of the superior planets, and the origin of Saturn's rings. The new hypothesis also leads to interesting explanations of various other facts and phenomena, such as the retrograde satellite systems of Uranus and Neptune, the inclination of the moon's plane to the earth's equator, etc.

Systematic Pomology. By F. A. Waugh, Professor of Horticulture and Landscape Gardening, Massachusetts Agricultural College. New York: Orange Judd Company, 1903. 8vo.; pp. 300. Price, $1.

The study and classification of fruits is necessary in order to make possible their more prolific development. Prof. Waugh, in his new book on this subject, gives instructions for the systematic study and classification of our various fruits, which will be of value to fruit growers, teachers, and all scientific investigators of this subject. The book treats exhaustively of the methods of describing fruits, of the perplexing system of nomenclature, of the practical and scientific classification of varieties, and of the judging and scientific laboratory study of all kinds of fruits. The book will be found particularly helpful to students who wish to learn more about pomology from practical self-investigation. It will also be of great service to nurserymen and fruit growers, as well as of use as a laboratory guide and manual. Complete instructions regarding the photography of fruits and the keeping of card catalogues of the same are among the valuable features of the book.

Dampfschnellbahnzug für 120 km. mittlere stündliche Geschwindigkeit (150 Km.-St. maximal). Von Dr. Ing. Heinrich Mehlis. Mit 10 Tafeln in Photolithographie. Zweite Auflage. Berlin: Verlag von Georg Siemens, 1904.

Notes on Electric Railway Economics and Preliminary Engineering. By W. C. Gotshall, M. Am. Soc. C. E. and Am. Inst. E. E. New York: McGraw Publishing Company, 1903. 8vo.; pp. 252. Price, $2.

This book is the outcome of a series of lectures which were given by the author at Lehigh University. It treats exclusively of high-speed interurban railways, taking up the subject at the preliminary office investigation of the probable earnings and expenses, and carrying it through track location and construction up to the completion and operation of the road. Detailed statements of costs of operation and their computation for different schedules are given, and the economics of such projects is thoroughly discussed. Full data regarding train resistance are given.

Machine Design. By William Ledyard Cathcart, Adjunct Professor of Mechanical Engineering, Columbia University. New York: D. Van Nostrand Company, 1903. 8vo.; pp. 285. Price $3.

This book, which forms Part I. of the complete work, is devoted entirely to all kinds of fastenings used in machinery. The book is practical in treatment, but the theoretical side of the subject is also fully given for completeness' sake only, since this side of the subject has already been exhaustively covered by able writers. Both scientific analysis and the records of practice are essential to success in the design of machine members, but neither alone is trustworthy, as the former predicts only those stresses which prevail under normal conditions and ignores the over load, the rough handling, or the slight accidents which the machine may meet, and when meeting which, it should not fail. Practical data show only the proportions which constructors have given in specific cases of stress and service, and empirical formulæ founded upon them may not give the desired results, if the inherent limitations of these formulæ be exceeded. The problem of design is one whose many elements vary continually in number, character and magnitude; and, for its solution, theoretical analysis, precedent and the trained judgment of the designer are required. The work has been prepared with the co-operation of many prominent engineers. Its chapters treat of shrinkage and pressure joints, screw fastenings, riveted joints, and keyed and pin joints. All formulæ and figures necessary for an adequate treatment of the subject, as well as a considerable number of illustrations, diagrams, and tables, add to the value of the book as a work of reference for practical engineers.

Metallurgical Analysis and Assaying. By W. A. Macleod, B.A., B.Sc., and Charles Walker, F.C.S. London: Charles Griffin & Co., Ltd.; Philadelphia: J. P. Lippincott Company, 1903. 8vo.; pp. 318. Price, $4.

The present volume is intended to meet the requirements of Anglo-Colonial schools of mines: and while we always feel a book which is intended as a textbook for specified courses is hampered, still the present volume appears to be an excellent one. Typographically the work is perfect, and the diagrams are very clear. It is a book which we can recommend to those who wish to study chemistry by themselves.

Railway Legislation in the United States. By Balthasar Henry Meyer, Ph.D. New York: The Macmillan Company, 1903. 16mo.; pp. 329. Price, $1.25.

The aim of this volume is to present a condensed analysis of the private and public laws which govern railways in the United States, and of important decisions relating to interstate commerce. The statements and comments are based upon actual analysis and, in a large part, upon analytical tables of charters and laws enacted in the various States. These tables present so many typographical difficulties, it was not thought expedient to publish them. The author is Professor of Institutes of Commerce in the University of Wisconsin. He has performed an exceedingly difficult task, and the book should appeal to all thinking persons.

Cassell's Popular Science. Vol. II. Edited by Alexander S. Galt. Illustrated. New York: 1904. Square 8vo.; pp. 556. Price, $3.

This second volume of Cassell's Popular Science is characterized by the same treatment which we had occasion to note in our review of the first volume. For the most part the subjects are confined to pure science, the reviews of applied science being confined to electricity, photography, and the like. The articles are all of them written with a true regard for scientific accuracy, and are yet couched in such simple language that the man who makes no pretensions to scientific knowledge can readily understand them. Their length, moreover, has been so calculated that they will not fatigue the attention.

Radium and Radio-Active Elements. A Popular Account Treated Experimentally. By Leonard A. Levy and Herbert G. Willis. Illustrated. London: Percival Marshall & Co., 1904. 12mo.; pp. 105. Price, 25 cents.

Messrs. Levy and Willis have in this book endeavored to give a popular and withal a scientifically accurate account of radium. The book may be said to accomplish its purpose, and to do credit to its authors. It is likely to be of interest to the man in the street. Although a compilation in its way of the writings of Curie, Ramsay, Rutherford, Elster, and Geitel, the book nevertheless presents a certain originality of treatment. In our opinion the work may be commended to those who are interested in something more than the sensational side of radio-active substances.

The Widow's Mite and Other Psychological Phenomena. By Dr. I. K. Funk. New York and London: Funk & Wagnalls Company, 1904. 12mo.; pp. 538. Price, $2.

If anyone expects to find in Dr. Funk's book a scientific exposition of spiritualism, or, indeed, anything at all that has not hitherto been known about spiritualism, he will be sadly disappointed. What Dr. Funk has done is to present an impartial account of certain spiritualistic experiences of his, which involved the finding of the Jewish coin, called the "widow's mite," through the spirit of Henry Ward Beecher. Dr. Funk's disclosures are no more remarkable than those of hundreds of other investigators, among them men of the standing of Sir William Crookes, Alfred Russel Wallace, Prof. Hyslop and Prof. James. Dr. Funk himself makes no attempt scientifically to explain the things that he saw or claims to have seen, contenting himself simply with a mere statement of facts, from which the reader is left to draw his own conclusions. Besides narrating the story of the "widow's mite," Dr. Funk presents an interesting account of the work of other men. Whatever may be one's opinion of the value of Dr. Funk's inquiry, one cannot fail to be impressed by his earnestness and his fairness.

Taschenbuch der Kriegsflotten. V. Jahrgang, 1904. Mit teilweiser Benutzung amtlichen Materials. Herausgegeben von B. Weyer, Kapitänleutnant a. D. München: J. F. Lehmann's Verlag, 1904. Pp. 341.

Capt. Weyer's new handbook contains pretty much the same information as last year's volume. We have had occasion to use his reference books more or less frequently ever since their publication, and have found them in every respect trustworthy and accurate. Indeed, in some ways his little volumes contain information not elsewhere to be found. Notably is this true of the general data pertaining to Russia's Baltic fleet, now in course of construction, to be found in last year's book. The events of the present war have naturally affected Russia's naval position to a marked degree. Capt. Weyer has still listed even those vessels of the Russian navy which have been destroyed: but has clearly indicated their loss, in order that no reader may be misled. It has been impossible to note similar losses in the Japanese navy, because no official reports can be obtained of the damage sustained.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending August 23, 1904

AND EACH BEARING THAT DATE

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