

RECENTLY PATENTED INVENTIONS.

Electrical Devices.

SUSPENSORY DEVICE FOR ELECTRIC LAMPS.—S. R. BELL, Tuscaloosa, Ala. The device comprises a spring-controlled drum around which is wound a duplex flexible conductor for both supporting an electric lamp and supplying electric current thereto, electrical connections being employed between the drum and one of the terminals of each of the wires forming the conductor. An attaching member for attaching the device to a ceiling or other support is employed, together with hangers for the drum and electrical connections between fuses held by such member and the drum.

Of Interest to Farmers.

PEA-HARVESTER.—H. M. CHISHOLM, Byron, Ga. The invention relates to improvements in machines for harvesting cow-peas. As the machine is drawn forward the stripper will be rotated, removing the pea-pods from the vines and depositing the pods into the body of the machine; and the body may be readily regulated or adjusted as to height from the ground.

DEHORNING IMPLEMENT.—S. T. WICKS, Denver, Col. In this invention the improvement is in that class of implements which is particularly adapted for dehorning calves or very young cattle and which comprises a blade, having opposite and converging cutting edges adapted to make a draw cut in removing the horn.

Of General Interest.

METAL PROTECTING-SOLE FOR FOOTWEAR.—W. J. LINWOOD and JENNIE BENNETT, Raton, New Mex. The invention pertains to improvements in soles for boots and shoes, the object being to provide a device of this character that will be light, yet strong, and adapted to readily yield to the varying movements of the boot or shoe, and therefore not cramp the wearer's foot. Novel means secure the device to a boot or shoe.

ART OF PRODUCING MASTIC.—H. PASCHKE, New York, N. Y. The invention relates to the bituminous mastics formed and capable of employment in a cold state and without the application of heat of any sort, so that the article may be produced as expeditiously as common mortar and applied in essentially the same manner. It possesses not only the advantages of eliminating the use of heat in all forms, but also that of an entirely waterproof composition, especially useful where waterproof walls, ceilings, or analogous structures are to be produced.

PROCESS OF SMELTING COPPER MATTE.—W. KEMP, Tucson, Ariz. Ter. Mr. Kemp's invention pertains to smelting, and more particularly to a process for smelting copper matte so as to produce black or metallic copper directly therefrom. The process readily saves seventy-five per cent of the cost of the process ordinarily used in converting. It is of peculiar value to smelters who work on a small scale and who find it necessary to ship the so-called "fifty-per-cent matte." The process is done in a single operation.

EDUCATIONAL DEVICE.—R. D. MITCHELL, Sandusky, Ohio. This simple device assists a teacher in instructing a class in mathematics, particularly in addition, and saves time of a teacher in dictating problems and the student's time in writing them, it being possible for the teacher to quickly and accurately designate the boundaries of figures on a chart in columns, the figures within which columns are to be added, and for the students to locate and rule off the boundaries without injury to the chart.

HAND-BAG.—A. WIGHARD, Jersey City, N. J. In the present patent the invention has reference to improvements in hand-bags or similar receptacles, the object of the inventor being the provision of a hand-bag or the like with a combined handle and frame, thus reducing the cost and simplifying the construction.

LIFE BELT OR PRESERVER.—P. C. PETRIE and H. L. DES ANGES, New York, N. Y. This life-preserver, constructed preferably of balsa wood and treated to render it fireproof and waterproof, is thoroughly durable and serviceable. The manner of forming the straps renders them almost indestructible, by fire or weather. By extending the straps' ends down between the buoyant blocks and connecting them with the binding-wire a secure construction is produced, while the manner of fastening the belt-straps to the preserver insures retaining the strap in position, and enabling it to be readily grasped and tied by the user.

LIFE-RAFT.—P. C. PETRIE and H. L. DES ANGES, New York, N. Y. The object of the inventors is to provide a life-raft with a suspended platform enabling the occupants to stand partly submerged, thus increasing the carrying capacity of the raft and yet to permit the platform, when desired, to be connected rigidly with the raft in the plane thereof, so that the raft may be utilized in the usual manner.

TOOTH-BRUSH HOLDER.—E. J. HYDE, Spokane, Wash. Novel features permit the attachment of the holder in a vertical position on a wall or the like, adapt it to completely incase a brush, afford a transparent side wall

for exposure of the brush while therein, afford spring-pressed end walls therefor that respectively serve as a lid and bottom for the holder and enable the convenient insertion and removal of the brush, provide drainage for the holder and means for ventilation for the holder to quickly dry the brush held therein.

RETORT.—P. JACKSON, Macon, Ga. The object in this instance is to provide a retort more especially designed for extracting turpentine from pine wood and arranged to permit of conveniently loading or charging the retort with the wood to insure proper destructive distillation of the wood and to allow dumping of the residue after the extracting process is completed.

BEVERAGE-SPOON.—H. MORGAN, Cripple Creek, Col. The improvement is in spoons for mixing and straining beverages such as are usually dispensed in restaurants, bar-rooms, and the like, the object being to provide a spoon that may be quickly and readily changed from mixing to straining position, thus saving considerable time in the mixing and straining of drinks.

CAMERA.—E. L. HALL, New York, N. Y. One purpose of the invention is to provide a simple and economic construction of camera wherein a prism is employed to reflect an image upon the focusing-glass and conveniently-operated means for obtaining an accurate focus by the movement of the lens-carrying section of the camera-box. The same inventor has also procured a patent on another camera, the purpose being to provide one of the type in which the shutter is connected with the focusing-mirror in such manner that when the mirror is brought to focusing position the shutter will be carried out of the focal plane of the lens and whereby when the mirror is carried up to effect an exposure the shutter is automatically carried to working position relative to the lens and is also automatically operated.

DRAWING-BOARD.—H. D. GRINNELL, New York, N. Y. The invention provides means by which a long sheet or continued web of paper may be safely held in position convenient for drawing and any part of the web or sheet exposed at will. This is done by providing a frame or board having two drums on which the paper is wound, the drums being connected to devices by means of which they may be rotated simultaneously in the same or opposite directions, thus enabling the sheet to be moved over the board and by turning the drums oppositely the sheet may be stretched firmly over the board.

ORE-CONCENTRATOR.—P. A. HARDWICK, Colorado City, Col. In the present invention the improvement has reference to apparatus for concentrating ore, and Mr. Hardwick has for his principal object the provision of an effective ore-concentrator which in this instance is especially adapted for the saving of the float values.

GAGE.—A. D. FELLOWS, East Auburn, Cal. In this case the invention refers to gages and more particularly to those adapted for use with shingling-hatchets or similar tools. Its principal objects are to provide a simple and inexpensive device which may be readily attached to the tool.

FRAME FOR FILTER-PAPERS.—A. M. VAUGHAN, Richmond, Va. The purpose of the frame is to facilitate the folding and placing of a filter-paper within a funnel. More specifically, the object is to produce a frame for this purpose which may be readily operated in applying the paper and in folding the same to conform to the shape of the funnel.

Hardware.

BORING DEVICE.—J. PRESS, New York, N. Y. In this case the invention relates to a new and improved boring device for use in conjunction with an ordinary brace and bit to enable the operator to bore a hole at right angles with the surface of the object in which the hole is bored.

COMBINATION-TOOL.—C. NIELSEN, Middletown, Conn. The purpose of the inventor is to provide a tool especially adapted for use by machinists, but which is also of value to all mechanics, and which may be used as a scriber, a carpenter's square, a compass-gage, etc., and to so construct the tool that it will be simple, compact, durable, and economic, and convenient of arrangement and manipulation.

Machines and Mechanical Devices.

COMPOUND SPRING-LEVER.—W. V. GILBERT, "Niton," East Wood road, South Woodford, London, England. This is an elastic or resilient device practically in the nature of a compound lever, and serves upon being actuated by one motion, as by being compressed in one direction or opposing directions from its normal condition, to impart or allow a plurality of motions in various directions and, in recovering its normal condition upon being released from said pressure or actuation, to impart or allow corresponding plurality of motions reciprocal to those caused or allowed by said actuation.

LAND-LEVELER.—J. J. JENSEN, Goshen, Idaho. The invention pertains to improvements in machines for leveling ground or land and making roads, lawns, and the like, the object being the provision of a leveler of simple and novel construction which may be easily manipulated to scrape the dirt from high places and dump it in low places.

Prime Movers and Their Accessories.

APPARATUS FOR LUBRICATING.—M. CASTELNAU, 28 Rue de Washington, Paris, France. This invention is based on a new principle as to the lubrication of engines. This principle is characterized in the first place by a process for the plentiful and perfect lubrication of the members subjected to friction, the lubricant being applied and acting clear of any contact with the gases, steam, vapors, and the like which are at work. It is characterized in the second place by the almost total recovery of the lubricant used. It is applicable to any kind of engine or motor, and can be applied either to distributing-pistons or to driving-pistons.

Railways and Their Accessories.

RAIL-JOINT.—W. NOLAN and C. H. PEARCE, Aspen, Col. The invention is an improvement in rail-joints. The lateral wing of the fish-plate underlies the inner end of a brace and also abuts at its outer edge against a shoulder of the tie-plate and is braced thereby on opposite sides of the brace, as well as beneath the brace, in the operation of the device. The tie-plate may be spiked down or otherwise secured to the tie, as may be desired.

STEP-HOLDER FOR CARS.—J. EDWARDS, New York, N. Y. The invention refers to running-boards or steps of street-cars, such as used usually at the sides of so-called "summer" cars. Where such cars are operated on double tracks, it is usual for the inner board or step, which is disposed over the devil-strip, to be turned up out of the way, this step being usually mounted upon pivots or hinge connections for this purpose.

Pertaining to Recreation.

TOP-SPINNING PISTOL.—J. W. ELBRA, Cleveland, Ohio. Assignee, J. W. HENCKE, No. 3609 Park Avenue, S.W., Cleveland, Ohio. The pistol is designed to rapidly rotate the top and eject it at its muzzle. The object of the inventor is to produce a simple and effective device, harmless, easily operated, and manufactured at a small cost. It consists of a casing assembled together to simulate a pistol, having means at its muzzle to hold a top and means to be forcibly projected in the barrel by a spring when released by a trigger to engage the periphery of the top, giving it a sharp twist and at the same time eject it from the muzzle.

Pertaining to Vehicles.

SWINGLETTREE.—A. DE L. LITTLE, Game-well, N. C. The inventor provides a swingle-tree in which the strain of starting a load will be relieved by the spring action, so that injury to the draft devices, as well as to the team, will be avoided, and he arranges the tension-spring in such manner as to prevent any danger of breaking or injuring the same, so that he provides an efficient and durable device at a small cost.

CAR STOP.—G. L. HOLLINGSWORTH, Silver-ton, Colo. patents a car stop for special use in connection with mine cars, and arranged to automatically stop the car when the latter reaches the place of dumping. The stop, which is secured in proper position on the ties between the rails, is in the form of a vertically rocking lever, one end of which is to be automatically engaged by the front axle of the car, the opposite end of the lever having a fork which receives the rear axle and prevents further forward movement of the car.

ATTACHMENT FOR ELASTIC TIRES.—W. H. VIOLETTE, Piceance, Colo. The improvement of this patentee relates to a means of protecting the tires of automobiles and bicycles and preventing punctures. An auxiliary tire of thin metal encircles the usual elastic tire and is apertured for receiving in close relation plugs of special form made in attachable sections adapted to be quickly placed in position on the auxiliary tire or removed therefrom.

DUMPING-WAGON.—P. PINTO, New York, N. Y. This invention provides improvements in the class of wagons used for trucking or heavy carting in which the box or wagon body is adapted to be turned or tilted for dumping the load. The wagon body may be moved to either side when it is desired to discharge the load at the sides, or it may be moved to the rear to discharge the load at the rear.

TRUCK.—C. H. RICHARDSON, Dover, N. H. The invention refers more especially to hand-trucks for barrels, boxes, and the like, though applicable to the handling of other freight or merchandise; and one of the objects is to provide a structure of this kind which is inexpensive to manufacture, besides being strong and easily handled. Means are provided for loading and maintaining a load upon the truck and for releasing the same when desired for facilitating the unloading.

Designs.

DESIGN FOR A CLOCK-CASE.—E. EHRLI, New York, N. Y. Mr. Ehrle has invented an ornamental design for a clock-case, which comprises at its upper part a circle or case surrounded by scroll work of very graceful lines, and supported by nude figures of two boys posed in the lower scroll work.

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.

Marne Iron Works. Chicago. Catalogue free.
Inquiry No. 8424.—Wanted, power looms for weaving wire cloth.

For mining engines. J. S. Mundy, Newark, N. J.
Inquiry No. 8425.—Wanted, name and address of the manufacturer of the Rose automatic knife and razor grinder.

"U. S." Metal Polish. Indianapolis. Samples free.
Inquiry No. 8426.—Wanted, manufacturers of cast steel books and eyes for connecting leather and hide rope banding.

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

Inquiry No. 8427.—Wanted, names of parties engaged in preparing seal skins for shipment.
Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 8428.—Wanted, manufacturers of heavy screw presses, also screw jacks and screw punches.

I sell patents. To buy, or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.
Inquiry No. 8429.—Wanted, manufacturers of hand heaters employing slow combustion fuel.

Metal Novelty Works Co., manufacturers of all kinds of light Metal Goods, Dies and Metal Stampings our Specialty. 43-47 S. Canal Street, Chicago.

Inquiry No. 8430.—Wanted, manufacturers of a newly invented rotary gas engine of 22 h. p., the cylinder being contained within a 12-inch flywheel.

The celebrated "Hornby-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. 8431.—Wanted, a machine for making tamales.

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. 8432.—For manufacturers of floor scrapers and smoothing devices.

Inquiry No. 8433.—Wanted, a machine, similar to a typewriter, for the use of the blind, for writing musical scores.



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.

A Reader asks a question, but does not even give his place of residence nor date his letter. He is respectfully requested to read the first Hint which stands at the head of the Query Column every week. Although the statement is perfectly plain in meaning, we yet receive every week more than one letter without name or address.

(10182) H. C. D. asks: Being a constant reader of your valuable paper, I take the liberty of asking you to kindly inform me through your Notes and Queries column whether the following statements which appear in the Encyclopædia Britannica (vol. xi, pages 66 and 67) are correct. Under the heading "Gravitation," paragraph 2, it says: "Movement of a Falling Body.—Our knowledge of the force of gravitation being ultimately founded on observation and experiment, it will be convenient at this point to describe the experiments by which a knowledge of the laws of motion of a falling body may be ascertained. We shall first describe these experiments, and then we shall discuss the laws to which we are conducted by their aid. A beginner is apt to be surprised when he is told that a heavy and a light body will fall to the ground in the same time if let drop from the same height. Yet nothing can be easier than to prove this important fact experimentally. Take a piece of cork in one hand and a bullet in the other, and drop these two objects at the same moment from the same height. They will reach the ground together. Nor will the results be different if we try a stone and a piece of wood." On page 67 it says: "The various experiments to which we have referred suffice to establish the very important result that the time occupied by a body in falling to the surface of the earth, if dropped from a point above it, is independent of the mass of the body as well as of the materials of which the body is composed." I always understood it to be a well-known fact that the velocity of falling bodies depends upon the specific gravity and the density of the medium through which they pass, and I am therefore at a loss to understand the meaning of the paragraph referred to. That the above para-

graphs cannot possibly refer to bodies falling in a vacuum seems to be shown by the sentence: "Take a piece of cork in one hand and a bullet in the other, and drop these two objects at the same moment from the same height." A. The article which you quote from the Encyclopædia Britannica was written by Prof. Ball, Astronomer Royal of Ireland at the time he wrote it. It is hardly likely that he was in error on so simple a matter as the fall of a cork and a bullet from the hand to the ground. Have you tried it for yourself? Had you done so, you could hardly have written the letter to us. The experiment is simple. So are others given by Prof. Ball. Try them till you are convinced that it is the matter of the earth which draws bodies down to its surface, and that the rate of fall is not dependent upon the weight or the density of the body falling. This was demonstrated by Galileo at the Leaning Tower of Pisa before the immortal demonstration of the law of gravitation by Newton. The paragraphs you refer to have no dependence upon the other fact that the lightest and heaviest bodies fall alike in a vacuum. They refer to the fact that all moderately heavy bodies fall practically alike through the air. Very light things are retarded enough by the air to have their rate of fall changed by the resistance of the medium through which they are falling.

(10183) H. M. asks: 1. Why are the guns on battleships not larger than 45 caliber, 12-inch? Is it because they are strong enough, or because an ordinary ship is unable to carry larger guns? A. 45 calibers is found to be the maximum length which can be used to advantage for the 12-inch gun. The greater length would prove cumbersome, and necessitate larger turrets to accommodate the greater weight back of the trunnions. 2. By what formula is the displacement of ships known before they are launched? A. The displacement of ships is found by calculating the cubical bulk of the ship below the water-line. 3. Would it be possible to build torpedo boats of say 400 tons with a speed of 45 knots? A. In the present state of the art it would be impossible to build a hull of 400 tons displacement which would float horse-power necessary to give a speed of 45 knots. The "Viper," a torpedo boat of slightly over 400 tons, holds the record for speed of slightly over 36 knots an hour. The horse-power increases as more than the cube of the speed, and hence the weight of the engines to give a propeller thrust suitable for a speed of 45 knots would be altogether prohibitive. 4. a. A description of the 21-inch torpedo in use in the United States navy. A. The United States 21-inch torpedo was described in the SCIENTIFIC AMERICAN of January 6, 1906. b. A description of the 45-centimeter torpedo in use in the German navy. A. We are not aware that any data regarding the German 45-centimeter torpedo have been made public. 5. Is there any work giving complete statistics of all rapid-fire guns in use in the large navies? A. Brassey's Naval Annual gives full statistics. 6. Please put an article in your paper that treats of the new ships now building in England, i. e., "Dreadnought," "armed cruiser," "Orion," T. B. destroyer "Afridi," and the special type torpedo boat that is intended to make 36 knots per hour. A. The "Dreadnought" was illustrated and described in the issue of the SCIENTIFIC AMERICAN of August 25, 1906. We have no data respecting the other vessels mentioned.

(10184) E. R. asks: Will you please state in your query column how many revolutions the earth makes in 365 days? A. The earth makes 366 revolutions on its axis in 365 solar days. One rotation of the earth on its axis is completed when a star which was due south last night is to-night in the same position. Since the earth is also moving in an orbit around the sun, the star seems to reach the south point about four minutes earlier each night than it did the previous night. The earth must turn on its axis about four minutes of time more to bring the sun to the same place day by day. This extra time constitutes the difference in length between the solar and the sidereal day, and in a year causes that there shall be one sidereal day more than there are solar days. There are 365 solar days and 366 sidereal days in each year. The sidereal day is the true measure of the rotation of the earth on its axis with reference to a star or to a fixed point in absolute space.

(10185) H. B. C. asks: 1. Why is it that a light, when put into a 110-volt circuit, will not short-circuit the current, while a piece of small copper wire of about the same length as the filament of the lamp, when placed in the same position, will immediately short-circuit? I have found it to be a fact that when an incandescent light's globe breaks, the filament does the same as the piece of copper wire, provided, of course, that the current is on. Do I not, therefore, have reason for thinking that the air has something to do with this? A. When the globe of an incandescent lamp breaks, the hot filament is instantly burned by the oxygen of the air just as any other piece of carbon would be. The current is not short-circuited by the filament. The flash of light which is seen is due to the chemical action of burning the filament, and not to any electrical action. When the circuit is bridged by a short copper wire, the resistance of the copper wire is small and a large flow of amperes takes place, which heats and melts

and also burns the copper. This is what is meant by a "short circuit." 2. How may a small, practical, 110-volt current electric heater be made? Is not German silver wire the best for this purpose? A. If you want an electrical heater which may be attached to a lamp socket, wind about 200 to 220 ohms of fine German silver wire on porcelain tubes and mount in some convenient fashion. SUPPLEMENT 1112, price 10 cents, contains valuable data concerning electrical heaters. 3. What is the smallest size of wire allowed by the Fire Underwriters' Association for wiring building with 110-volt current? I have been using what is known as No. 14 rubber-covered for my outside, and No. 14 weather-proof for my inside wiring. In this am I meeting the requirements or not? A. No. 14 wire is allowed by the Underwriters to carry 12 amperes in rubber insulation, and 16 amperes in other insulations. 4. Do wires necessarily need to be soldered in joining them to make them more electrically and mechanically perfect? A. In good work wires are always soldered at junctions to other wires. No other connection is allowed.

(10186) J. C. E. says: 1. In what probable way does Edison expect to utilize cobalt? Can he use the chlorine gas from it as a motive power? If not, how to use it in storage batteries? A. We regret to say that we are not able to answer your inquiry, "In what probable way does Mr. Edison expect to utilize cobalt?" etc. It would be a hazardous thing to attempt to tell what Mr. Edison will probably do, or may be expected to do. We doubt if he tells any one, even if he knows himself, what he expects to do. We may say that there is no chlorine in cobalt, and no motive power in chlorine. We are sure that Mr. Edison does not expect to find either of these results in his investigations. 2. In antebellum days here in North Carolina, by rubbing a pocket knife blade across the points of the old flat strap iron on the railroad track, the blades of the knife so rubbed became highly magnetic, capable of lifting iron or steel objects of considerable weight, a fourpenny nail or larger perhaps. I have so done often myself, but after some forty years cannot say positively I raised anything heavier than a fourpenny nail. Have tried the present T-iron rail repeatedly, with no magnetism resulting at all. Why is this? The magnetic properties were then well known, but do not know if I can now establish the fact by another witness than myself. A. Any magnetizing of a knife by stroking it on a rail was due to the fact that the rail was a magnet. If the old experiment cannot now be repeated, it is because the present rail is not a magnet. 3. From what source does the ocean derive its intense saltiness, and how retain same in uniform strength? A. The salt now in the ocean has been in the past ages washed out of the land or dissolved from beds of salt in the earth to which the water gained access. The saltiness remains, since all the water which evaporates from the ocean is fresh water. The original water was fresh. It became salt by dissolving salt from the earth. 4. Why are the conventional number of guns (21) fired in honor of the President of the United States? Is it by Congressional enactment? Why 21 and not 13 for original in thirteen States? A. The firing of 21 guns as a salute for the national flag, the President of this or other countries, or the sovereigns of foreign states, is an international custom.

(10187) O. B. writes: 1. There seems to be an idea that artificial ice does not keep so well as natural. Is there any truth in the statement? A. Artificial ice frozen rapidly is not usually as dense as natural ice, which forms slowly and rejects the contained air more completely. The air can be seen in a cake of artificial ice in the middle of the cake. When artificial ice melts, it separates into prismatic pieces, because of its less density. These features of artificial ice seem to us to account for the impression that it does not keep as well as natural ice, that is, that it has not so great cooling power by the cubic foot as natural ice. A pound of artificial ice should be equal to a pound of natural ice. 2. In winter in the north temperate zone, in fact everywhere north of the equator, the sun shines at sunrise and sunset on north sides of houses that face due south. Has refraction of the sun's rays anything to do with that fact? A. Your second query reads as follows: "In winter in the north temperate zone, in fact everywhere north of the equator, the sun shines at sunrise and sunset on north sides of houses which face due south. Has refraction of sun's rays anything to do with the fact?" We do not understand the fact to be as you state it. At the autumnal equinox in September, the sun rises in the east and sets in the west the world over. In that position the sun's rays at rising and setting would glance along the north and south sides of a house which faces south. The same is true at the vernal equinox. From September 22 till December 22 the sun moves to the south, fill on the latter date in your latitude it rises about 29 degrees south of the east point and sets the same distance south of the west point. It is obvious that its rays cannot in these positions shine on the north sides of houses which face south. Refraction could not produce any such effect as this. It changes the apparent position of the sun on the horizon about the diameter of the sun, or about a half degree; more exactly, 34 minutes of arc.

NEW BOOKS, ETC.

DICTIONARY OF ENGINEERING IN ENGLISH AND SPANISH. By Andres J. R. V. Garcia. New York: Spon & Chamberlain, 1906. 32mo.; pp. 150. Price, \$1.

The user will find some 3,000 technical terms in this little dictionary. The author provides two indices, one in Spanish and one in English, and the former will be found specially valuable in translating from Spanish into English. The English index has been made as complete as possible without causing it to become too voluminous. The book is well adapted to satisfy the demand for an up-to-date technical dictionary of the terms in general use by engineers using one or the other language.

ILLUSTRATED TECHNICAL DICTIONARY. Vol. I. Compiled by K. Deinhardt and A. Schlomann, Engineers. New York: McGraw Publishing Company, 1906. 16mo.; pp. 403. Price, \$2.

This is the first volume of the American edition of a series of technical dictionaries prepared by K. Deinhardt and A. Schlomann, eleven volumes being in contemplation to give successively the industries of electricity, steam, hydraulics, mechanical handling of railways, bridges and structures, metallurgy, architecture, and naval construction. The dictionary is published on a new plan, and one that appears more nearly to meet the numerous requirements of thorough technical work of this character. The main feature is the classification whereby related subjects are brought together, the reference to any particular subject being obtained through a general index of the terms for all the languages covered. These are six in number. In addition to the German, English, French, etc., terms, the symbol or illustration of the term is frequently given. The work seems carefully prepared, with few typographical errors, and should be found useful by engineers and other technical men. The present volume treats of titles used in metal and wood work, drafting and general terms, machine design, and general machine-shop terms.

CATECHISM ON PRODUCER GAS. By Samuel S. Wyer, M.E. New York: McGraw Publishing Company, 1906. 24mo.; pp. 42. Price, \$1.

The author utilizes the effective question and answer method for imparting considerable valuable information regarding producer gas and its manufacture. Both the questions and the answers, 287 in number, are concisely and clearly stated. The catechism will doubtless be found useful by engineers as well as non-technical men interested in this subject.

DIRECTORY OF THE ALUMNI OF STEVENS INSTITUTE OF TECHNOLOGY. Hoboken, N. J.: Stevens Institute Alumni Association, 1906. 32mo.; pp. 132. Price, 50 cents.

This booklet should prove useful not only to the large number of Stevens alumni, but in general to any one desiring the services of an engineer or technical man. The first part of the text comprises an alphabetical list of the graduates of the Institute, with reference to the following pages upon which these names will be found. The alphabetical list is followed by a geographical list with county and State divisions and urban subdivisions. This is followed by a geographical list of countries, including foreign residents. The fourth and main subdivision of the book comprises a business directory, in which the alumni are grouped under the various industries in which they are actively engaged.

ELECTRICITY OF TO-DAY. Its Work and its Mysteries. By Charles R. Gibson, A.I.E.E. Philadelphia: J. B. Lippincott Company, 1907. With 39 illustrations. 16mo.; pp. 344.

In this book Mr. Gibson has given us a popular account of electricity as it is applied in everyday life. In spite of the fact that he has avoided the use of technical language, he has been able to discuss the various subjects which have fallen within the scope of his book with a fair amount of thoroughness. Among the more important topics which are discussed may be mentioned electricity in medicine, electric traction, electric heating and cooking, electro-chemistry, electricity from heat, lightning, telegraphing with and without wires, electric measurements, theories of electricity advanced by modern thinkers. The book is excellently printed and well illustrated.

THE MANAGEMENT OF ELECTRICAL MACHINERY. By Francis B. Crocker, E. M., Ph.D., and Schuyler S. Wheeler, D.Sc. New York: D. Van Nostrand Company, 1906. 12mo.; pp. 223. Price, \$1.

The simple directions and useful hints for the management and practical utilization of dynamos and motors contained in this book of Drs. Schuyler and Wheeler first appeared as a series of articles in the Electrical Engineer some fifteen years ago. The arrangement is so that the different subjects are treated separately and in proper order, with headings of heavy type to facilitate reference to the subdivisions. The volume is intended to be simply the basis of a more elaborate treatment of the subject in a future work, but as such will be found of value. The present edition is, of course, brought up-to-date in all its phases.

POLYPHASE CURRENTS. By Alfred Still. New York: Whittaker & Co., 1906. 12mo.; pp. 352. Price, \$2.50.

The use of polyphase alternating currents for the transmission and distribution of electric power is becoming so extended, that the present volume should prove a welcome addition to the literature of the subject. The book treats in a non-mathematical way of the theoretical considerations involved in polyphase work. Practical engineers and students without the necessary mathematical knowledge required for the study of more advanced works will find the text and illustrations of value in obtaining a clear and comprehensive knowledge of the subject. The non-mathematical treatment of polyphase currents has been made possible to a large extent by the author's extensive use of graphical methods.

PERPETUAL CARE IN AMERICAN CEMETERIES. Reprinted from Park and Cemetery and Landscape Gardening, with additions of criticisms, and forms of contracts used by different cemeteries. Chicago: R. J. Haight, 1906. 12mo.; pp. 62.

LAYING AND FINISHING HARDWOOD FLOORS. By Frank G. Odell. New York: David Williams Company, 1906. 12mo.; pp. 50. Price, 50 cents.

INDEX OF INVENTIONS

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