RECENTLY PATENTED INVENTIONS.

Electrical Devices.

ELECTRIC HEATER.—E. P. WEGGEN, Jefferson City, Mo. The invention relates to electric heaters admitting of general use, but more particularly to a type of heater used to a great extent in the boot, shoe, and leather working trades. It is especially valuable for heating burnishing-irons for ironing the bottoms or soles of shoes and boots and for treeing-irons used for ironing the uppers of boots and shoes.

MOVABLE INCANDESCENT LAMP OR GAS-LIGHT HOLDER.—J. H. STANTON, St. Catherines, Canada. Mr. Stanton's invention is an improvement in that class of hangers or holders for lamps which are suspended and adapted to swing or be adjusted in different positions or at different angles. The hanger is adapted for holding a gas-tip at any required angle or position with the same facility as an incandescent lamp.

Of Interest to Farmers.

FRUIT-GATHERER.—J. R. REID, Vancouver, Wash. With some classes of fruit it is expedient to shake the same from the trees; but the fruit falling on muddy or similar ground is objectionable, because of the washing and cleaning that must follow. The object is to here provide an inexpensive device adapted to be arranged around a tree below the branches and into which fruit may fall and from which discharged into a suitable receptacle. The device may be easily removed from tree to tree, orchard to orchard, and compactly folded when not in use.

FENCE.—H. M. MEINECKE, Tomah, Wis. The invention comprises the combination of a post threaded at its lower end, and a base-plate having an opening for the post and provided at its edges with the laterally-extending spur-like arms projecting downwardly at their outer ends and forming extensions laterally beyond the edges of and below the base-plate. The post can be used in any kind of soil and sunk to any depth to prevent leaning and loosening, and used at corners or at intermediate points.

Of General Interest.

MANUFACTURE OF BISCUIT CUPS.—A. JUDKA, New York, N. Y. The invention refers to cups to be filled with ice-cream, candies, etc., and its object is to provide certain improvements in the manufacture of cups whereby a uniform baking of the biscuit dough in the baking-iron is obtained, a large number of cups are simultaneously and uniformly baked at each operation, and operator enabled to quickly manipulate the baking-iron.

LATCH.—C. H. BLANDING, Harvey, N. D. In the present patent the object of the invention is the provision of an improved substitute for ordinary door-latches which shall be simpler, cheaper, stronger and more durable. The latch or latch-bar is constructed of wire bent upon itself and twisted. All parts of the improved door-latch are constructed of wire, so that the device excels in the qualities mentioned above.

AIR-SHIP.—T. C. BENBOW, Absarokee, Mont. Mr. Benbow's invention is an improvement in air-ships, and especially in that class which employ gas-bags forming supports for the car, and the invention relates particularly to means for propelling the car in either direction, for causing the same to descend, and for aiding in the ascent of the ship.

FABRIC TRIMMING.—B. BRANNER, New York, N. Y. The object of the invention is to provide an improved fabric trimming adapted to be converted or made up into different articles such, for instance, as a lady's collar or other neckwear, a bow, rosette, or the like—used on hats, dresses, and other wearing apparel.

CORSET.—E. SAVOYE, 35 Rue du Caire, Paris, France. In this invention, the main feature of the corset resides in the vertical whalebones, the lower ends of which lie at a certain distance above the lower edge of the corset, and the upper ends lie under the upper edge of the corset and fastening ribbons or similar devices arranged circumferentially on the upper part of the corset. This corset sustains the body, is very comfortable, and the whalebones are arranged to be less liable to break, especially when what are called "spring-steel" whalebones are used.

BILL-FILE.—J. P. WOMBLE, Newport News, Va. The invention is an improvement in that class of files which comprise a pointed pin, a supporting-base therefor, and a tube adapted to slide on the pin and extending the whole length of the same and serving to receive and hold bills and other papers which are removed with it when it is desired to examine them for the purpose of detaching one or more.

GARMENT-FORM.—G. WEANT, Mannington, W. Va. The object in this improvement is to provide an inexpensive form through the agency of which a perfect form or model of a person can be produced to serve as a lay-figure on which dresses or other garments may be fitted, and insuring a perfect fit for the person from whom the form was made, thus relieving the person of much annoyance and loss of time in submitting to the usual methods of dress-fitting.

FIRE-ESCAPE.—J. WENIG, Mount Pleasant, Mich. In this instance the inventor's object is the provision of a novel construction whereby the chute may be raised to a window and may be connected therewith in such manner as to afford a means for the safe escape of the occupants of the house. The chute may be of canvas or other suitable material, and has at its upper end a frame by which it may be held open, and handles at its lower end, by which firemen on the ground can hold it in any desired position.

GAS-CHECK.—A. ULLMANN, Macon, Ga.—Mr. Ullmann's improvement is in that class of checks in which a pin-valve is employed for regulating the flow of gas. His check obviates well known objections. By employing a plurality of small openings he is able to secure a high pressure of gas and greater velocity of the same, and by using a pin-valve for each port or exit the latter never becomes clogged. The check is practically self-cleaning and never requires attention after installment.

TOBACCO-POUCH.—O. VAN COLE, Cripple Creek, Col. Users of tobacco in plug form generally experience inconvenience and loss of time in reaching a knife for cutting tobacco from a plug, and this frequently leads to the practice of persons biting parts of the tobacco from the plug. The object of the inventor is to overcome this disadvantage and to provide means which will enable parts of the plug to be readily and quickly cut and also tend to reduce the evils of biting off parts of the plug.

PROPELLER.—T. G. THOMPSON, Cambridge, Wis. The inventor seeks to provide a construction which in its operation will simulate closely the movements of a fish in propelling in water, and to this end he makes provision for what he calls the "main" arm, with the outer swinging end of which is connected the blade, so the latter can be swung bodily by the movements of the main arm on its center and also can swing on its pivotal connection with the arm in such manner as to secure a double action in the propeller, resulting from the movements of the arm with the blade and from movements of the blade to a limited extent independently of the arm.

FINGER-RING.—C. SCHMIDT, New York, N. Y. This invention has for its object the provision of a finger-ring resembling an ordinary signet ring and arranged to provide a locket containing pictures and the like. Pictures, etc., can be readily viewed when swinging the segmental cover into an open position. The cover is not limited to a flat seal portion, and may be arranged exteriorly and of different forms, and ornamented with precious stones and the like.

JEWEL-PIN SETTER.—O. E. SCOTT, Waterbury, Vt. In this case the object is to provide a setter arranged to insure an accurate setting of the ruby-pin without removal of the roller-table or hair-spring from the balance-wheel to prevent the rim of the wheel from being subjected to heat, and hence injured by the heat employed in melting the shellac used for fastening the ruby-pin in position in the table.

PROCESS OF MAKING HOMOLOGUES OF IONONE.—R. SCHMIDT, Holzminden, Germany. This application is a division of a prior United States application, filed by Mr. Schmidt. The inventor obtains the pure isomerides, the kind of isomeride obtained depending upon the nature of the acid, those acids which, like concentrated sulfuric acid, exhibit very marked hydrolytic action producing isomerides of the beta series, while the actions of acids such as phosphoric, formic, and the like, the hydrolytic action of which is inferior to that of sulfuric, will not go beyond formation of isomerides of the alpha series. The invention relates to manufacture of alpha and beta ionone.

BEVERAGE.—E. M. ROBERTS, Atlanta, Ga. The more particular object in this instance is to produce a beverage which simulates the bitter and pungent taste generally found in lager-beers, ales, etc., containing little or no ferment or fermentative product and made without the direct use of alcohol, malt, or hops. It may be dispensed after the manner of soda-water and to some extent used as a medicine.

PASTEURIZING BOTTLED LIQUIDS.—O. MATHIE, Wausau, Wis. The inventor provides an apparatus for use in sterilizing bottled liquids, especially beer. In the sterilizing process many bottles burst, entailing more or less loss. Further, in the sterilizing process beer is often so changed as to have a burned or other disagreeable taste, and also objectionable color. By Mr. Mathie's improvement both the above indicated results are avoided with certainty, so that great economy is effected and an improved product obtained.

ADJUSTABLE PIPE-HANGER.—O. C. MEYER, New York, N. Y. The purpose of the improvement is to provide a hanger in which lightness is combined with strength and by means of which pipes may be arranged in series one over or under the other and be placed in parallelism or at angles with each other to each other vertically or horizontally. The hanger is constructed so that it is flexible in its clamping action.

ARTIFICIAL FUEL.—G. K. HOLLISTER, JR., New York, N. Y. The inventor's process is a simple process free from all those materials that go to make an artificial fuel so costly, thereby placing such processes beyond actual operation, and from demonstrations already given it has been proven that briquets made by his process are as good as the real article. Therefore it is possible by the Hollister process to utilize a large amount of coal waste or screenings and the like, that has always been an undesirable fuel.

HANDLE ATTACHMENT.—W. CHAMBERS, Chicago, Ill. The invention refers to improvements for attaching handles to pots, kettles, and utensils of various kinds. It is especially adapted for use on receptacles which have to be heated and which have a pivoted bail or handle that hangs down in contact with the receptacle while it is being heated. The bail or handle quickly becomes heated when in such a position; and the object is to remedy this undesirable state of affairs.

Hardware.

FOOT-VISE FOR ANVILS. E. M. CORNELL, Centerburg, Ohio. The objects of the invention are to secure an arrangement of an anvil with a vise attached, which shall be for general use and of special value in horseshoe-work, such as welding sharp toe-calks. To so construct the vise that it may be very easily and quickly brought into position for use with the anvil and may be swung out of the way when not in use to permit other work to be done on the anvil. To provide a holding device normally open, so that it is always ready for use without first making a superfluous motion to open the jaws.

FLUE-EXPANDER.—J. A. PLAYER, Southern Marine Works, New Orleans, La. Mr. Player's invention relates to improvements in tools for expanding boiler-flues in flue-sheets, the object being to provide a tool adapted to be operated by a suitable motor and by means of which a flue may be quickly expanded to a tight fit in the flue-sheet opening and parallel with wall of the opening.

RIVET.—G. L. MILLER, Socialville, Ohio. The invention may be used in every connection to which the ordinary tubular rivet is applied, such as harness, trunk, and certain kinds of shoe work, and upon heavy cloth goods, and the like. It has a smooth head at each side, and is therefore without rough edge to catch or scratch material, the clenches not coming in contact with adjacent surfaces. There is, moreover, no irregular portion for dirt or the like to collect about.

SASH-FASTENER.—J. H. CLEMENTS, Coperas Cove, Texas. In this case the improvement relates to sash-fasteners or supports, and is applicable to sashes which are not counterweighted. It contemplates the use of a vertically-disposed rod which is attached to a window-casement, and in connection with this rod a clutch is employed which is attached to the sash. The invention resides especially in the construction of the clutch and improvements in the means for attaching the clutch to the sash.

Machines and Mechanical Devices.

DIE-STOCK.—J. J. DELEHANT, Chicago, Ill. Mr. Delehant's invention relates to improvements in stocks for thread-cutting dies, an object being to provide a die-stock with a simple means for quickly adjusting it to different sizes of pipes or rods on which a thread is to be cut and serving as a guide to cause a perfectly straight cut of thread.

CONDUIT-THREADING MACHINE.—E. U. MACK, Florence, S. C. In this patent the invention has reference to machines for traversing conduits to effect the drawing in of an electric or other conductor or a cord for attachment to such conductor. The inventor's principal objects are to provide an effective apparatus of this class which will act automatically.

VISE.—E. CLARK, Dover, Del. In the present patent the intention of the invention is the provision of a new and improved vise arranged to permit the operator to conveniently and quickly open and close the jaws to firmly grip or release the article while it is undergoing the desired treatment.

GRINDING-MACHINE. D. S. THOMPSON, Livermore Falls, Maine. The object is to provide a machine more especially designed for the use of manufacturing opticians to permit of grinding cylindrical, toric, and other lenses with the greatest accuracy and producing exceedingly fine surfaces without requiring skilled labor and without giving much attention to machine during the grinding process. The invention relates to grinding-machines such as shown and described in the Letters Patent of the United States formerly granted to Mr. Thompson.

BOOK-FINISHING MACHINE.—F. A. STEELE and M. KALABA, New Rochelle, N. Y. In this patent of the Messrs. Steele and Kalaba the invention has reference to a machine for marking the backs of books with gilt and various other inscriptions, whereby the marking or finishing is performed with mechanical accuracy and much more rapidly than could be done by hand.

SAWING-MACHINE.—J. R. REID, Vancouver, Wash. The invention has particular application to improvements in a motor-driven drag-saw mechanism. An object is to provide a machine that may be easily carried or transported from place to place over rough and uneven ground, such as found in wooded localities, without the necessity of using teams or consuming time in clearing a path for passage of the machine through the woods. Further, to provide a novel machine, the saw whereof is designed to be driven by a suitable engine or motor mounted upon the frame.

PACKAGING-MACHINE.—A. MCLEOD, and J. H. MCLEOD, Marietta, O. In this patent the inventors have made certain improvements in packaging-machines, and especially in force-feed devices for flaked or powdered material. The present invention is especially adapted in handling flaked goods, such as rolled oats, for which work the machine has proved very satisfactory.

WINDMILL-PUMP COUPLING. — C. W. DECKER, Charles City, Iowa. The object here is to provide means of coupling the hand-lever of the pump to the pump-rod, at the same time uncoupling the windmill-rod from the pump-rod and *vice versa*. Means for obtaining this are embodied in a device attached to a special form of windmill-rod, all apparatus for coupling and uncoupling being contained in this pump-rod with its attachments. The device is practical and extremely convenient in that the pump-rod may be placed in the pump, replacing the original pump-rod, and after attaching the device by certain means the apparatus is ready to be used.

LEADING ATTACHMENT FOR TYPE CASTING AND SETTING MACHINES.—S. DRUMMOND and W. C. LIEBERKNECHT, New York, N. Y. The invention refers to improvements in leading attachments for type casting and setting machines, and particularly to the so-called "monotype machine," the object being to provide a device by means of which leads of any desired size will be automatically fed between the lines of type as composed, thus not only expediting the setting up of matter, but resulting in a uniformity of work.

MACHINE FOR MAKING TUNE-SHEETS OF MUSIC.—N. COLLINS, 22 Grays Inn road, London, England. As usual with tune-sheets, notes are represented by perforations in the sheet, there being a line of perforations corresponding to the notes of each pitch in the scale, the length of the several perforations and of the intervals separating them representing the length of the respective notes and intervals in the piece of music to be reproduced. The invention relates to improvements in machines for making "note" or "tune" sheets which are used in connection with automatically-played instruments.

STREET-SWEEPER.—A. BROWN, Plainfield, Ill. Mr. Brown's invention relates to sweepers of that class which take up and collect dirt gathered from the street and retain it in dirt receptacles which are removable from the sweeper and designed to be loaded onto a separate vehicle to be carried away to the dump, so that the sweeper itself may be kept continuously at work. A former patent granted this inventor is a sweeper of this type, and the present comprehends features by which the machine sweeps cleaner, operates closer to curb, and is rendered more compact and stronger.

BLUE-PRINT MACHINE.—H. A. BUCHHOLZ and E. J. G. RADEMACHER, New York, N. Y. The purpose here is to provide a form of machine especially adapted for making blue prints or photographic prints from tracings on transparent material or drawing-paper adapted for the purpose, and to so construct the machine that properly-prepared paper in reel form is protected from light and held in revoluble manner in machine in suitable receptacle and means for feeding the prepared paper in connection with the tracing-cloth or other material from which a print is to be made beneath a transparent pane which will uniformly hold the sensitive paper and cloth containing designs to be copied in smooth, close relation to each other.

Prime Movers and Their Accessories.

ROTARY ENGINE.—W. BEAUMONT, Granite, Oklahoma. Mr. Beaumont's invention refers to improvements in rotary engines, an object being to provide an engine of this type so constructed as to be evenly balanced while running and which may be operated with an economical use of steam. The body of the engine is cast in four parts, suitably bolted together, and is therefore comparatively cheap to manufacture and assemble and is easily trued or turned up.

CONTROLLING AND GOVERNING GEAR FOR PRESSURE-ENGINES.—E. CROWE, Bircholm, Bushey Wood, Totley Rise, Sheffield, England. Mr. Crowe's invention relates to the controlling (including the starting, stopping, and governing) of steam and other pressure engines, and has the twofold object of reducing to a minimum the manual labor required to adjust the controlling device and of automatically regulating during the running of the engine the supply of steam or other motive fluid according to the amount of load for the time being on the engine.

EXPLOSIVE-ENGINE.—R. MILLER, New York, N. Y. In this case the invention relates to an engine of simple construction and great thermodynamic efficiency. This efficiency is obtained by an initial pressure of high intensity, due to thorough scavenging and to a complete expansion and utilization of the explosive charge.

RELIEF-VALVE FOR LOCOMOTIVE-CYLINDERS.—F. L. ROBINSON, Cheyenne, Wyo. The improvement made by this inventor has reference to relief-valves, and more particularly to a type of such valve suitable for use upon locomotives to enable the engineer to vent cyl

inders at will and also to remove the water of condensation as fast as formed while the engine is not in motion.

Pertaining to Vehicles.

SPRING-SLEIGH. W. C. PROUTY, Wayne, Mich. The principal object of this improvement is the provision of a sleigh in which the body is supported upon a spring structure of novel design which may be applied to a sleigh running-gear of ordinary construction and which is so constructed that it may be connected with the sleigh-body and running-gear in such manner that no rattling will result and there will be but little tendency to loosen the spring connections.

AUTOMOBILE ATTACHMENT.—J. B. MOTT, Fredonia, N. Y. Mr. Mott's invention has reference to an attachment for automobile-decks adapted to be placed in position when the tonneau or rear seat of the machine is removed. By means of the inventor's improvement a storage-chamber of greatly increased area is provided and the appearance of the vehicle is very materially enhanced.

AUTOMOBILE DRIVING-GEAR.—G. C. CANNON, New York, N. Y. This invention relates to differential gear and appurtenant parts of a motor-vehicle. The differential gear is located directly in the crank-case of the engine and driven by a direct connection with crank-shaft. The divided transmitting-shaft passes from the gear and is joined by Cardan or equivalent flexible connections with short shafts mounted, respectively, in the sides of the vehicle-frame, which shafts in turn have suitable connections with the driving-wheels. Thus a more compact, reliable structure is produced, and by peculiar arrangement of shaft-sections and cardans unavoidable "working" of frame affects not the easy movement of driving parts.

Railways and Their Accessories.

FREIGHT-HANDLING APPARATUS.—F. B. HEWITT, Fort Myers, Fla. Apparatus for loading and unloading railway-cars, vessels, and the like is improved in this invention, the object of the inventor being to provide a device by means of which freight may be rapidly and safely handled. If desired, freight may be both loaded into a car and the same time freight discharged therefrom or the carriers may leave the car empty, to be provided with freight or other material arranged alongside the main frame.

SPIKE.—J. B. ANDERSON, Portland, Ore. Though applicable to other purposes in the arts this improvement has reference more especially to railroad-spikes, and one of the principal objects of the invention is to provide a device of this kind which is thoroughly effective and reliable in use and one which may be easily driven into place and again withdrawn, besides possessing the capacity for long and continued service.

CATTLE-GUARD.—J. F. WOODIN and F. H. WOODIN, Lexa, Ark. This invention has for its object to provide novel details of construction that afford a guard which is very simple, durable, easy to place in position and remove, and that very effectively guards a railroad track against the travel thereover of horses, cattle, or other beasts in either direction. The guard may be moved from one point of a railroad to another and be readily placed in position without requiring any material change in the road-bed, other than to excavate trenches for the reception of the troughs. Inclination given sides of troughs correspondingly increases area of contact with road-bed, and insures stability when in position.

BRAKE-RIGGING.—J. M. DAVIES, JR., Plattsburg, N. Y. This inventor's objects are attained according to the embodiment of the improvement by a connection which contracts automatically, taking up the slack as it occurs and coacting with a brake-lever restrainer which is automatically shifted as the brake-rigging becomes slackened and which limits or restrains the movement of the brake-rigging within the proper throw. The invention relates particularly to the brake-rigging of freight-cars, although useful in other connections.

HAND-BRAKE.—H. B. VICKERS, Schenectady, N. Y. The object of this invention is to provide a brake, more especially designed for use on street-cars and similar vehicles and aranged to permit the operator to powerfully and quickly apply the brake and hold it applied without the operator being required to manipulate locking devices and to allow quick release of the brake whenever desired.

Designs.

DESIGN FOR TRIMMING.—A. M. WEBER, New York, N. Y. In this highly ornamental design the ladies' collar or dress trimming has two thickened rims or edges duly spaced apart and connected by chiffon or bolting cloth. Fagoting covers and extends inward from the outer side of rims, and to the inner edges of the fagoting an ornamental cord is attached, having a series of loops that extend across the chiffon, while another similar cord extends sinuously between the loops and along the longitudinal center of the collar or trimming.

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

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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.**

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Marine Iron Works. Chicago. Catalogue free.

Inquiry No. 6258.—For a machine for tying up box shooks in a factory.

For bridge erecting engines. J. S. Mundy, Newark, N. J.

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AUTOS.—Duryea Power Co., Reading, Pa.

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

Inquiry No. 6261.—For makers of power corn shellers and grinders of capacity of about twenty-five bushels per hour; also for makers of power grinders for dry bones and oyster shells.

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

Inquiry No. 6262.—For manufacturers of blue steel enamel signs and white enamel letters for window signs on glass.

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

Inquiry No. 6263.—For manufacturers of hand power paint mills for grinding white lead in Japan.

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

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WANTED.—Patent attorney to sue for infringements on commission basis. X. Y. Z., Box 773, New York.

Inquiry No. 6265.—For manufacturers of brushes of medium grade, wooden back and stiff bristles.

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We manufacture tripoli stones of all dimensions, disc, cylinders, etc., samples free. Seneca Filter Co., Seneca, Mo.

Inquiry No. 6267.—For manufacturers of handles for shaving brushes, particularly those made of bone or composition.

Glass preserving company, organizing, will issue stock in payment for glass machine or jar patent. Valuable, Box 773, New York.

Inquiry No. 6268.—Wanted, a complete mattress and carpet renovating outfit, for starting a mattress factory.

Patented inventions of brass, bronze, composition or aluminum construction placed on market. Write to American Brass Foundry Co., Hyde Park, Mass.

Inquiry No. 6269.—For makers of electric motors for direct current, for limited field, armature only having small number of coils.

Sheet metal, any kind, cut, formed any shape. Die making, wire forming, embossing, lettering, stamping, punching. Metal Stamping Co., Niagara Falls, N. Y.

Inquiry No. 6270.—Wanted, names and addresses of manufacturers of arsenical sheep-dips.

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

Inquiry No. 6271.—For parties engaged in printing on glass with rubber type, and otherwise, also for parties who print on celluloid with black printers' ink.

LIVE MAN WANTED.—If you have $5,000 and want $1,000 yearly in manufacturing business. Big demand, no competition. Write Manufacturing, Box 773, N. Y.

Inquiry No. 6272.—For manufacturers of mattress-making machinery.

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

Inquiry No. 6273.—For makers of tubes or pipes for musical chimes.

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

Inquiry No. 6274.—For manufacturers of machinery for making wooden toothpicks and clothespins.

We manufacture gasoline motor and high-grade machinery, castings best quality gray iron. Select patterns, and let us quote prices. Frontier Iron Works, Buffalo, N. Y.

Inquiry No. 6275.—For manufacturers of storage batteries.

AUTOMATIC (CARPENTER'S) HAMMER DEVICE.—U. S. patent No. 726,466 for sale. Send for descriptive circular with cut. Any reasonable proposition considered. No brokers or agents. Geo. H. Rowe,, L. Box 442, Ennis, Texas.

Inquiry No. 6276.—For manufacturers of bench motor grinders.

WANTED.—An estimating clerk. Must be competent to figure with accuracy time and material on plate work, tanks, boilers, castings, etc.; no one need apply except an experienced man. Address Broomell, Schmidt & Steacy Co., York, Pa.

Inquiry No. 6277.—For machines for making paper bags.

Inquiry No. 6278.—For makers of machinery for making nut food product and extracting of oil.

Inquiry No. 6279.—For manufacturers of an apparatus for distilling water.

Inquiry No. 6280.—For manufacturers of dish-washing machines.

Inquiry No. 6281.—For dealers in all kinds of machinery pertaining to paper making.

Inquiry No. 6282.—For manufacturers of machinery for making paper car wheels.

Inquiry No. 6283.—For manufacturers of programme clocks, for school and college use.

Inquiry No. 6284.—For makers of machinery and materials for the manufacture of brooms, candles and soap.

Inquiry No. 6285.—For a neat eyelet and fastener for same, for fastening the two sides of a small leather pocket book.

Inquiry No. 6286.—For manufacturers of electrical devices and novelties.

Inquiry No. 6287.—For small refrigerating machinery for private use.

Inquiry No. 6288.—For parties to manufacture, in quantities, a small, cast iron fixture, as follows: To be first turned into malleable iron, then copper plated and finally nickel plated.

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.

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(9489) G. C. asks: 1. What is the cause of the slight snap which is heard at the poles of an electro-magnet when the circuit is broken? I observe that it seems louder when the poles are close to a large mass of iron. A. The sound heard at the instant the current is broken through an electro-magnet is called the "magnetic click." It is caused by the demagnetizing of the molecules of the iron core. The theory is that the particles of unmagnetized iron or steel stand in all possible positions in the bar. Magnetization consists in setting these particles so that their axes are in the same direction; demagnetization deranges them again. A click is heard both when the bar is magnetized and when it is demagnetized. 2. If matter is considered as composed of molecules with relatively large spaces intervening, how can it be explained that certain solids, even in very thin sheets, can completely bar gases and liquids under pressure from passing through said spaces in their substance? A. All solids, when in sufficiently thin sheets, allow gases to pass through the spaces between their molecules. That some require to be made thinner than others may be explained on the supposition that the molecules of such solids are nearer together than those of others which permit transfusion easily. 3. In a gas engine, what percentage of the heat of combustion escapes with the exhaust gases? What portion through the cooling circuit? A. The heat losses in a gas engine vary greatly with the heating power of the gas and air mixture; the compression as well as the proportions of the mixtures, and the working temperature of the cylinder, as indicated by the volume and temperature of the cooling water passing through the cylinder pocket. In good practice the loss by the exhaust is about 40 per cent, by the water jacket about 30 per cent, leaving the total efficiency about 30 per cent. 4. Does the operation of compressing the explosive mixture in an engine consume any of its power? A. Compression would be a loss if not for the effect of combustion, which expands the compressed charge, and thus increases the effective pressure and the efficiency of the engine. 5. Is the compression made only in order to get a larger amount of fuel into the clearance space? A. Compression increases the density as well as the volume of the charge at the moment of ignition, and therefore increases the pressure far more than the amount of compression. 6. The electric current is spoken of as flowing at a certain rate. Has "rate" here any reference to the *speed* of the particles of electricity? Is not the speed of current practically that of light, whatever the conditions? A. The electric current cannot be correctly spoken of as flowing at any certain rate or velocity. Its velocity depends upon the capacity of the conductor and other conditions. The propagation of electric waves in the ether is quite another matter. These have doubtless the velocity of light, which, according to the present belief of scientists, is simply an electro-magnetic phenomenon. 7. If the charge on electrons is simply static electricity, how can such charge be affected by a magnetic field, as is seen to be the case? No such effect on a charged pith-ball is producible. A. An electron is a particle moving under an impulse and carrying a charge of electricity. Electricity is static when it is in the condition of a charge, as on a pith ball, or on the plates of a condenser, or at the ends of conductors, when its further motion is impeded. If now this charge becomes able to fly off into space, its streaming particles are affected by a magnetic field, and the stream is deviated from its direct path. See the experiments of Maxwell, Crookes, Hertz and others. 8. Does the striated appearance of an iron filing diagram of a magnetic field indicate that no magnetic force is present in the spaces between the lines of filings? Or is the space within the field completely occupied and filled by the flux, as a cup is filled with water? A. The arrangement of the iron filings in lines, with intervening vacant spaces, has given us the conception of space as occupied more or less fully by lines of force. Lines of force are simply a convenient supposition to convey the greater or less intensity of electro-magnetic action within a certain area. The flux may be considered as distributed uniformly through the space, as the molecules of water are in a cup; but not as completely filling the space, any more than do the molecules of water in a cup. These do not fill the cup. However, no more water can under constant conditions of temperature and pressure be put into the cup, while more lines of force can be made to pass through the space. There is thus both a similarity and a difference between the two. 9. Is an induced E. M. F. due primarily to the *cutting* of lines of force, or merely to the change in the number of them passing through the circuit? In the transformer with closed magnetic circuit, it would seem that the flux from the primary, following the iron ring, would simply pass through the secondary coil from end to end, and no lines would cut across the wires, yet a great E. M. F. is caused. A. An induced current is set up in a *closed* conductor when the number of lines of force which it incloses is made to increase or decrease. In the case of the transformer with closed magnetic circuit, the lines of force pass through the convolutions of the wire and around, completing their circuit on the outside of the convolutions of the wire. It is by the varying of the number of lines that the E. M. F. is produced. The variation is incessant by reason of the alternations of the primary E. M. F. This you seem to have overlooked. 10. Can an electric discharge pass across a space completely devoid of matter, however great the potential? If not, why is it that the nearer this condition is approached in a vacuum tube, the less force is required to pass the discharge through? A. A perfect vacuum is not a conductor of electricity. Vacuum tubes can be exhausted till no discharge will take place through them. It is not true, as you state it, that less force is required to pass the discharge through a high vacuum than through a lower one. When the vacuum is higher than a millionth of an atmosphere, it is very difficult to force the discharge through it. 11. Do any of the radium rays *directly* affect the eye as light? A. Radium does not directly produce the sensation of light in the eye. By some it is thought to produce a fluorescence of certain of the media of the eye, and thus indirectly cause a sensation as of light. 12. Can any electricity, however great the tension, pass through chemically *pure* water? Can it pass through any fluid except the metals without causing decomposition? A. Chemically pure water is to be classed as an insulator; but an insulator may have electricity pass through it, if the pressure of the electricity is sufficient. All electrolytes are decomposed by the passage of electricity, but all electrolytes are classed as conductors, better or poorer. All your electrical questions would be resolved more satisfactorily by the study of good books, than by the brief replies in our columns. Thompson's "Elementary Lessons," which we can furnish for $1.50, explains most of them. 13. I have been told that a bicycle tire when tightly inflated is less liable to punctures than when softer. If so, why is this? A. You are correct in your assertion.

(9490) J. H. M. asks: As I am running a new engine that has a bad pound in the cylinder that comes from a badly fitted piston, would you please advise me as to what is the correct allowance to be made for the expansion for piston rings? The above engine is a 20 x 20, speed 210 R. P. M., rated at 328 horse-power. The piston has a clearance of 3-32 inch, and the groove in the piston for the ring is ¾ inch deep; the rings are ⅝ inch deep; this allows the piston to ride all on the cylinder. Should not the ring be at least equal to the depth of the groove in piston? Please state what is good practice in this respect. The piston strikes the top of cylinder on the forward strike, making a very bad sound, otherwise the engine runs perfect. The piston is fitted with snap ring, or as better known spring ring, those being sprung on over the piston into the grooves; cylinder is of the overhanging type. A. The rings on the piston of your engine should not rest on the bottom of the groove, and should not carry the weight of the piston. The knocking may be caused by loose fit of boxes of the crosshead pin, crankpin, or main journal. There should be a take-up adjustment at all these points. We advise you to address the builder of the engine on your trouble.

(9491) H. S. B. writes: Would it be asking too much for you to inform me of a treatment or substance to use to make wood proof against water (or nearly so)? Our wood in the hames we make is in a few cases subjected to contact with sulphur water in the mines, and when saturated, softens the wood; would like a coating to prevent this, in a measure. A. For waterproofing hames we suggest soaking them for a few hours in boiled linseed oil, warmed nearly to the temperature of boiling water. On removing the hames from the bath, brush off the surplus oil, and dry in the sun or a warm oven. The addition of about two ounces of paraffine to a gallon of the oil by heating will make a finer finish to the hames by rubbing with a cloth after drying.

(9492) J. P. O. writes: In moving an object from place to place under a common arc light, the object appears to vibrate. What causes the apparent vibration? A. The apparent vibrations to which you refer are seen only when moving an object under an arc lamp fed by an alternating current, the light of which consists of a series of flashes which, due to the persistency of vision, appear to give