particular purpose being to provide a type of such table in which there are a number of leaves connected together at all times and adapted to fold and unfold for the purpose of extending or reducing the length or width of the table.

IRONING-BOARD.—O. W. Mims, Dardanelle, Ark. The board can be supported from the wall at right angles thereto, it being possible to change the angularity. Means are provided whereby the board can be quickly and conveniently installed in any room and readily removed from its support, and wherein when the board is connected with a support and is not needed, it can be made to stand paralled with and close to its support.

POWDER-PUFF.—P. E. Page, Asheville, N. C. This powder puff is very compact in construction and is arranged to permit of convenient application or storing in a receptacle to retain the puff and the powder therein in good condition for a long time, and to allow of conveniently carrying the receptacle and puff therein around in a pocket, hand bag or other carrier.

Machines and Mechanical Devices.

TRANSMISSION-GEARING.—E. E. Larson, Thompson, Iowa. The more particular purpose here is to produce a type of gearing in which the power is transmitted through gears acting upon a revoluble member, this member being retarded to a greater or lesser extent by aid of friction gears, the degree of retardation governing the positiveness of the drive, and also controlling the speed of the driven element as compared with that of the driving element.

MACHINE-TOOL.—B. Franz, 20 Giesserstrasse, Leipzig-Plagwitz, Germany. The invention relates to tools in which the feed or re-setting of the work or of the tools for the next operation is effected automatically. An object is to cause the feed or re-setting to take place on the one hand during the return movement, and on the other hand directly by means of the mechanism producing the return, so that a special dividing device is unnecessary.

LINE-CUTTER.—J. J. Davin, Washington, Pa. This cutter is for use in wells and borings. It is adapted to be slidably arranged on a drill controlling line, and having cutting means for engaging a line at any desired point to sever it. It is also adapted to be slidably arranged on a drill line and has cutting means for severing the line at any desired point, the cutting mechanism being operable by an upward pull on the cutter.

CIRCULATING SYSTEM.—T. E. Warren, Ticonderoga, N. Y. The object here is to provide a system, more especially designed for circulating fibrous stock, such as sulfite pulp, wood pulp, soda pulp, and the like from a stock chest to beaters and other machines, and arranged to require comparatively little power to circulate the stock through the line and to prevent the water from leaking out of the stock and thus prevent the same from hardening in the pipe line.

TIDE-MOTOR.—W. J. White, Oyster Bay, N. Y. This invention relates to motors adapted to be operated by the rising and falling of a water level. On the rising of the level the motor is operated by the buoyancy of the float, and on the downward movement it is operated by gravity. It can also be used wherever there is a rising or falling of the water level from any cause whatever.

POWER-TRANSMISSION MECHANISM.—F. E. Seddon, Hoboken, and W. H. Douglas, Belleville, N. J. This mechanism is for use on automobiles and other vehicles and mechanisms requiring a varying and differential action in either direction and arranged to allow forward or backward driving of any desired speed without reversing or changing the speed of the motor, and to permit the driven wheels to run at a differential speed when the vehicle turns around a corner or in a sinuous track.

PORTABLE TURNING-LATHE.—W. D. Verschoyle, Tanrago, Ballisodare, Ireland. The principal object here is to provide a tool which will be little heavier and will occupy little more room than an ordinary drilling brace and which, when required for use, can be assembled and clamped to any convenient support, or can in various situations be employed instead of a brace for boring holes with accuracy and dispatch, while the parts can be quickly taken asunder and carried in an ordinary tool basket.

FEEDER FOR GRINDERS.—R. J. Steen, Canyon, Texas. The invention involves a new attachment for use within the hopper of crushers or grinders, and the object is to facilitate the feeding of the material to the grinding or crushing mechanism. It is applicable to any form of grinder having a hopper, but it is especially applicable to grinders and crushers for grain.

SPOOL-HOLDER.—F. Mayor, New York, N. Y. A holder is provided adapted to be applied to the machine either vertically or horizontally, the same embodying two heads arranged at the opposite ends of a cushioned stem, one head being permanently attached to the stem and provided with a number of spool-supporting pins, and the other detachably applied to the stem and secured thereto by a novel lock.

WATER-METER.—C. Lory, New Windsor, and C. A. Lory, Fort Collins, Colo. The fact is made use of in this invention that there is a definite relation between the rate of discharge and the varying depth of the water, this rate of discharge being different in different instances, yet capable of being calculated from measurements or appropriate weir formulæ.

CAN-STRAIGHTENER.—T. H. Hart, Everett, Mass. The purpose in this instance is the provision of a supporting former provided with surfaces arranged at an angle to each other adapted to respectively engage in the inside of the breast and body of the can, and a pivoted compressing former having corresponding surfaces for engaging the outside of the breast and body opposite the supporting former.

DITCHING-MACHINE.—E. J. Schramke, Saginaw West Side, Mich. In this machine a wheeled truck is mounted on a wagon, so that the truck can travel on the wagon. The wheeled truck carries a motor and at its front has a reciprocating frame carrying cutters at the under side and has a belt elevator for the dirt. The motor serves to reciprocate the frame and cut the ditch as the truck moves rearwardly on the wagon. The wagon serves to shift the whole apparatus to a new position.

COIN PACKAGING AND COUNTING MACHINE.—A. Serena, New York, N. Y. This machine is for use in facilitating the forming of packages or cartridges of coins of different dimensions. These packages are simply small cylinders of paper which are of sufficiently large diameter to receive the coins laid side by side. When the package is filled its ends are simply folded over the coins at the outer ends so as to form a compact package of the coins.

ACTUATING MECHANISM FOR PRINTING-PRESS THROW-OFFS.—J. Springer, San Francisco, Cal. The invention is an improvement in the actuating mechanism for printing-press throw-offs, and has for its object to dispense with the conventional hand-operated lever for this purpose and provide a treadle as a substitute, whereby the operator may have the free use of both hands for feeding the press.

ABRADING-MACHINE.—J. Milne, Jr., Cleveland, Tenn. This machine will sandpaper and smooth wood and other like materials. Means provide for increasing or decreasing the pressure of the abrasive members, thereby regulating their action on the material which is being worked. Means also provide for new abrasive surfaces being brought into operative position.

FLOOR-SCRAPING MACHINE.—R. S. La Rue, Bellefontaine, Ohio. The invention pertains to machines used for leveling and smoothing the surfaces of floors, and has for its purpose to provide details of construction for a machine of this type, that afford a scraper which is simple, strong, and durable, perfect in operation, readily adjusted, and easily operated.

ROTARY MEASURING DEVICE.—S. Irino, Salt Lake City, Utah. The invention relates more particularly to a measuring device which has a rotatable measuring wheel, distance indicating mechanism controlled thereby, a detent for holding the wheel immovable when not in use, and means for positioning the wheel with its point of contact with the ground, at a predetermined distance from a fixed point, so that it is possible therewith to measure accurately a distance starting from a wall or other obstruction.

OPERATING MECHANISM FOR DOORS.—W. H. Evans, Buffalo, N. Y. This mechanism is for use on exit or other door for pay-as-you-enter cars, but may be employed to operate doors of almost every description. A vertical shaft having a crank secured thereto, the latter being connected by an adjustable connecting rod to an operating lever disposed so as to open the door, one end of the lever being supported in a swivel hanger, provided with roller bearings which act as a fulcrum. A detachable handle is also provided to engage the connecting means secured to the shaft.

Prime Movers and Their Accessories.

INTERNAL-COMBUSTION ENGINE.—C. W. Snyder, Hudson, N. Y. The inventor's object is to provide an improved construction of valve mechanism, whereby the exhaust gas may be more completely scavenged from the cylinder at the end of the explosion stroke and the fresh charge more effectively admitted thereto. It relates more particularly to two-cycle engines.

LINE-CHECK.—W. H. Fowler, Selma, Ala. This invention is an improved line check for use in connection with injectors and boilers. In its use the line check is placed half way between the injector and the boiler check, and the purpose is to provide a simple construction which will insure the working of the injector when the boiler check is stuck or otherwise inoperative.

INTERNAL-COMBUSTION TURBINE.—P. Krause, Babylon, N. Y. This invention refers to turbines and more particularly to special construction whereby successive charges of an explosion mixture are ignited and the resulting gases under high pressure are delivered into engagement with the vanes or blades of the turbine. The specific construction involves certain improvements over the previous construction illustrated in the patent formerly granted to Mr. Krause.

Railways and Their Accessories.

RAILWAY PORTABLE COUCH.—E. Berlinger, New York, N. Y. The invention has reference to couches, and more particularly to couches of such type as to be readily carried around by hand and useful to passengers upon railways, as a means for enabling a traveler to recline while aboard a car. When not in use the couch may be taken apart and the two cushions placed together.

CAR-FENDER.—G. R. Watson, North Yakima, Wash. The purpose in this instance is to provide details of construction for a fender, that are practical and inexpensive, and which, when assembled and mounted upon a street car, will prevent serious accidents by catching and lifting into a safe position any one who has been struck by the fender.

SWITCH-ROD.—H. M. Mitchell, Salt Lake City, Utah. A yielding rod allows the switch to be run through by a car either direction without damaging the switch points or breaking the operating connections; and after being passed, the points will automatically resume normal closed position. The improved rod is made in sections with a spring between, the latter being held in a novel manner and the rod section being so constructed as to maintain alinement and position, and adjustable to take up any slack and to properly make the connection between the switch point and the stand.

AUTOMATIC RETAINING-VALVE.—C. Martin and M. Beasley, Dickson, Tenn. The invention relates to fluid pressure brakes of the Westinghouse and like types, and its object is to provide an automatic retaining valve, arranged to allow of recharging the auxiliary reservoir without releasing the brakes, thus preventing the acceleration of the train, especially when running down a steep grade.

Pertaining to Vehicles.

SEALING COMPOSITION FOR VEHICLE-TIRES.—W. W. McCord, G. F. Clark, and P. M. Hall, Seattle, Wash. In this patent the invention has reference to certain improvements in pneumatic vehicle tires, and more particularly to a fluid or plastic substance, so arranged in the tire that in case of a puncture, the substance will immediately fill the aperture and prevent the escape of air.

WAGON-JACK.—D. A. Gilchrist, Belgrade, Mont. Upon this lifting jack a wagon may be readily mounted and its wheels raised from a floor or the ground, and thus be free for removal for lubrication of the spindles that the wheels rotate upon. This lifting and supporting jack will serve effectively as a stock chute for a wagon.

STEERING-GEAR FOR TRACTION-ENGINES.—D. H. Randall and C. C. Whitcomb, Coon Rapids, Iowa. This invention is in the nature of a gear designed more particularly for use on traction engines and motor vehicles, but applicable also to other uses. In such vehicles the usual method of steering is by a deflection of the front axle in a horizontal plane about its vertical kingbolt and it has been common heretofore to effect this by the motor mechanism of a steam piston acting through a chain passing around pulleys to the opposite ends of the front axle.

EMERGENCY-STOP FOR MOTOR-VEHICLES.—P. Krause, Babylon, N. Y. In this case the invention pertains to improvements in motor vehicles, and more particularly to an emergency stop mechanism whereby the brakes may be applied and the engine stopped by a passenger other than the chauffeur, should the chauffeur be unable or unwilling to act in an emergency.

PORTABLE APPARATUS AND PROCESS FOR VULCANIZED REPAIRS OF PNEUMATIC TIRES.—E. Anselmi, Viterbo, Italy. The present invention refers to an apparatus which allows all vulcanized repairs for damages in pneumatic tires in general, and in automobile tires more particularly, to be made without the aid of special workshops. The repairs may be made anywhere, in a short time, easily and with the best results.

Pertaining to Recreation.

SCORE-BOARD.—M. J. Shimer, Bethlehem, Pa. The invention consists of a form of metal board supported above the table and having a movable tray pivoted to the under side thereof in such a manner as to be normally held in place, but readily movable to such a position that the pins may be taken therefrom or inserted therein. The score-board is for use in different games, but particularly in "cribbage."

FISH-HOOK.—R. E. Sheward, Council Bluffs, Iowa. The hook is more especially designed for holding live frogs, and while operating to securely hold the frog against displacement, will not impale or otherwise injure it, whereby the frog will appear natural in the water and will remain alive and fit for bait a comparatively long time.

Designs.

DESIGN FOR A JUNCTION-BOX.—H. Ashworth and A. D. Welch, Kennebunkport, Maine. In this new and original design for a junction-box the construction shows a box of very simple and plain ornamental 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.

Kindly write queries on separate sheets when writing about other matters, such as patents, subscriptions, books, etc. This will facilitate answering your questions. Be sure and give full name and address on every sheet.

Full hints to correspondents were printed at the head of this column in the issue of March 13th or will be sent by mail on request.

(12070) N. R. Co. says: For some time we have been getting complaints from our customers that our radiators contain core sand, which gathers and obstructs the pipe leading to the radiators. We were confident that it was not core sand, since the trouble only appeared where the steam supply came from central heating plants using exhaust steam. The deposit usually gathered on the vertical pipes connecting with the radiator valve, collecting gradually until the pipe is entirely closed. We were anxious to know the nature of the material causing the obstruction, and had it analyzed by a chemist and inclose copy of analysis. You will note that it is composed almost wholly of iron peroxide. If the obstruction was caused by core sand, the analysis would undoubtedly show at least 95 per cent silica, as we use sand crushed from silica rock for our cores. Our chemist was unable to give us any idea why the formation would appear only in the pipe connecting with the brass radiator valve, or why it would start to accumulate at the valve and extend down the pipe. We believe some of your engineers can solve the problem, and would thank you for an early reply, sending your bill for services along with your reply. [Note: The Editor of the Notes and Queries Column prosecuted investigations as requested, and rendered a bill for $5 for same. Questions of a purely special nature requiring considerable research will be answered at cost.—Ed.] A. Your letter presents an interesting and rather mysterious problem, and after careful study of the possibilities we beg to submit the following alternative hypotheses for its explanation: The explanation on the whole most probable is that your clients are at least partially right, and that the deposit, while not core sand, may come from the inside of the radiator. The particular form of the deposit carefully shown in your sketch rather strongly suggests this. Any material in solution or suspension in the condensed steam collecting above the valve, upon closure of the latter, would upon the opening of the valve or by leakage past it be admitted to the vertical pipe, which would be much hotter. The material can readily be imagined, therefore, to be deposited by re-evaporation of the conveying liquid before the latter has had time to trickle far down the vertical pipe. The interior surface of the radiator, while carrying no core sand, may readily be supposed to be sufficiently spongy on the surface for particles of iron to become detached by the alternate heating and cooling of the radiator and the alternate action of steam and air. If this is the explanation, the action should not be repeated, or should be so much reduced as to be negligible upon the deposit being removed and the radiator and pipes being cleaned after a few weeks' use, so that a noticeable cessation in the action should be contributory evidence that such is the cause. The occurrence of the deposit at a junction between brass and iron immediately suggests galvanic action, but electrolytic deposit of iron could not take place unless iron were already present in acid solution in the water. A very slight acidity would be sufficient to cause the iron to be attacked in some part of the system, most probably the boiler, and very little sulphate or other soluble salt of iron would cause a slight galvanic action between the brass and iron, the cumulative effect of which would be sufficient to produce the deposit. The fact that analysis shows the deposit to be peroxide and not metallic iron is no proof to the contrary, as the deposited metal, although in metallic form, is spongy and readily attacked by water, steam, and air, the electrolysis itself accelerating oxidation. If this is the explanation, the trouble is more serious, as iron must be attacked continuously elsewhere by the acid to provide electrolyte. The remedy is, however, comparatively simple: substitution of iron for brass valves would immediately stop the deposit, but a change of boiler water is to be recommended, or failing that, neutralization of the acids is solution by addition of alkali. We hope that the foregoing will at least suggest the means by which you can discover the cause of the trouble, and that the remedy will easily follow. Analysis of your boiler water for acids and recommendation of an anti-corrosive in accordance with analysis is the most obvious course.

(12071) W. C. D. says: As a subscriber of your paper I ask for the following information: I have two tanks, one for copper solution and the other for nickel. I would like to know what chemicals should be used, and in what proportions, both for nickel and copper plating, and what kind of a current must be used. Can I use a storage battery for the purpose? Articles to be plated are

such as braces for cripples, which are made of steel. Please explain to me how many amperes or volts it requires. A. Carbonate of copper is commonly used for copper plating, and a double sulphate of nickel and ammonium for nickel plating. The methods for making the solutions are given in Van Horne's "Modern Electroplating," wh' h we send for $1. We cannot write out the several pages given to the description. A direct current must be used, either from a battery or from a dynamo. For copper a voltage of about 2 is perhaps a mean, and for nickel 3.5 to 5 volts are used. The amperes depend upon the area of surface to be worked. We would suggest that there is more to plating than simply to make a solution, place the articles in the bath, and turn on the current. The chances of failure are numerous. It would be prudent to secure a man of experience to run the plant and teach you the trade secrets.

(12072) G. S. asks: One of the mural paintings found at Herculaneum and exhibited at the Metropolitan Museum of Art represents an object resembling a globe, with the lines of latitude and longitude plainly visible. Taking into consideration that the ancient Romans imagined the earth having the form of a disk, what could this picture mean? A. Since Hipparchus, a Greek who lived in the second century before Christ, invented trigonometry for the use of astronomers, and both Hindoos and Romans were fully trained in the subject, it is suggested that globes and circles of the sphere were well understood at the time of the highest splendor of Herculaneum and Pompeii. See Encyclopædia Britannica under "Ptolemy" and "Astronomy," vol. 2, p. 749, for the work of Hipparchus.

(12073) P. M. E. asks: 1. To what height has man ascended in the air? A. A height of 33,790 feet is claimed by Dr. Breson as the height gained by himself in a balloon. We have not noted any ascent higher than this. Upon mountains the record is much below this altitude. We have no exact figures at hand. 2. How is lightning generated? What kind of electricity is it? A. Lightning is due to the burning of something by the intense heat produced by the resistance of the air to the passage of an electric current. The electricity is the same in kind as all electricity. There is but one kind of electricity. If it has a low intensity, it cannot jump across an air gap; if it is of great intensity, it can do so, and a spark is the result. When a trolley leaves the wire, or a wire breaks in which a current is flowing, we see a spark due to the flow of electricity through the air. This is lightning on a small scale. 3. How can oxygen and hydrogen be transformed to water? A. By burning oxygen and hydrogen they will unite and form water. The burning is most violent and makes a great noise if they are mixed and set on fire. If burned in a proper jet, such as is used in the oxyhydrogen lantern for the production of the lime light, the burning is quiet but the heat is very intense.

(12074) L. W. D. asks: Noting inquiry No. 12036, by A. E. H., in your SCIENTIFIC AMERICAN of March 27th last, I wish to know where I can get some information on delicate electroplating of that nature. A. Full and satisfactory instructions for electroplating delicate structures may be found in the SCIENTIFIC AMERICAN, Vol. 99, No. 22, price ten cents. Much beautiful work has been done in this direction recently, which has sold at high prices in the holiday season.

(12075) R. D. asks: The matter of the rusting of galvanized barb wire under various conditions is a very interesting one, and to my mind has never been clearly explained. Whether or not there are yet sufficient data to warrant a satisfactory explanation I do not know; but if some one of your readers can give a reason why the zinc coating should all drop off some of the wire, and it becomes thoroughly rusty, and the other wire under nearly the same conditions retain all of its coating and brightness, I should be very glad. The conditions of a case in point are as follows: About twenty rods off an ordinary reel of barb wire was stretched in two strands, the lower one two feet from the ground and the upper one three feet from the ground. The balance of the reel was left on the ground coiled up as it came from the factory. It is now four years since this was done. The reel has been turned over a few times to keep the wood from decaying. That is all that has been done. The strands on the fence have entirely lost their coating of galvanizing, and are completely covered with a thick coat of rust. The coil on examination was found to have lost none of its coating, and almost as bright as when it came from the factory. A clear and cogent reason for the above conditions might interest others as well as myself. A. Variations in the deterioration of galvanized wire are generally due to unavoidable variations in the uniformity of the zinc coating, and the frequently marked difference between one part very rusted and another quite bright is due to the fact that once the zinc coating is penetrated by moisture, galvanic action is set up, which accelerates rusting considerably. In your case, however, the difference is obviously due to the protection both from moisture and circulation of air afforded by the reel to the wire coiled upon it, whereas that stretched upon the fence has been exposed to rain and air currents from every direction.

NEW BOOKS, ETC.

DER MOND. By Dr. M .W. Meyer. Illustrated. Stuttgart: Kosmos Gesellschaft der Naturfreunde, 1909. Pp. 98. Price, paper, 50 cents.

Dr. Mayer has here presented in a very popular and readable form what is at present known about the moon. To the man who does not care to read long technical treatises, this book ought to prove an acceptable medium of acquiring much useful information.

ALASKA. THE GREAT COUNTRY. By Ella Higginson. New York: The Macmillan Company, 1908. 16mo.; pp. 537. Price, $2.50.

The wonders of our great northern possession which we purchased from Russia are very numerous, and all those who have traveled in this delightful region will never forget the exciting experiences and the beautiful views obtainable. The illustrations in the present book give some slight idea of the very great beauties of this country. A vast mass of excellent material has been collected by the author. The book is exceedingly well written.

SOCIAL ENGINEERING. By William H. Tolman, Ph.D. New York: McGraw Publishing Company, 1909. 380 pp.; 8vo.; ill.

The author describes himself as a "social engineer," and to the average reader this does not at first convey much—one wonders if it does not mean perhaps municipal, even sanitary, engineering—but his book reveals that the term engineer is used in the larger sense to apply to one whose work is concerned with the application of exact sciences, for such social engineering aspires and even promises to be. A glance through this book shows the results of most interesting experiments and achievements in industrial betterment on the part of large manufacturing and other concerns throughout the country, and it is a great pleasure to observe what is being done to improve conditions of life and labor for the employee in, as it would seem, a philanthropic or humanitarian way. Further perusal of the treatise inclines one to believe, however, as the author claims, that industrial betterment is a "cold business proposition." Setting aside any considerations of philanthropy, it is shown that attention to the hygiene of factories has a direct result upon efficiency, in other words, that it increases output, which is what all producers are after. Manufacturers are prepared to spend large amounts upon improvement of the efficiency of their machines, and it is shown that proportionate results are obtainable by attention to the efficiency of the more complex human organism which operates them. And this goes much further than the evident fact that the individual workman can accomplish more in good light and fresh air. The effects of indigestion following a too hasty breakfast or a cold lunch eaten at a work bench cannot be figured on cost tickets, but its elimination or palliation by the provision of attractive lunch rooms and warm food supplied at cost, figures as an appreciable economy in the books of many a firm. The provision of club rooms for social purposes has proved an effective counter attraction to the saloon and promoted temperance among workers, as has the improvement of housing conditions added to their self-respect and general cheerfulness. Rest rooms and sick rooms for women and girl workers and the supply of simple remedies have saved many a half day's work on the part of an employee who would otherwise have gone home, as well as forestalling many an incipient epidemic which would otherwise have decimated a factory. Preference in choice of time and even in length of vacations given to those having the best record for attendance and punctuality has proved a marked stimulus to those virtues. The provision of safety devices and educational facilities, mutuality, opportunities for thrift, recreation, profit-sharing schemes, and communal or social benefit all receive attention from the author. Each is shown to be an economic problem; but though told in a plain, straightforward, matter-of-fact style, the whole is woven by the sympathy and enthusiasm of the author into a most attractive story. Where so many firms have made experiments so praiseworthy, it would be invidious to mention any; but it is most gratifying to learn that so many American captains of industry are making these endeavors, which must lead to greater harmony between capital and labor and therefore greater national efficiency.

APPLIED MECHANICS FOR ENGINEERS. By E. L. Hancock. New York: The Macmillan Company, 1909. 382 pp.; 8vo.; ill. by diagrams. Price, $2.

In the preparation of this work the author has followed the excellent rule that each new principle developed in the study of applied mechanics should be illustrated by its application to a practical problem, with the result that after each theorem showing how to find the moment of inertia of a parallelopipedon or the center of gravity of a paraboloid of revolution or similar bodies not frequently encountered, we are shown the kind of practical problems to which the formula developed can be applied. This, we should say, would make the subject much more interesting to the student, as the average engineering student is keenly in search of the practical, and apt to be skeptical about what seems to him only mental gymnastics. All the principles of the subject are amply covered, and the mathematics from which it is inseparable are as adequately given as anywhere, but it is the practical applications which distinguish the book from others on the subject. Tables of logarithms, trigonometric functions, etc., are given in the appendix, and the only improvement we can suggest is a little more cross reference in the index. The diagrams are clear, and the printing and paper in the usual excellent style of the Macmillan Company.

THE BOOK OF WHEAT. By P. T. Dondlinger, Ph.D. New York: Orange Judd Company, 1909. 370 pp.; fully ill. with photographs and diagrams. Price, $2.

The growth of a great industry, which synchronizes with and is sometimes essential to the growth of a state or nation, does not always receive from historian or economist attention proportionate to its importance. While many phases of the wheat industry have been adequately covered from the standpoint of the botanist, the farmer, the miller, or the merchant, no attempt has been made to cover the history of the industry as a whole as completely as its importance deserves, and it is this need that it is the endeavor of the author to supply. There are industries in which perhaps so complete a treatment would be more of a task, or even impossible in the same space—industries into which enter a greater variety or complexity of supplementary mechanical processes; but we cannot imagine that any industry could be more thoroughly or systematically treated than in the present work. Beginning with the etymological history of the very name, the botanical history of the plant, and its physical properties, the author conducts us through its evolution by selection, artificial cross fertilization, and environment, to its distribution, cultivation and harvesting, telling of the kind of soils it likes and their correction by fertilizers, and of the development of machinery accessory to its cultivation, from the earliest "header," described by Pliny a thousand years ago, to the monstrous combined steam plow, disk-harrow seeder, and fertilizer, or the combined harvester and thresher of the wheat belts of the great West to-day. The costs are carefully noted throughout, yield and cost of production, crop rotation and irrigation being considered in turn. There is a chapter on fertilizers, and one each devoted to diseases and insect enemies of wheat. Then we come to the transportation, storage, marketing and causes of fluctuation of prices of wheat, from which latter many an operator who knows wheat only through the medium of the ticker (and the baker) could learn much. Milling is adequately treated, as are consumption, production, and movement. Under consumption even breakfast foods in all their endless variety and the spectacular growth of this allied industry are discussed. The author's style is admirable, the language being lucid without the attempt to be unnecessarily ornate, and so well adapted to the subject. The book as a whole is as interesting reading to the layman as it should be valuable to farmer, miller, or merchant. Not the least valuable feature is an excellent bibliography of the subject and topical index.

THE MANUFACTURE OF EXPLOSIVES. Twenty Years' Progress. By Oscar Guttman, M. I. C. E. London: Whitaker & Co., 1909. Imported by the Macmillan Company. 85 pp.; 8vo.; ill. Price, $1.10.

The present work reproduces the Cantor Lectures delivered by the author before the Royal Society of Arts and, although not designated as a sequel, forms a supplement to the author's larger work with the first title, which remains the most complete and reliable practical and theoretical treatise on the history, physical and chemical properties, and manufacture of explosives. Within the limits by which a lecturer is confined the present volume describes as fully as possible the improvements and researches of the last twenty years; especially interesting are the experiments to determine what if any explosives are safe in fire damp, coal dust, and other dangerous atmospheres, and the manufacture of unfreezable nitroglycerin. The whole is told in an entertaining manner as attractive to the amateur as to the scientist.

CHILDREN AND GARDENS. By Gertrude Jekyll. London: "Country Life," S. W., 1908. Imported by Charles Scribner's Sons. 8vo.; 111 pages. Price, $2.

A charming book filled with delightful engravings of flowers and children. Children's gardens and playgrounds are extensively treated.

INDEX OF INVENTIONS

For which Letters Patent of the Upited States were Issued for the Week Ending April 27, 1909,

AND EACH BEARING THAT DATE

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

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Adding and listing machine, Vincent & White 919,656
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Agricultural tool, hand, P. H. Withington .. 919,799
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Beaking mill, J. Kennedy 920,067
Bearing box, adjustable, J. F. & H. E. Dodge 919,700
Bedstead crib attachment, C. D. Beeland ... 920,009
Beet puller, W. D. Nason 919,748
Beet topper, G. Nicol 919,929
Belt striking device, P. Karthaus 919,437
Belt tightening device, J. E. Delhomme 919,548
Bench clamp, A. V. Davis 919,546
Bench stop, carpenter's, D. F. Larkin 919,732
Bib seat dresser, R. McBee 919,618
Binder, loose leaf, S. C. Nott 919,453
Binder, loose leaf, F. B. Jordan 919,589
Binder, temporary, C. D. Trussell 919,497
Binders, leaf or sheet for loose leaf, C. C. Maltby 920,072
Bird and insect catcher, combined, Martin & Ross 919,907
Bit, R. I. Watts 919,503
Blank-conveying apparatus, P. H. Standish .. 919,487
Block. See Die block.
Blowpipe, J. Harris 920,054
Boat, land and water, A. G. Cummings 919,829
Boat, life, J. H. Stoelt 919,974
Boat or yacht, J. M. Gibbons 919,343
Boat, roller, R. E. Sharp 919,782
Bobbin holder, C. E. Lovejoy 919,899
Bobbin winding machine, J. Scharer-Nussbaumer 919,475
Body brace and suspenders, combined, C. Klopf 919,885
Boiler, W. A. Henry 920,057
Boiler appliance, steam, J. A. Ray 919,462
Boiler cleaner, F. X. Bayer 919,680
Boiler tubes, machine for removing scale from, J. A. Silver 919,785
Bolt and nut, C. G. Ette 919,840
Book and filing case, sectional, J. S. McComb 919,619
Book, copy, E. H. Roudebush 919,642
Book, manifold, H. P. Brown 920,015
Boots and shoes, making vamps for, A. G. Legg 920,070
Boring, drilling, and tapping machine, T. M. Boggs 920,011
Bottle, E. C. Royer 919,468
Bottle, R. L. Williams 919,987
Bottle cap, C. F. Jenkins 919,872
Bottle closure, H. A. Olsson 919,937
Bottle, non-refillable, A. V. Westerlund 919,664
Bottle sealing machine, E. J. Godman 920,048
Bottle soaking machine, S. Volz 919,796
Bottling machine, A. Calleson 919,319
Box-making machine, W. H. Holland 919,866
Box or case for cigarettes and like articles, J. Rheinberg 919,952
Box strap supply reel, C. W. Mitchell 919,371
Bracelet bag, C. O. Mason 919,613
Bracelet, elastic link, F. Speidel 919,486
Bracket, G. R. Cockrum 919,421
Brake, W. S. Adams 919,671
Brake beam finger guard, W. E. Fowler, Jr. 919,565
Brake hanger, car truck, J. H. Baker 919,676
Brake shoe, C. W. Armbrust 919,518
Breast strap attachment, hame, H. M. Dingsley 919,555
Brush, C. W. Patrick 919,756
Brush filling machine, S. Levi 919,734
Brush, fountain, Lawson & Smith 919,440
Brush, fountain bath, P. Ford 919,844
Brush handle, E. Maeder 919,610
Brush, leader, M. Blackman 919,813
Brush, shaving, E. C. Ripley 919,466
Bucket, clam shell, F. W. Lovell 919,446
Buckle, lock, W. H. McGee 919,919
Buckle, suspender, J. H. Russ 919,959
Bumper guard, G. Hipwood 920,060
Buoy, log, C. M. Boll 919,531
Burglar alarm for suit cases, satchels, etc., A. T. Ruthven 919,385
Butter mold, R. A. Simpson 919,478
Button making machine, J. W. Miller 919,914
Buttons, buckles, etc., to boots, shoes, gaiters, etc., machine for attaching, T. H. & W. H. Stringer 919,791
Cabinet, lace, R. A. Thornton 919,398
Calcimine, sanitary, C. Ellis 919,560
Can body making machine, J. C. Donnelly .. 919,557
Can lacquering machine, C. B. Manthorn ... 919,858
Car ajustable platform, railway, W. Robinson 919,383
Car brake, J. S. McWhirter 919,746
Car coupling, J. F. & V. S. Durbin 919,331
Car coupling uncoupling device, T. M. Ramsdell 919,949
Car fender, F. A. Nelson 919,451
Car folding step, subway, J. M. Ernst 919,333
Car gate, E. L. Gillespie 919,711
Car, mining, C. M. Dibler 920,033
Car, muck, Henderson & Sheriff 919,863
Car packing case or box, motor, E. Weinacht 919,798
Car, passenger, H. Howson 920,062
Car roof construction, L. G. Nilson 919,931
Car roof construction, freight, Queenan & Murphy 919,461
Car, semiconvertible, E. S. Bucknam 920,020
Car stake or spike, logging, D. W. Marsh .. 919,447
Car underframe, C. H. Howard 919,356
Cars, etc., life guard or obstruction remover for tram, J. Bowring 919,688
Card table, F. E. Faulkner 919,709

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