

Action of Mineral Substances on Milk.

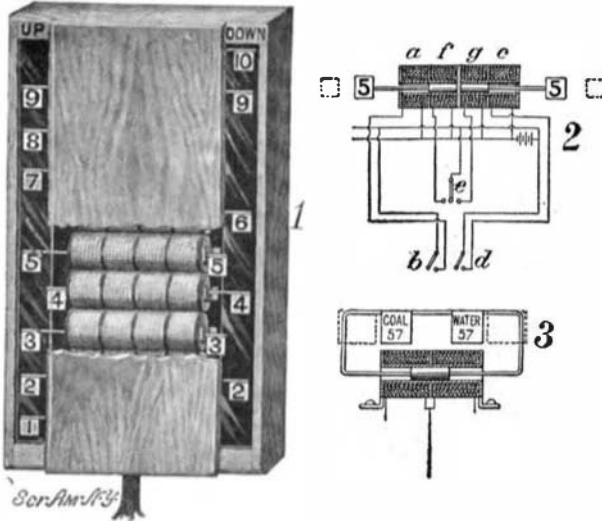
Experiments have been made as follows: (1) On lime in the form of milk of lime; (2) on chlorine, in the form of sea-salt; (3) on phosphoric acid (phosphate of lime); (4) on iron (neutral acetate of iron). The animals received as nourishment green herbage, *ad libitum*, and a daily ration of half a kilogramme of linseed oilcake and half a kilogramme of malt grains.

The results of the tests may be summed up as follows: (1) The mineral substances, lime, chlorine, iron, and phosphoric acid, in combination with the nourishment of the cows, do not sensibly modify the quantity of the milk produced, or its proportion of fatty matters. (2) The total percentage of ash in the milk of the cow is very constant; it is scarcely influenced by the absorption in noticeable quantities of mineral substances. (3) Among the mineral substances experimented on in analysis, lime is that which is found in the most variable proportions in the ash, proportions which may be somewhat influenced by the alimentation. (4) The percentage of lime in the ash may be raised by several centesimal units (3 to 6 per cent) from the fact of the absorption by the animals of important quantities of lime. (5) This absorption may augment, not only the percentage of lime in the ash, but also that of a given quantity of milk. (6) The increase of the percentage of lime in the ash or the milk takes place, not only with the absorption of caustic lime, but also with that of lime phosphate. (7) Nevertheless, the increase in the percentage of lime in the milk consequent upon the alimentation is so slight that it is of no importance in regard to the properties of the milk; besides, it is restricted to narrow limits of the percentage of lime in the produce of different cows. (8) The absorption of sea-salt by the animals does not increase the percentage of chlorine. Even for portions higher than the animals can support, the increase in the percentage is scarcely perceptible. (9) The percentage of chlorine in the milk increases very considerably with the progress of the period of lactation, independently of saline alimentation. (10) The percentage of phosphoric acid, as well of the milk as of its ash, is not at all affected by considerable quantities of this substance, at least in the form of lime phosphate. The question whether the increase of the proportion of phosphoric acid in the milk only fails when this already contains a high proportion of it, has not yet been settled; it is

not impossible that in the case of a milk otherwise poor in phosphoric acid, this proportion may increase as a consequence of a phosphate alimentation. (11) The percentage of iron in the milk is not sensibly affected by alimentation.—Condensed from the French of M. Schulte. Communication to the Fédération Internationale de Laiterie.

AN IMPROVED ANNUNCIATOR.

A recent invention provides an annunciator in which there are no mechanical devices of any kind for moving the signals into view. Instead, a series of solenoids is used and the signals are attached to the floating cores of these solenoids. Each solenoid comprises two coils, one of which is energized to move the signal into view, while the other is used to withdraw the signal. The core is either square or oval in cross section and fits into a bore of similar outline. This holds the signal in an upright position, preventing it from falling over. In Fig. 1 we show the annunciator as applied to an elevator car and a diagram of the electrical connections is shown in Fig. 2. It will be observed that the solenoids are arranged in pairs, those on one side for operating the "up" signals, and those on the opposite side for operating the "down" signals. The outer coils, *a*, of the "up" solenoids are respectively connected to the switches or

**AN IMPROVED ANNUNCIATOR.**

buttons, *b*, on the different floors, and the coils, *c*, of the "down" solenoids are connected to the buttons, *d*. The operator can thus signal his desire to ride up or down from any floor, in the usual manner. The inner coils of the solenoids are all operated by a common switch, *e*. The switch may be thrown to one side to energize the coils, *f*, and thus withdraw all the "up" signals, or to the other side to energize the coils, *g*, and thus withdraw the "down" signals. The absence of any levers or other mechanical devices for moving the signals renders the apparatus very compact. The annunciator illustrated measures but 5 inches by 8½ and is only 1¼ inches thick. It can be used either on a main or a battery current and can be wired to withdraw any single signal on either the "up" or the "down" side or to withdraw all the "up" and "down" signals at a single touch of the push button. In Fig. 3, a modification is shown which may be used in hotels. The solenoids comprise two coils as in the construction just described, but each solenoid is arranged to exhibit either of two signals. When one coil is energized one of the signals is brought into view and when the other is energized the other signal is exhibited. The signals are withdrawn by energizing both coils at once, when the core is moved to the neutral position, as shown in the drawing. Messrs. James and William Patten, 2535 Eighth Avenue, New York city, N. Y., have recently procured a patent on this improved annunciator.

Aeronautical Note.

In addition to the \$10,000 prize already offered by M. Deutsch for first covering a certain specified course in the air above Paris with a flying machine of the "heavier than air" type, this gentleman has recently given a \$2,000 challenge cup which is to be competed for by all kinds of aeronautical apparatus and which will be held permanently by the club which wins it three years in succession. The airship or flying machine that goes 100 kilometers (62 miles) to a specified point and returns to the starting place in the quickest time will be declared the winner. A cash prize of \$4,000 will be given in 1906, 1907, and 1908 to the man who pilots the winning machine. Capt. Ferber, of the French army, is having built by the Buchet Company a light-weight motor for a motor-driven aeroplane with which he expects to compete for the Deutsch prizes.

RECENTLY PATENTED INVENTIONS.**Electrical Devices.**

ELECTRIC SWITCH FOR STREET ARC-LAMPS, ETC.—P. H. F. SPIES, New York, N. Y. The object of the inventor is to provide a switch more especially designed for street arc-lamps, chandeliers, and the like and arranged to keep the main-line circuit completely uninterrupted whenever the lamp is cut or lowered for the insertion of new carbons or for repairs or other purposes, the lamp on being returned to its normal position being immediately and automatically cut in without interruption of the main-line circuit.

Of Interest to Farmers.

SICKLE.—P. E. FLETCHER, Ridge, Ore. This sickle mechanism is designed to be used in connection with a harvester, reaper, or binder, the object being to provide a mechanism that will be of comparatively light draft, thus requiring but little power to run it, and further, to employ a very thin sickle-blade that may be readily sharpened with an emery-wheel without removing the blade from the machine.

COMBINED SEEDING AND MANURE-SPREADING MACHINE.—D. TOSCANI, Rocca Imperiale, Italy. The object of the invention is a machine which opens furrows in the ground to receive the grains or seeds, spreads in said furrows the seeds at equidistant intervals, together with the manure necessary for their successive development, and then covers the seeds and the manure spread in the bottoms of the furrows.

MOTOR-PLOW.—H. J. KYLE, Tipton, Ind. The improvement pertains to plows such as used upon farms for tilling the soil. The object of the invention is to produce a plow which will be advanced by a motor carried on the framework thereof. Special objects are to provide operating mechanism which is of simple construction and which enables the operation of the plow to be easily controlled by a person not skilled in mechanical arts.

BINDER ATTACHMENT.—A. WILLIAMS, Joliet, Mont. In the present patent the invention is an improvement in self-binding harvesters, and it has for an object the provision of a novel construction by which to collect and save the grain and grass-seed which are ordinarily wasted off the deck of the binder.

PLOW.—S. S. WEAVER, Carrollton, Mo. The invention relates particularly to a plow intended for preparing the soil for seed, in which plow means are provided for acting on the subsoil at the bottom of the furrow. The object is to provide a device which may be readily attached to existing plows of this class and by means of which the subsoil may

be effectively cultivated and furrows prepared for the reception of the seed.

BALE BINDER AND TIER.—W. C. MORGANS and T. GILLOON, Dubuque, Iowa. It is intended that the device is to be mounted upon the frame of any power baler or one that has a self-feeding arrangement, and it is so arranged that the power may be taken from any shaft of the baler, according to the style and construction thereof. The invention saves time, increases the capacity of the baler, saves the service of tying, saves in the length of wire and therefore its cost.

DEVICE FOR LOADING SUGAR-CANE.—G. D. LUCE, New Orleans, La. A loading attachment to carts and other vehicles for loading sugar-cane or like material is provided by this invention. The device includes a permanently-attached standard adapted to receive removable cranes, which cranes are provided with grapples and with means for raising and lowering the grapples and operating their trips, together with means for swinging the cranes on their supports, the cranes being independent in their action.

Of General Interest.

STEAM-TRAP.—W. BLETSO, Youngstown, Ohio. This improvement relates to a trap of that class in which the steam and water of condensation are entered into a chamber the outlet of which is sealed by a valve and in which when the water attains a certain height in the chamber the valve is opened and the steam-pressure is permitted to discharge the liquid contents of the chamber. Primarily the object is to improve the general design of the trap and provide means for effectually and rapidly operating the discharge-trap.

EXTENSIBLE HANDLE.—D. LAWSON, New York, N. Y. In the present patent the invention has reference to extensible handles—such, for instance, as are used upon shovels and analogous implements for handling coal, and also admitting of general use in instances where longitudinal cylindrical handles are employed. The length of the handles can be changed by the operator at comparatively short intervals.

SELF-FASTENING COTTON-MARKER.—G. W. LONG, Lindsay, Ind. Ter. This invention pertains to improvements in cotton markers, its object being to provide a device which will be self-fastening and one which is simple, cheap, and efficient, one which will remain in place when once attached to a bale of cotton, etc.

MARINE VESSEL.—J. E. JOHNSON, Ishpeming, Mich. The object of this invention is to provide means for propelling marine vessels which will at the same time decrease the resist-

ance offered by the hull to this propulsion. The inventor provides peculiarly-arranged propeller-shafts mounted diagonally on the vessel with respect to water-line and carrying propellers at their lower ends, so that upon the rotation of the shafts the propellers exert a combined lifting and propelling force on the hull, causing it to displace less water, and enabling it to be driven with less resistance.

GARMENT-SUPPORTER.—H. F. NILES, Chicago, Ill. In this case the invention pertains to supports for garments, and more particularly to belt-suspenders for trousers. Its principal objects are to provide a concealed support for such garments as hip-trousers which shall be effective, comfortable, and readily adjustable to the wearer and garment.

DISPLAY DEVICE FOR MILLINERY ARTICLES.—H. SILBERMAN, New York, N. Y. The invention has reference more especially to devices for displaying millinery articles, as ladies' hats and the like, in stores and show-windows and other places; and one of the principal objects thereof is to provide a device of this class which is comparatively inexpensive to manufacture, besides being thoroughly reliable for its purpose and possessing the capacity for long and continued service.

RAZOR-BLADE HOLDER.—J. H. HUNT, Massillon, Ohio. The purpose of the improvement is to provide a readily-operated holder for the blades of safety-razors when it is necessary to hone or strop the same, and, furthermore, to so construct the holder that the blade can be quickly and conveniently introduced into the holder or removed and held firmly between the jaws of the holder during the sharpening process without the use of set-screws or their equivalents.

RAZOR-STROP.—G. W. COLLINS, St. Joseph, Mo. Mr. Collins has found in his experience that many persons who use razors constantly injure them by an improper use of the ordinary swinging strop. The object of the invention is to construct a strop in such a manner that this cannot be done. He avoids the disadvantages of those stropps which have been formed of rigidly-connected straps that could not be adjusted with respect to each other or the supporting means employed.

COMBINED CIGAR CUTTER AND LIGHTER.—W. H. CRAWFORD, Cliftonforge, Va. The invention is an improvement in combined cigar cutters and lighters. The device is entirely automatic in its operation, performs its cycle of movements in proper sequence and always returns the burner into position under the extinguishing-hood, thus preventing waste of fuel from failure to extinguish the flame.

DEVICE FOR TEACHING PENMANSHIP.—R. W. MANUM, Minneapolis, Minn. An en-

velop is employed for containing used and unused practice-sheets to be used by pupils, and means for attaching to the back of envelop a plurality of copy-slips having samples to be followed in any order when practicing examples given. Back of envelop is utilized as a writing-base, upon which practice-sheets are placed. As each line of a practice-sheet is filled out the sheet may be pushed forwardly to temporarily conceal such lines and to bring next succeeding line adjacent to lower edge of the copy-sheet being followed, until all lines of the practice-sheet have been utilized, thus preventing mistakes in copying their writing instead of the exercise on the slip.

UMBRELLA ATTACHMENT.—MARGERET A. BRUNNER, New York, N. Y. In using the device the umbrella is stood near the person and a portion of his garment at a convenient point is placed between inwardly-projecting teeth, whereupon the body of a tassel is slid in the direction to lock the claw to the garment. Rising without noticing the umbrella it will tug at the garment as he moves and he will be apprised that the article is forgotten. It has substantially the appearance of an ordinary umbrella tassel.

COMPUTING DEVICE.—G. M. BROWN, Otto, N. Y. The invention refers to a device for rapidly determining the value of a certain line of goods at a given price without mathematical calculation, and has for its object to produce a device of this character which will have a very large range both in respect to the prices and quantities, which will be very compact in structure and which will be so simple as to render mistakes impossible.

PIPE-WRENCH.—L. V. REMION, San Bernardino, Cal. This wrench is designed especially for use in oil-fields, as in the putting down of pipe-lines. The invention is simple in construction yet efficient in operation, and no complicated mechanism forms part of the wrench. The handles are easily detached. Hence the wrench may be used in a limited space, and when the pipes are properly seated and started power may be used to turn it by means of a belt engaging the wheel-sections. The sections are removable.

HOSE-COUPLING.—M. L. SCANLON, J. S. SCANLON and A. A. ARNOLD, Galion, Ohio. In this patent the invention has reference to means for rendering hose and pipe couplings water, air, and steam tight. The object had in view by the inventors is the provision of a coupling of this character which shall not only be adapted for effecting an improved coupling of the parts, but be simple of construction and easy to operate.

LINE-FASTENER.—D. W. ROBBINS, New York, N. Y. This device is an improvement for securing the ends of and taking up the slack

of clothes-lines or the like, the object being to provide one that will be simple and inexpensive in construction and by means of which the slack of the line may be easily taken up and secured.

CONCRETE-BLOCK MOLD.—J. McL. PERRY, Terre Haute, Ind. The invention relates to molds more particularly intended for use in the manufacture of concrete into blocks commonly used in place of ordinary brick and heavy stone blocks, and the inventor's object is to obviate certain objections to similar molds as now constructed, such as with some thereof the block must be removed by lifting or lowering action from the mold and with other forms there is much liability of marring the corners, etc., of the block when removing the mold from the block.

LUNA FOR HOLDING THE HOST.—H. F. NEHR, New York, N. Y. One purpose of the invention is to construct a luna in which the host is visible from the front and the back and wherein when the luna is opened the host or wafer will be so supported on the back member of the luna that it can be readily removed by the officiating divine.

FOLDING BABY-CARRIAGE AND CRADLE.—I. ANDREWS, New York, N. Y. The purpose here is to provide a construction which will permit the carriage to be compactly folded when not required, and to provide a construction which permits the carriage body being given a rocking motion, adapting it for use as a cradle, and also to so construct the conveyance that it will be simple, durable, and capable of convenient and expeditious operation.

V-BLOCK.—R. BLAZEK, New York, N. Y. The object of this invention is to provide a V-block with an attachment enabling a shaft to be drilled transversely with absolute certainty and to render the attachment adjustable to shafts of various diameters. This he attains by providing a peculiar gage-bar adapted to lie over the block on top of the shaft and connected with the block by means of slides mounted thereon. In connection with the block he uses a support having certain peculiar connection with the block, enabling its position to be adjusted at will.

ATTACHMENT FOR CHAIRS.—VIRGINIA M. HOLLYDAY, Baltimore, Md. This attachment is for chairs for facilitating conversation between persons of impaired hearing. Speaking-tubes are applied to a double chair or seat, which is preferably of the vis-à-vis type, in such manner that persons seated on opposite sides of the central support between the seats may converse by means of the tubes while supported comfortably and even while their hands may be used for work, since they are not required to support a mouthpiece or ear-tube.

SUPPORT FOR HOISTING DEVICES.—L. GREENKY, New York, N. Y. The object of this invention is to provide a support for hoisting devices, arranged to form a permanent part of the building, to permit convenient attachment and support of the hoisting-tackle employed for hoisting pianos, safes, furniture, and other heavy articles up to a window and through it into a room of the building, and also for use by painters and other mechanics for supporting scaffolds, etc.

COIL-SPRING.—E. HOGAN, Portland, Ore. Some of the many advantages of Mr. Hogan's invention are, it is made all complete with loops, hooks, eyes, snaps, rings, etc., of one unbroken piece of rod or wire; it has four rods or wires, two from each end, passing through the coil to support it, and as they are fastened around last coil opposite each other the strain or tension is the same from each end on two sides of spring, and it gives strength, durability, and efficiency with economy in construction.

EGG-CARRIER.—N. H. CLARK and R. L. CLARK, Munsville, N. Y. The invention provides a carrier whose body-section consists of a receptacle having partitions forming a series of pockets, each adapted to receive an egg. The cover for the package is in the form of a tray, together with a locking device for the cover, forming a portion of the carrier body, which device holds the tray-cover in place during transportation, whereby upon releasing the device and inverting the carrier eggs will be received by the tray and when the carrier body is removed from said tray-cover the latter will continue to act as a receptacle for the contents of the carrier.

PIANO-REPAIRER'S TOOL.—S. M. KING, Marion, Ind. In this case the invention is an improvement in devices for use by piano-repairers, and has for an object to provide a simple construction for use in polishing and cleaning rust from the tune-pins and that portion of the piano-strings which is coiled around the pins and becomes rusted when the pins rust.

Heating and Lighting.

AIR-HEATING SYSTEM.—F. S. LAMSON, Washington, D. C. Mr. Lamson provides a heat receiving and radiating medium; regulates fresh air supply and retards its movement from radiator to receive desired temperature before escaping; superheats mixed gas and air in the burner before combustion and air furnished exterior to the flame; regulates amount of gas used and air heated by opening and closing the register; provides ingress of cool and egress of heated air through the one register-plate; provides continuing flame when register is closed, from which burners may be lighted upon opening of and extinguished by

the closing of the register; prevents escape of gas when the flame is not burning; and incloses the system to conserve and utilize the heating power of the fuel.

RANGE CONSTRUCTION.—M. F. ALLEN, Nashville, Tenn. This invention relates to improvements in the construction of ranges, the bodies of which are formed of steel or other metal. The construction of the stove or range is greatly simplified, and yet the strength and durability are increased. Further, the inventor is enabled to add to the range a hot-water reservoir by the expenditure of but a nominal amount of labor and material.

Household Utilities.

WINDOW-BLIND SLAT-FASTENER.—M. J. COOGAN, Port Chester, N. Y. In this instance the invention pertains to improvements in window-blinds, the object being to provide a simple and novel means whereby the upper and lower sets of slats will be simultaneously operated and locked in closed position or at any desired opening.

Machines and Mechanical Devices.

ORE-CONCENTRATOR.—G. M. WHITNEY, Lawson, Col. The invention refers more especially to that class of ore-concentrators in which an inclined reciprocating bed or table is employed over which pulverized quartz or sand containing mineral is sorted by gravity and discharged therefrom. One of the principal objects is to provide an apparatus in which the quartz may be subjected to such action as to liberate all the minerals without losing the fine particles of minerals known as "slimes," thus making the separation complete at one operation and discharging the ore automatically.

MILL.—H. A. HOWARD, Sherburne, N. Y. The object of this invention is to overcome the disadvantage in "attrition-mills" where the discharge is clogged, not only causing the mill to drive hard, but also to heat, and therefore injure, the material to be ground. To attain this end Mr. Howard provides a peculiar clearing member or members attached to and rotating with the grinding-heads and located outward from their peripheries, by which means to produce peripheral air-currents, tending to disclose the accumulations referred to and also tending to mechanically scrape or clear away the accumulations.

CONCRETE-BLOCK MACHINE.—J. A. BLAKE and J. KENRICH, Wolcott, Ind. In this machine a circular series of mold-boxes is arranged and to one side of the same there are mounted upper and lower press-heads between which the mold-boxes are adapted to be brought in succession. Suitable operating devices cause the press-heads at the proper time to move respectively against the top and bottom of the mold-box. The mold-boxes and core-blocks employed herewith employ novel features looking to the quick formation of the concrete block and its removal when finished.

TYPE-WRITING MACHINE.—J. A. HAGERSTROM, New York, N. Y. One of the purposes of the inventor is to provide a construction of type-levers and a manner of pivoting them whereby each type lever or bar will have an extended bearing, insuring accuracy in printing action and stability in all positions, the bearings being so constructed that while extended the type bars or levers can be arranged the conventional distance apart, all striking at a common center.

GLASS-WORKING MACHINE.—J. NORTH, Lancaster, Ohio. The invention relates to machines for producing glass articles, and more particularly of those for drawing tubes and cylinders. The means employed results in the production of a tube of fixed diameter and by virtue of the constancy of speed secured by a controller said tube will be of uniform quality. The machine is exceedingly simple and convenient to operate.

TYPE-DISTRIBUTING MECHANISM.—H. C. HENSEL, Chicago, Ill. This improvement insures exact registry of pockets, and consequently rapid and reliable type distribution. The mechanism gives the moving part of the type-distributing mechanism not only its usual step-by-step movement from pocket to pocket, but one or more additional and very slight movements when pocket is reached, so that if when moving parts halt at a pocket registry is not then exact a slight additional movement or movements is given to moving part, whereby to bring pockets into exact registry. These additional movements are necessarily minute and the interval is arranged to be sufficient to allow type to drop freely.

Prime Movers and Their Accessories.

ROTARY EXPLOSION-ENGINE.—P. BARTOLETTI, Brownsville, Pa. In the present patent the object of the invention is the provision of a new and improved rotary explosion-engine arranged to give impulses in quick succession to the piston-heads of the engine with the view to impart a continuous, powerful, and uniform rotary motion to the piston.

STEAM-VALVE.—J. D. AUSTIN and E. N. AUSTIN, Campbell Hill, Ill. The invention pertains to improvements in valves for controlling the admission of steam or other motive agent to an engine-cylinder, the object being to provide a valve of novel and simple construction and by the operation of which the ports leading to the cylinder will remain entirely open until the piston nearly completes its movement, thus resulting in an economy of power.

Pertaining to Recreation.

ARTIFICIAL BAIT.—J. L. ACKERMAN, Monticello, Ind. The invention contemplates constructing an artificial bait with a body comprising two separate sections fitting face to face, together with means for securing said sections. Sections of bait may be made of wood or other material with a plate held between and provided with hooks for securing the fish-hooks. Different forms of wire devices in connection with one of the bait sections are adapted to be held in grooves or otherwise in the body sections and having portions to which the fish-hooks may be connected. The invention comprehends use of sectional body with interposed device—such as the plate or wires for securing the fish-hooks.

Pertaining to Vehicles.

WHEEL.—G. L. HINSCH, Waverly, Iowa. The invention refers to improvements in wheels for vehicles—such as motor-cars, automobiles, machinery-wheels, and pulleys, and the like—the object being to provide a wheel with a spring-yielding hub, so as to relieve the vehicle, machinery, or pulley from undue shock and jar while in motion or while making sudden stops or starts and also obviating the use of pneumatic tires on vehicle-wheels.

DESIGN FOR A PLATE.—C. E. ZIEGLER, Limoges, Haute Vienne, France. This beautiful design gives the plate a circular form. The surface or top edge presents a slightly raised scroll work of six sections, each of which contributes to an outer edge of graceful bow-shaped curves.

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

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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. 7827.—Wanted, address of maker of machinery for the manufacture of rubber-cored golf balls and pneumatic golf balls.

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

Inquiry No. 7828.—For manufacturers of machines to make little teeth on sickles, for hand and machine power.

WANTED.—Purchaser for Monazite, Molybdenite and Wolfram. Apply Monazite, Box 773, New York.

Inquiry No. 7829.—For manufacturers of tools for filing saws, etc.

I sell patents. To buy, or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

Inquiry No. 7830.—For the makers of special nuts drop-forged.

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

Inquiry No. 7831.—For manufacturers of steel tubing.

WANTED.—Ideas regarding patentable device for water well paste or mucilage bottle. Address Adhesive, P. O. Box 773, New York.

Inquiry No. 7832.—For manufacturers of machinery to wind base balls.

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

Inquiry No. 7833.—For manufacturers of devices designed to prevent smoke where shavings and sawdust are used for fuel.

Lithographing adds solidity and strength to your business stationery. Letterheads, \$2 per 1000. Stillwell, 709 Pine Street, St. Louis.

Inquiry No. 7834.—For manufacturers of machines to pare potatoes in large quantities.

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

Inquiry No. 7835.—For Canadian manufacturers of coal cars.

Inventors and Manufacturers.—I design and make drawings for all kinds of Tools, Dies, special Labor-saving Machines, and estimate cost of same.

J. L. Pomeroy, 84 Juniper St., Lockport, N. Y.

Inquiry No. 7836.—Wanted, address of party making the "Talking Electrical Sign," as exhibited at the Pan-American Exhibition.

For Sale or to Manufacture on Royalty.—Patent No. 766,976. Support for Press Drills. No agents. For information or model apply F. P. Shek, 875 Myrtle Ave., Brooklyn, N. Y.

Inquiry No. 7837.—Wanted, addresses of parties making metal button-making machines, machines for bluing, polishing and cleaning cutlery goods; also factories making watches, spectacles, photographic materials and novelties.

Inquiry No. 7838.—For manufacturers of electric hand portable drilling machines, also of air drills.

Inquiry No. 7839.—For manufacturers of perforated music for mechanical piano player.

Inquiry No. 7840.—For manufacturers of stage arc lamps and accessories.

Inquiry No. 7841.—For parties using willow wood in diameters up to 20 inches.

Inquiry No. 7842.—For manufacturers of machinery for making banana flour.

Inquiry No. 7843.—For manufacturers of Portland cement containing no oxide of iron.

Inquiry No. 7844.—For manufacturers of transferable designs; also dealers in chemicals and drugs.

Inquiry No. 7845.—For addresses of hardwood lumber companies.

Inquiry No. 7846.—For manufacturers of small turbine water wheels.

Inquiry No. 7847.—For manufacturers of coffee roasters that will roast or cook 30 pounds of coffee and 45 pounds of sugar until the sugar is burned into the coffee.



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.

(9884) E. E. W. asks: In corresponding with an electrical dealer about hand-power for running a 75-watt dynamo, he said that it could not be run by hand-power, it was too large. This dynamo at 1,400 R. P. M. will furnish 15 to 20 volts; at 2,000 R. P. M. will furnish 40 to 50 volts. In a circular I have there is a 75-watt dynamo advertised. This dynamo will furnish an alternating and direct current at the same time or separate. It will run as a motor on a direct current and at the same time furnish an alternating current to light lamps by. In all other respects it is the same except in design. The questions in my mind are why cannot the first dynamo be run by hand-power if the one can that I last described? Does it take more power to run a dynamo as you increase the amount of current or the voltage? If a dynamo is run at a higher speed than it was designed to run, would there be a higher voltage or amperage? A. A 75-watt dynamo can be run by hand, by one-man power, for awhile. It is one-tenth horse-power. And a strong man can exert more power than that for a short time. It matters not how the 75 watts are made up—1 ampere at 75 volts, or 3 amperes at 25 volts, or any combination which gives 75 for a product. Power is in watts, and these are the product of volts and amperes. If the speed of a dynamo is increased the volts are increased, but the amperes remain the same. All the amperes flow which the resistance allows to flow. The volts depend upon the rate of cutting lines of force by the revolving armature. This is increased by increased speed. But if 1,400 turns per minute give 15 volts, 2,000 turns per minute can only give 22 volts, and not 40 volts as you give it.

(9885) S. L. D. asks: In your column "Answers to Inquiries" will you oblige a 45-year reader of the SCIENTIFIC AMERICAN by stating scientists' explanation of the great weight of the earth? Astronomers say the whole weight is 5 1/2 times that of water; viz., about 344 pounds per cubic foot. Marble and the densest granite rarely exceed 180 pounds per cubic foot. By far the largest part of the earth known to man is much less in weight than granite; for example, water, earths of all kinds, coal, all woods, etc. If astronomers are correct, a few hundred miles down and thence to the center of the earth there must be great density of matter. A. It is true that the average density of the materials on the earth's surface is not greater than three times that of water. The weight of a cubic foot of such materials then is not far from 180 pounds per cubic foot. Your inference is the only possible one, that the interior of the earth is much heavier than the surface portions. Nor is this any different from what would be expected, if once the earth were fluid. At that time the heavier substances sank to the bottom of the fluid mass, and are at present nearer the center of the earth.

(9886) B. E. H. asks: 1. Imagine a tunnel through the center of the earth. If an iron ball was dropped into it, where would the ball come at rest? A. If there was nothing to impede or deflect a falling ball from its path down a hole drilled through the center of the earth, it would go to the surface on the opposite side and then fall back again to its starting point, and never come to rest. If only the resistance of the air were taken into account, the ball would fall to and fro a less distance each time, and ultimately come to rest at the center of the earth. 2. Please give me the formula for making a sal-ammoniac battery. A. For an ordinary LeClanche cell dissolve four or five ounces of sal-ammoniac in water enough for the cell and pour it in.

(9887) H. D. G. asks: Desire an opinion on a question that probably is an old one, that certainly admits of a correct solution. If it were twice as cold as two degrees above zero, how cold would it be? Fahr. computation. A. Degrees measured from the ordinary zero of a thermometer do not express the relative amount of heat or cold. To do this the degrees must be counted from the absolute zero, which in the Fahrenheit scale is 459 degrees below ordinary zero. In this scale 2 degrees above the common zero is 461 degrees above absolute zero. Twice as cold as this, or better, half as hot, is 230.5 degrees above absolute zero. It would be expressed as 230.5 degrees absolute Fahr.