ROTARY ENGINE. — J. R. LEWIS, Jersey City, N. J. The invention relates to engines and more particularly to those of the rotary type. Its principal objects are to provide a simple and efficient engine. By the means employed both the impact and expansion force of the steam are utilized. If the apparatus is to be used as an internal-combustion engine, the supply may be to the casing-section, the exhaust of which is delivered to one of the two separate sections. In this manner not only is the impact of the exhaust applied to the rotating of the shaft, but a muffling effect is secured in its passage between the blades with comparatively little back pressure.

OIL-BURNER. — W. S. JENKINS, Cleburne, Texas. This improvement pertains to an apparatus for burning heavy oils with the aid of an atomizing-jet. It is particularly adapted to locomotive-work; but it is useful in other connections—for example, with stationary and marine boilers. A special feature lies in an arrangement causing the oil to flow steadily from the burner in common with the atomizing jet of steam or other fluid, thus producing a regular flame and thorough combustion.

ROTARY VALVE. — J. CRUIKSHANK, Yorktown, Va. In the present patent, Mr. Cruikshank's invention is an improvement in the valve action of steam-engines, and is intended to relieve the valve-seat of boiler-pressure and to keep the balance without readjustment, without regard to what pressure there may be in the boiler. This note will be followed later by a cut and a fuller explanation of this important invention.

Railways and Their Accessories.

MAIL-BAG-DELIVERY DEVICE.—P. J. A. SCHNOOR, Holstein, Iowa. Mr. Schnoor employs a specially-constructed derrick at each of the railway-stations or other places at which the mail-bags are to be delivered and taken up by the devices on the car, and within the car employs a specially-constructed swinging crane, combined with retaining devices therefor, as well as operating devices and specially-constructed brake devices for preventing motion of the car from causing the mail-bag to be carried too violently within the car as the crane is caused to be swung in an inward direction.

BRAKE.—C. E. F. BURNLEY, Eckman, West Va. This brake is more particularly adapted for use upon such vehicles as mine-cars. When brakes are mounted upon hangers supported upon fixed pivots, they must be constructed with accuracy to secure equal pressure upon front and rear wheels, and even this will continue only so long as wear on shoes is identical, a condition not attained in practice. Therefore one pair of shoes wears more than the other and power applied is expended upon the least-worn pair and the hangers, with companion shoes having little or no friction upon the wheels. This invention allows the shoes to bear upon the wheels with equal force, this continuing until all the shoes are worn out.

Pertaining to Recreation.

SWING.—T. H. BARGER, Peekskill, N. Y. Mr. Barger's invention pertains to swings, the main objects being to secure great flexibility and to provide for the operation and expenditure of comparatively little power without introducing any complications or any features likely to get readily out of order.

Pertaining to Vehicles.

LOG-CART. — R. J. WILLIAMS, Natalbany, La. In operation the tongue of this device is made slidable by removing a pin, and the sets of hooks are attached to the logs to be carried. Horses or other moving power is attached to the tongue end, and by this means a chain will draw a lever forward until the hook engages a catch. Logs are thus raised by reason of chains being wound on a drum. The tongue is then slid back, and the pin is again placed in its opening and logs are ready for transportation. To unload, lift the handle of the catch, to disengage the hook, and the logs' weight causes them to drop upon the ground on skids. Hooks disengage themselves, and the cart is ready for another load.

VEHICLE. — T. WILSON, Lewistown, Mont. The invention relates to vehicles, and particularly to sleighs. The principal object is to provide an automobile vehicle of this character which will operate satisfactorily under varying conditions of surface over which propelled. Although in this case the power-shaft is rotated by means of an explosive-engine, any convenient motor may be employed or if the vehicle be sufficiently light hand-operated mechanism may be used to effect the driving of the shaft.

Designs.

DESIGN FOR A PENDANT.—G. FOX, Cincinnati, Ohio. This design is for a watch-chain pendant, society pin, or badge. It includes two elks facing each other, rampant, their horns being connected by a ring, and the hind legs of the animals being attached to and suspending ornamental scrolls surrounding a disk or plate bearing a representation of a mallet and a rolled chart.

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.

Marine Iron Works. Chicago. Catalogue free.

Inquiry No. 7104.—For manufacturers of picture mouldings.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 7105.—For manufacturers of blue flame (paraffin) stoves.

For bridge erecting engines. J. S. Mundy, Newark, N. J.

Inquiry No. 7106.—For manufacturers of red cedar bark.

2d-hand machinery. Walsh's Sons & Co., Newark, N. J.

Inquiry No. 7107.—Wanted, small planing mill with all equipments.

Perforated Metals, Harrington & King Perforating Co., Chicago.

Inquiry No. 7108.—For manufacturers of alcohol engines.

Handle & Spoke Mchy. Ober Mfg. Co., 10 Bell St. Chagrin Falls, O.

Inquiry No. 7109.—For manufacturers of nut-cracking machinery.

Adding, multiplying and dividing machine, all in one. Felt & Tarrant Mfg. Co., Chicago.

Inquiry No. 7110.—Wanted, address of the Mitchell models of the Westinghouse air brake.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 7111.—For manufacturers of advertising novelties.

Marketers of meritorious inventions and specialties throughout the world. Tatem Mfg. Co., Buffalo, N. Y.

Inquiry No. 7112.—For manufacturers or users of automatic electric switching devices for use on street railways.

I sell patents. To buy them on anything, or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

Inquiry No. 7113.—For manufacturers of small, flat, flexible chains.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Machine Company, Foot of East 138th Street, New York.

Inquiry No. 7114.—For manufacturers of high-grade toilet mirrors.

WANTED.—Manufacturers of the Solid Back Scrub Brush and other brushes. Handy Article Co., 117 S. Michigan Street, South Bend, Ind.

Inquiry No. 7115.—For manufacturers of weight motors or blowers, to be used in connection with gasoline light system.

Gut strings for Lawn Tennis, Musical Instruments, and other purposes made by P. F. Turner, 46th Street and Packers Avenue, Chicago, Ill.

Inquiry No. 7116.—For manufacturers of air pumps to be run by water for gasoline light system.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, wood fiber machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 7117.—For firms who sell all kinds of household goods, hardware, etc., nothing to cost over 10 cents each.

Absolute privacy for inventors and experimenting. A well-equipped private laboratory can be rented on moderate terms from the Electrical Testing Laboratories, 548 East 80th St., New York. Write to-day.

Inquiry No. 7118.—For manufacturers of wire goods such as paper fasteners, small coil springs for holding display cards, etc.

WANTED.—To buy ideas or patents for new articles to manufacture as a side line. Will consider all propositions, but prefer articles commonly used by the populace. Briefly give full particulars. F. Raniville Co., Grand Rapids, Mich.

Inquiry No. 7119.—For manufacturers of cellulose from cornstalks.

QUANTITY CLERK WANTED. — In the office of a large ornamental iron and bronze manufacturing company. A man understanding plans. Opportunity to develop from drafting office to quantity and estimating clerk. Address Clerk, P. O. Box 773, New York.

Inquiry No. 7120.—For manufacturers of beads out of soft stone.

A GOOD LOVE STORY.

"A Paper Proposal" is the title of a clever piece of fiction contained in "Mountain and Lake Resorts," a book just issued by the LACKAWANNA RAILROAD in which some of the most delightful summer resorts in the east are illustrated and described. The story is well worth reading, and the other information may help you in selecting your vacation place.

The book will be mailed on receipt of ten cents in stamps addressed to T. W. LEE, General Passenger Agent, New York City.

Inquiry No. 7121.—For manufacturers of condensers for telephone or wireless telegraph.

Young man, practical engineer, large acquaintance, desires to represent manufacturer on Pacific coast on commission basis; can furnish best of references as to industry, character and ability. Address W. Brown Smith, 620-622 Laughlin Building, Los Angeles, Cal.

Inquiry No. 7122.—For manufacturers of glass tubing having 1-16 inch inside diameter, for making wireless telegraph coherers.

Inquiry No. 7123.—For parties who can furnish raw hide.

Inquiry No. 7124.—For manufacturers of wire musical instrument strings.

Inquiry No. 7125.—For manufacturers of advertising novelties.

Inquiry No. 7126.—For manufacturers of capsules of carbon dioxide gas; also siphon for charging water.

Inquiry No. 7127.—For parties selling sheet aluminium and a soldering flux for soldering aluminium.

Inquiry No. 7128.—For manufacturers of machinery for making banana into fine flour.

Inquiry No. 7129.—For manufacturers of brass band instruments.

Inquiry No. 7130.—For manufacturers of springs wound by a key and run for five or ten minutes.

Inquiry No. 7131.—For parties who print colored pictures on paper in one continuous piece of about 6 inches wide and 12 feet long.

Inquiry No. 7132.—For manufacturers of telescoping steel flag poles.

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.

(9717) P. H. C. asks: 1. I ask you to explain in your column of Notes and Queries why a small battery meter will run on a 110-volt alternating current when a 50 candle-power lamp is put in series. If the 50 candle-power lamp is removed and a 16 candle-power put in its place, the meter will not start. A. A 16-candle lamp does not carry current enough to run your meter; a 50-candle lamp does. 2. How long a spark ought an induction coil to give which is 8 inches long, 7½ inches in diameter, the core being 1 inch in diameter; the primary coil consisting of two layers of No. 16 copper wire and the secondary coil containing 4 pounds of No. 36 copper wire? A. You may be able to get a spark 3 inches long from your coil, but its proportions are not of the best. The primary winding is of too small a wire. No. 12 would have been right. The coil is too short. It should have been 12 or 14 inches. This would have made the outside diameter less, and brought the secondary nearer the primary and into a stronger magnetic field. The coil might then have given a spark of four inches. See our SUPPLEMENT No. 1527 for plans for a 4-inch coil; price ten cents. 3. Having five known parallel forces applied at known points to a stick, what is meant by taking one of these points as the center of moments? A. When a point is taken as the center of moments, a force acting at that point does not assist in any way to rotate the stick. It simply produces pressure on the point. 4. What is meant by moments of forces? A. The moment of a force is the value of that force in producing rotation of the bar or wheel to which it is applied. The value of any force in moment is equal to the product of the force multiplied by the acting distance of the force. See textbook of physics for full explanation of moments and forces.

(9718) G. W. asks: 1. In a sal-ammoniac battery the zinc was crystallized. Now I suppose that the zinc ions were deposited on the carbon. A. If too strong a solution of sal-ammoniac is used in the Le Clanche cell, the result is the formation of crystals upon the zinc which cut down the current from the cell. The solution should not be stronger than 3 ounces of sal-ammoniac to a pint of water. We do not think the zinc ions had given up their job and returned to the carbon in your case. Since the solution was too strong, there were not so many ions as there should have been for the production of current. 2. I have a small spark coil which we made ourselves, and a while ago tried to work it with four cells of dry battery, and the amperage in four cells was the same as in one. Why was this? A. The discovery that four cells in series gave no more current than one cell has been made as an original discovery by a great many people who had not learned the relation of the resistance of the circuit to the proper arrangement of the battery. When the resistance of the circuit is low (the external resistance, as it is called) put the cells in multiple. The addition of cells in series does not increase the amperes delivered to the line proportionally, and energy is wasted. On the other hand, when the external resistance is high, put the battery in series. You will find this demonstrated in textbooks of electricity. See Swoope's "Elementary Lessons," price $2 by mail.

(9719) F. J. B. asks: We have a small ground switchboard with series jacks, from which it seems as if we could hear talk when lines are busy, but though they sometimes talk quite loud, nothing can be distinguished. A. Grounded lines are almost inevitably subject to the annoyance of cross talk. It is due to the fact that different wires lie nearly parallel to each other, over some portion of their course; perhaps in coming into or in going out of the central. The only certain remedy for this is a metallic circuit. Then the wires of each circuit are carried on the poles in such a way that they are twisted around each other quite often.

(9720) E. De V. asks: Will you please tell me what kind of steel makes the best bar magnets? Also, I would like to know the relative strength of bar and electro-magnets. A. For permanent magnets some prefer Jessop's steel, some Stubs' steel, some manganese steel, and some tungsten steel. Probably any good high-grade steel will answer very well for the purpose, with little to choose. This is generally the case when there are so many opinions on a matter. There is no "relative strength" of perm[illegible]ent magnets. A good permanent magnet m[illegible] times its own weight. An electro-m[illegible]ch more than this.

(9721) J. J. G. asks: Does an object which is viewed through the telescope of an engineer's transit appear to be larger than when seen with the naked eye? Although this may seem to you to be a foolish question, I find that several of my acquaintances, two of whom are graduate civil engineers, claim that while the image is clearer, it is no larger. By looking through the telescope with one eye and past it with the other, I am able to see both object and image at the same time, and thus seen the superficial areas appear to be about as 1 to 16. My friends claim that this is due to my eyes, but I do not think so. A. An engineer's transit usually is provided with a telescope which will magnify from 3 to 6 diameters, or from 9 to 16 times. If it did not magnify at all, an object seen through it would not be seen any more distinctly than with the naked eye. A simple way to determine the magnifying power of a glass is to look at bricks at some distance with one eye through the telescope and with the other eye directly. Find how many bricks seen with the naked eye are covered by one brick seen through the telescope. This is the number of diameters the telescope magnifies.

(9722) E. G. S. asks: Will you kindly give an explanation of the following through the columns of your paper? If a one-cent piece be centered over the end of a spool such as cotton thread comes on, and barely supported by pins, a current of air blown through the hole in the spool, instead of forcing the coin away actually produces a kind of suction and holds the coin tighter than ever, so that the spool may be held in a position where the coin will fall off as soon as the current of air stops, while something seems to hold the coin on while the current of air is passing. A. There are many variations of the spool and coin experiment which you ask about. Some of these are given in Hopkins's "Experimental Science," which we send for $5. The most practical one is the ball nozzle of fire engine hose to disperse the water as it issues from the nozzle in a fine spray, the ball in the nozzle sticking tighter as the pressure of the water increases. The explanation is simple. The air is forced to spread out under the coin as it issues from the hole in the spool, and as it spreads the pressure of the air is reduced. The swifter the stream of air the more rapid the spreading of the air, and the more the consequent reduction of the pressure of the air under the coin. So the air under the coin has less pressure than the outer air, and this excess of pressure of the outer air it is which pushes the coin against the end of the spool.

(9723) J. W. M. says: Does the shadow of a cloud move over the earth's surface faster than the cloud, the cloud moving in an easterly direction? If so, is the difference susceptible of measurement? Would the time of day affect the answer to the question in any way? Or the direction of the cloud's motion? A. The shadow of a cloud does not move perceptibly faster than the cloud itself moves. Clouds vary in altitude above the earth's surface. Aeronauts at the highest altitudes attained have still seen cirrus clouds above them. The ordinary heavy cumulus clouds, however, are not at any high altitudes; probably five miles would be a maximum for them. So the distance of the cloud from the sun is almost the same as the distance of the earth's surface from the sun, and the shadow of the cloud, cast by the sun, will move with the same velocity as the cloud and in the same direction. Nor can the curvature of the earth, that is, the time of day, affect the relative motion very much.

(9724) H. N. asks: 1. G. F. in Query 9677 says: Is there any sound when there is no ear to hear it? I read in a book of the roaring gale on the vast ocean where no ship had ever sailed. The sea gulls were supposed to hear it. Now, can there be a howling gale without such obstructions as a ship's rigging, etc., to cause the sound? A. The explanation of what you write about sound is found in the dictionary in the meanings of the word. There are two. One is the sensation in the mind, as when you say "I hear a sound"; the other the mechanical cause of the sensation, as when you say a sound is produced by the vibration of some heavy body. In the first sense there is no sound where there is no ear to receive it. 2. What reduction is made in the lifting power of an ordinary hand well pump at different altitudes? A claims that at this elevation, 3,000 feet above sea level, 25 per cent of height should be deducted, i. e., the pump won't lift water 33 feet, but only 75 per cent of that height, or 24.75 feet. A. At an altitude of 3,000 feet the pressure of the air is about 27 inches when it is 30 inches at the sea level. This is a tenth less than normal; hence a pump will lift water nine-tenths as high as when the barometer is at 30 inches. The height to which an ordinary pump will lift water is practically 23 feet to 30 feet at full pressure; hence at 27 inches such a pump will lift 25 feet to 27 feet. This of course is on the supposition that the pump is in good condition.

(9725) S. L. S. asks: Please state whether the current from a step-down transformer is direct or alternating? A. All stationary transformers deliver alternating currents. The step-down transformer receives an alternating current of a certain voltage and changes it to a lower voltage. A step-up transformer delivers the current at a higher voltage than it receives it. Neither of them can transform a direct current. This can only be done by a rotary transformer. 2. How is a wireless signaling receiver made? A. The coherer is the principal instrument for receiving the signals by a wireless telegraph. Its construction is given in our SCIENTIFIC AMERICAN of September 14, 1901, price ten cents. Full details for the whole apparatus are to be found in this paper.

(9726) L. W. asks: In reference to the construction of condensers to be used in connection with induction coils, will you please advise, under Notes and Queries, whether it is absolutely necessary that the foil must be pure tin foil, or whether the ordinary foil used for various purposes, which I understand is a combination of lead and tin, will answer the same purpose equally as well? A. A condenser may be made of any kind of metal. Tin foil is ordinarily used, since it can be rolled into very thin sheets, which also have considerable strength and stiffness. It is also light as compared with the heavy and thick sheets of the so-called tin foil, which contains lead. Only the surface of the plates of the condenser have any part in its action. Hence the lighter the sheet, the better adapted it is for the purpose.

(9727) H. L. B. writes: While experimenting with a small induction coil, I discovered the following, which may be useful to some, i. e., on the interrupter, not having platinum points, if a drop of water be placed on the point of contact with the vibrator, the interrupter will work perfectly, just as if it had platinum contact points. A. Water acts to keep the contact points cool. A break under water would be better, and under oil better still. Alcohol makes a very sudden break, and is used in some interrupters to cover the contact of the vibrator.

(9728) J. L. P. asks: What is the difference in one square foot and one foot square? A. In one sense there is no difference between a square foot and a foot square, that is, 1 square foot and 1 foot square. Both mean a figure with four right angles and four equal sides, containing 144 square inches. In another and better sense there is a difference between the terms. A foot square is a square figure one foot on a side; but a square foot is any area which contains 144 square inches. If one buys a square foot of board, he may wish a piece 1 inch wide and 12 feet long, or a piece 6 inches wide and 2 feet long, or any other shape which will give him 144 square inches in area. You may have a square foot in the form of a circle or an irregular figure of any conceivable shape. In the last sense, a square foot is not the same thing as a foot square. If you had carefully defined the words you were using, you need not have bet about it. But we cannot decide the bet unless we decide that the two expressions are *not the same.*

(9729) F. M. asks: Please tell me how many pounds each of magnet wire are required for the armature and field magnet for the simple electric motor described in SUPPLEMENT No. 641. Will the simple electric motor work if made twice the original size? A. The amount of wire required for the simple electric motor of SCIENTIFIC AMERICAN SUPPLEMENT No. 641 is about as follows: For armature core, 200 feet No. 18 B. & S. iron wire, about 1¼ pounds; for field, 400 feet No. 16 B. & S. wire, 3¼ pounds; for armature, 350 feet No. 18 B. & S. wire, 2½ pounds. As some will wind the wire more closely than others these amounts are only close approximations, and it would be better to allow a slight excess. It is not advisable to build the motor larger, since it is not adapted to heavy work. It is designed for an amateur to build who has little experience with tools. Its wooden parts will not stand strain. It is an excellent machine for its purpose.

In our reply to Query 9681, issue of July 15, by a typographical error 32 thousand millions, English, was made equivalent to 32 millions, or 32,000,000 French. Of course, any one who knows will see that the word *millions* should be *milliards*, the French word for a thousand million.

NEW BOOKS, ETC.

THE STUDY OF CHEMICAL COMPOSITION. By Ida Freund. Cambridge: University Press, 1904. 8vo.; pp. 650. Price, $5.50 net.

This work, which is one of the books in the Cambridge Physical Series, gives an elaborate account of the method of chemical composition and the historical development in the study of the same. In the earlier part of the work the author has sought to demonstrate that the notation by which chemical composition is usually represented can be developed from a purely empirical basis, independent of any hypothesis concerning the ultimate constitution of matter; while in the subsequent treatment of the subject of composition on the basis of the atomic and molecular theory, she has endeavored to keep distinct the boundary line between facts and hypotheses, and to emphasize those special features of the argument which bring out the nature and function of hypotheses, and their place and importance in the science of chemical composition. The author has dealt in detail with a few researches which she could utilize repeatedly from various points of view, rather than tracing separately the entire historical development of the subject. She has not only stated final results, but has reproduced the values obtained in the actual measurements made, so as to indicate the scope of the work involved, and the degree of accuracy obtained in each instance. In stating the various great discoveries, Miss Freund has quoted largely from classical memoirs, and has given as much as possible the actual language used by the experimenters in announcing their own discoveries. The book has also a considerable number of explanatory interpolations and footnotes which will greatly aid those having no previous knowledge of chemistry in following its argument. The chapter on crystallography, which has been introduced into the work, will be found valuable to the average student, because not enough information on this subject is available in current textbooks to allow one to appreciate the results obtained in the study of the relation between crystalline form and chemical composition. All the great discoveries in the science of chemistry will be found set forth in considerable detail within the pages of this work.

THE NEW KNOWLEDGE. By Robert Kennedy Duncan, Professor of Chemistry in Washington and Jefferson College. New York: A. S. Barnes & Co., 1905. 8vo.; pp. 263. Price, $2.

This volume of the New Science Series gives in a popular manner the information to date upon many of the problems in physics and chemistry which are of interest to-day, and which have not been altogether solved. Such conceptions as the three entities; compounds and elements; the periodic law; gaseous ions; the resolution of the atom; and inorganic evolution are described in full. A considerable portion of the work is given up to radio-activity, which is discussed in all its forms. The last part of the work deals with the new knowledge and old problems, and explains, from the modern point of view, such things as the age of the earth, the zodiacal light, aurora borealis, and atmospheric electricity. The reconstruction of the universe is also discussed, and the definitions of science redefined. The book will, no doubt, serve its purpose as a popular science volume, and will be found of real value.

OUTLINES OF INORGANIC CHEMISTRY. By Frank Austin Gooch and Claude Frederick Walker. New York: The Macmillan Company, 1905. 8vo.; pp. 514. Price, $1.75.

In this textbook of chemistry it has been the aim of the authors to introduce the student to the study of the science by the consideration of the simplest and fewest things. The experimental phenomena have been so placed that the inferences drawn from them can hardly be missed. The book is in two parts, of which the first treats of the consecutive experimental development of the principles upon which systematic chemistry rests. With such inductive reasoning the consideration of the identity of substances, chemical change, the chemical elements, and the laws of combination and chemical equivalents naturally come first. In treating of equivalents—electrical, chemical, and thermal—electrical phenomena and ions, and the constitution of acids, bases, and salts from the ionic point of view; conditions of action and equilibrium; and the thermal relation of chemical action, are all discussed in succession. From this discussion the idea of valence is developed, as is also the conception of the molecule.

In the second part of the work the discussion of the properties of elements and their compounds is gone into. With some modifications, Mendeléff's periodic system is followed, as it enables orderly treatment. Graphic symbols are employed, and the ionic terminology has been made use of, the function of ions as parts of compounds and units of reaction being pointed out. The book is one of the latest and best elementary textbooks of chemistry which has so far been published.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending July 25, 1905

AND EACH BEARING THAT DATE

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

Abdominal supporter and truss, B. F. Lacy, 795,624, 795,625
Absorbent and deodorizer, S. T. Tatti..... 795,562
Accordion, J. Galleazzi 795,795
Acids, making alkyl-barbituric, A. Einhorn 795,495
Adding machine carrying mechanism, C. Wales 795,378