plied holder for this purpose. An arrangement of the looped ends secures a comparatively rigid and strong pivotal support for the rod, while adding little to its weight.

SLEIGH.—A. P. LINN, Escanaba, Mich. Mr. Linn's invention refers to the running part of sleighs, sleds, and all devices adapted to run upon the snow and ice, and it is capable of general use upon articles of the class mentioned. The objects of the improvement are to secure greater rigidity, and cheapness in this class of articles of manufacture. The invention is equally applicable to a sleigh having a running portion consisting of two sleds or to a sleigh having only one set of runners.

DRAFT-TREE.—H. T. REEDER, Missoula, Mont. The purpose here is to provide a tree in which a double whiffletree or a swingletree will not break at the center or pivotal point by reason of a cross pull, as when the draft is on the tree instead of the tension being crosswise of the bar of the tree it will be endwise, thus adding to the lifetime of the device and preventing the tree from breaking under severe tension, under which conditions in the ordinary tree the tension is forward or crosswise directed to the weakest point of the tree —its pivotal point— which under the improved form of draft-tree is reinforced and the tension not directed thereto.

VEHICLE-BRAKE.—W. M. FLEWELLING, Santa Rosa, Cal. The invention is an improvement in brakes for logging-trucks, and is especially designed for use in logging-trucks in which the logs are suspended from the trucks, and the weight of the log operates to hold the beam-carrying bars down in position for the proper operation of the brake when set by means of the devices.

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 the 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.**

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AUTOS.—Duryea Power Co., Reading, Pa.

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

Inquiry No. 6387.—For the manufacturers of the electrical machine for making puffed rice.

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

Inquiry No. 6388.—For manufacturers of leaden hair combs.

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

Inquiry No. 6389.—For an apparatus to destroy roll tickets in large quantities.

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

Inquiry No. 6390. For manufacturers of table knives, forks and spoons sold under different names, as Australian silver, Mexican silver, etc.

Leyden Chemical Works. Sole manufacturers of all luminous preparations. 656 East 182d Street, New York.

Inquiry No. 6391. For makers of lead pencils in large quantities stamped with name and address, for advertising; samples wanted.

Robert W. Hunt & Co. bureau of consultation, chemical and physical tests and inspection. The Rookery, Chicago.

Inquiry No. 6392.—For the address of the manufacturer of glass which can be heated red hot and plunged in water without breaking.

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

Inquiry No. 6393.—For manufacturers of or dealers in German silver tubing ⅛ inch in diameter.

I have every facility for manufacturing and marketing hardware and housefurnishing specialties. Wm. McDonald, 130 Main St., East Rochester, N. Y.

Inquiry No. 6394.—For sectional posts ⅝ inch diameter, for use in making sectional post binders for loose leaf books.

We manufacture anything in metal. Patented articles, metal stamping, dies, screw mach. work, etc. Metal Novelty Works, 43 Canal Street, Chicago.

Inquiry No. 6395.—For wholesale dealers or manufacturers of the Handy Wagon Jack.

The SCIENTIFIC AMERICAN SUPPLEMENT is publishing a practical series of illustrated articles on experimental electro-chemistry by N. Monroe Hopkins.

Inquiry No. 6396.—For the manufacturers of the Plaza Lawn Mowers.

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

Inquiry No. 6397.—For manufacturers of or dealers in machinery and supplies for corn-canning factories.

If you wish to buy patents on inventions or sell them, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

Inquiry No. 6398.—For makers of telephone plates, also manufacturers of galvanized and telephone wire.

Inquiry No. 6399.—For manufacturers of brick-making plants.

Inquiry No. 6400.—For makers of small brass gears, either cut or stamped.

Inquiry No. 6401.—For apparatus operated by air pressure, such as engines or pumps; a small hand air pump to generate sufficient air pressure in a small tank to give motive power of from 5 to 10 pounds for temporarily raising weight.

Inquiry No. 6402.—For parties manufacturing Buff's Eye lenses, for concrete sidewalk lights.

Inquiry No. 6403.—For makers of hydraulic pumps, sand suckers and siphons.

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.

(9516) V. E. M. asks: 1. What is the method of making a small battery such as is used in a small vest-pocket electric light? The battery can be bought for about 25 cents. A. The battery for lighting miniature lamps usually contains two or three dry cells. We published in our SUPPLEMENT, Nos. 1383 and 1387, price 10 cents each, a full description with illustrations of the manner of making such cells, with all the materials used and all necessary instructions. 2. What is the method of making a Fuller battery? A. The Fuller cell (see SUPPLEMENT, No. 159, price 10 cents mailed) is a bichromate cell in which there is a continuous amalgamation of the zinc. The zinc is in the bottom of the porous cup, and has a quantity of mercury, an ounce to a cell will answer, poured around it, which maintains the amalgamation of the zinc through the life of the cell. A brass or copper rod covered with gutta percha is fastened to the zinc, and extends above the cell as a terminal to which the circuit is connected. The carbon plate is placed in the glass jar and surrounded with a bichromate solution. Water is poured into the porous cup upon the zinc. The acid diffuses through the porous cup fast enough to act upon the zinc and produce the current. The cell evidently will not furnish a strong current. A good formula for the bichromate solution may be given: Take 21 ounces of sodium bichromate and 3 quarts of water. When the solution of the salt is complete, add slowly and with constant stirring, 1 pint of strong sulphuric acid. The solution is ready for use when it has cooled.

(9517) W. R. C. writes: State in the column of Notes and Queries if there is any liquid that will dissolve amber that has no oil in it? Something like alcohol, that will soon evaporate. A. We do not think that there is any liquid that will dissolve amber that has no oil in it. We know of none.

(9518) W. D. O. says: I would like to know the composition of the preparation with which the particles of carbon, in the carbon pencils for electric arc lamps, are held together; that is, the cementing substance. A. Arc light carbons, carbon plates for battery cells, and similar articles are made from coke. The higher grades are made from coke derived from the residue of petroleum stills. The crude material is dried, ground fine, and sorted into different sizes. The binding material may be a coal tar product, or some other substance containing carbon, and which will be reduced to carbon by the heat of the furnace. These are thoroughly mixed, pressed into forms by hydraulic pressure, and afterward baked in a furnace. For a full description see SUPPLEMENT, No. 1287, price ten cents.

(9519) R. S. C. asks: Why, if known, does the skin of a chameleon change in color, in moving from an object of one color to one of another color; that is, why does its skin always assume the same color as the object it may be resting upon? A. One answer to the question, "Why does the chameleon change the color of its skin?" is that the chameleon has a better chance of life by reason of this protective resemblance to its surroundings. Those chameleons which had the largest range of change of color in the past have survived, and the capacity of change has been evolved in their descendants to a higher degree, so that all chameleons now living readily change the color of their skins to that of the bark of the tree upon which they at the time may be. They are thus protected from their enemies. There are many such adaptations of creatures to their habitat or environment. The polar bear, living among Arctic snows, is white. The tiger in the jungles is striped, as if painted to resemble rushes, reeds, or other stiff and straight plants. Many fish have backs of the hue of the sand or sea bottom upon which they lie. Nature has thus attended to the needs of her weaker children. Another answer might be that the effect of the color of the surroundings is to produce a change in the pigment in the cells of the skin, so that the color becomes like that of the surface upon which the animal is resting. In the chameleon this is comparatively rapid.

NEW BOOKS, ETC.

THE TREATMENT OF SEPTIC SEWAGE. By George W. Rafter, M.Am.Soc.C.E. New York: D. Van Nostrand Company, 1904. 32mo.; pp. 137. Price, 50 cents.

The author has endeavored to give, in a limited space, the more important developments in the bacterial treatment of sewage. All the leading works on the subject have been consulted, and the present small volume is a compendium of the information contained in these. The book is non-technical in character, and is intended to give to the everyday person a knowledge of the proper and scientific treatment of sewage.

AUTOMATIC SURVEYING INSTRUMENTS AND THEIR PRACTICAL USES ON LAND AND WATER. By Thomas Ferguson. With an Introduction by E. Hammer, Ph.D., Professor of Geodesy at the Royal Technical High School of Stuttgart. London: John Bale, Sons & Danielsson, Ltd., 1904. 12mo.; pp. 87. Price, $1.60.

This book forms a practical handbook on the use of automatic surveying instruments, such as the pedograph and cyclograph, which are used for the purpose of recording the topography of the country. The instruments and their mode of operation are described in detail, and clearly illustrated by drawings and photographs.

OBSERVATIONS SUR LES FOURMIS. Par Charles Janet. Limoges: Imprimerie-Librairie Ducourtieux et Gout, 1904. 8vo.; pp. 70.

This book contains much information upon ants, their anatomical construction; their length of life, means of subsistence, habits, etc. It is illustrated with about ten full-page plates containing drawings showing the anatomical structure of ants. The book contains considerable scientific information regarding these little insects.

UNTECHNICAL ADDRESSES ON TECHNICAL SUBJECTS. By James Douglass, LL.D. New York: John Wiley & Sons, 1904. 12mo.; pp. 84. Price, $1.

This small volume is made up of three interesting addresses on the following subjects: The Characteristics and Conditions of the Technical Progress of the Nineteenth Century; the Development of American Mining and Metallurgy, and the Equipments of the Training School; and Wastes in Mining and Metallurgy. The first-named paper treats largely of the management of large works and of the methods of treating employes both here and abroad; the second tells of the requirements which will be made of a student after he has left a mining school, and of the methods obtaining in large American mining and metallurgical works; while the third tells of the approved processes and methods now in vogue for utilizing products in ores which heretofore have gone largely to waste. The papers will be found most interesting by all students of mining and metallurgy.

THE LOCOMOTIVE. Hartford, Conn.: The Hartford Steam Boiler Inspection and Steam Boiler Company, 1903. 8vo.; pp. 195.

This book contains the numbers of that excellent monthly, well known to many of our readers—The Locomotive. Much useful information regarding locomotives, boilers, burners, and boiler explosions is contained within its pages. The annual report of the Chief of the Bureau of Steam Engineering for 1902 on oil burners is given in condensed form in the first number of the volume, and is illustrated by large diagrams of the various burners used so successfully in the tests with freight steamers made by this bureau. The paper is too well known to our readers to need further comment, save that all the articles published in it are of an altogether practical character.

DIE MECHANISCHEN VORRICHTUNGEN DER CHEMISCH - TECHNISCHEN BETRIEBE. Von Friedrich Weigand. Illustrated. Octavo. Pp. 416. Price, $2.

Many books have appeared on industrial chemistry, but so far as we know, the appliances of the industrial chemist have not been described in any work. The modern industrial chemist must be something of a mechanical engineer. It is the purpose of this work to describe the mechanical appliances which he employs. This purpose has been accomplished with praiseworthy thoroughness in this newly-issued book of Hartleben's.

ORNAMENTAL TURNING. A Work of Practical Instruction in the Above Art. By J. H. Evans. Three Volumes. London: Guilbert Pitman, 1903. 12mo.; pp., each volume, 165; with numerous engravings and plates. Price, $1.50 each volume.

Followers of this fascinating occupation, and those who simply make of it a hobby, will alike be delighted with these three little volumes. Mr. Evans, well known as a maker of high-class lathes and a professional turner of marked ability, has issued this popular-priced edition of his "Ornamental Turning." The volumes are progressive, Vol. 1 dealing with the simpler processes requiring inexpensive apparatus, while Vols. 2 and 3 initiate the worker into the manipulation of the more costly and efficient chucks and appliances.

MODERN PRACTICAL ELECTRICITY. By R. Mullineux Walmsley, D.Sc., F.R.S.C. Chicago: W. T. Keener & Co., 1904. Quarto; pp. 325. Numerous illustrations; 4 vols. Price, $12.

This book forms Volume IV. of one of the most popular yet practical treatises on the application of electricity in modern life, which we have yet seen. It is written in a simple, concise style, and abundantly illustrated with fine half-tones and numerous diagrams. Volume IV. opens with a continuation of the chapter on the Magnetic Circuit, and also contains chapters on batteries of generators of both the continuous and alternating current types; continuous current motors, of the open, closed, and tramcar types; alternate current motors of the monophase and polyphase induction types; and electrical measurements and dynamo and motor testing. The chapter on electrical measurements contains descriptions of standard meters of all kinds, and discusses in a thorough manner the measurement of electrical energy. The work contains some 325 illustrations, which greatly aid in interpreting the text.

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