

RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

CONTACT-PLUG.—CHARLES WAGNER, Manhattan, New York city. The inventor has devised an improved contact-plug for attachment to walls and other supports. The plug is arranged to insure a perfect contact when in the socket, to be readily removed in order to break the contact, or to be inserted in order positively to make the circuit. Porcelain is used for the socket and plug.

BATTERY-TRAY.—JAMES R. BLACKWELL, Manhattan, New York city. It sometimes happens that the working of the apparatus connected with a battery is deranged by the breaking of one of the cells. The object of this invention is to provide a tray to hold a number of cells and to indicate when a cell is broken. The battery elements are connected with an alarm, so that should a cell be broken its liquid, flowing into the tray, will cause a current to pass through the alarm, thus indicating that there is a break.

COMBINATER WATER-TIGHT JUNCTION-BOX, RECEPTACLE, AND FIXTURE.—ANNA E. JAHN, Manhattan, New York city. The invention provides an improved combination water-tight junction-box, receptacle, and fixture, which is especially designed for use in places subject to considerable moisture, as along the shore of a river, in ships, and in subterranean and submarine work. The device is arranged to insure at all times proper connection, and, in case of an overload in the main current, to prevent breakage of the electric lamp by burning out a fuse.

Mechanical Devices.

ELEVATOR FOR BINDERS.—ALBERT M. ALLEN, Pauls Valley, Indian Territory. Mr. Allen has dispensed with the top elevator-apron by providing a single apron having slats carrying teeth, and has thus materially reduced the draft of the machine. The apron of the elevator is passed over two wheels, the slats at the inner face being adapted to enter the spaces between the teeth of the wheels. Hence the apron is given a positive and uniform movement, and will not be shifted as heretofore, by frictional contact with a smooth surface.

CLUTCH AND REVERSING MECHANISM.—JOHN BLEM, West Hoboken, N. J. The mechanism comprises a shaft to be driven; an internal gear-wheel; and an external gear-wheel, both gear-wheels being loose on the shaft. With the gear-wheels a driven pinion meshes. For each gear-wheel an independent clutch-mechanism is provided to lock either of the gear-wheels to the shaft to be driven. The device permits the operator readily to drive the shaft in either direction or to stop whenever he may desire.

STOP-MOTION FOR MECHANICAL TOYS.—ATHERTON D. CONVERSE, Winchendon, Mass. The purpose of the invention is to provide a means for automatically preventing the wheels or axles of a motor-controlled vehicle from turning until the vehicle is placed upon the support on which it is to travel. The driving-axle is provided with a projection. A second axle is employed, which is mounted to turn and slide and to operate a check-device which is arranged for contact with the projection from the driving-axle. The moment the vehicle is placed upon a support the wheels begin to turn.

SHOE-TURNING DEVICE.—GEORGE B. GARDNER, Haverhill, Mass. This invention relates to devices for facilitating the work of turning shoes, which work is necessary in the manufacture of certain kinds of shoes. The turner comprises two essentially parallel arms movable relatively toward and from each other. One of the arms has its end portion turned laterally approximately parallel with the line of relative movement of the arms.

CONCENTRATOR.—EDWIN A. SPERRY, Biwabik, Minn. The material treated is to be mixed with water and delivered on the surface of the table from the distributing-box. By adjusting the conical pitch of the table-top the ore-pulp is allowed to flow down toward the edge of the table, while the vanning or agitating motion, together with the action of the water mixed with the pulp, gives the particles an opportunity to separate according to their respective specific gravities. The heavier particles settle on the table, while the lighter particles remain on top of the heavier. The revolution of the tables moves the material so deposited, and a spray from a pipe washes off the upper and lighter portions of the material deposited and leaves the heavier values on the surface of the table. The values are in turn washed off into suitable receptacles.

DISINTEGRATING MACHINE.—BRUNO MOUSTIER, Roquevaire (Bouches du Rhône), France. The machine is a powdering or disintegrating machine which breaks up, crushes, granulates, and pulverizes by inter-reciprocating shock of the material, and is characterized by a special construction which is exceedingly efficient and which reduces the wear of the working parts to a minimum.

MOTOR.—CHARLES W. STEELE, Detroit, Mich. The motor is designed to be employed in connection with boiler-tube cleaners, and comprises a casing which can be connected at one end with a motive-agent supply-pipe. A cap is secured to the opposite end of the casing, and is provided with exhaust-ports. In the casing is a series of deflectors. A shaft has bearing at one end in the deflector at the inlet end of the casing and at the other end

in the cap. Propeller-wheels are secured to the shaft and alternate with the deflectors, the wheels having peripheral angularly-disposed blades. The scoring-off process is materially assisted by the exhaust motive agent.

CLOTHES-WRINGER.—ALBERT G. CARLING, Hackensack, N. J. By means of the improvements devised by Mr. Carling the clothes-wringer can be actuated speedily for light work and can be adapted, by a quick change of working parts, for slow movement with great increase of power when heavy work is to be performed.

PROPELLER.—KIRK G. JOHNSTON, Piqua, Ohio. The object of the invention is to provide simple means for shifting the angle of the blades and locking them in order to propel the vessel forward or backward without reversing the direction of rotation of the propeller-shaft. The device is particularly serviceable in naphtha and gasoline launches.

ACETYLENE GAS GENERATOR.—TYRRELL H. DUNCOMBE, 300 Talbot Street, St. Thomas, Ontario, Canada. The water-reservoir, gas-receiver, and generating-chamber are arranged side by side. The water is allowed to gravitate from the reservoir to the carbide in the generator in order to produce gas, and is forced back and away from the carbide by the gas so produced, to cause the generation of gas to proceed or to be discontinued automatically in accordance with the consumption.

COAL-MINING MACHINE.—OWEN JACOBY, Sandrum, Ohio. The chief features of the invention are a strong main frame and a carriage which supports the cutting devices and the engine or motor mechanism and which moves back and forth in the main frame, so that the cutting devices can be properly projected to cut into the bank of coal when the machine is operated. In this machine the main frame possesses great strength to resist the vibration and lateral strain when the cutters meet an unyielding obstruction.

MACHINE FOR OPERATING UPON PITHY STALKS.—GEORGE R. SHERWOOD, 971 Warren Avenue, Chicago, Ill. The shell from one side of the stalk is severed by a cutter which is reciprocated longitudinally. To this cutter the stalk is fed by rollers which extend parallel with the cutter. The roller on the side from which the shell is cut is practically unyielding during operation and under the control of adjusting devices; while the other roller is yieldingly supported. Both of these cutters discharge on a carrier which can be coupled to other carriers to deliver the shell at any desired point. The pith is discharged by a screw-conveyor at one side of the machine.

STREET-SWEEPER.—JESSE M. HARR, Ninth and H Streets, Washington, S. E., D. C. This machine is designed to be propelled by one laborer and automatically to sweep up the dirt and deposit it in a receptacle by the machine. The dirt receptacle rests on the bottom of the machine. A rotary brush and a bucket are provided, the bucket being adapted to be opened on the side adjacent to the brush and to be automatically raised and dumped into the dirt-receptacle.

Vehicles and Their Accessories.

BICYCLE-LOCK.—EARL F. L. RUSSELL and CHARLES M. BROWN, Denver, Colo. The purpose of this invention is to provide a simple device for rendering bicycles inoperative and thereby preventing them from being stolen. This device comprises a bolt adapted to be forced against the tire of the bicycle-wheel so that the wheel cannot be turned.

ELASTIC TIRE.—WILLIAM F. WILLIAMS, 17 and 18 Great Pultney Street, London, W., England. The invention relates to the manufacture of hollow rubber tires of D section adapted to be secured to the wheel-rim by a band passing through the bore of the tire. The inventor produces a tire having embedded in the rubber (in immediate proximity to the bore) helical springs conforming with the transversely-arched shape of the tire, in combination with cords adapted to form a core to fill up the interior of the springs. Cords and springs co-act to strengthen the tire.

MEANS FOR SECURING ELASTIC TIRES TO WHEELS.—WILLIAM F. WILLIAMS, 17 and 18 Great Pultney Street, London, W., England. The invention relates to tires which are clasped about the wheel-rim by a metal band binding the base of the tire, or by inwardly-turned marginal flanges on the margin of the tire. The novel feature of the invention is to be found in a means for adjustably tightening and securing the tire.

Miscellaneous.

PIPE-STOPPER.—GEORGE B. SIDELINGER, Danville, Ill. Mr. Sidelinger has devised a means for hermetically sealing the ends of pipes in a most secure manner and yet so as to permit him to remove the plug quickly and easily whenever necessary.

WATER-REGULATING DEVICE.—THOMAS J. SANFORD, Chicago, Ill. The device is designed to regulate the water fed into an elevated tank on a building, is automatic in operation, is adapted to supply water to water fixtures for use as required and likewise to supply water to a heating-tank which is connected with the system of water-distribution.

POCKET-BOOK, HAND-BAG OR THE LIKE.—MAX VORGERSSANG, Brooklyn, New York city. By means of the improvements invented by the patentee a convenient change-pocket is

provided entirely separate from the other compartments of the article. Hence it is possible more readily to store change, bills, cards, handkerchiefs and the like separately.

GAS-METER SUPPORT.—HENRY T. HOLLAND, Manhattan, New York city. The inventor has devised a support which is cheap, strong, and simple, which permits ready access to the meter from all sides, which is capable of being used in different positions, and which is compact, permitting the gas-meter to be set where but little space is available.

TUNING-BUTTON.—ARTHUR J. LANG, Brooklyn, New York city. The tuning-button is of the kind used at the neck sections of stringed musical instruments. The purpose of the invention is to provide such a tuning-button with a light, yet durable head, and firmly to secure this head on the stem or shank.

PRESERVETIN.—EMILE BESSE and LOUIS LEBIN, Paris, France. These two inventors have devised a tin which can be soldered with or without pressure, in such a manner as to prevent the melted solder (which is interposed between the tin and its cover or its bottom plate) from running during the soldering into the interior or down the outside of the tin.

TOOL-HANDLE.—JOHN C. LAMBERT, Tonica, Ill. The handle comprises a shell in which two jaws are fitted. The jaws are tapered and the inner walls of the shell are correspondingly formed. One of the jaws has a threaded shank at its upper end over which is passed an eye formed on the under jaw so that the jaws may be connected with each other. The threaded shank of the first-named jaw screws into the upper end of the shell.

WORKMAN'S TIME RECORDER.—JOHN A. DEMUTH, Oberlin, Ohio. The workman who is late is provided with a special time-card which he perforates by a register. When the workman leaves at night he repeats the operation so that the card bears two perforations. If the workman goes out and returns at noon the card bears four perforations. In order to verify the record of a late man a special device is employed by which the card is perforated. If this perforated record tallies with the workman's account, the workman's record will be accepted as correct.

SAFETY-CHECK.—WILLIAM H. BLACK, 100 Broadway, Manhattan, New York city. The invention is an improvement in checks, drafts, and other papers representing value, including foreign exchanges, letters of credit, etc., and is specially designed for use as a traveler's check without necessitating a personal identification. The paper is good anywhere in the hands of the purchaser or his indorsee, but is good nowhere in the hands of a wrongful holder. The check can be cashed in by the purchaser at the issuing office without the necessity of giving bond or securing identification further than that afforded by the counter-signature.

BADGE-BAR.—BENJAMIN HARRIS, Manhattan, New York city. By means of the badge-bar a ribbon is fastened to the coat. The device comprises a bar the front face of which is ornamented and the rear face of which is provided with peculiarly-arranged pins, one being adapted to pierce the coat and the other to engage and suspend the ribbon.

BADGE-BAR.—BENJAMIN HARRIS, Manhattan, New York city. This badge-bar comprises a back-plate, a front binding-rim, a panel-bearing insignia or ornamentation, and pins at the back for securing the bar and the badge ribbon. The various parts are held together in a novel way.

PROCESS OF TREATING BLAST-FURNACE SLAG IN ITS MOLTEN STATE.—ALEXANDER D. CLEGG, Hoboken, N. J. The molten slag is gathered in a kiln having non-conducting walls and having an air-space above the surface of the slag. This space has restricted communication with the atmosphere. Communication between the air of this space and the atmosphere is regulated so that the air above the slag is intensely heated by radiation and the cooling of the slag is retarded while the slag is in a state of transition to the solid form.

MUSIC RACK AND LIGHT-SUPPORTING ATTACHMENT FOR STOOLS OR CHAIRS.—CHARLES H. BACON, Danielson, Conn. The invention provides means for adjustably securing a music-rack and a support for a lantern to a stool, thus accommodating each musician of a band with a support for music and with a light.

CIGAR.—FREDERICK E. ARNOLD, Ann Arbor, Mich. The cigar is arranged to prevent the ashes from falling off while smoking and at the same time to preserve all the flavor in the cigar and insure a free draft.

DESK-TOP.—ROBERT M. SMITH, Chicago, Ill. By means of Mr. Smith's invention an ordinary school-desk can be transformed into a desk fitted both for academic work and for manual training. This end is obtained by fitting the desk with a reversible top, one side of which can be used for academic work, and one side of which is arranged for manual work.

WATER INDICATOR.—WILHELM VOLTZOW and HENRY JÜRGENS, Brooklyn, New York city. By means of this machine the depth of water in a receptacle is accurately indicated in feet and inches at any desired point above or below the receptacle or at any point within the receptacle. The device is particularly applicable for automatically indicating to the watch or officer of the deck of a vessel the depth of water in the hold in feet and inches.

DOOR SPRING AND STOP.—HENRY McCURRY, Evanston, Ill. This invention is an improved closing spring for stop devices for swinging doors of carriages to prevent the doors from swinging too far outwardly and striking the carriage-wheels. The device is entirely hidden from view when the door is closed.

CAN-SPOUT.—VIRGINIE A. HENRY, Manhattan, New York city. The invention provides a spout which is readily attachable to a can and which protects the contents of the can against dust and other foreign matter, and which excludes the outside air from all but a small portion of the surface of these contents.

DESK.—ROBERT M. SMITH, Chicago, Ill. The desk is a combined study and manual-working desk adapted for use in schools which combine both manual and academic studies. A reversible top is pivotally connected with slides mounted in slideways of a framing. Upon the movement of the slides from one end of the desk to the other the top is reversed. It is to be understood that the one side of the top is designed to be used for manual training, and the other side in the ordinary manner.

Designs.

BADGE.—FREDERICK KOCH, Manhattan, New York city. The design shows the new Pan-American Exposition badge which has recently gained such wide popularity. The badge consists of two heart-shaped elements arranged one beneath the other.

CANDY-MOLD.—CHARLES REPETTI, Manhattan, New York city. The mold produces a candy which bears a design consisting of two crossed flags upon which a pan is superposed, the dish of the pan bearing the head of a buffalo. The purpose is obvious.

GRASS-HOOK.—HENRY B. BARDEN, Wallingford, Vt. The shank of the hook is near the heel of the blade and slightly elevated at that point. The blade hangs at an angle to the cutting edge lower than the back, giving free play for a broad swath, and preventing the hand from coming in contact with the ground.

PARING KNIFE.—CORNELIUS T. DEMAREST, Hackensack, N. J. The leading feature of the design consists of a blade having two points extending therefrom which are dish.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the inventor, title of the invention, and date of this paper.

NEW BOOKS, ETC.

THE VICTORIA JUBILEE BRIDGE. Complimentary Souvenir Booklet, issued by the Grand Trunk Railway System.

This artistic little souvenir book is bound in silvered metal covers and well illustrated with fine engravings, showing both the original Victoria tubular bridge across the St. Lawrence at Montreal and the new Jubilee bridge, which was finished in 1899. Considerable interest attaches to the original bridge, especially as it was opened in 1860 by the Prince of Wales. A photograph of the Prince and party, as well as the various commemorative medals, are all reproduced in the book, which contains a complete description of this great engineering feat and its accomplishment.

PLAIN FACTS ABOUT THE AUTOMOBILE. By Albert S. Clough, S.B. Manchester, N. H.: The Nature Study Press. 1901. 36 pp.

This pamphlet contains a popular description of the three systems now in use in this country, viz., steam, electric and gasoline. A comparison of them is made and the prospective purchaser is enlightened as to the advantages and disadvantages, and also given some valuable points as to their care.

SNAP SHOTS. Photographic Paper. J. W. Willard, Editor. New York: Snap Shot Publishing Company. 20 pp.

This breezy little photographic paper is now in the midst of its ninth annual volume, and continues to be the purveyor of interesting notes and short articles on practical photographic methods.

THE LOCOMOTIVE. Hartford Steam Boiler Inspection and Insurance Company. Vol. XXI. 1900. 191 pp., 40 ill.

The bound volume for 1900 of this little paper contains many articles of value to engineers and others having the care of steam engines and boilers. A number of photographs of curious boiler explosions are reproduced, and the causes gone into and described. In each number a monthly list of boiler explosions is given, as well as a list of boilers found defective upon inspection.

BIBLIOTICS, OR THE STUDY OF DOCUMENTS. By Persifor Frazer. Third Edition, greatly enlarged, rearranged and in part rewritten. Philadelphia: J. B. Lippincott Company. 1901. 266 pp., 45 ill.

This little volume is a complete handbook for those interested in the determination of the individual character of handwriting for exposing forgery and fraud. The author uses scientific methods throughout, employing composite and micro photography for obtaining a standard of comparison and for investigating tremors in the pen stroke respectively. His book describes (1) physical considerations, (2) graphology, or the study of the individual characteristics of the writing, (3) plessopheny, or the means to be employed for

the detection of forgeries, (4) chemical considerations, including a statement of the constitution of common inks and chemical tests applicable to documents by means of which the nature of an ink may be ascertained. The author describes no less than seven methods of investigation of which he is the originator. The book also has an appendix containing valuable notes on the scientific aspect and legal status of the subject.

ELECTRIC LIGHTING. By Francis B. Crocker, E.M., Ph. D. New York: The D. Van Nostrand Company. 1901. 500 pp., 391 ill. Price \$3.

This book, which is the second of two volumes dealing with the subject, describes the distributing system and lamps, and covers all parts of electric lighting systems excepting the generating plants. In treating each branch of the subject the principles are first stated with considerable fullness and are then followed by practical examples of prominent methods and apparatus employed in actual practice. Both volumes are intended as textbooks for engineering schools and as handbooks for practicing engineers, and thus all abstruse and detailed matter has been omitted as far as possible. The National Electrical Code and the Report of the Committee on Standardization of the American Institute of Electrical Engineers are added as appendices.

THE TRUSTS. By William Miller Collier. New York: The Baker & Taylor Company. 1900. 336 pp.

Mr. Collier should receive the thanks of every business man for such a fair-minded and able discussion of this great problem of the new century in America. He approaches the trust question from the economic standpoint and views it in the light of past experience. He shows the causes that have led to the giant corporations of to-day, as well as the dangers that lie in the monopolistic tendencies of these corporations; and also indicates what appears to be the proper legislation to hold such tendencies in check. The conclusion he reaches is that the trust is a natural outcome of modern competition; that it is the most economical form of conducting industries, and that its only danger is in its power to become temporarily a monopoly and raise prices if it so desires. That such a course is in the end self-destructive he very clearly demonstrates. A chapter on trusts and expansion offers some good suggestions as to one unappreciated aid in remedying the evil, while another chapter is devoted to all the various remedies. A number of appendices give the various acts that have been passed, both State and Federal, thus far to regulate trusts. The book is a fair-minded discussion of both sides of this burning question by an able student of political economy.

UNTERSUCHUNGEN UEBER HETEROGENESE. Von Dr. A. P. Fokker in Gronigen. IV. Die Granula der Milch. Three plates. Gronigen: P. Noordhoff. 1901. Octavo. Pp. 102. Price, paper, \$1.

The work before us is an ingenious demonstration of a new hypothesis that bacteria are not individual living creatures, but only partial bios, proliferative forms of diseased protoplasm from which they have sprung by heterogenesis.

SUR LE SYSTÈME GLANDULAIRE DES FOURMIS. Par Charles Janet.

SUR LA VESPA CRABRO L. Ponte. Conservation de la chaleur dans le nid. Par Charles Janet.

VORSCHLAG ZU EINER NEUEN EINFACHEN METHODE DER VIELFACHTELEGRAPHIE. Von J. W. Giltay, in Delft. Sonderabdruck aus der Electrotechnischen Zeitschrift. Berlin: Verlag von Julius Springer. 1901.

ETUDES SUR LES FOURMIS, LES GUEPES ET LES ABEILLES. Note 18, Aiguillon de la Myrmica rubra, Appareil de fermentation de la glande à venin. Par Charles Janet. Paris: Georges Carré et C. Naud. 1898. Pp. 27.

THE PRACTICAL HOTEL STEWARD. By John Tellman, Chicago, Ill. The Hotel Monthly. 1900. Price, \$1.

A most excellent book which will be welcomed by all hotel and club stewards. It gives precisely the information which stewards need to conduct the affairs of a house with economy. The steward is very much in the position of a general of an army, and in order to make a success it requires unremitting attention to the smallest detail. The book before us gives samples of menus for various grades of hotels, samples of requisition blanks, etc., and takes up the question of wines with rare intelligence. It is written by a thoroughly practical hotel steward.

The American School of Correspondence of Boston has just published a Reference Library of Engineering Practice, Steam, Electrical and Mechanical, which comprises a set of five large and extremely handsome volumes. The editors have been led to prepare this library as a result of success obtained in teaching engineering subjects to mechanics and others who are not deeply versed in mathematical science; and in the preparation of the library the use of clear and simple language has been adhered to throughout. The illustrations, which have been carefully chosen, number some 2,000. The volumes are handsomely bound.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**

MUNN & CO.

Marine Iron Works. Chicago. Catalogue free.

Inquiry No. 858.—For manufacturers of electric motors.

TURBINES.—Lefell & Co. Springfield, Ohio, U. S. A.

Inquiry No. 859.—For makers of electro-magnetic resistant material, or formula for same.

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

Inquiry No. 860.—For a hand power machine for sifting and mixing baking powder.

WATER WHEELS. Alcott & Co., Mt. Holly, N. J.

Inquiry No. 861.—For manufacturers of cigarette papers.

Yankee Notions. Waterbury Button Co., Waterbury, Ct.

Inquiry No. 862.—For a small engine driving two or three stones for sharpening razors, run by steam or foot power.

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

Inquiry No. 863.—For a machine for making ice in small quantities adapted for hotel and family use.

Sheet Metal Stamping: difficult forms a specialty. The Crosby Company, Buffalo, N. Y.

Inquiry No. 864.—For manufacturers of sheet copper and brass.

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

Inquiry No. 865.—For manufacturers of small jeweler's rollers.

For Sheet Brass Stamping and small Castings, write Badger Brass Mfg. Co., Kenosha, Wis.

Inquiry No. 866.—For parties to manufacture a tinware novelty on royalty or otherwise.

Rigs that Run. Hydrocarbon system. Write St. Louis Motor Carriage Co., St. Louis, Mo.

Inquiry No. 867.—For manufacturers of carpet cleaning machinery.

Ten days' trial given on Daus' Tip Top Duplicator. Felix Daus Duplicator Co., 5 Hanover St., N. Y. city.

Inquiry No. 868.—For manufacturers of pumps for supplying water from a river for a lawn.

SAWMILLS.—With variable friction feed. Send for Catalogue B. Geo. S. Comstock, Mechanicsburg, Pa.

Inquiry No. 869.—For whistles or other alarms for gasoline launches.

Wanted—Punch and Die Work, Press Work and light Manufg. Daugherty Novelty Works, Kittanning, Pa.

Inquiry No. 870.—For dealers in 2 horse power alternating current dynamo, second-hand or new.

We are equipped to manufacture all kinds of specialties. Send samples. Chicago Handle Bar Co. Chicago Ill.

Inquiry No. 871.—For manufacturers of oil machinery.

Machinery designed and constructed. Gear cutting. The Garvin Machine Co., 149 Varick, cor. Spring Sts., N. Y.

Inquiry No. 872.—For dealers in cinematographs or kinetoscopes.

Kester Electric Mfg Co's, Self-fluxing solder saves labor, strong non-corrosive joints, without acid, Chicago, Ill.

Inquiry No. 873.—For catalogues of paint making machinery.

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

Inquiry No. 874.—For manufacturers of kilns for burning lime continuously; kilns from which the lime can be taken out without interfering with the burning.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Inquiry No. 875.—For manufacturers of rotary cement furnaces.

Will give a one-half interest in twelve inventions, or any part of number, for money to perfect patent and dispose of same. Address S. O. Stewart, E. Las Vegas, New Mexico.

Inquiry No. 876.—For manufacturers of lime burners to burn a substance in a powdered form.

ELECTRICAL ENGINEER (Tramways).—Wanted immediately by the Council of the City of Wellington, New Zealand, a thoroughly qualified Electrical Engineer, who must have had special experience in carrying out and equipping overhead electrical tramways and power stations. Full particulars and conditions may be obtained on application to Messrs. R. W. Forbes & Son, Produce Exchange, New York, and applications must be delivered at the office of Messrs. John Duthie & Co., Ltd., Lime Street, London, E. C., England, not later than noon on the 20th July.

Inquiry No. 877.—For manufacturers of sugar machinery.

EVER MADE THE TRIP?

While it has always been a beautiful trip over the Lackawanna Railroad to Buffalo, yet the fact has not been so generally known as it has of late, and the result is that the increase of traffic is very large. One of the most talked of pieces of scenery is the Delaware Water Gap, and it would pay any one who has never made the trip to Buffalo by way of the Lackawanna to take it and view this beautiful spot. Another great advantage is the shortness of the route. It is a fact that the Lackawanna is the shortest road to Buffalo.—Insurance Times.

Inquiry No. 878.—For manufacturers of screw-top, round tin cans for liquids in quart and smaller sizes.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Inquiry No. 879.—For manufacturers of small malleable iron castings, near Canon City, Col.

Inquiry No. 880.—For manufacturers of aluminum and brass novelties by contract.

Inquiry No. 881.—For manufacturers of glass.

Inquiry No. 882.—For manufacturers of cigarette making machines.

Inquiry No. 883.—For manufacturers of copper pails.

Inquiry No. 884.—For manufacturers, in Michigan and Ohio, of dress hooks and eyes.

Inquiry No. 885.—For dealers in dishes, lamps, silver ware, dress suit cases, watches mandolins and guitars, rocking chairs and jewelry; western houses, if possible.

Inquiry No. 886.—For manufacturers of pipe-making machinery, also machinery for working and cutting amber.

Inquiry No. 887.—For small glass articles.

Inquiry No. 888.—For the address of the manufacturers of the Packard vacuum pump.

Inquiry No. 889.—For manufacturers of well drilling machinery.

Inquiry No. 890.—For a sand screen and elevator for loading railroad cars.

Inquiry No. 891.—For tools and machinery to make picture frames.

Inquiry No. 892.—For fertilizer dryers.

Inquiry No. 893.—For tobacco dryers.

Inquiry No. 894.—For tobacco grinding mills.

Inquiry No. 895.—For glue machinery.

Inquiry No. 896.—For vacuum pans for glue.

Inquiry No. 897.—For manufacturers of paint machinery.

Inquiry No. 898.—For manufacturers of steam river boats of the stern-wheel pattern.

Inquiry No. 899.—For responsible manufacturers to build apparatus requiring heavy sheet copper and cast bronze in construction.

Inquiry No. 900.—For machinery for making coal slack eggettes.

Inquiry No. 901.—For opera chairs, hardwood floors, etc.

Inquiry No. 902.—For a toothpick machine.

Inquiry No. 903.—For manufacturers of diving belts, supplies, etc.

Notes & 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.

(8215) C. J. K. asks: What horse power electric motor, connected to axle by double reduction gearing, would be necessary to draw a train of cars weighing five to six pounds, track perfectly level? How many cells of acid battery would be required? A. A very small motor should pull a couple of pounds on the drawbar, which is all that is required to draw a weight of 6 pounds on a level track. **SUPPLEMENT** Nos. 783 or 1210, price ten cents each, may contain plans which will meet the case. Two cells will drive the first, and four to six the second of these motors.

(8216) U. M. writes: 1. I would like to ask a few questions in regard to voltmeters described in **SUPPLEMENT** No. 1215, page 19480. 1. What necessary changes are required to make the voltmeter register from 0 to 12? That is, divide the full length of scale into 12 divisions in place of 125 divisions. A. To cause the needle to swing the whole length of the scale for a voltage one-tenth as great, or for 12.5 volts, you should use one-tenth as much wire. 2. Would it be advisable to use copper plate of 1/4 inch (which I have) in place of brass, for the back of voltmeter? A. There would seem to be no reason why copper may not be used in place of brass, except that copper is harder to work than brass.

(8217) C. G. asks: Is nickel plate acted upon by photographic chemicals? A. All acids dissolve nickel with more or less rapidity, hence these dishes are not suitable for use in photographic work. Use hard rubber, celluloid, glass or porcelain. The use of nickel-plated dishes is unsafe in the kitchen for the reason that the acids of the foods will form with the nickel compounds which are poisonous.

(8218) J. L. M. writes: All wiring tables are figured mostly in algebra. I am not up in this study, and wish you would give me some table that can be worked out in plain multiplication and division for getting sizes of wire for carrying different amounts of current at different voltages any given distance and with different percentages of loss. A. Cushing's "Standard Wiring," price \$1 by mail, contains the rules expressed in initial letters, with the signs of multiplication and division. These can be easily learned and are the simplest form for expressing the rules.

(8219) C. H. asks: 1. Can glass be made by sand and potash falling between two arcs or is it necessary that it should be held in place before it will form into a liquid, and would it then interfere with the carbons or current? A. We do not think sand could be melted in the time it would occupy in falling through between the carbons, and if it were it would turn solid in the same time after it passed into a colder place below. You will find a furnace to be the cheapest way for melting sand and making the glass. 2. If glass were held in an arc would it break the current? A. Yes, if the heat did not crack it too soon. 3. Would a blowpipe

have any effect on an arc the same as with gas to direct the heat? A. No. The blowpipe does not direct the heat of a gas jet. It produces the heat. The heat of a blowpipe is due to the fiercer combustion of the gas in the greater supply of oxygen furnished by the blast. It is a blast furnace on a small scale. The arc would be cooled by a blast of air, since its heat is not due to combustion, as in the ordinary flame. An arc can be blown out to a point and act as a blowpipe by using an electro-magnet to repel the arc.

(8220) J. J. D. writes: In the **SCIENTIFIC AMERICAN** of March 23, page 178, I saw the expression, "a current of three thousand volts at the motors." Is the expression correct? A few weeks ago in your inquiry column, in answer to a correspondent, you said, "We get the expression very frequently, 'A current of so many volts.' The statement is entirely wrong. A current is measured in amperes, not in volts." A. The voltage of a current is its pressure. The current is measured in "amperes." The expression so often heard, "A current of 110 volts," is not correct. It should not be used, even if it does occasionally find its way into our columns. We confess that we do not always use entirely correct language; that does not prevent our pointing out incorrect language when it comes in our way to do so.

(8221) C. G. asks: Will you please publish in the **SCIENTIFIC AMERICAN** a description how to make a Wehnelt interrupter for a direct current of 125 volts? A. The **SUPPLEMENT**, pages 19602 and 19811, price ten cents each, contains illustrated articles upon the Wehnelt interrupter. The interrupter is adjusted to the voltage of the current by varying the length of the platinum wire which is in the acid.

(8222) R. H. C. asks: 1. In a copying camera or enlarging camera, how far from the source of light (incandescent gas burner) should the condensing lens (ground glass) be? A. A condensing lens is not found necessary. Place the ground glass one or two inches in front of the negative. It will then diffuse the light of the lamp so as to give an even illumination over the negative. 2. At what distance from the condensing lens should the negative be placed? A. If a lens is used the negative should be quite near it, so that the negative shall be covered by the cone of light from the lens. 3. What size should the condensing lens or ground glass substitute be for a 4 x 5 or 2 1/4 x 3 1/4 negative? A. Anything larger than the negative. 4. What kind of lens or lenses should be used in enlarging to obtain the best results? And what size (diameter) should the lens be? A. The same lens that was used in making the negative will work to enlarge it to any size. If the lens will cover the plate, it will serve to enlarge it.

(8223) W. T. M. writes: In answer 8111, for specific heat of hydrogen and constant volume for 0.2419 read 2.419. The ratio of the specific heats at constant volume and pressure is 1.41 for hydrogen and 3.4062 divided by 1.41 equals 2.419. A. We confess the error. And yet we quoted the best authorities accessible. Our error arose from not verifying the calculation and making sure that the reference was correctly made. Since our correspondent has called our attention to the matter, we have been through a large number of authors on this subject with interesting results.

Authority.	Specific Heats.	Constant Pressure.	Constant Volume.
Smithsonian Tables	3.4062	0.2419
Barker's Physics	3.4090	0.2359
Ganot's Physics	3.4090	0.2359
Pickering, Phys. Manip.	3.409	0.236
Kohlrausch, Phys. Exp.	0.409
Hastings and Beach Physics	2.402
Ames and Bliss' Manual	3.406	2.419
Whiting, Phys. Meas.	3.40	2.40

It is of course known by every student of thermodynamics that the ratio of the specific heat at constant pressure to that at constant volume, for a perfect gas, is constant, and is 1.41. Our table makes it plain that at some time a typographical error occurred in giving the specific heat at constant volume, giving it as 0.24 instead of 2.41, and that this error once started has been transmitted from text to text. The oldest book quoted above was printed in 1876, and contains the error, which is thus shown to be venerable. Another more glaring error of the same sort is seen in the number given by Kohlrausch, 0.409, an obvious error, if one is informed on the subject; but a reference book is for the learner and the uninformed. These cannot detect such a misprint unless by a comparison of authorities, which may not be at hand, and for which there may not be time. Very few would think of verifying the statements of so eminent an authority as Kohlrausch. We think we have shown that we were in good company when we committed the error. This is not a solitary instance of errors traveling for a long time in textbooks without detection. Many an experiment has been printed without being performed by the author, which was an impossibility. A laboratory book in chemistry recently published by a professor in a university directs the student to collect chlorine by the displacement of water! He will get some after the water is saturated, but meanwhile the back pressure may interrupt the complete success of the operation, and even break things.