RECENTLY PATENTED INVENTIONS.

Pertaining to Apparel.

TROUSERS PRESSER AND CREASER.—R. M. TATE, Somerset, Ky. By means of a curved board and a flexible apron the inventor secures uniform pressure on the trousers, and this pressure may be assisted in forming the crease by pressing with the hand or some other substance, an iron, if necessary, upon the apron. When the lever is drawn to strain the apron over the bed, it will be stopped by engagement with the folding leg. The apron is made so as to conform to all inequalities of garment thickness, thus giving pressure in every portion.

EAR-GUARD.—I. D. JAMES, Roselle, N. J. The guard has means for retaining itself in the desired angular relation to the side of the face. The device is so constructed that while thoroughly protecting the ear of the wearer from the wind and rain and preventing entrance of dust or dirt it also serves to convey ordinary or nearby sounds to the auditory canal so that there is no difficulty in carrying on conversation with occupants of automobiles or other vehicles.

Electrical Devices.

ELECTRIC MOTOR.—D. MENDELSON, New York, N. Y. The inventor utilizes the attraction value of the remote ends of both electromagnets as well as their proximate ends—that is, in addition to the attraction value between the adjacent ends of the movable magnet and the stationary electromagnet he utilizes also the attraction value of the two ends of these magnets which are remote from their adjacent poles. The next feature consists in means for reversing the current through the movable and the stationary electromagnet at short intervals to clear out or prevent accumulation of residual magnetism.

Of Interest to Farmers.

COTTON PICKING AND HARVESTING MACHINE.—W. H. LE VIN, New Orleans, La. The invention relates to the class of pickers and harvesters in which pneumatic force and suction-hose are used. The objects are to provide a means for the easy application of suction-hose to the ripe cotton-boll at all stages of development of the maturing plants and by means of an automatic picker detach the matured cotton.

INCUBATOR.—G. H. LEE, Omaha, Neb. This improvement pertains to incubators and the object of the inventor is to improve the circulation of the warm air and ventilation of the eggs during incubation. Further objects of the invention are to render the heating of the eggs more uniform and to provide improved means for supporting the eggs in the egg-tray.

CHURN.—G. LAKE, Memphis, Tenn. Mr. Lake's invention is an improvement in churns which are provided with vertical rotary dashers that are operated by a horizontal shaft arranged above the churn body and suitably geared with the dasher. It is also applicable for mixing various materials, such as paint, cream, paste, powders, and drugs.

GATE.—O. E. CONAT, North Yakima, Wash. One purpose of this invention is to provide a lever-operated gate or a farm-gate that will be perfectly safe, not liable to stop on a dead-center and return to a shut position while a person or vehicle is in transit through the gate, and also to so construct the gate that it will be light, simple, strong, and economic and so evenly balanced that it can be operated with ease by a child.

COMBINED COOP AND BROODER FOR YOUNG CHICKENS.—J. A. CLARK, Bolckow, Mo. A combined coop and brooder is employed, embodying special means for preventing overcrowding of the young chicks in the compartment in the structure, due to which hitherto poultrymen or culturists have incurred considerable losses by smothering of chicks in large numbers, it being their peculiarity to crowd together in small space in the coop or brooder however ample the housing provisions. Special means are provided for airing, fumigating, and ventilating.

Of General Interest.

LEAF-TURNER.—K. H. DILLON, Philadelphia, Pa. The apparatus of this inventor is primarily intended for turning sheet music. The individual arms provided for each sheet are operated in succession by means of a treadle, the arms being mounted in connection with a rock-shaft which connects with the treadle by a cord. A torsion spring is provided for returning the shaft after each movement of the treadle. The mechanisms include means for readily permitting the assemblage and rearrangement of the turning arms as desired.

HOIST.—S. T. WALLACE, Los Angeles, Cal. The object is to primarily adapt the invention to handling mortar, lime, cement, brick, and other material required to be carried in a hopper or bucket. A carriage is provided adapted to move along a vertical track and mount pivotally a bucket. Coacting with the bucket is a peculiar latch and trip, by means of which the bucket is held during the ascent and automatically released when the top of the track is reached, the bucket being pivoted off center, so that as the bucket is released it automatically tips and dumps its load.

SOAP.—L. H. REUTER, New York, N. Y. This liquid soap or soap solution is for toilet and medicinal purposes and for use in the arts. The method of making soap consists in saponifying oils or fats with an alkali, dissolving the alkaline soap in water and alcohol, allowing the liquid to settle, filtering, adding gradually a predetermined quantity of a salt of perboric acid, stirring the liquid during process of dissolution, keeping temperature low, and adding finely powdered boric acid in small portions.

Hardware.

WRENCH.—J. CHRISTIAN, Hydraulic, and C. E. WETZEL, Naturita, Col. This implement may be readily adjusted and securely locked in position. The side of a recess remote from the pivot engages a projection upon the wedge when the handle is swung outwardly and tends to move the wedge slightly downward upon the bar, whereby to loosen the wedge from between the frame and the bar. In this construction the long arm of the handle is provided with means for tightening the wedge, while the short arm is provided with means for loosening the wedge.

Machines and Mechanical Devices.

REDUCING AND SEPARATING SYSTEM.—M. S. WEBER, Ephrata, Pa. A coffee-berry has, between and within its sections, an integument, which is a continuation of a hull and which is not removed in preparing coffee for the market. This contains tannic acid, which impairs the flavor and renders it unhealthful. To remove this substance and to furnish means for reducing or grinding the berry for use are the objects of the invention.

PULP OR PAPER STOCK SCREEN.—W. W. WELLS, Sandy Hill, N. Y. The object of the present invention is to provide a new and improved screen arranged to permit of screening an exceedingly large amount of pulp or paper stock in a short time. It relates to pulp or paper stock screens such as shown and described in Letters Patent formerly granted to O. H. Moore, in 1902 and 1903.

DEVICE FOR MAKING AND FINISHING BOTTLE-NECKS.—W. S. BREEDEN and H. H. BREEDEN, Bradford, Pa. The invention relates to a machine for making and finishing the necks of glass-blown jars, bottles, and homeopathic vials; and the purpose is to provide a machine in which a revoluble shaping and polishing tube is employed for that portion of the tube to be formed into the neck, and means for adjusting the bottle to the said tool, and also means for bringing the tool quickly into and out of action with relation to the neck.

TOOTH-BAR.—T. O. BERG, Little Falls, Minn. The improvement is in tooth-bars used in sawmills for shifting and turning logs, one of the objects being to provide a tooth-bar formed in a single casting, thus giving it greater strength and rigidity than is found in bars made in several pieces riveted together, as such a bar is weakened on account of the great number of rivet holes.

Prime Movers and Their Accessories.

ROTARY MOTOR.—A. PRIMAT, 103 Rue Lafayette, Paris, France. Four rigidly-connected pistons rock around a central point, moving in cylinders arranged circularly in the casing of the motor, cast in a single piece, this rocking movement being converted into continuous circular movement by means of a connecting-rod and crank, while the explosive mixture is conducted alternately into each of the four cylinders so that an explosion takes place for each reciprocatory movement, while the suction, compression, and the exhaust of the burnt gases take place alternately in each of the other cylinders, owing to the provision of a set of valves.

Railways and Their Accessories.

SWITCH-TONGUE GUARD.—M. MALIA, Scranton, Pa. The invention refers to improvements in guards for the free ends of railway-switch tongues, the object being to provide a simple device to prevent chains, couplings, stretchers, or other devices that might be dragging from a car from catching over the end of an open switch-tongue, thus preventing damage or possible accidents.

Pertaining to Recreation.

MARINE ILLUSION APPARATUS.—F. M. WHITE, Fort Worth, Texas. Two boats are apparently floating in a waterway, and a fixed structure spans the latter intermediate the boats. The first boat is tied to a dock by which passengers are transported along the waterway until the fixed structure is met, and through this they pass onto the second, which is stationary, but capable of being rocked to simulate motion of a boat and also provided with paddle-wheels revolved to produce further illusion of propulsion. Passengers suppose that they pass through the bow to stern of boat instead of making the transfer, as stated. The second boat is moored within a building ornamented with marine views and moving pictures are thrown on a screen, giving a steamboat tour with realistic effect.

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. 8350.—Wanted, the name and address of the manufacturer of the Imperial Smoothing Iron, which is heated by gasoline or oil.

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

Inquiry No. 8351.—Wanted, the name and address of the patentee and present manufacturer of the toy top called the New 20th Century Gyroscope.

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

Inquiry No. 8352.—Wanted, manufacturers of decorated glass, such as used in clock doors and quaint dials.

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

Inquiry No. 8353.—Wanted, manufacturers of bricks made of sawdust compressed with coal oil.

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

Inquiry No. 8354.—Wanted, the name and address of the manufacturer of the Mars Gas Engine Lubricator.

The celebrated "Hornsby-Akroyd" safety oil engine. Koerting gas engine and producer. Ice machines. Built by De La Vergne Mch. Co., Ft. E. 138th St., N. Y. C.

Inquiry No. 8355.—Wanted, the name and address of the manufacturers of the following: Alarm watch, automatic time stamps and registers, and Baldwin's calculating machine.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machine work and special size washers. Quadriga Manufacturing Company, 18 South Canal St., Chicago.

Inquiry No. 8356.—For manufacturers of adding and listing machines.

Inquiry No. 8357.—For manufacturers of large magnets.

Inquiry No. 8358.—Wanted, makers of models, in the steam line, or just boilers and engines.

Inquiry No. 8359.—Wanted, machinery for the manufacture of alcohol from apples, molasses and sugar.

Inquiry No. 8360.—Wanted, machines for grinding the straw of alfalfa into meal.

Inquiry No. 8361.—Wanted, plans and specifications for a one-story, frame Knoch Down building, size and appearance suitable for a small machine shop.

Inquiry No. 8362.—For parties engaged in making small buildings, Knoch Down, suitable for small machine shop.

Inquiry No. 8363.—Wanted, machinery to make wooden bungs, stoppels, etc.

Inquiry No. 8364.—Wanted, a machine for extracting fibers from plants.

Inquiry No. 8365.—Wanted, makers of buckram for carriage work, also manufacturers of malleable corner irons used in buggy work.

Inquiry No. 8366.—Wanted, makers of reliable melodeon cloth, and a general line of buggy oil cloth.

Inquiry No. 8367.—Wanted, a mill for grinding lumps in cup grease.

Inquiry No. 8368.—Wanted, apparatus for the distillation of wood for charcoal, wood spirit and acetic acid.

Inquiry No. 8369.—Wanted, manufacturers of pulley rims, for motor cycle outfits.

Inquiry No. 8370.—Wanted, makers of glasses with miniature pictures, such as are in knife handles, etc.

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.

(10158) E. B. asks: 1. I want to magnetize an ordinary twist drill, making a magnet of it. Will I have to draw the temper of the drill first, or can I make a magnet of it as it is? A. The cutting end is already hard enough for your purpose. Heat the other end to redness and plunge into water, then magnetize. 2. How many amperes of current will it take to magnetize it by means of a coil of 6 or 8 layers of No. 18 silk-covered wire, the current being 110 volts? A. You must be governed by the heating of your coil. Use only so much current as will not heat the coil so that the insulation burns. That would destroy the coil. 3. In making a permanent magnet of tool steel, shall I first soften the steel before magnetizing it, or should it be hardened at the ends? A. Harden the bar at the ends glass hard.

(10159) E. S. D., Jr., writes: 1. I would like to know if you could give me the formula for a solution for bichromate cells, with a good ampere output, in the right proportions, and how to mix it, etc? A. A good solution may be made after the method described in SUPPLEMENT No. 792, price ten cents. 2. Which is the best form of bichromate to use for making electropoion fluid—the sodium or the potassium? A. The sodium salt is easier of use. 3. What is the best way of amalgamating a zinc? A. The usual method is to clean the plate with dilute sulphuric acid, and then rub mercury over the plate, dipping it into the dilute acid if necessary to make the mercury take to the surface. 4. I would like to know if I could have a battery rheostat made for these batteries, steady current, etc.? A. Yes; though there is little need of one. The amount of current can be regulated by immersing the zincs to a greater or less depth in the liquid.

(10160) W. G. S. asks: 1. What is the output in amperes of the common telephone battery called sal-ammoniac battery? A. The Leclanche cell gives probably 3 amperes as a maximum discharge rate. 2. Also of the dry battery called the 1900, and does the size of the battery govern the number of amperes? A. A dry battery has a small discharge rate. The amperes of discharge of any cell are greater with a large than with a small plate. 3. Also give output in amperes of the common Crowfoot gravity battery, 6 x 8 size. A. You will not be far wrong to take the discharge of the gravity cell at two amperes. 4. Where can I get a table giving the above information? A. Most cells are rated in Carhart's "Primary Batteries," price $1.50 by mail.

(10161) D. C. E. asks: 1. Which is the correct way to place a fuse block—outside or inside the cut-out switch? I have seen fuse blocks put outside the switch, but doubt its being right. A. Switches are placed so that the handles turn down when opened. They cannot then drop by gravity and close themselves. This is much more important than the position of the fuse. 2. Tell me the best oil to use on commutators. A. Use some one of the commutator compounds prepared for this especial purpose.

(10162) H. B. asks: What in your opinion is the best material or substance to cut off or take away the power of the magnet? For instance, a magnet will draw steel toward itself; what can be placed between the piece of steel and the magnet to take away the power of the magnet to draw the steel? A. Iron of considerable thickness is the only screen against the lines of magnetic force.

(10163) P. S. S. asks: What solution is used in plating, for instance silver, or nickel, when batteries are used for circuit? A. For nickel the double sulphate of nickel and ammonium is commonly employed, and for silver the cyanide of silver is almost universally used. Full instructions are to be found in Langbein's "Electro-Deposition of Metals," price $4 by mail.

(10164) A. B. McK. asks: Will you kindly give me what information you can on the following subject? Take a piece of steel and cut in two pieces. Make one as soft as possible and the other as hard as possible; now, what will be the difference in resistance in ohms, if any? A. Barus and Strouhal give the specific resistance of glass-hard steel as 45.7 and of soft steel at the same temperature as 15.9. This is the resistance in thousandths ohms of a bar one square centimeter in cross section.

(10165) M. and S. J. write: If iron or steel is properly cleaned before plating with nickel, it can be burnished like silver without peeling or stripping, therefore, the burnish is a good test for poorly nickeled goods, as the loose nickel will come off.

(10166) C. W. asks: Please inform me as to the difference between an aneroid and a holosteric barometer. A. The word *aneroid* is from two Greek words meaning without liquid, and the word *holosteric* is from two Greek words meaning wholly solid. They are two names for the same thing. There is no difference between them.

(10167) G. M. D. asks: What should be the dimensions, size and amount of wire for a 12-inch coil, 15-inch coil and 18-inch coil? Is there any definite relation existing whereby the above information may be determined from a known coil? A. The dimensions of induction coils are the result of experience rather than of calculation. The properties of the magnetic circuit and the effects of induction are well known, and can be applied to an induction for giving sparks; but almost every builder works from designs which have been wrought out by experiment and are known to give good results. The sizes and windings of certain large coils are given in Hare's "Large Induction Coils," price $2.50 by mail.

(10168) H. O. writes: Can you give us a formula for a preparation for the tempering of mill picks? A. The treatment of mill picks before hardening is of far greater importance than any hardening preparation other than salt water, which is the only menstruum that we can recommend. No hardening solution can recover the lost properties of steel that has been overheated, burnt corners of mill picks, or hammering at above or below a full red heat. Cyanide of potassium dissolved in the hardening water or powdered and sprinkled on the red-hot point before dipping, or even common soap rubbed on the pick before heating, are used by experienced men in the business.

(10169) F. H. P. asks: Is it possible to wind a spark coil of the simple pattern and

make a jump spark coil of it? If so, kindly give directions and state the way it should be coupled up. A. A simple spark coil may be made with a core of iron wire (No. 16) 10 inches long and one inch in diameter. Fasten heads for the spool on this, and cover the core with a few turns of brown paper. Wind No. 14 single cotton-covered magnet wire on this to a depth of about ⅝ inch, insulating each layer from the next by a layer of paper. It is better to give each layer a coat of shellac also. The coil is used in series with a battery, and the spark is obtained when the circuit is broken. With six or eight strong cells a thick spark will be given.

(10170) F. H. R. writes: I have a stereopticon lantern, and have been experimenting some with it. For a screen I have a blank wall tinted an orange red. Can you tell me what colored glass I can use with my lens in order to throw a white light upon the red surface? A. To obtain the best effect you must find a glass of a tint the exact complementary of the color of the wall. This will be a bluish green. Of course much light is lost both by the absorption of the wall and of the glass. We should suppose that very little would be left.

(10171) G. W. H. asks: How can I connect the wires on the carbon element of an open circuit, home-made battery which I have? I use sal ammoniac. They work fine for about two weeks, when I have to renew connections on the carbon. It seems the fluid rises within the carbon and corrodes the wire. Have tried paraffine and also rubber on the outside, but to no avail. The carbons are arc-light pencils, well up out of the fluid. A. Dip the tops of the clean and dry carbons into melted paraffine till they are saturated with the paraffine as far as the surface of the liquid, so that the sal ammoniac cannot climb through the carbon, nor over the outside of it. In sal ammoniac cells usually there is a thick head of composition on the upper end of the carbon.

(10172) A. K. M. asks: 1. Can you let me know the cheapest and most simple way of producing oxygen? A. Oxygen is generated by heating a mixture of manganese dioxide and potassium chlorate in a metal flask. Care is necessary in doing this not to disengage the gas too rapidly and thus produce an explosion of the apparatus. The materials also should be tested in advance to see that they will give up the oxygen quietly and not too rapidly. 2. Can you explain what caused electric sparking at point of connecting 3-inch suction pipe let in from top of tank car containing a mixture of turpentine and naphtha, the discharge pipe from pump leading to large storage tank of several thousand barrels of the same mixture? Also being connected with large storage tanks of gasoline and carbon oil. The suction pipe being of iron, every attempt made to connect would cause heavy sparking, so that the men dared not connect for fear of fire, the temperature being about 15 deg. Fahr., having had cold weather for some time; whereafter the men got a suction pipe of galvanized iron, let it down into the tank car, and in connecting there was no more sparking. A. The charge of electricity was due probably to the very cold air and friction of the pipe and pump. If the liquid was not set on fire by the sparks which passed while the men held the pipe near the tank, it could not have been after they had brought the ends into connection with each other. The danger would then have been over. These oils are not conductors of electricity.

(10173) J. F. C. asks: 1. What advantages has the double pole receiver over the single pole (as they are called) electrically? Why would not one coil, the same resistance of the two, placed on one pole of a permanent horseshoe magnet (traversed by an alternating current) affect the magnet flux as much as the two coils of half the resistance, one placed on each pole? A. A horseshoe magnet is always stronger than a bar magnet of the same number of turns of wire upon its poles, and so a double pole magnet in a telephone will act more powerfully than a single pole of a straight magnet. 2. Is pure soft iron free from resistance to magnetic flux? What is the resistance of the air to magnetic flux as compared to pure Norway iron? A. The number of lines of force which will pass through iron as compared with air under the same degree of magnetization varies with the degree of magnetization. It may be as much as 5,000 times as many, and it may be only a few times as many when saturation is nearly reached. See the table of permeability in electrical works such as Foster's "Pocket Book," price $5 by mail. 3. Which is correct to say, that a magnet attracts a piece of soft iron because it lowers the resistance of the magnetic flux, or that an opposite magnet is induced in its mass by induction? A. When a piece of iron approaches a magnet it both becomes a magnet and furnishes an easier path for the lines of force than the air. 4. Is the *greatest* force of attraction exerted in a magnet in attracting opposite poles of itself? A. We do not know whether a magnet works most in attracting its own poles or not. 5. What electrical disturbance is made by the action of the wind on telephone wires that a receiver takes it up? A. The noise to which you refer in a telephone is produced by vibrations caused by induction of adjacent wires and not by the friction of the wind. The wind produces no electrical disturbances.

NEW BOOKS, ETC.

THE CHEMISTRY OF PAINTS AND PAINT VEHICLES. By Clare H. Hall, B.S. New York: D. Van Nostrand Company, 1906. 12mo.; pp. 134. Price, $2.

In the great mass of analytical chemistry it is often difficult to discover particular methods applying chiefly to any one subject, or, rather, to find those methods concisely collected between the covers of a single volume. The author has attempted to sift out those methods which apply particularly to the analysis of paints, while at the same time dwelling with a certain degree of completeness upon the most important physical characteristics of the raw material; for it will be understood that no chemist can be proficient in the analysis of paints without a thorough knowledge of all the materials with which he comes in contact. Of course, the limits of the book make it impossible to give more than the general facts regarding these raw materials. While the information has been written from the standpoint of the chemist, the author tries to bridge the space between the laboratory and the factory, and to show that the less this space is in evidence, the better will be the resulting product of the manufacturer.

DWARF FRUIT TREES. By F. A. Waugh. New York: Orange Judd Company, 1906. 16mo.; pp. 125. Price, 50 cents.

American agricultural and horticultural conditions are usually on so large and extended a scale, especially in a commercial sense as well as in a physical one, that these subjects have hardly been introduced as avocations and pastimes, and the growing of trees largely for pleasure has been hitherto extremely limited. The author of this book will doubtless succeed in his undertaking of arousing interest in dwarf fruit trees more as a pastime than as a commercial enterprise, though the latter is by no means precluded.

THE AMERICAN STEEL WORKER. By E. R. Markham. New York: The Derry-Collard Company, 1906. 16mo.; pp. 339. Price, $2.50.

Mr. Markham's book, which has reached its second edition, is based on the experience of nearly a quarter of a century in the selection, annealing, working, hardening, and tempering of the various sorts and grades of steel. The new edition contains an interesting section on high-speed steel, which includes the latest information on the subject, thereby bringing the text to a condition of completeness which was lacking in the earlier edition.

JAHRBUCH DER NATURWISSENSCHAFTEN 1905-1906. By Dr. Max Wildermann. Freiburg im Breisgau: Herderfsche Verlagshandlung, 1906. 8vo.; pp. 501. Price, $2.

The interesting volume edited by Dr. Wildermann, with the collaboration of eminent experts, is a comprehensive survey of the advances that have been made in the natural sciences during 1905-6. The latest developments in physics, chemistry, astronomy, mineralogy, zoology, botany, geology, and many other fields of science are discussed, often in detail, and frequently with excellent illustrations. This book will be found valuable for the general reader, who desires to keep in touch with the general advances of our age in science and natural history.

OUTLINES OF THE EVOLUTION OF WEIGHTS AND MEASURES AND THE METRIC SYSTEM. By William Hallock, Ph.D., and Herbert T. Wade. New York: The Macmillan Company, 1906. 8vo.; pp. 304. Price, $2.25.

The authors declare themselves flatly in favor of the metric system, both on the ground of its intrinsic superiority and because of the manifest advantage of having a universal system of weights and measures for all industries throughout the world. A complete and fair history of the metric system is given in the various chapters of the volume, with its logical development and chief characteristics. An account is given of the experience of the European nations which have tried and adopted the system. The citation of the authorities is voluminous, and the references to the bibliography of the subject are extensive. The tables of equivalents have been carefully worked out, and are put in very convenient form, and therefore as a work of reference on the subject the book will doubtless be found scholarly and useful.

ITALIAN VARNISHES. By George Fry, F.L.S., F.C.S. London: Stevens & Sons, Ltd., 1904. 16mo.; pp. 170.

Little attention has apparently been given to the subject of the varnishes used on the old Italian musical instruments, and the theory has been accepted that these are oil varnishes, or rather an oil varnish colored to suit individual tastes. The author gives an account of the interesting research which forms the subject of the treatise, and he shows, to his own satisfaction at any rate, that the old violin makers used as the constituents of their varnishes the natural products of coniferous trees and the flax growing in their immediate vicinity, both abundant and easily procurable, and that therefore the varnish was a simple one composed of resin and turpentine, or both of these with linseed oil. The work is interesting from the standpoint of the chemist as well as from that of the general reader.

FIELD TO DAIRY. By William Shepperson, F.C.S. London: Simpkin, Marshall & Co., Ltd., 1906. 16mo.; pp. 49. Price, 80 cents.

The object in gathering the material in "Field to Dairy" was to give in as concise a form as possible the essential points pertaining to the management of fields and cattle, and the production of milk, cream, butter, cheese, and various by-products in the dairy. The little volume will be found a handy book of reference where time is lacking for the study of a completer history of any particular subject.

FARM SCIENCE. By Joseph E. Wing, P. G. Holden, Waldo F. Brown, Hon. W. M. Hays, Thomas Shaw, Clinton D. Smith, Cyril G. Hopkins, and Fred R. Crane. Chicago: International Harvester Company of America, 1906. 32mo.; pp. 128.

This excellent little book has been compiled by a number of eminent specialists for the particular purpose of assisting American agriculturists in the work of farm management. With this end in view, the highest authorities in their respective fields of research have been called upon to prepare a number of special articles covering the results of extended experiments involving the most important operations on the farm, and the subjects treated deal substantially with every branch and phase of modern agriculture and cover a wide range of thought. It is generally conceded that the astonishing progress made in agriculture in this country is due mainly to the intelligence of the American farmer, notwithstanding that considerable credit must be given our unlimited agricultural resources, and to the material assistance rendered the farmer by the work of inventors who, recognizing the necessity of improved methods, have supplied both machines and implements to lighten or entirely obviate manual labor. A careful perusal of "Farm Science" will undoubtedly suggest methods of improving the quality or yield of the crops, of making the dairy more profitable, and of securing larger results with less labor.

ROPP'S COMMERCIAL CALCULATOR AND SHORT-CUT ARITHMETIC. By C. Ropp. Chicago: C. Ropp & Sons, 1906. 8vo.; pp. 160. Price, $1.

In this convenient volume the author gives a new, complete, and quite comprehensive system of tables intended to save time and labor in the various phases of commercial calculation. The text includes condensed and simplified explanations, rules, and reviews of the essence of arithmetic and mensuration. It is designed for the use of farmers, mechanics, business and professional men, bankers, and storekeepers. The explanations of the principles of arithmetic, mechanics, and mensuration are well prepared, and the book will doubtless make the study and use of figures easy, if not interesting, for the user. Altogether, the work is convenient, practical, and labor-saving, and will be found useful by business men.

SCHOOL TEACHING AND SCHOOL REFORM. By Sir Oliver Lodge. London: Williams & Norgate, 1905. 16mo.; pp. 171. Price, $1.20.

This book by the well-known English educationalist, Sir Oliver Lodge, should be of interest and value to teachers in Great Britain and this country. The text comprises a series of four lectures on curricula and methods, and they were intended for the information of teachers in general, notwithstanding that they were delivered before the secondary teachers and teachers in training at Birmingham.

GAS ENGINES AND LAUNCHES. By F. K. Grain. New York: Forest and Stream Publishing Company, 1905. 16mo.; pp. 123. Price, $1.25.

This little manual is a collection of a series of papers published in Forest and Stream on internal-combustion engines and launches. The subject is placed before the reader in terms which are easily understood even by the inexpert, and technicalities have been avoided wherever possible. The illustrations are clear and sufficient in number advantageously to supplement the text.

PORTLAND CEMENT. By Richard K. Meade, B.S. Easton, Pa.: The Chemical Publishing Company, 1906. 8vo.; pp. 385. Price, $3.50.

One of the latest contributions to the literature of the cement industry is this book, which is really a second and enlarged edition of a small handbook by the same writer published some years ago. Of course, the advance of the industry necessitated the rewriting of large sections of the earlier work, and the addition of much information and data collected since then. The analytical methods given have been found satisfactory in the writer's laboratory. The section on the analyses of cement is exceptionally good.

THE ELECTRICAL NATURE OF MATTER AND RADIOACTIVITY. By Harry C. Jones. New York: D. Van Nostrand Company, 1906. 8vo.; pp. 212. Price, $2.

Prof. Jones's book is a collection of a series of articles which he wrote for the Electrical Review, and the correlation of the subjects under consideration, as well as the general interest of which they are worthy, thereafter led the discussion to be placed in compact form in a single volume. The text has been carefully revised with the assistance of Dr. H. S. Uhler. The object of the lectures was to place as far as possible, in non-mathematical language, the important facts and conclusions in connection with the work on the subject, and this has been done in the interest of those who, while having a really scientific interest in the developments in physics and physical chemistry, nevertheless are ill equipped technically and mathematically to comprehend a purely scientific treatment of the subject. Thus, while the work has been written in a semi-popular style, the subject has doubtless been covered with scientific accuracy.

THE ANALYSIS AND SOFTENING OF BOILER FEED-WATER. By Edmund Wehrenfennig in collaboration with Fritz Wehrenfennig. Translated by D. W. Paterson, M.E. New York: John Wiley & Sons, 1906. 8vo.; pp. 290. Price, $4.

The present form of this book is the result of a number of changes from the original one, in which it appeared as an essay in "Das Organ fuer die Fortschritte des Eisenbahnwesens" of Austria. The translator first performed that part of the work for his own personal information, but it was found to contain so much excellent data of practical value and general interest, that it was decided to place the book before the public. The chemistry of the subject is treated with great care, and includes simple methods of analyzing water intended for boiler feed. These methods are explained in such a manner that they can readily be understood even by the layman. Certain European railroads have been very successful in softening water intended for steam purposes, and the exposition of their methods should be of use and value to American roads introducing or contemplating the utilization of water-softening plants.

NEW EXTENSIVE A B C TABLES FOR AZIMUTH, POSITION LINES, ERROR IN LONGITUDE DUE TO AN ERROR IN LATITUDE, ETC. By S. Mars. Groningen: P. Noordhoff, 1906. 12mo.; pp. 56.

ILLOGICAL GEOLOGY. The Weakest Point in the Evolution Theory. By George McCready Price. Los Angeles: The Modern Iconoclast Company, 1906. 8vo.; pp. 93. Price, 25 cents.

UNSOLVED PROBLEMS IN METALLURGY. By Robert Abbott Hadfield, M.Inst.,C.E. London: The Institution of Civil Engineers, 1906. 12mo.; pp. 36.

DIE ABHANGIGKEIT DER BRUCHLAST VOM VERBUNDE. By Dr. Ing. Fritz v. Emperger. Berlin: Wilhelm Ernst & Son, 1906. 8vo.; pp. 47.

AUTOMOBILI STRADALI E FERROVIARIE PER TRASPORTI INDUSTRIALI. By Ing. Ugo Baldini. Milan: Ulrico Hoepli, 1906. 8vo.; pp. 351.

OPERE. Vol. II. By Galileo Ferraris. Milan: Ulrico Hoepli, 1903. 8vo.; pp. 473.

THE QUEST OF THE GERM. With Observations Thereanent. By Eugene H. Wood, A.M., M.D. Milwaukee: Published by the Author, 1906. 12mo.; pp. 229. Price, 75 cents and $1.50.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending September 11, 1906.

AND EACH BEARING THAT DATE

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

Account register, Staples & Potter..... 830,936
Agricultural implements, riding attachment for, L. E. Waterman 830,690
Air and other gases, apparatus for liquefying, R. P. Pictet 830,613
Air compressor, compound, E. Hill 830,503
Air or oxygen, apparatus for producing highly ozonized, A. Dechaux 830,975
Amalgam carrier and plugger, H. W. Arthur 830,872
Amusement apparatus, F. W. Thompson.. 830,853
Amusement device, F. Ingersoll 830,838
Amusement device, E. H. Lanier..... 831,012
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Anthracene derivative and making same, M. H. Isler 831,002
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Axle spindle, T. Babbitt 830,955
Bag holder, J. J. Hatin 830,994
Bale bands, fastening, D. M. Campbell.... 830,966
Ballot, pocket, M. Dunn 830,979
Barrel, knockdown, Milligan & Bee..... 830,670
Bearing for the ends of shafts, roller, W. T. Fleming 830,985
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Belt coupling, J. N. Johnson 830,593
Belt fastener, E. Mundschenk 830,913
Belts, machine for attaching slats to conveyer, W. T. Gordon 830,709
Berth, ship's, D. Tagliafico 831,019
Binder, H. E. Dade 830,573
Binder lock, loose leaf, A. D. Hulquist.... 830,835
Binder, loose leaf, G. Labarre 831,011
Binder, temporary, T. R. Eddy..... 830,579
Bisulfite liquor, making, N. Heath..... 830,996
Blast furnace, M. Mannaberg 830,513
Boat, sailing, T. Jensen 830,720
Boiler. See Steam boiler.
Boiler cleaner, H. C. Daley 830,574
Boiler trap, C. Dennis 830,649
Book, sales, H. P. Brown 831,023
Boot and shoe ware and other goods, appliance for inserting beading in, E. Townsend 830,855
Bordering machine, W. R. Phillips 830,612
Bore holes, means for surveying, H. F. Marriott 830,730
Bottle and stopper, milk, C. M. Conley.... 830,886
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