

## RECENTLY PATENTED INVENTIONS.

## Engineering Improvements.

**ROTARY ENGINE.**—HENRY F. FARLEY, Kalona, Iowa. The piston of this rotary engine has a yielding piston-head. In the cylinder a valve-abutment is mounted, having a cam-surface for pressing the piston-head. The abutment is hollow, is connected with the steam supply, and is arranged to open into the cylinder. Slide-valves control the amount of steam passing from each abutment into the cylinder at the time an abutment is in an inactive position. The engine is characterized by its simplicity and durability.

## Mechanical Devices.

**TURBINE WATER-WHEEL.**—WILLIAM W. TYLER, Dayton, Ohio. By reason of the improvements made by the inventor the cylinder-gate is completely balanced, and the pressure of the water tends neither to open nor to close the gate at any point of its position. The course of the water through the chutes is always smooth, and the water is not obstructed by the sharp edges of the gate projecting in the water course. Hence, the full power of the waterhead is utilized to the greatest profit.

**MACHINE FOR MAKING PASTED TUBES FOR CIGARETTES.**—ANATOLE BENOIT, JULIEN GUENIFFET, and JULES NICAULT, Rue Daguerre, Paris, France. The improvements which form the subject of the present invention consist notably in the particular construction of a tube-forming device, of a paste-distributor, and of a tucking device. These devices are combined so as to form a machine for producing a cigarette-tube which is pasted and closed at one end.

**MOVABLE REGULATING RAIL FOR PIANOS.**—VETAL BESSIER, 677 MacDonough Street, Brooklyn, New York city. In grand pianos, when the hammer strikes two strings in obedience to the pedal action, the hammer-felt is cut in; and when the hammer subsequently strikes the three strings the tone produced is uneven, as the third string receives a harder blow than the other two. In upright pianos the hammer-rail is moved toward or from the strings by the soft pedal—an arrangement which is defective since the lever on the hammer-butt is cut and worn in a very short time. To overcome these defects the inventor has devised a means for varying the distance between the heels of the jacks and the buttons in the rail. A richer tone is thus obtained—a tone which is permanent.

**DUMPING-SCOW.**—JOHN M. GOODWIN, Manhattan, New York city. The inventor has provided a simple means for causing the discharge and for preventing the careening of the scow. Cargo-carrying compartments of V-shaped cross section are provided.

**SAWMILL.**—JAMES L. GRANT, Johnson City, Tenn. By means of this sawmill quarter-sawed wood can be more effectively produced. A carriage is employed on which a log is held to turn around its longitudinal center, and a saw is arranged to cut radially into the log from the outer surface to a point near its center. With this machine a log can be sawed into fourteen sector-like parts. These parts can be cut into planks, each a full broad figure quarter-sawed.

**EXPANSIBLE PULLEY.**—JOHN W. HILLAND, Manhattan, New York city. The purpose of this invention is to construct a simple form of expansible pulley and to provide a means practically constituting a portion of the pulley whereby the driving-face may be quickly and conveniently increased or decreased in diameter, thus obviating variable motion.

**CONVEYER MECHANISM.**—DR. SAMUEL M. JENKS, Madison, So. Dak. In the construction of the Jenks system of overhead-track, overhead-carrier, and overhead conveying mechanism, a radical departure has been made from similar contrivances. The most striking feature is to be found in the haul-rope. A permanent loop is made in the haul-rope; and this feature is the basic principle of the whole system. By reason of this permanent loop a direct draft is obtained in lifting the load. The merits of the direct draft are too obvious to require extended comment. The permanent loop is used in connection with a novel automatic interlocking sling-pulley. By reason of this pulley the amount of haul-rope required is reduced by 16 to 18 feet; friction is lessened; the haul-rope is prevented from twisting; the force necessary to return the empty sling and carrier, and bring the sling back to the load is diminished; and the strain on the haul-rope is so relieved that the two sections of the pulleys separate of their own weight. The Jenks steel-bar track differs from other tracks in so far as both legs of the angles are supported, stiffening the track far more than usual.

**BICYCLE-RACING MACHINE.**—JOSEPH MATTHEWS, New Bedford, Mass. The purpose of the invention is to provide an apparatus for enabling bicycle-races to be conducted in a limited area, without the necessity of the machines' actually traveling over the distance supposed to be covered in the race. This end is attained by mounting the machines so that they do not move bodily and by transmitting the movement of a rapidly-spinning driving-wheel to a dummy-machine which travels on a small track. By these means the racing effect is obtained.

**APPARATUS FOR UNLOADING CARS.**—WATSON BATCHELOR, Manhattan, New York

city. The apparatus comprises a cradle poised at its middle and provided with a weight, the parts being arranged so that when a loaded car is run on the cradle the weight of the car will tilt the cradle. The car is thus thrown into an inclined position, whereupon the load may be discharged. When the car is unloaded the weight at the end of the cradle will assert itself to throw the cradle and car back to the horizontal position. The apparatus is particularly adaptable to unloading freight-cars into vessels.

## Miscellaneous Inventions.

**RAZOR-STROP.**—WILLIAM G. MOSIER, Greenville, Miss. By means of the device invented by Mr. Mosier, a number of stropps may be held so that when one strop is in use the others will not interfere with the operation of stropping the razor. Each strop may be turned readily from side to side so that the razor may be applied to either face.

**TREE-PROP BRACKET.**—ROBERT S. MCINTYRE, Riverside, Cal. The tree-prop bracket is arranged for movable attachment to a supporting-post at any desired point, and is adapted properly to engage and securely to hold the branch of a tree. The branch of a tree is not liable to be cut or chafed while it is supported.

**AUTOMATIC BIB OR WATER-COCK.**—DANIEL H. STREETER, Norristown, Pa. The object of the invention is to provide a construction whereby the water-valve will be automatically operated by the water-pressure. The bib or cock is so constructed that it can be readily taken apart for cleaning. The construction is simple; the operation is efficient. Means are provided for regulating the flow of water.

**SEALING-BUCKLE.**—AMBROSE F. THOMPSON, Hunter's Hill, New South Wales. The buckle is to be used on mail-bags, and is constructed so that the strap securing the contents of the bag cannot be unbuckled without breaking the seal. A buckle of ordinary construction underlies a metal bed for sealing wax, the bed having a flat floor and slides slightly raised so arranged that the buckle cannot be opened without breaking the wax.

**NON-RESEALABLE BOTTLE.**—FRANK M. WEIR, Monmouth, Ill. The inventor has provided a bottle, jug or jar with a simple means for sealing it after the original filling. When the bottle or jar is open the vessel is so disfigured that the rights of the dealer are fully protected and the purchaser insured from dishonest practices. The neck of the vessel is so constructed that an ordinary cork cannot be placed therein.

**COT.**—ALBERT A. GREGG, Buffalo, Wyo. Mr. Gregg has provided a cot which can be readily folded, and which, when extended, will form a more secure structure than the cots heretofore constructed. The cot is so made that it can be readily folded or set up for use.

**ROLL FOR ROLLING-MILLS.**—CASPAR HUESER, Bruckhausen, Prussia, Germany. A core consisting of a tube of steel having a thin wall is arranged within the roll body and welded therewith. The core of the tube is cut a suitable length, and, when in place within the roller, projects at both ends outward, so that the projecting parts may be pressed at their extreme ends into the shape to fit coupling-crosses. The rest of the parts may be employed as journals. The rollers are cooled from the inside. The weight of the rolling-train is reduced; for the new rollers are considerably lighter than the old.

**LAMP.**—CHARLES E. GERVAIS, Manhattan, New York city. An electric battery is used in connection with this lamp, a heat or resistance coil being employed to ignite a primary wick, the flame of which is instantly communicated to the illuminating-wick. As soon as the illuminating-wick is ignited the current from the battery is switched off and the flame of the primary wick automatically extinguished.

**BINOCULAR MICROSCOPE.**—JOSEPH KROULIK, Rochester, N. Y. The optical axes of the two object-glasses intersect upon the stage. The distance between the two eye-pieces corresponds with the distance between a man's eyes. Each object-glass is provided with a separate tube in which a mirror is located to deflect the rays condensed by the object-glass to the eye-piece by a single reflection. Very effective stereoscopic vision and high magnifying and dissolving power are thus obtained.

**NUT-LOCK.**—EDWARD R. CAMPBELL, East Ryegate, Vt. The nut-lock comprises a nut with a pawl in the nut designed to engage teeth on the thread of a bolt whereon the nut is screwed. A second pawl in the nut is arranged to engage teeth on the material to be secured by the nut and bolt.

**FEED-BAG.**—GEORGE A. CARLETON, JR., Edgewater, N. J. To avoid the great loss of feed occurring when bags of ordinary construction are employed, Mr. Carleton has devised a false bottom which is fed steadily upward toward the horse's mouth so as to keep the feed easily in reach of the animal and to avoid the necessity of the animal's throwing the bag upward to reach the feed.

**MARKING-TOOL.**—MICHAEL M. CLARKE, Farmington, New Mexico. The marking-tool comprises a shank having a head at one end which terminates in a point and has its end face beveled. The cutting-lip on the head extends from the point rearwardly along one side of the head. The tool is arranged to make

a perfect mark on the wood when drawn along the edge of a carpenter's square, straight edge, or like instrument.

**MAIL-BOX.**—WESLEY O. ROWE, Yonkers, N. Y. The object of the invention is to provide in connection with a mail-box a simple means for canceling the postage-stamp and otherwise marking the envelope while passing into the box. The operation of canceling a postage-stamp by this device is practically automatic. The time and expense now required for canceling stamps after collecting the letters are obviously saved.

**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.

## NEW BOOKS, ETC.

**ELECTRICAL DESIGNS.** Comprising Instruction for Constructing Small Motors, Testing Instruments and Other Apparatus. With Working Drawings for Each Design. New York: American Electrician Company. 1901. 8vo. Pp. 262. Price \$2.

A thoroughly practical book with working drawings on a satisfactory scale. The descriptions are clear and concise, putting the book in the class which is earnestly desired by electricians. It is illustrated by 289 figures.

**THE PRACTICAL ENGINEER ELECTRICAL POCKETBOOK FOR 1901.** Manchester, England: Technical Publishing Company. 1901. Pocketbook form. Pp. 292. Price \$1.

Works of this class are numerous, but there always seems to be room for another. The first issue of this book was well received last year. Considerable care and labor have been expended upon the present issue to make it even more worthy of popular favor. The tables will prove of special value.

**ELEMENTARY ORGANIC ANALYSIS. DETERMINATION OF CARBON AND HYDROGEN.** By F. G. BENEDICT, Ph.D. Easton, Pa.: The Chemical Publishing Company. 1900. 12mo. Pp. 186. Price \$1.

This little manual is presented in the hope that the descriptions and processes here recorded will aid in making the method of analysis by organic combustion more familiar and more satisfactory.

**TAXIDERM.** Edited by Paul N. Hasluck. London and New York. 1901. 16mo. Pp. 160. Price 40 cents.

The little volume comprises the skinning, stuffing and mounting of birds, mammals and fish. It does not, of course, compare with the sumptuous works of Hornaday and other American writers, but it will doubtless prove useful to amateurs who do not wish to carry their knowledge of the art very far.

**FIELD MANUAL FOR ENGINEERING.** By Philletus H. Philbrick, C.E., M.S. New York: John Wiley & Sons. 1901. 16mo. Pp. 401. Morocco, gilt. Price \$3.

The aim in this work has been to present the subjects of the text in a mathematical and logical order, to classify all problems presented, and to express the resulting formula of every problem in the form requiring the least numerical computation; to furnish a large number of useful tables, and to treat the general problem of railway engineering more extensively than other similar works have done. The author has accomplished his task in an admirable manner.

**MUNICIPAL ACCOUNTING.** By F. H. Macpherson, C.A. Detroit, Mich.: The Bookkeeper Publishing Co., Ltd. 1900. 8vo. Pp. 46.

A comprehensive treatise on the subject of municipal accounts is here presented, illustrated by specimens of improved forms of books and reports, including sinking-fund and instalment, or annuity tables, for terms of two to thirty years, at rates of interest from 2 to 6 per cent, and other labor-saving tables.

**A GLOSSARY OF BOTANIC TERMS, WITH THEIR DERIVATION AND ACCENT.** By Benjamin Baydon Jackson. London: Duckworth & Co. 1900. Philadelphia: J. B. Lippincott Co. 12mo. Pp. 327. Price \$2.

Neither the typography nor printing of this book is comparable with the text. A good glossary of botanical terms in handy form is badly needed, and the volume before us seems to have been prepared with great care.

**DER GIPS UND SEINE VERWENDUNG. HANDBUCH. FÜR BAU- und MAURERMEISTER STUCCATEURE, MODELLEURE, BILDHAUER, GIPSSEISER u. s. w.** Von Marco Pedrotti. 45 illustrations. Vienna: A. Hartleben. 1901. 16mo. Pp. 264.

The production of formaldehyde in the last few years has increased enormously; Germany alone produces yearly an enormous quantity, fully half of which is employed in the manufacture of anilin, while the remainder finds use in tanneries and paper factories. The present work is especially designed to meet the requirements of the chemist, physician-apothecary, and the technical manufacturer. The work explains clearly and concisely the method of manufacturing formaldehyde, its properties, and particularly the various uses to which the product may be put.

## Business and Personal Wants.

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

Marine Iron Works. Chicago. Catalogue free.

**Inquiry No. 1096.**—For jobbers of sporting goods, guns, etc.

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

**Inquiry No. 1097.**—For parties to make castings for small locomotives.

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

**Inquiry No. 1098.**—For hand and power machine for broom factories.

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

**Inquiry No. 1099.**—For manufacturers of a packing that will stand hot or cold weather.

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

**Inquiry No. 1100.**—For manufacturers of carriage bodies for the trade.

FOR SALE.—Patent. Johnson, 2 Masonic Temple, Cincinnati, O.

**Inquiry No. 1101.**—For a second-hand engraving machine for jewelry; also roller top watchmaker's bench.

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

**Inquiry No. 1102.**—For manufacturers of toys and puzzles.

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

**Inquiry No. 1103.**—For manufacturers of small tempered brass springs.

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

**Inquiry No. 1104.**—For power freight elevators.

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

**Inquiry No. 1105.**—For hot air injectors.

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

**Inquiry No. 1106.**—For machines for cutting paper stencils.

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

**Inquiry No. 1107.**—For manufacturers of steel enameled pans about 42 inches long by 15 inches wide, and 8 inches in depth.

Your advertisement on 1,000 gummed stickers, 59c. Agents wanted. G. E. Dunbar, 332 Main st., Malden, Mass.

**Inquiry No. 1108.**—For wood-turning lathes for making oval work, such as picture frames.

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

**Inquiry No. 1109.**—For lithograph embossed wrap pictures and fancy and colored edge cards.

Machine Work of every description. Jobbing and repairing. The Garvin Machine Co., 149 Varick, cor. Spring Sts., N. Y.

**Inquiry No. 1110.**—For a general line of novelties.

See our Collective Exhibit—Section "S." Electricity Building, Pan-American Exposition. Standard Welding Company, Cleveland, Ohio.

**Inquiry No. 1111.**—For manufacturers of children's toys.

FOR SALE.—New process for making oil with fish and fish offal is offered for sale or licenses in United States of America. Address Foreign, Box 773, New York.

**Inquiry No. 1112.**—For manufacturers of beer bottle stoppers.

FOR SALE.—Combination pocket dime bank, pen-knife, bill holder and match safe. Patent applied for. Address John Tanner, 112 N. 4th st., Paterson, N. J.

**Inquiry No. 1113.**—For a second-hand marine engine, about four horse power.

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

**Inquiry No. 1114.**—For a small family ice machine.

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

**Inquiry No. 1115.**—For manufacturers of kites for lifting flags, cameras, etc.

FOR SALE.—Astronomical telescope, silvered glass reflector, 6 1/2 inches aperture, perfect definition guaranteed, equatorial stand. Very moderate price. Address P. O. Box 115, Mystic, Conn.

**Inquiry No. 1116.**—For electric hoists for ware houses.

The Australian Commercial Agency will undertake a few manufacturers, or other sole agencies. Thorough knowledge of Australian trade. Highest references. The Australian Commercial Agency, 108 Pitt street, Sydney.

**Inquiry No. 1117.**—For the manufacturers of the "Hold fast" skirt supporters.

WANTED.—A thoroughly competent engineer to push in United States of America a new, efficient and economical process, for dealing with large benefit towns' sewage and refuse waters from industry. Address France, Box 773, New York.

**Inquiry No. 1118.**—For a 24 to 30 inch drill press.

WANTED.—Agents to handle blocks of territory for our new, improved gasoline lighting system designed for commercial lighting. Gives better light than electricity at less expense to operate than oil lamps. Money maker for right parties. Address Improved Gasoline Incandescent Light Company, Ltd., Howell, Mich.

**Inquiry No. 1119.**—For machinery for mixing and filling cans of baking powder.

Persons interested in patents of merit are hereby invited to inspect Daggett's safety trolley for use on electric cars. It prevents trolley pound, runs smoothly, does not jump the wire, is easy on the wires. Daggett's safety trolley prevents accidents. Its merits have been proven by actual use on three different lines. This patent, No. 68243, is for sale. Reference by companies using this trolley. Call or address Wm. A. Daggett, 116 W. Boulevard, Vineland, N. J.

**Inquiry No. 1120.**—For seamless steel tubing 1-8 to 5-16 inch bore.

Sheet metal, any kind, cut, formed, any shape. Prompt work. Metal Stamping Co. Niagara Falls, N. Y.

**Inquiry No. 1121.**—For a buttonhole moistener and opener, preferably Miller Brothers.

**Inquiry No. 1122.**—For handles for rubber stamps.

**Inquiry No. 1123.**—For centrifugal gold-separating machinery.

**Inquiry No. 1124.**—For machinery for powder mills.

**Inquiry No. 1125.**—For an automobile lawnmower (gasoline preferred) with detachable roller.

**Inquiry No. 1126.**—For manufacturers of cigarette cardboard boxes.

**Inquiry No. 1127.**—For flexible steel ladder suitable for portable fire-escapes.

**Inquiry No. 1128.**—For a concentrator.

**Inquiry No. 1129.**—For manufacturers of printing presses, also type for same.

**Inquiry No. 1130.**—For manufacturers of paper for printing purposes.

**Inquiry No. 1131.**—For machinery for making toothpicks.

**Inquiry No. 1132.**—For machines for making linen collars.

## 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.

(8283) F. H. O. asks: What effect, if any, has a draught during a thunderstorm? Does a draught act as a conductor or in any way tend to change the direction of a lightning stroke? A. We cannot decide this matter. If doors and windows are open during a thunderstorm, the air is continuous and the path of the flash is direct through the openings into the house. Doors and glass are better insulators than air, and we feel protected to a greater degree when doors and windows are shut than when they are open. There is little scientific basis for this feeling, we are aware, but having it we shut the doors and windows.

(8284) J. S. C. asks: 1. What is the lifting power in pounds of one cubic foot of the gas used in balloons? A. The lifting power of any gas is the difference between the weight of the gas and the weight of the same volume of air. Since these weights vary with the temperature and the pressure of the atmosphere, it is common to give them for the freezing point and the normal barometer, 29.92 inches. The French aeronauts work upon the basis that one cubic meter of hydrogen will lift one kilogramme, and ordinary illuminating gas will lift about one-half as much as hydrogen. If a closer value is desired, it may be obtained as follows: 1 cubic foot of air at freezing and normal pressure weighs 1.29 ounces avoirdupois; 1 cubic foot of pure hydrogen under the same conditions weighs 0.089 ounce avoirdupois. The difference between these two weights is 1.2 ounces, which is the weight that 1 cubic foot of hydrogen will balance in the air. It will lift any weight less than that. Illuminating gas is of varying composition. If its density is taken at 0.458, its weight is 0.59 ounce per cubic foot, and 1 cubic foot of gas will balance a weight equal to the difference between 1.29 ounces and 0.59 ounce or 0.70 ounce. 2. What is the lifting power of a perfect vacuum (per cubic foot) if such could be obtained? A. The question is already answered above. It is 1.29 ounces per cubic foot, the weight of the air in a cubic foot. 3. What is the approximate weight per square foot of the gas holder of a balloon? A. We do not know. It varies greatly according to the material employed and the number of coats of varnish it has received. The total weight of bag and outfit is much more important.

(8285) R. E. M. writes: I am somewhat interested in some lead land in this part of the country which is as yet undeveloped, and with a view of starting to work on same at an early date, I write to ask you of your opinion of the electrolytic process of treating ores as compared with the stamp mill and smelter process. I understand there has been an electrolytic process whereby lead ore can be treated by electricity and a much larger per cent of the assayed value of the ore can be obtained than by the old method. A. Electrolytic processes are very rapidly coming into use and superseding the older methods of refining and smelting. We have not published any data upon the matter. The machinery can be secured from any of the large electric companies, and any good electric engineer can operate the plant.

(8286) F. F. asks: Can German silver wire be used in place of copper wire on volt-meter in SUPPLEMENT 1215, if only 1-12 as much wire was used and wind it all on the bobbin? A. German silver wire may be used in place of copper if it be made to meet the

same conditions as are specified for the copper wire in the description of the volt-meter.

(8287) E. N. asks: Kindly inform me in what issues of the SUPPLEMENT shunt-wound and induction coils for medical purposes are described. A. SUPPLEMENT, No. 600, gives the connections of a shunt-wound dynamo or motor, and No. 569 contains the instructions for making a medical coil. The price of each of these is ten cents.

(8288) G. S. W. writes: I wish directions for making an electric dynamo suitable for electrolysis and of such size as to consume at its full load nearly one man power. Have you the plans for one which will do this? A. Yes; in SUPPLEMENT, No. 161, price ten cents.

(8289) LeM. L. P. asks: Kindly give details of charging storage battery for automobile. The best current to use, voltage, amperes, etc. A. We recommend Salomon's "Practical Management of Accumulators," price \$1.50 by mail, for the purpose you have in view. The chapter upon "Charging" contains 33 pages. It is obviously out of the question for us to give "details" on the point in this column.

(8290) E. H. R. G. asks: 1. What is the specific gravity of corn meal, and how is it ascertained? A. The specific gravity of corn meal would be the same as that of the corn from which it was made. This would differ with the sample, since the same bulk of corn does not always weigh the same. To ascertain the specific gravity of corn, weigh a quantity very exactly. Weigh it again hung in water, and find the difference between the two weights. Divide the first weight by the difference. The quotient is the specific gravity. The corn may be put into a wire basket or gauze bag and hung from the balance to obtain its weight in water. It must be thoroughly wet with the water before its weight in the water is taken. 2. Is corn meal heavier than water, and is not this the reason that it sinks when put into a glass or tumbler of water? A. Yes, to both parts.

(8291) L. H. H. asks: 1. Could you please inform me what is the voltage and amperage of one cell of Fuller battery? I have a 1/2 H. P. motor which requires 8 volts and 5 amperes to run it. Do you think 4 cells of Fuller battery would run it, giving that power? How long do you think they would run it on one charge? A. The motor requires 5 amperes at 8 volts. This is 5 x 8, or 40 watts; 746 watts are one horse power. Your motor is a little less than 1-18 horse power. You overrate it. Four cells of Fuller battery will not give 8 volts for any length of time after they are charged. Five cells should be used. To obtain 5 amperes discharge, the cells should be of the largest size. They would be run down in 6 to 8 hours so far that they could not furnish enough current to run full speed. 2. Do you think five cells of carbon cylinder battery charged with bichromate and sulphuric acid solution would run it six hours? A. Yes.

(8292) S. C. asks: 1. What should I use for the lining of the cells of the plunging bichromate battery described on page 394 in "Experimental Science" in the absence of gutta percha? A. Nothing will completely replace hard rubber for the cells of a battery. Glass cells are the next best, but they are fragile. Next to glass is a wooden box with a thick coating of asphaltum upon the wood of the box. This should be frequently renewed. 2. Which would be the most efficient way of connecting the cells of this same battery? A. If the battery is to be used for caution, or for sudden heating, connect in multiple; if for power, connect in series.

(8293) I. M. A. asks: 1. Where can I get descriptive illustrated article on electric plants of the United States navy? A. No single article contains this information. It is scattered through the files of the technical electrical press for the last three years. 2. Name some good book on incandescent wiring that gives diagrams with full explanations as to putting in all kinds of switches. A. Herick's "Modern Switchboards," price \$3; Kilgour, Swan and Biggs' "Electrical Distribution in Theory and Practice," price \$4; Walker's "Electric Lighting for Marine Engineers," price \$2; Davis' "Standard Tables for Electric Wiremen," price \$1; Noll's "How to Wire Buildings," price \$1.50. All these are helpful in the various parts of the work.

(8294) W. W. P. asks: 1. Can lithium, calcium, barium phosphates, potassium and zinc be used in colored lights, and what salts of these elements, and which phosphates will give the best results? A. The chemistry of this inquiry seems to be slightly mixed, but it will not explode as some of the compounds would if they were mixed as badly. In general, it may be said that chlorides and carbonates of lithium, barium, strontium, etc., are used for colored lights. Phosphates do not seem to be adapted to such a use. 2. How are ammonia, sulphate of copper and oxychloride of copper (Cu<sub>2</sub>O<sub>3</sub>Cl<sub>2</sub>H<sub>2</sub>O) made commercially and in the laboratory? A. Ammonio-sulphate of copper is made by adding ammoniac hydrate to a solution of sulphate of copper in water, till the precipitate which is formed at first is dissolved. A clear blue liquid results. The oxychloride of copper is a common paint under the name of Brunswick green. For its manufacture consult works on the manufacture of paints. 3. What furnishes the oxygen neces-

sary for combustion in the following: Chlorate of barium, 2 ounces; nitrate of barium, 3 ounces; sulphur, 1 ounce? A. All chlorates contain a large proportion of oxygen and are very unstable compounds, easily decomposed, often with violent explosions. It is from potassium chlorate that oxygen is manufactured for commercial uses. Nitrates contain three equivalents of oxygen. Potassium nitrate is used in the manufacture of gunpowder because of the oxygen it furnishes to consume the carbon and the sulphur. The compound whose formula you give is explosive. 4. I recently saw that "flowers" is the name applied to distillates, but I also saw that "floreszinc" is oxide of zinc. What, therefore, is flowers of zinc? A. We are not familiar with the usage of the word "flower" as a distillate; nor do we find any such definition given in Webster. It may be sublimated was used where you read distillate. In this sense of flowers, the word simply means a fine powder. Flowers of zinc is finely powdered zinc oxide as used by the druggist in preparing ointment. 5. Where can copper disulphide and mealpowder be bought, and how much does mealpowder cost? A. Apply to the nearest druggist.

## INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

July 23, 1901.

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Advertising device for doors, M. J. Quinn... 678,902  
Alarm, See Fire alarm.  
Alkali metals, apparatus for electrolysis of the salts of, H. S. Anderson... 678,851  
Annealing box, W. E. Harris... 679,145  
Antiseptic applying apparatus, W. M. Kelso... 679,262  
Armature winding, W. Lau... 679,284  
Artillery mount, field, L. L. Driggs... 679,113  
Autocar starting means, Hope & Buckley... 679,024  
Automatic brake, J. Hughes... 679,001  
Axle, vehicle, B. S. Morden... 679,180  
Baling press, W. R. Colman... 678,941  
Barrel, O. H. P. Cornell... 679,277  
Barrels, manufacture of, O. H. P. Cornell... 679,276  
Basket and cover therefor, H. J. Sitterly... 678,985  
Bearing, vertical shaft, F. L. Kimball... 679,078  
Bicycle driving mechanism, M. L. Nichols... 679,283  
Bicycle handle bar, L. L. Luce... 679,086  
Bleaching powder, apparatus for making, P. Naef... 678,970  
Blending machine, automatic, J. S. Ulmer... 679,096  
Bobche lifter, M. O'Carroll... 678,898  
Book support, shelf, G. J. Kraushaar... 679,054  
Boot or shoe trimming machines, attachment for grinding shank cutters for, G. A. Knowlton... 679,027  
Bottle caps, device for applying, A. Baumgarten... 679,012  
Bottle filling machine, R. R. Stone... 679,064  
Bottle, non-refillable, P. F. Lenhart... 679,173  
Bowling alley pin, Barrett & Phillips... 679,205  
Box lock, cigar or other, F. H. Mitchell... 679,030  
Brake shoe, W. E. Gorton... 678,997  
Brick or artificial stone, mold for, S. M. Kimble... 679,232  
Broiler, A. Tenen... 679,137  
Brush shaving, Nettlich & Korzinger... 678,971  
Buckle and hame tug loop, combined trace, C. N. Ling... 679,282  
Buckle, suspender, A. A. Abrams... 679,200  
Bungs, implement for operating spring, E. C. Phillips... 679,160  
Burglar proof bar for window gratings, W. H. Larmore... 679,028  
Button, W. Hornum... 679,052  
Button, collar, J. W. McLaughlin... 679,157  
Calender roll grinding machine, J. Linton... 678,961  
Callipers, micrometer, E. Giebler... 679,258  
Camera, C. W. Barnekov... 679,271  
Can cutting machine, F. W. Prael... 678,901  
Can filling machine, F. D. Cleveland... 678,862  
Can or vessel, E. M. Jones... 679,171  
Car bolster, railway, G. L. King... 678,886  
Car brake, T. B. Hyland... 679,150  
Car coupling, J. E. Wade... 679,021  
Car draft riding, J. Timms... 679,021  
Car fender, R. F. Preusser... 678,974  
Car loader, C. D. Cole... 679,048  
Car, ore or gravel, F. Peteler... 679,033  
Car platform closure, W. M. King, Sr... 679,080  
Car seat, F. G. Koehler... 679,081  
Cars, etc., operating lever for hand, J. L. Twyman... 679,095  
Carbureted air, making, S. C. North... 678,973  
Carburetor, Fischer... 679,019  
Carburetor oil feed, G. Fischer... 679,018  
Carpet fastener, G. B. Somers... 678,910  
Carriage washing device, F. W. Mott... 678,967  
Carrier, See Stone carrier.  
Carving and delineation machine, A. C. Feron... 679,120  
Cash indicator, D. K. Allison... 679,250  
Cash register, D. W. Harper... 679,073  
Cash register, G. Browning... 679,251  
Cataphoric pad, J. F. Mossberg... 679,239  
Cheese press, L. Middleton... 678,965  
Cigar mold, S. K. Snively... 678,986  
Circuit breaker, C. E. Holmes... 678,881  
Circuit breaker, H. P. Ball... 678,991  
Circuits, controlling high potential, E. W. Rice, Jr... 678,905  
Cleaning and polishing compound, L. G. Tomoor... 678,919  
Clock, stop, Stedell & Vogt... 678,953  
Cloth cutting machine, G. E. Lewis... 679,056  
Cloth folding and holding device, N. P. Denckla... 678,945  
Clutch hub, friction, J. McCaffrey... 679,060  
Coal dust and carrying it to furnaces, apparatus for producing, F. de Camp... 679,046  
Coat, J. De Mayo... 678,996  
Cock, J. Garnier... 679,071  
Coin retaining device, J. T. H. Dempster... 679,082  
Coin receptacle, Burns & Strauss... 679,116  
Collar fastener, J. H. Emerson... 679,118  
Commutator for dynamo electric machines, F. A. Merrick... 678,964  
Compress, J. C. Davis... 678,943  
Concentrator, J. J. Montgomery... 679,155  
Concrete material, producing elastic, Nobbs & Wenzel... 679,158  
Conduit plow, J. Hoffmann... 678,880  
Corn chopper, C. E. Lykke... 679,177  
Corn from the cob, machine for cutting green, S. E. & W. W. Morral... 679,156  
Cotton press self-locking door clamp, J. A. Westbrook... 678,923  
Crate, buggy, C. Varner et al... 679,098  
Crayon sharpener, G. O. Anderson... 679,136  
Cultivator, D. Hill... 678,879  
Cut out block, H. O. Swoboda... 678,990  
Cutting articles from sheet material, machine for, J. J. Breach... 678,935  
Cycle, motor, G. W. Manson... 678,963  
Damp regulator, E. G. Tilden... 678,917  
Die head locking mechanism, H. W. Oster... 679,241  
Discharging apparatus, E. P. Waggoner... 679,042  
Disintegrating mill, A. J. Sackett... 678,983  
Display rack, W. H. Blandin... 679,210  
Display rack or stand, W. S. McKay... 679,003  
Door, J. W. Bapp... 678,903

Door check, G. W. Mallory... 678,889  
Doors, automatically operating, J. H. Whitaker... 679,009  
Driving mechanism, friction, S. F. Allen... 679,270  
Dust absorbent, L. Rosenfeld... 678,881  
Dust guard, H. S. Goughnour... 679,021  
Dust pan, H. W. Rogers... 678,906  
Dye and making same, black polyazo, O. Ernst... 679,221  
Dye and making same, blue sulfur, J. Abel... 679,199  
Dye and making same, orange, P. Julius... 679,172  
Dye, producing blue sulfur, A. Kertesz... 678,884  
Elbow forming machine, F. Dieckmann... 678,946  
Electric circuits, locating grounds on, E. M. Hewlett... 678,878  
Electric machine, dynamo, E. W. Rice, Jr... 678,904  
Electric meter, Barker & Ewing... 678,929  
Electric metering system, L. Bell... 679,138  
Electric motor, J. A. Heany... 678,874  
Electric motor controller, E. W. Stull... 678,915  
Electric motor controller, E. W. Stull... 678,889  
Electrical distribution system, H. E. Heath... 678,989  
Electrical distribution system, E. W. Rice, Jr... 679,006  
Electrical distribution system, C. P. Steinmetz... 679,008  
Electrical distribution system, E. J. Berg... 679,102  
Electrical installation, junction box and adapter for, J. Meehan... 679,057  
Electrical instrument, J. F. Kelly... 678,957  
Electrolytic apparatus, liquid feed device for, R. Girouard... 679,050  
Elevator, R. Farmer... 679,142  
Elevators, automatic electric stop for, H. B. Newhall, Jr... 679,004  
End gate and scoop board, combined, G. Brittell... 679,165  
Engine, See Rotary engine.  
Engine piston, rotary, H. A. Buck... 679,105  
Engine vaporizer, explosive, L. M. Johnson... 679,053  
Engines, electrical sparking device for explosive, R. Varley, Jr... 679,041  
Engines, mixing and controlling device for gas, R. B. Olds... 679,263  
Engines, sparking igniter for explosive, Rhode & Dubord... 679,243  
Ensilage cutter, E. W. Hoyt... 679,168  
Envelope or wrapper opener, W. S. Timms... 679,066  
Extension table, E. Estes... 678,948  
Fare register and recorder, W. J. Fordney... 678,950  
Feather renovator, J. A. Moon... 678,966  
Feed water regulator, F. M. Chappell... 679,273  
Feed water regulator, steam boiler, Bibb & Duncan... 679,209  
Feeder, boiler, H. H. Clover... 679,252  
Fence, wire, V. Hoxie... 679,954  
Fence, wires, die for joining intersecting, V. Hoxie... 678,955  
Fiber separating machine, S. B. Allison... 679,164  
Filter, J. J. Betzold... 678,857  
Filter, A. R. Grever... 678,870  
Filter beds, apparatus for spreading liquids onto, G. E. Ridgway... 678,979  
Filter, driven well, A. E. Hunt... 679,169  
Filter press, oil or other, P. Bonvillain... 678,858  
Fire alarm, A. J. Linden... 679,176  
Fire extinguishing apparatus, H. Eversmann... 679,049  
Flue cutter, expansible, J. W. Collins... 679,274  
Foot power machine starter, G. Sims... 679,190  
Frequency of speed, indicating and regulating device, P. M. Lincoln... 679,175  
Fruit picker, H. F. Rambler... 679,265  
Furnace, McKenzie & Sargent... 679,240  
Furrow opener attachment, C. S. Kemper... 679,025  
Garment supporter, A. Henning... 679,122  
Gas burner, electrically operated, H. W. Webb... 679,197  
Gas cooling apparatus, H. E. Eddy et al... 679,191  
Gas jet cage, G. Perkins... 678,159  
Gas, making coal, R. S. Moss... 679,059  
Gold from sea water, extracting, H. C. Bull... 679,215  
Governor, centrifugal engine, H. Lentz... 679,055  
Grain, apparatus for removing and separating bran from, Lind & McKee... 679,233  
Grain, removing and separating bran from, Lind & McKee... 679,234  
Grain, treating spent, J. A. Tilden... 679,065  
Graphophone, H. H. Macdonald... 679,236  
Grinding machine, S. Diescher... 678,865  
Gun, automatic, J. M. Browning... 68,937  
Gun carriage for heavy ordnance, S. N. McClean... 678,969  
Gun parapet mount, L. L. Driggs... 679,112  
Guns, safety lock for breech mechanism for, L. L. Driggs... 679,116  
Harvester, J. H. Daniel... 678,255  
Harvester, cutter mechanism, T. S. Brown... 679,113  
Hat protector, H. C. Dick... 679,111  
High or low water alarm, C. E. Zimmermann... 678,925  
Hoeling and thinning turnips, machine for, P. J. Parmiter... 679,090  
Hoops on round silos, water tanks, barrels, etc., device for tightening, G. Brett... 679,139  
Hopper, cinder, M. Laux... 679,083  
Horsehoe, elastic heel, O. W. Siebenhaar... 679,038  
Hot air furnace, V. L. Sullivan... 679,236  
Hot water tank, H. A. Buck... 679,107  
Hub, vehicle, W. J. Holland... 679,230  
Hydraulic coupling, T. C. Prouty... 679,005  
Hydrocarbon burner, J. J. Busenbenz... 679,015  
Hydrocarbon burner, V. H. Slinack... 679,245  
Hydrocellulose, obtaining, M. C. L. Althausse... 679,203  
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Incubator, G. L. Horall... 678,882  
Indicator, See Cash indicator.  
Injector, C. Prusmann... 679,127  
Iron into lengths, machine for sawing bars of, R. B. Charlton... 678,940  
Ironing edges of collars and cuffs or other starched articles, machine for, F. E. Fay... 678,949  
Jar cover, W. C. Kern... 679,077  
Knitting machine, W. E. John... 678,883  
Knitting machine, E. Johnson... 679,281  
Knockdown tank, H. W. & T. C. Harry... 679,146  
Lace, E. F. Madden... 678,962  
Lamp chimney removing or elevating device, B. C. Caudry... 678,939  
Lamp, electric arc, J. A. Heany... 678,952  
Lamp, electric arc, E. Thomson... 678,916  
Lamp extinguisher, automatic, R. Tattu... 678,915  
Lamp, miner, C. L. Anton... 678,852  
Lamp, portable gas, McGovern... 678,961  
Lamp socket, J. C. Tournier... 678,920  
Lamps, locking socket for incandescent electric, Barrett & Phillips... 679,206  
Lath screw cutting attachment, L. J. Monahan... 679,238  
Lid holder for vessels, Koch & Cogswell... 679,125  
Liquid dispensing and measuring apparatus, C. W. Cramer... 679,254  
Liquid drawing device, A. H. Keefe... 679,201  
Liquid meter, Duchamp & Philippe... 679,016  
Lock, D. B. Ozmert... 678,899  
Lock, O. Katzenberger... 678,956  
Lock, P. Feelling... 679,119  
Locking device for doors, etc., automatic, A. Heller... 679,023  
Locomotive, R. M. Bryant... 679,214  
Loom, hand, M. P. & D. Todd... 679,132  
Loom thread parter, welt replenishing, J. Peter... 679,034  
Lubricator, D. H. Roberts... 678,980  
Lubricator, C. A. Hirth... 679,149  
Lubricator, J. J. Tunney... 679,246  
Measuring and winding machine, cloth, B. Anderson... 679,101  
Metal article, W. A. Day... 679,218  
Metal working machine, A. Crocker... 679,278  
Meter readings, device for recording, C. D. Haskins... 678,871  
Milling tool, W. H. Ford... 679,143  
Minerals or ores, apparatus for separating or concentrating, H. P. H. Brumell... 678,860  
Molding apparatus, J. C. Reed... 678,977  
Molding flask, J. C. Reed... 678,976  
Mop wringer, L. H. Evans... 678,867  
Motor control, induction, A. H. Armstrong... 678,854  
Motor control system, F. H. Armstrong... 678,853  
Motor control system, F. E. Case... 678,861  
Movable gate, dredge, O. C. Smith... 679,163  
Mower, lawn, H. Garret... 679,020  
Musical instrument pedal action, W. C. Bosenbury... 678,859  
Musical instrument tune controlling device, E. de Kleist... 679,026  
Nail machine, Smith & Hillard... 679,128  
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