

RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

BLASTING.—CALEB F. BRYANT and CHARLES H. BROWN, Cripple Creek, Colo. The blasting device is provided with a fuse and with a primary igniting device for the fuse comprising a shell engaged by the fuse. Terminals forming part of an electric current, extend into the shell. A disk of tin-foil connects the terminals. Combustible material is arranged between the disk and the fuse. By means of the device, the reports can be successively counted; and if one charge has not exploded the operator knows which one of the charges has not exploded. By using tin-foil as a partial conductor for the current, a positive ignition is always insured; and more primary igniters can be set off at the same time by an electric current of a given strength than would otherwise be possible.

CIRCUIT-BREAKER.—GEORGE W. PARSONS, La Grange, Ill.—This circuit-breaker is designed in addition to being opened and closed manually, to be automatically opened either instantaneously upon an overload of current. When the overload is not immediately dangerous the circuit will be opened only after the lapse of a reasonable time. During this interval an alarm is sounded, giving ample warning to reduce this overload before the circuit could be opened by the continuance of the overload to the expiration of the time limit.

Engineering Improvements.

ENGINE.—JACOB E. HARTWELL, Troy, Mont. The invention relates to engines working by internal combustion or explosion, and has for its object to increase the power of such engines, and to provide at the same time improved means for cooling the explosion-chamber and adjacent parts of the engine. This result is obtained by the injection of water, which not only has a cooling effect, but by the generation of steam increases the motive power of the engine.

ROTARY-ENGINE.—BENJAMIN F. LAZENBY, Wentworth, Mo. This rotary engine is provided with a revolving piston having two annular steam-spaces and two piston heads, related, respectively, to such spaces. These parts work with a peculiar valve mechanism shifting the steam alternately from one steam-space to the other, whereby the piston is caused to rotate continuously.

BOILER-FEEDER.—HENRY J. DAVIS, PLAYFAIR G. AULT, WILBER W. BAILEY, and JAMES WIDEMANN, Birmingham, Ala. The water is automatically admitted to the machine by gravity at a time when the connections with the boiler are closed automatically. When the water-tank employed is filled, the water is automatically cut-off and the boiler connections at the same instant open, both top and bottom. The water in the tank when full standing at a considerably higher level than that in the boiler and the pressure being equalized, the water naturally falls into the boiler until the level is the same as in the tank. The boiler connections being then again automatically closed, the water connection is opened and the operation is repeated. When the tank has discharged its water into the boiler, it is full of steam at boiler-pressure. This pressure is automatically relieved at the same instant the boiler connections are closed and the exhaust-steam is conveyed to a condensing-tank, whereby the water therein is heated before discharging into the water-tank.

Motor-Vehicles.

MOTOR-PLOW.—FRANK P. FELTER, Haverstraw, N. Y. On a carriage a motor is mounted. Underneath the rear portion of the carriage plows are arranged, the beams of which are connected by links with the platform. A bar connects the beams of opposite plows. Curved rods are extended upward from the beams at their rear ends; and these rods pass through guide-tubes attached to the platform. Mechanism is connected with the cross-bar for raising and lowering the plows.

GEARING.—EDWARD R. BALES, Centralia, Ill. The invention provides a gearing adapted especially to automobiles, the object being to provide means for transmitting the driving power from the motor to the traction axle, which means will not be influenced by the movement of the vehicle-body independently of the driving-axle.

Mechanical Devices.

SNOW-MELTING MACHINE.—EDWARD BEATTY, Brooklyn, New York city. This snow-melting machine has a snow-melting box or tank provided with a top overflow whereby the tank is kept full of water. The products of combustion from a furnace are forced into the water in the tank at a point below the overflow, thereby keeping the water heated and quickly melting the snow placed in the tank. The machine is designed for use in cities and is arranged to be conveniently moved along the streets and to discharge the melted snow directly into the sewer.

EMBROIDERING ATTACHMENT FOR SEWING-MACHINES.—JOSEPH GRUBMAN, Brooklyn, New York city. The inventor has devised a new attachment for Bonnaz or other embroidering or sewing machines, which attachment is arranged to intertwine or otherwise arrange embroidering materials, such as braid, chenille, tapes, cords, bands, or the like, upon the fabric to be embroidered. An intermittent swinging motion is given to two carriers so that they alternately cross their embroidering materials and form intertwining loops secured in place on the fabric by stitches.

CLAY SCREENING-APPARATUS.—HORACE G. VIRGIN, Penrith, W. Va. Mr. Virgin has invented an ingenious means for screening clay used in brickmaking. His machine comprises an inclined screen with a brush or a gang of brushes arranged therein and connected with means for reciprocating them on the screen, so that the fine clay is sieved therethrough and the lumps of coarse clay are caused to gravitate down the screen into a suitable receptacle at its lower end.

CHERRY-PITTER.—EDWARD H. SKINNER, Springbrook, Ore. The object of this invention is to produce a device which shall pit cherries and similar fruit in large quantities. The device can be economically used for pitting fruit to be canned on a commercial scale. An endless belt has a series of pivoted plates which are adapted to turn on the pivots as the belt makes a turn at

one end. The plates are provided with apertures designed to receive the fruit. As the plates turn, the cherries are jarred free; and a number of pitting-rods or pins are caused to pass through the apertures in the plates in order to remove the pits from the cherries.

DRILLING-MACHINE.—HANS O. NIENSTADT, Copenhagen, Denmark. Hand-power drilling-machines are subject to the disadvantage that the velocities of their flywheels are not variable. All such machines work with the same flywheel velocity whether small or large holes are to be drilled; and as the driving-crank is rotated more quickly when a small hole is being drilled than when a large hole is being drilled, the flywheel speed is too high in the one case and too low in the other. In order to overcome this difficulty, the flywheel of the machine forming the subject of this invention is applied to the drilling-spindle, so that change-gear can be applied to the intermediate shaft. By these means, revolutions of the driving-crank can be so transmitted to the flywheel that the velocity when the crank is turned at its normal speed can be increased when drilling large holes and reduced when drilling small holes.

Railway Appliances.

CAR STARTER.—THOMAS GERAGHTY, Bayonne, N. J. This device is, in the nature of a crowbar, especially adapted for starting freight-cars and is so constructed that it is simple, light, and readily transportable. The device consists primarily of three parts: a lower bar section, a socket in which the bar enters, and a handle which enters the socket and engages the bar-section.

CAR-COUPLING ATTACHMENT.—THOMAS P. SMYTH, Pocatello, Idaho. It is the purpose of this invention to provide means for preventing the fall of the coupler, should it for any reason become detached from the car on which it is mounted, and also to prevent the loss of the knuckle or breakage of the coupler. Ordinarily both of these disadvantages are frequently noticeable; and the present invention comprehends a simple attachment which will prevent the falling of the coupler and prevent the breakage of the pivot-pin of the jaw. A rigid banger is extended under the coupler for the purpose of preventing the falling of a mating coupler. A support is designed to receive the lower end of the pivot-pin of the coupler-jaw to prevent the fall of the pin when it becomes fractured.

OPERATING RAILWAY-SWITCHES.—AMOS YOUNGBLOOD, North Augusta, S. C. In this railway-switch tongues are connected with a bar formed with a projection near one end. A bell-crank lever has one arm arranged for engagement with the projection to move the bar in one direction. A forwardly spring-pressed slidable rod is connected with the other arm of the lever, and a lever is fulcrumed in the sliding and is arranged for engagement by the rolling stock. The lever is connected with the rear end of the slidable rod. The switch is automatically operated by the railway rolling stock. Its setting is always properly insured, whereby the possibility of a wreck on account of an open or misplaced switch is precluded.

Miscellaneous Inventions.

FRUIT-GATHERING BAG.—GEORGE W. BOWMAN, Palisade, Colo. In order that the hands may be free to pick the fruit, the inventor hangs the bag from the neck of the fruit-picker. The bag is convenient in use, is adjustable in length; so that fruit placed therein need not be dropped and bruised; is adapted for change in position on the person of the fruit-picker; and affords means for the quick discharge of the fruit without injury.

SCRAPER.—CHARLES A. SUTTON, Pitkin, Colo. This one-piece scraper has a number of scraping-surfaces which may be readily restored to good condition when worn. The device is so shaped and its scraping-surfaces so arranged that it may be conveniently applied to remove the matter which collects on pots, pans, kettles, and their handles, no matter what shape the bodies or handles may be. The scraper can also be used as a crumb-collector or for cleaning or scraping floors, wainscoting, or the like.

PRINTING APPARATUS.—CAROLINE MONTEITH, Manhattan, New York city. The object of the invention is to provide a new and improved apparatus for kindergarten and school use and for the preparation of bulletins, charts, and the like. The apparatus is provided with a guideway having longitudinal parallel members extending over or in front of the paper to be printed on. A type-holder and spacer is movable on the guideway, to guide a type-block between the members of the guideway to the paper in order to make an impression. The holder has a type-receiving opening with a continuous surrounding wall.

COIN-HOLDER.—THOMAS O. MILLER, Houston, Tex. The coin-holder comprises a tube in which a coil-spring is arranged. Spring catches secured to the upper end of the tube extend upon the top of the uppermost coin to hold the coins in place in the tube and to permit the operator to slide the uppermost coin forwardly out from under the catches and away from the tube. The under sides of the catches are a distance above the upper edge of the tube. The coin-holder is designed for use on a belt or on a stand placed on a counter or desk. Several holders are to be provided to receive coins of desired denominations. By means of this device, change can be quickly made.

DISK-SHARPENER.—MARTIN J. LOHRBACH, Peotone, Ill. This invention relates to means for manually sharpening the cutting edges of harrow or plow-disks while they are in place on their supporting-shaft. The disk is supported by a post which carries a bracket in which a cutter is held. One man grasps the post, and another, by means of a specially-constructed crank-handle, turns the disk so that it can be sharpened by the cutter. This disk-sharpening device is very simple, is cheaply manufactured, and is very efficient in operation.

METHOD OF MAKING WHEELS.—JOHN T. KELLEY, New London, Ohio. The purpose of this invention is to cheapen the work of producing metallic wheels, both in respect to labor and cost of materials, to which end the invention consists in forming the wheel from metal

sheets. A sheet of metal is slit at opposite ends to form strips and an unbroken middle portion. The sheet is rolled into the form of a tube; and the strips are bent out radially to form the web or spokes of the wheel. The hub is formed of the unbroken middle portion of the sheet of metal.

POCKET-FILTER.—AUGUSTA M. HAMILTON, Meindie, 12 Robe Terrace, South Australia. The invention is especially designed to be applied to the canvas water-bag carried by troops in war and by bushmen. The filter comprises essentially a carbon block permanently secured within a ring of metal, having a cap secured on each end of the ring, forming a chamber on each side of the carbon block. Each chamber having a pipe connected therewith, one forming the inlet and the other the outlet.

JAR-CLOSURE.—FRANK M. WEIR, Monmouth, Ill. The cover of the jar has longitudinally-curved recesses in its upper surface, in which recesses a curved spring-plate has its ends movably engaged. A bail is mounted to swing on the vessel and is adapted to engage the spring-plate. The closure is of simple construction, so that it can be quickly and easily attached and detached.

ACETYLENE GAS APPARATUS.—FREDERICK METZGER, Hondo, Tex. The machine comprises a body portion in which a bell is arranged. A pipe extends down one side of the body portion to communicate with the top of the body portion. In a cylinder arranged within the body portion a pipe leads from the body portion. A guide-rod is attached to the bell and is extended in the pipe. To the pipe a blow-off is secured. A pipe is fixed to the body portion; and in this pipe the outer member of the blow-off pipe is movable, thus forming a guide for the bell. The carbide holder is located in the cylinder. Gas discharge pipes and valve-controlling mechanism are provided. With this machine, the inventor states there can be no loss or leakage of gas. Before passing to the distributing pipe the gas will be thoroughly washed and the coal tar run off.

BOOT OR SHOE.—MICHAEL HALLANAN, Manhattan, New York city. The purpose of the invention is to provide a yielding treading surface for boots and shoes in order to relieve the wearer of jar and concussion. The invention comprises a member forming a yielding tread—for example, a rubber heel—which is so constructed that it cannot only yield to the weight of the wearer, but also expel a certain volume of air at each step and draw in fresh air around the top of the shoe.

HOLDBACK AND SHORT-HITCH.—GEORGE BOUSLOG, Winamac, Ind. The invention relates to an attachment of vehicle thills by which to facilitate the connection of the holdback strap. A bar or body is provided with an undercut groove in which a keeper is slidingly mounted. A holdback is mounted on the bar or body adjacent to the groove. Means extend between the holdback and the keeper to engage the holdback with the inner walls of the undercut groove whereby adjustably to fasten the holdback on the bar or body.

RECEIVER FOR FOLDED PAPER BAGS.—JOHN CARLEN, Havana, N. D. The device is capable of receiving folded paper bags of any size and of sustaining the bags so that they will be kept smoothly lying one upon the other, and so that only one bag can be withdrawn at a time. The bottom folded portions of the bags serve as a medium through which the bags may be grasped to facilitate their withdrawal. Roller weights, provided for holding the bags in position, automatically accommodate themselves to the thickness of the package of bags or to the thickness of a single bag contained in the device.

ENVELOP.—SPENCER CLAWSON, Salt Lake City, Utah. The inventor constructs envelopes in continuous sheets so as to save material and to place the envelopes on the market in connected form. The continuous sheets are provided with score lines between the envelopes to facilitate their detachment.

HANGER FOR PICTURE FRAMES.—PETER DOBLE, Centerville, Mont. The hanger is so constructed that it can be made from one piece of wire and include means for ready attachment to the screw eyes or loops of a frame. Means are provided for steadying the frame; and also means whereby the hanger may be supported from a molding or bar, or from a nail or like article.

PROCESS OF MAKING ARTIFICIAL SILK THREAD.—JULES DUQUESNOY, Avenue Kléber 14, Paris, France. The inventor has devised a new solvent of nitrocellulose or gun cotton used in the making of artificial silk. The solvent consists of acetone, acetic acid, and amyl alcohol. By the use of this solvent an artificial silk is obtained which in quality it is said surpasses that hitherto produced.

KNEE OR ELBOW CAP.—FRANK W. GORSE, Highlandville, Mass. The invention provides an elastic tubular bandage comprising a front piece and a rear piece. The side edges of the rear piece are shorter than the side edges of the front pieces; and the pieces are fastened together at the side edges. The rear piece has its upper and lower portions formed with elastic warp threads. The middle portion is in the form of a fine, loose weave of elastic threads. By reason of this fine loose weave the skin is not liable to be irritated at the joint of the knee or elbow. The member to which the bandage is applied can be bent without undue binding of the flesh at the joint. The middle portion readily forms into folds or wrinkles corresponding with those of the skin, and consequently irritation is entirely prevented.

FILTER.—ARTHUR G. GRENAMER and GEORGE A. ROBINSON, Leetonia, Ohio. The filter comprises a tank into the upper portion of which a basket is extended having a flange portion projected upon the top of the tank. A packing or gasket is arranged between the flange and the top; and a vacuum regulator is connected with the tank. In this filter the material is rapidly refined. The construction is cheap and simple. The parts may be thoroughly and rapidly cleaned. The vacuum serves the purpose of preventing the material from overflowing the basket, for it will be forced out of the basket as rapidly as poured in. Indeed, the filter will work as fast as oil and water will separate.

SPRAYING APPARATUS.—JOHN J. COUGHLIN, Bradford, Ohio. This invention is an apparatus adapted especially for spraying trees, shrubbery, and the like. The apparatus comprises a liquid reservoir and an air reser-

voir, the two being separable and provided with means for removably engaging them, so that they may be carried about on a cart. The air reservoir has a pump and communicates with the liquid reservoir by means of a flexible tube.

LADDER.—LUITJEN J. R. DE VRIES, Panola, Ill. It is the purpose of this invention to provide a new step ladder which is designed for use in fruit packing, washing, painting, scrubbing, and other purposes. The ladder is provided with a shelf stick on which a shelf is pivoted. A supporting and adjusting device carried on the leg of the ladder receives the shelf stick to adjust the shelf up or down, or to swing the shelf into an angular side wise position. The device in question comprises a disk having grooves secured to the leg of the ladder; and a socket mounted to turn on the disk and carrying two cam levers, one of which is adapted to engage the stick, and the other of which is adapted to lock the socket to the disk. By reason of this construction one can reach a large area at each adjustment. Baskets, pails or other receptacles can be supported within convenient reach.

LAMP-SHADE OR GLOBE.—WILLIAM L. STRACHAN, 88 St. James Street, London, England. A light reflecting and diffusing medium is the subject of this invention. A spirally-wound rod of glass of hemispherical or bowl shape, hermetically inclosed between inner and outer walls of translucent glass is the reflecting medium. The rod is protected from injury in handling the shade and is shielded from the accumulation of dust.

DOUGH-MIXER.—JAMES F. STEVENS, Port Chester, N. Y. By means of this mixer the dough is quickly kneaded and finally converted into a practically round mass which, after the dough has been fermented, may be lifted by the mixing agent from the receptacle in which it is kneaded and transferred to another pan, or to a moulding board, without leaving any particles of dough behind in the vessel or on the mixer. The device can be also used as a sifter for flour. The flour is discharged in the bottom of the main receptacle so as to form a central depression in which water may be poured. Or the flour may be sifted and the dough mixed at the same time. As it leaves the sieve more rapidly than the dough is mixed, the flour will be kept within the mixing-dough and the sides of the pan.

PAPER-FILE.—FRANCIS J. McDONNELL, New Bedford, Mass. The paper-file has a fixed document-holder upon which a document is guided by a spindle. A guard for the documents is placed on the file, which guard is controlled by the spindle. When the spindle is pressed, the guard moves out of an active position; and when the pressure on the spindle is released, the guard moves back into an active position.

Designs.

COAT-FORM.—WILLIS L. JOHNSON, Seymour, Ind. This patent is for a coat-form for use in exhibiting coats. The form is provided with a projecting flange or lip forming a neck portion and with a flat crown portion coinciding with the arm-hole of the coat.

BELT.—JOHN STEMBER, Manhattan, New York city. The belt has an ornamental front panel embossed on its body, so that a pointed center and side members are presented, which curve upward from the pointed center. Button-like ornaments are arranged longitudinally on the side members of the panel.

PEN, PENCIL, AND INK-HOLDER.—EMILE BICK, 521 Seventh Street, Buffalo, N. Y. This novel design embodies, as its main feature, a frying or stew-pan whose body is provided with notches adapted to receive and hold a pen or pencil. The stew-pan is to be suspended vertically by its handle. A socket for an inkstand is provided on the lower side of the rim. A thermometer and a weather indicator or barometer are arranged vertically on the bottom of the pan; and between them a calendar is located. The pictures of a bison's head and two small stew-pans are located above the calendar.

NOTE.—Copies of any of these patents can 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.

NEW BOOKS, ETC.

STREET PAVEMENTS AND PAVING MATERIALS. A Manual of City Pavements. The Methods and Materials of their Construction. For the Use of the Student, Engineers and City Officials. By George W. Tillson, C.E. New York: John Wiley & Sons. 1900. 8vo. Pp. 544. Price \$1.

The literature relating to paving is quite extensive, but there is ample room for a work of sterling worth like the volume before us. The history and development of pavements, stone, earth, brick, cement, concrete, cobble stone, block pavements, wood pavements, broken stone pavements, the construction of street car tracks in paved streets, the width of streets, etc., all are treated in an adequate manner.

TECHNOLOGISCHES LEXIKON. Handbuch fuer alle Industrien und Gewerbe. Redigirt von Louis Edgar Andés. Illustrated. Parts 6 to 10. Vienna: A. Hartleben. 1900. Large octavo. Price per part, 25 cents.

THEORY AND CALCULATION OF THE ALTERNATING CURRENT PHENOMENA. By Charles P. Steinmetz, with the assistance of Ernst J. Berg. New York: Electrical World and Engineer. 1900. 8vo. Pp. 525. Price \$4.

This is the first work ever written in any language dealing in a complete and logical manner with all the phenomena of alternating currents in the designing of alternating current machinery. The work contains the very latest knowledge relating to alternating current phenomena as applied in engineering, much of which is original with the author, and here appears for the first time in book form. The eminent authority of the author and the original methods he pursues have assigned to this work a high place in electrical literature, in which it takes rank as a classic. The present is the

third edition, revised and enlarged. It is well illustrated by diagrams and there are many tables.

ENAMELS AND ENAMELING. By Paul R. Rindan. London: Scott Greenwood & Company. New York: D. Van Nostrand Company. 1900. 8vo. Pp. 188. Price \$4.

The book is intended as an introduction to the preparation and application of all kinds of enamels for technical and artistic purposes for enamel makers, workers in gold and silver and manufacturers of objects of art. Until recently the literature on enameling was neglected, but with this book and the one by Cunyng-hame the field seems to be adequately covered. The directions are straight-forward and the formulas appear to be excellent. It is a book which can be safely recommended.

STUDIES FROM THE YALE PSYCHOLOGICAL LABORATORY. Edited by Edward W. Scripture, Ph.D. Researches in Experimental Phonetics. Observations on Rhythmic Action. By E. W. Scripture. Vol. VII. 1899. Octavo. Price \$1.

Dr. Scripture has opened up an entirely new field in psychological research. He has critically studied talking machine records of English poetry, and has shown us that if our concepts of the elementary sounds of language are not altogether wrong, they certainly need revision. It is the opinion of Dr. Scripture that "the correct concept of the English poetical line seems to be that of a certain quantity of speech-sound distributed so as to produce an effect equivalent to that of a certain number of points of emphasis at definite intervals." Our very limited space prohibits an extensive review of Dr. Scripture's work.

DYNAMO-ELECTRIC MACHINERY. Its Construction, Design and Operation. Direct Current Machines. By Samuel Sheldon, A.M., Ph.D., assisted by Hobart Mason, B.S. New York: D. Van Nostrand Company. 1900. 12mo. Pp. 281. Price \$2.50 net.

The book is intended to be used primarily in connection with instruction in electrical engineering institutions for technical education. It is intended equally as much for the general reader who is looking for information concerning dynamo-electric machinery, of types discussed, as well as a book of reference for engineers. The author is Professor of Physics and Electrical Engineering in the Polytechnic Institute in Brooklyn, and has been very successful as a teacher and a lecturer. He has produced a most excellent book.

IRON CORROSION. ANTI-FOULING AND ANTI-CORROSIVE PAINTS. By Lewis Edgar Andes. London: Scott Greenwood & Company. New York: D. Van Nostrand & Company. 1900. 8vo. Pp. 275. Price \$4.

There is no more important subject with which the civil and mechanical engineer has to deal than corrosion of iron and steel and the methods of preventing it. The author has done a signal service in preparing such a comprehensive work upon the subject. It is a unique contribution to technical literature, and is a work which we can heartily commend to all who are in any way engaged in building iron and steel structures.

THE TESTING AND VALUATION OF RAW MATERIALS USED IN PAINT AND COLOR MANUFACTURE. By W. W. Jones, F.C.S. London: Scott Greenwood & Company. New York: D. Van Nostrand Company. 1900. 16mo. Pp. 88. Price \$2 net.

This little text-book is intended to supplement the larger and more comprehensive works on the subject, says the Preface, but at the same time it is filled with most valuable matter, which interests all who are in any way connected with the paint manufacturing industry. The various processes given have been selected from numbers of others after many years of experience.

PREPARING FOR INDICATION. Practical Hints. By Robert Grimshaw. Second edition. New York: Practical Publishing Company. 1900. 18mo. Pp. 56. Price \$1.

Nothing is more annoying than for a mechanical engineer to reach a plant, possibly far out in the country, and find that the engine has to be drilled and the pipe attached. The author prepared the little book before us in order to obviate difficulties of this kind, and to show how necessary connections should be made.

INTELLIGENCE IN PLANTS AND ANIMALS. By Thomas G. Gentry, Sc.D. New York: Doubleday, Page & Company. 1900. 8vo. Pp. 489. Price \$2 net.

The present volume is a new edition of the author's privately printed "Soul and Immortality" and is filled with most interesting animal stories. It is unusually impressive, being a collection of strange and curious facts from the life of animals and plants which seem to bear out Mr. Gentry's claim for them of a much higher order of intelligence than is generally allowed them.

TEXT BOOK OF IMPORTANT MINERALS AND ROCKS. WITH TABLES FOR THE DETERMINATION OF MINERALS. By S. E. Tillman. New York: John Wiley & Sons. 1900. 8vo. Pp. 176. Price \$2.

This book is a slow outgrowth of efforts to meet the necessities of the United States Military Academy for a convenient text-book of important minerals and rocks. The author has performed a difficult task in a very acceptable manner. The tables are excellent, and tend to afford a ready determination of rocks.

Business and Personal.

Marine Iron Works. Chicago. Catalogue free.

For hoisting engines. J. S. Mundy, Newark, N. J.

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

Yankee Notions. Waterbury Button Co., Waterbury, Ct. Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

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

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

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.

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

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.

(8012) C. H. H. asks: 1. Could you give me a receipt for transferring newspaper or other pictures in which printer's ink is used, the same as letter copying is done? A. Dissolve a stick of caustic potash in 20 fluid ounces of water. Wet the printed matter with it, blot off the excess of water, apply plain unclendered paper and rub with a hard object. 2. Can I use copper-plated sheet iron in an acetylene gas holder? Would there be any chemical action caused by the gas? A. We do not recommend copper in an acetylene generator. Under certain conditions it may cause an explosive compound to be generated. 3. Is there only one factory in the United States for the manufacture of carbide for making acetylene? A. We believe there is only one. 4. Is there any way of obtaining a fair quality of lubricating oil from petroleum, having an asphaltum basis, without distillation? A. Petroleum and asphaltum may make a good tar lubricant for axles or other heavy machinery. We cannot suggest a method of manufacture.

(8013) I. H. M. asks: 1. Wish to build a small dynamo about 1/2 horse power (4-pole type preferred). Can you give me dimensions? Have you a SUPPLEMENT describing such a machine? A. See SCIENTIFIC AMERICAN, vol. 77, No. 11, price ten cents. 2. Is the current of an induction coil direct or alternating? A. An induction coil gives an interrupted current. By the construction of the coil the current in the secondary which would be produced by the closing of the primary circuit is suppressed, that is, it does not produce any spark. The spark is produced only when the primary circuit is broken, hence the sparks are all in the same direction. 3. Have you a SUPPLEMENT giving description of an alternating current motor? A. No, except the one referred to in answer above. 4. Can the small alternating dynamos used in telephones be changed to direct by changing armature connections? A. Yes, by putting a commutator upon the armature in place of the rings which take off the current. 5. Would it be practicable to build a small 4-pole dynamo with changeable connections, making it both direct and alternating, for experimental work? A. It would be better to build it with a commutator at one end of the armature shaft and the rings at the other, or else with both side by side at the same end. Then connect the wires to either pair of brushes as you please.

(8014) I. C. T. asks: Is permanent magnetism limited? A. No; magnetism is not limited, but the capacity of steel to receive it is limited. 2. What weight in soft iron would a permanent magnet weighing 100 pounds, magnetized as strong as possible, sustain? A. We do not know. Heavy magnets do not support so large loads relatively as lighter ones do. A 1 pound Haarm magnet has, it is said, supported 28 pounds. A 3/4 pound Haarm magnet has held up 62 pounds. These are extraordinary results, which have not been equaled elsewhere. See Thompson's "Electromagnet," \$6 by mail. A 100 pound laminated magnet might hold up 100 to 150 pounds. 3. With 550 volts how many amperes would it require to run a 1,000 horse power motor? A. About 1,500 amperes. 4. Can electric currents of different voltage and different amperage be mixed together? A. Yes; but it would not be a nice thing to do if there was any great variety in the voltages. 5. What is the least voltage and least number of amperes required to run a 1/2 horse power motor? A. With allowance for losses 1/2 horse power is about 100 watts. You can divide this up as you please. If your current pressure is 10 volts, 10 amperes are required; if 100 volts, 1 ampere is required.

(8015) G. K. D. writes: I wish to make a so-called solar microscope for exhibition purposes. If you can aid me in this matter, I shall feel very thankful to you. A. The solar microscope is a very simple piece of apparatus. It consists of a mirror outside the window of a darkened room, usually fastened to the shutter through a hole in which the beam of light is reflected by the mirror. The light then passes through a condensing lens of 4 or 5 inches in diameter and with a focal length of 9 inches. The objective of the microscope is placed

near the focus of this condenser. The object to be projected is supported in the proper position in front of the objective, and the image is focused on the screen beyond. The stand of the microscope is not usually employed, since its tube is too long. It would cut off a part or the image from the screen. No eyepiece is used. You would better call upon the teacher of science in your high school, who would show you the whole apparatus, for there is probably one in the high school of your town. The best description of the instrument is to be found in Dolbear's "Art of Projecting," price \$2 by mail. Your sketch would not answer the purpose. You could not make one of the size shown. A beam of light so large when condensed on an object would melt it. Nothing could stand it.

(8016) F. L. S. asks how a small Wimshurst machine is connected to a Holtz machine when used to excite the Holtz machine? A. Connect the discharging rods of the Wimshurst to the exciting brushes or the armatures of the Holtz machine. When the Holtz machine is charged, disconnect. A switch can be used for connecting and disconnecting the Wimshurst exciting machine.

(8017) W. O. M. asks: Will you please inform me if the armature of the motor described in SUPPLEMENT 641 will do for a dynamo, provided it has properly designed fields? If so, about what would the current be in volts and amperes if fields were excited from another source? A. The motor of SUPPLEMENT 641 is a dynamo if power be applied to it to drive the armature. It will give more current if the fields are excited from an external source; probably about the same, or nearly the same, current as is required to drive it as a motor.

(8018) W. G. asks: 1. Are better results obtained by including Leyden jars in the circuit of a Roentgen ray tube? A. No Leyden jars are required with an induction coil in operating an X-ray tube. With a static machine the Leyden jars are required and are a part of the machine, always in place when the strong spark discharge is produced. 2. Is thin copper better for the sectors of a Wimshurst than tin-foil and does it decrease the output if air bubbles are under them? A. Any metallic foil will answer for the sectors of a static machine. One metal is as good as another for this use. Aluminium would be preferable because of its lightness and its retention of its polish. 3. Mention SUPPLEMENT fully describing the new Wimshurst; one giving directions to build a machine of suitable size for amateur investigations. A. We have a number of SUPPLEMENTS upon the Wimshurst machine—Nos. 548, 584, 647, 914, 948, and 1131. Price ten cents each.

(8019) W. G. W. asks: Can a fundamental, when sounding, produce undertones as well as overtones under any conditions? If so, what are the laws governing the same? Can you tell me where I can obtain a book which illustrates and describes in detail Chladni's figures? A. Fundamental tone alone cannot produce any other tone except a body capable of sounding in sympathy with its tone is near. Then the same tone is produced by that body. The lower tones to which you refer are probably combination tones, "difference tones," they have been called. You will find them treated in Tyndall's Lectures on Sound, price \$2 by mail. Also in Helmholtz's Sensations of Tone, price \$9.50. Chladni's figures are given in Tyndall's book, mentioned above.

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