RECENTLY PATENTED INVENTIONS.

Engineering.

BLOWER.—Thomas Kitson, Stroudsburg, Pa. This is an improvement which may be applied to an ordinary furnace without changing or renewing the grates, enabling an even steam pressure to be kept up with the use of cheap fuel. It comprises a pipe with bell-shaped mouth through which extends a steam nozzle delivering in the pipe, an approximately conical valve being secured to the nozzle and held within the mouth, the valve being adjustable in and out upon the nozzle to permit the passage of the requisite quantity of air. The device is of simple construction and adapted to create a very strong draught.

Railway Appliances.

CAR COUPLING.—John J. Schairer, Clint, Texas. This improvement comprises a knuckle pivoted in the drawhead and provided with cam surfaces on opposite sides of its pivot, an arm mounted to swing being adapted to engage the cam surfaces to open and close the knuckle and to lock it in either open or closed position. The improved coupling is of simple and strong construction, designed to prevent accidental uncoupling, and permit of coupling without the brakeman going between the cars, while also adapted to the coupling of cars of different heights.

CAR COUPLING.—James O. Miller, Rochester, Ind. According to this invention the drawhead is arranged to rock laterally in contact with a supported spring-cushioned yoke piece, there being a slidable spring-retracted drawbar whereon the drawhead rocks and slides, while a spring-pressed arm vibrates in a side slot of the drawhead, a pivoted link swinging laterally thereon. A hook having an elongated limb is pivoted in an opposite slot of the drawhead, a spring throwing forward the limb of the hook. Cars provided with this coupling are automatically coupled as they come together, the uncoupling being effected from either side, and the device may also be used in connection with the ordinary link and pin coupling.

EXPRESS CAR.—Miguel Morell and Ramon M. Ferrer, Santa Barbara, Cal. This is a burglar-proof car with cages which can be opened only from the outside, to contain safes and valuable parcels, and accessible only to the depot man at the station to which consigned. If robbers enter the car they will be exposed to the fire of the messenger, in a bullet proof compartment, which is so arranged that the messenger may also protect the engineer and shoot along the sides of the car without exposing himself.

Electrical.

CUT OUT.—Elmer E. Hersh, Denver, Col. This device is more particularly designed for electric cars, and comprises a revoluble cylinder over the face of which extends a series of fuse wires introduced in succession between contact springs connected with the conductors as the cylinder turns, the fuse wire melting and the circuit being broken when the current exceeds the prescribed strength. Each motorman is preferably supplied with an extra cylinder fitted with fuse wires, so that when all the wires of one cylinder are melted, it may be easily replaced by a cylinder containing a full set of wires.

Mechanical.

MECHANICAL MOVEMENT.—William W. Beaumont, London, England. This invention comprises a spindle journaled in bearings on a suspended device, a rotatable link being connected with the spindle, and an unbalanced weight on it. It is especially designed to impart a gyratory motion to sieves, such as sifters in flour mills, coal screens, machines for sizing and sorting grain, etc., to advantageously replace the ordinary crank mechanism, avoiding excessive wear and harmful vibrations.

WIRE FORMING MACHINE.—Frank H. Howe, Port Townsend, Washington. This is a machine for forming rods or wires from metal disks or plates. A rotary spindle carries the disk from which the rod or wire is to be formed, a feed mechanism feeding the disk to rotary cutters for cutting the strip, which passes between drawing rollers, whereby the disk-carrying spindle is rotated, the drawing rollers and cutters being simultaneously operated by gearing. The disk is thus cut into a continuous strip of wire or rod of any desired cross section.

Agricultural.

PLOW.—Thomas J. Kelly, Tolosa, Texas. The share of the plow designed by this inventor is readily and quickly removable, being connected with the shank of the beam and with the wing or other support by a locking connection not involving the use of bolts. The handle of the plow may also be readily adjusted to suit the plowman, and all braces and other like barriers, usually located at the back of the wing, or share, or land side, are dispensed with, thus allowing the plow to run free. The clevis also is of peculiar construction, being adjustable as to position to bring the team into desired draught, and a single or double tree may be attached directly to the clevis.

PULVERIZING CULTIVATOR.—Henry Strasser, Thornburg, Iowa. This is an improvement on a formerly patented invention of the same inventor, providing for such construction that two teeth-carrying bars may be located at angles to one another and adjustable upon a yoke, to accommodate the cultivator to rows of varying width. A double cultivator is also so made that either one of the sections may be used as a single cultivator. A simple and inexpensive attachment facilitates the adjustment of each section upon the yoke, and the teeth are adapted to thoroughly pulverize the ground and effectually remove weeds.

CORN HARVESTER.—Winfield S. Osborn, Gilboa, Ind. This is a construction capable of ready attachment to the box body of any wagon, the harvester, as it is advanced along a row of corn, stripping the ears from the stalks and delivering them at the rear, where the ears are stripped of their husks and silk and the husked ears delivered to an elevator to be conveyed to the box of the wagon. The driving shaft is driven from the axle of the vehicle, and pivoted in the main frame is a working frame, in an inclined forward slotted end of which work longitudinal spiral rollers, over one of which are stripping bars moving in opposite directions. At the rear open end of the working frame is an endless apron, adjacent to which are the husking rollers, the faces of which may be either smooth or roughened.

COW MILKING MACHINE.—William B. Bland, Maquon, Ill. This is an improvement on a formerly patented invention of the same inventor, simplifying the construction and improving the action of the milking fingers, the means of adjusting the fingers and their carrying frame to different positions, the main frame and driving mechanism remaining the same. The milking fingers consist of a series of leaf-like spring leaves provided with tension devices designed not to injure the surfaces with which they come in contact, and resembling in their action the pressure of the fingers of the hand.

DRAUGHT EQUALIZER.—Henry Sturm, Nauvoo, Ill. This invention relates more particularly to four-horse eveners for use with either right or left tongue, or tongueless gang plows. The evener devices are so arranged that the plows can be drawn to work close up to the ends of the field, the front draught being changed to right or left to take more or less land and allow more space for the horse in the furrow without crowding others. The construction is simple and inexpensive, and the several parts can be readily assembled and adjusted, and easily replaced in case of breakage.

Miscellaneous.

CABLE GRIP FOR LOGGING, ETC.—Gilbert Gagnon, Nanaimo, Canada. In the use of this device the drag or resistance of the log or other object being hauled, and also the draught of the cable, are utilized to hold the jaws closed on the cable. The body of the device has a fixed jaw and is formed with a rounded surface on its under side to act as a runner, a rearwardly extending arm carrying an idler around which the rope passes, while a movable jaw is pivoted on a lever fulcrumed above the fixed jaw, and a rope connects the lever with the log or other object to be hauled.

PRINTING PRESS.—Daniel Maurer, Middle Village, N. Y. In this press the type bed is held in vertical position when the press is being operated, but may be given a rearward inclination to facilitate securing the type in a frame or chase on the bed. The platen is pivoted, and held normally in such position that it will bear against the frame of the type bed through the medium of springs, the operation of a hand lever causing the platen to approach the type bed with a quick movement. The construction is simple and worn parts may be readily replaced.

DRYING MACHINE.—Peter Cooper Hewitt, New York City. This is a machine particularly designed for spreading melted glue or gelatine into sheets and drying and delivering it in commercial form, and the invention consists in an endless apron supported on drums and traveling through an evaporating chamber heated by steam or hot air, there being also a device for cleaving the dried sheet of glue or gelatine from the apron as it emerges from the machine. The flow of liquid glue to the apron is regulated according to the speed of the apron and the evaporating power of the air passing through the evaporating chamber. The machine is made of different lengths to adapt it to drying films of different thicknesses without producing bubbles.

FIBER DRYING APPARATUS.—Willy Saulmann, Berlin, Germany. An apparatus for conditioning textile fibers has been devised by this inventor, providing means whereby a dried and heated current of air is passed through the fiber-holding receptables, the latter being surrounded by hot air, so that the textile fibers come in direct and indirect contact with the hot air current. The weighing of the receptacles takes place not during the conditioning itself, but after its termination and the cooling of the receptacles.

ALUMINOUS CAKE.—Jean V. Skoglund, Brooklyn, N. Y. This cake consists of sulphate of alumina, ferrous iron, an excess of a stannous compound, and a stannic compound, and the invention provides for making it by reducing aluminum sulphate free from ferric iron by treating the crude material, as bauxite, with sulphuric acid to dissolve the aluminum oxide and the iron oxide, adding a weaker reducing agent, such as sulphurous acid or a sulphite, then heating the solution, and finally adding any stannous compound, and continuing the heating until all of the ferric iron is reduced. The product is especially suited for the sizing of paper pulp without darkening or reddening the pulp.

COMPOSITION FOR TANNING.—Jesse B. Hodges, Salem, Ark. Extract of palmetto root, stramonium, gambier and salt, in stated proportions, with water, form this patented composition, with which it is designed to tan light hides in two days, and the heaviest hides in twenty days, at a cost of about three cents per pound to the tanned leather. The hides are to be limed, unhaired, fleshed, and bated, in about the usual way, and plunged and bandled in vats in liquor made with the composition. It is claimed that the palmetto roots contain twice as much tannin as oak bark, and that extract can be made therefrom for much less than oak bark extract.

BIT STOCK.—Francis M. Hay, Erie, Pa. According to this invention, there is an elastic or yielding screw connection between an outer sleeve and the stock proper, the screw connection having a slot or channelway across its threads, so that a screw segment may be slid longitudinally therein to close quickly the jaws, and the other sleeve then turned with a rotary axial adjustment to tighten the screw connection and give a final clamp to the jaws. Special means are provided whereby the screw segment may be made to more certainly and easily enter into mesh with the other screw threads after having been disconnected therefrom for longitudinal adjustment.

VEHICLE POLE.—Edward Clark, New York City. This pole is made of a metal tube or pipe, and into its rear end extends a metallic bar fastened to the solid wood base of the pole. The base is fitted into a recess in the hounds, where it is secured by rivets and top and bottom plates, and the head, carrying rings, is formed of two flanged sections secured in the end of the pole. This pole is comparatively inexpensive, is not liable to break or bend, and is not flexible, to injuriously bear down on the neck of the animal.

BRIDLE BIT.—Max Lesser, Duncansby, Miss. To facilitate managing an unruly animal and prevent him from breaking loose when hitched to a post, this inventor has devised a bit comprising cheek pieces and a main mouth bar cranked between its ends and having a surface groove throughout its length, while an auxiliary mouth bar pivoted in the cheek pieces has a crank and lies wholly within the groove, there being operating cranks at the ends of the auxiliary mouth bar. There are slides on the cheek pieces linked to the end cranks, and levers pivoted to the upper ends of the cheek pieces and slides.

VEHICLE SEAT CORNER IRON.—Charles C. Field, New York City. An angular body is, according to this invention, fitted into the corner formed by the side and back of the seat, an inwardly projecting flange resting on the seat bottom, while a top portion has a flange adapted for engagement with the outer faces of the seat back and one of the sides, being so curved as to avoid forming an angle at the corner. The iron is readily applied, and is inexpensively made in a single piece.

PACKAGE.—Marion J. Meeker, Puyallup, Washington. This is an inexpensive device for containing hops, fruit, vegetables, etc., not liable to leak out of small apertures, the package also being readily transformable into a cot bed, and, when made of water proof material, suitable for use as a portable bath tub. Combined with a pair of poles is an attached sack of such width that it may be slipped over the ends of the poles, thus fastening the ends of the sack, trestles being employed when the device is used as a bed, box or bath tub, and looped cords preventing its spreading when mounted on trestles.

REFRIGERATOR.—George A. Green, Rogers, Texas. A cooler for preserving milk, butter, etc., constitutes the improvement designed by this inventor, which operates by the evaporation of water, whereby the contents of the cooler may be kept at a lower temperature than that of the outside atmosphere. The water-holding receptacle has a covering of absorbent material hugging the bottom and entering into the water, while a dish-like water-holding cover has also a covering of absorbent material whose ends adhere to the covering of the body, and a drip receptacle is located beneath the body of the cooler.

CHECK ATTACHMENT.—Robert Sears, Newark, N. J. This is a device for use in connection with an overdraw check to hold the horse's head in position to prevent choking and keep the animal under control. It comprises a bowed frame with rearwardly extending arms, a nose band having its lower ends connected with the rear upper ends of the frame, and a chin strap having its ends connected with the frame at a point in advance of the nose band, the frame being adapted at its front end to receive an overdraw check. In the use of the attachment, the lowering movement of the animal's head causes pressure on the nose and chin straps, but avoiding bruising or pinching.

ACCOUNT KEEPING DEVICE.—Ernest McCulley, Houston, Mo. In a flat-topped case, with detachable name cards on one side, is held a series of paper strips, there being a roll for each depositor in a bank, this device being especially designed for use in keeping bank balances. The strip may be readily pulled along from the roll so that succeeding balances may be easily written on it, the balances coming near the name of the depositor, that they may be easily seen.

STRINGED INSTRUMENT.—John Connery, Long Island City, N. Y.—This is an instrument of the mandolin type, and the invention provides such an instrument having an attachment whereby the instrument may be played after the manner of a violin, by drawing a bow back and forth. The strings are arranged over a convex bridge, by which they are held concentric with a slotted convex guide secured to the top of the instrument, the bow being adapted to move on the guide and having pins or teeth which project through its slot to engage the strings.

FOLDING SNOW SHOE.—Hermann Bremer, Halberstadt, Germany. This shoe is made in two sections, with adjacent overlapping ends, the parts being joined by a pivoted lever or turning clasp to form one connected piece, and the relative arrangement being such as to give the resiliency of a spring to the joint.

BOTTLE STOPPER.—Gilbert L. Matthews, Newton, N. J. This is a stopper for bottles holding gaseous liquids, the pressure of which holds the stopper in place. It is very cheap and simple, comprising a button inclosed by an elastic gasket, the shank of the button being pivoted on the bent lower end of a wire loop, curved portions of which spring apart and engage the sides of the bottle neck.

TRUSS.—Carl B. Rostel, San Francisco, Cal. (608 Sacramento Street, room 2). This inventor has devised an elastic truss belt for the support of abdominal rupture, the belt being adjustable to suit the size of the person, and being provided with pads having an elastic pressure device whereby the tension is adjustable to any part of the pad and to any degree of strength. It also has relieving pads to prevent soreness at points of contact.

Designs.

CENTRIFUGAL MACHINE CASING.—Henry B. Weiper, Durand, Wis. This is a circular casing with upper opening somewhat contracted, and with bottom raised at the center for most of the diameter of the casing.

BASE FOR A GAME APPARATUS.—Frank M. Whiteman, Canton, Ohio. This is a design for a device by which a ball may be thrown or tossed by a trap. It has a hollow cylindrical body, from one side of which extends an arm like the trail of a gun carriage, a slot in this arm opening into the cylinder.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THEORY AND CONSTRUCTION OF A RATIONAL HEAT MOTOR. By Rudolf Diesel. Translated from the German by Bryan Donkin. New York: Spon & Chamberlain. 1894. Pp. viii, 85. Price $2.50. No index.

This monograph describes and explains the theory of an internal combustion engine. The principle on which the engine is based is that coal or other combustible, when burned, produces so high a temperature that a large excess of air (100 parts by weight to 1 part of the combustible) is essential to utilize the heat. The author objects to discharging it at a high temperature from the exhaust, and properly recognizes the water jacket as a great source of waste. The theory of the motor is worked out in the greatest detail, and the work is illustrated by a very full series of figures and plates. On general principles, the want of an index is to be regretted. The Diesel motor is now being tested in Germany, using atomized petroleum for fuel. The petroleum in question, the translator states, is "pulverized," rather a peculiar adjective to apply to a liquid.

F. B. VANDEGRIFT & CO.'S HANDBOOK OF THE UNITED STATES TARIFF. Containing the Customs Tariff Act of 1894. New York and Philadelphia: F. B. Vandegrift & Co. Pp. 547.

This convenient sized book, with very full schedule of articles and rates, contains the new tariff law, and will be found a most useful manual for all interested in commerce between this and other nations. In one thing it is open to criticism. The extensive use of ditto marks in the alphabetical schedule sometimes causes a large number of pages in succession of the index, for such it really is, to be printed without the initial word, which should, of course, have been repeated at the top of each page. Thus, under iron and steel, ditto marks run for some ten pages, so that on opening the index anywhere between pages 371 and 382 it is wholly problematic what the ditto mark refers to, and this can only be ascertained by guess or by turning back a number of pages. The same trouble appears elsewhere. The work, however, is so complete, portable, and well arranged that otherwise we warmly commend it.

STATISTICAL SUPPLEMENT OF THE ENGINEERING AND MINING JOURNAL. The mineral industry, its statistics, technology and trade, in the United States and other countries, from the earliest times to the end of 1893. Vol. II. Edited by Richard P. Rothwell. New York: The Scientific Publishing Company. 1894. Pp. xxx, 894. Price $5.

The Department of the Interior of the United States, in its publication of reports on the mineral resources of the United States, has done excellent service. The present volume to a certain extent carries out the system of the government work alluded to, but on a much enlarged scale, and is far better printed, and with more detail. It will be found a most useful work, and one which any one interested in these topics will be likely to make frequent reference to. A more or less interesting feature of the book is the publication of the portraits of contributors, with abstracts of their lives. It is the second volume, by which the subject is carried down to the end of 1893, and we believe that a new annual volume is to be looked for, which will make the publication one of the most important scientific works of the day.

LESSONS IN QUALITATIVE AND VOLUMETRIC CHEMICAL ANALYSIS. By Charles O. Curtman. Including lessons in qualitative chemical analysis by Dr. F. Beilstein. Saint Louis, Mo.: John L. Boland Book and Stationery Co. 1894. Pp. xii, 295. Price $1.50.

This work is designed principally for the use of medical students and physicians, and like all books written under such restrictions, may seem a little inadequate for its subject, but we do not hesitate to say that, even by those who have gone through a more thorough course with one of the larger works, this will be found an excellent reminder of their studies.

INDUCTION COILS AND COIL MAKING. By F. C. Allsop. New York: Spon & Chamberlain. 1894. Pp. xi, 162. Price $1.25.

Mr. Allsop's books are characterized by their practical aspect. In the present work a very good description with numerous illustrations of the construction of induction coils is given, and one which will be found of interest by many electrical constructors, especially amateurs. It is illustrated by a number of figures, some newer than others, some being advertising cuts. On the whole, the subject is not treated as fully as we would like, but it cannot but be of use, and deserves notice as a notable addition to electrical literature.

MODERN METHODS OF SEWAGE DISPOSAL FOR TOWNS, PUBLIC INSTITUTIONS AND ISOLATED HOUSES. By George E. Waring, Jr. New York: D. Van Nostrand Company. London: Sampson Low, Marston & Company, Limited. 1894. Pp. vi, 252. Price $2.

Mr. Waring appears once more before the public treating of one of his favorite topics. In his graphic and decisive way, he unhesitatingly criticises things generally, which he considers to be wrong, giving his views with a strong and decided expression. By his advocacy and development of the Moule draining process, which as applied in this country has received his name and is known

as the Waring system, his name has obtained wide currency among suburban residents. He himself, on page 215, says that the term "Waring system" is a misnomer. He says that it would be better to call it Mr. Field's system. But the author's qualifications for speaking of sewage, sewage irrigation and sewage farms give the book an especial value and a peculiar timeliness at the present day, when suburbs are known to offer so important a field for the work of the sanitary engineer. An excellent index is an important feature of the book.

CAVALRY LIFE IN TENT AND FIELD. By Mrs. Orsemus Bronson Boyd. New York: J. Selwin Tait & Sons. 1894. Pp. 376. Price, cloth, $1.

This excellent account of cavalry life in the American army will, no doubt, make interesting reading for many. The preface alone, describing the trials of Captain Boyd, the husband of the authoress, at West Point, in itself describes a curious episode in West Point life. In the appendix, written by Richard H. Savage, the same episode is referred to, and the infamous persecution to which as a boy the authoress' husband was subjected at West Point is described. Not the least interesting part of the book is Mrs. Boyd's description of her own life in the field, and the trials which she has been obliged to go through.

BEFORE THE GRINGO CAME. By Gertrude Atherton. New York: J. Selwin Tait & Sons. Pp. 306. Price, cloth, $1; paper, 50 cents.

Eleven stories of old California in the days before the discovery of gold, gathered from different magazines, make up this work, which will, no doubt, be found interesting reading for many.

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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.

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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.

(6248) W. S. F. writes: In a late number of the SCIENTIFIC AMERICAN, vol. 70, page 86, there was published a formula for solidifying petroleum, pressing into block and baking it. This product was intended for burning, and it was stated that it had many advantages over coal. I followed out the formula, and got the oil in a solid state. On baking it, however, it all crumbled to pieces, rendering it of course unfit to handle or transport it, and on burning it a very dense, black smoke was emitted. Will you please give me some advice on this subject? A. Possibly you baked at too high a temperature or for too long a time. Try the addition of sawdust and clay.

(6249) E. J. asks how to get the gear of a bicycle. A. Count the teeth on the two sprockets. Divide the number on the large or crank shaft sprocket by the number on the driving wheel sprocket and multiply the diameter of the driving wheel by the quotient.

(6250) L. V. H. says: Will you give me a formula for sticky flypaper? A. Resin 1 pound, molasses 3½ ounces, linseed oil 3½ ounces. Boil until thick enough. 2. Also how to treat old files with acid, so they will be partly useful again? A. Boil the files in strong soda and water to clean off all grease, oil or gum. Then dip for a few minutes in a bath of nitric acid 1 part, water 4 parts; the length of time being less on fine files, as your experience may suggest. 3. Will you also state if there is any difference in the working power of a windmill, in hot or cold weather, the barometer pressure and velocity of the wind being the same at each trial? A. There would be little, if any, difference.

(6251) H. C. S. asks how to make a stage dimmer for 30 or 40 lights alternating current. A. Use No. 6 or 7 wire made into a coil with a movable laminated core. The size required depends on the frequency.

(6252) S. T. W. asks for a receipt for making a cement that will cement paper, canvas or leather to a wood or iron pulley to keep belts from slipping. A. Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for 15 minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of a strong solution tannic acid, oak bark, or gallnuts, as convenient to obtain, to a quart of thick glue; stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(6253) W. L. S. says: Please let me know what is the best thing to use on collars, cuffs, and shirts to make them stiff and glossy. A. Starch, 1 ounce; paraffine, about 3 drachms; white sugar, tablespoonful; table salt, tablespoonful; water, q. s. Rub up the starch with soft water into a thick, smooth paste, add nearly or quite a pint of boiling water, with the salt and sugar dissolved in it, and, having dropped in the paraffin, boil for at least half an hour, stirring to prevent burning. Strain the starch and use while hot. Sufficient bluing may be added to the water, previous to the boiling, to overcome the yellowish cast of the starch, if necessary. Spermaceti may be used in place of paraffin. Starched linen can only be properly finished by hard pressure applied to the iron.

(6254) C. H. T. says: Will you kindly let me know in your Notes and Queries of a cheap fixative for charcoal drawing? A. 2 tablespoonfuls of rice boiled in 1 pint or 1½ pint of water; strain, and pass the drawing quickly through the liquid; use a large flat dish for the liquid.

(6255) G. W. C. says: Will you please give me the formula of a solution to remove corns? A. Caustic potassa, 1 drachm; alcohol, 1 fluid ounce. Mix, in a stoppered phial, and agitate until solution is complete. The corns are either moistened with the above or a small piece of lint, or rag, of the size of the corn, is moistened with them and then bound on, care being taken, particularly with the last one, that the liquid does not touch the surrounding parts.

(6256) J. G. R. asks: 1. How many cubic feet of hydrogen and how many cubic feet of oxygen gas can I get in one hour by decomposing water with a battery of 3 volts or 10 volts? A. The gases generated depend on the amperage, not on the voltage directly. The voltage of course is concerned as being the cause of the amperage, the latter depending on the voltage and the resistance of the circuit. 2. If water is decomposed by passing steam through red hot iron tubes, is the oxygen free or will the oxygen unite with the iron? A. The oxygen unites with the iron, and hydrogen only is evolved. 3. If water is heated to such a degree that it will decompose through heat only, will not the mixture of gas unite with a terrific explosion as soon as they are liberated (because the heat is over its kindling point)? A. The gases will unite when the temperature falls below the point of dissociation. They may however be separated to some extent by diffusion through a porcelain diaphragm. 4. Is a living milk white raccoon more valuable than when of common color? A. We should imagine so. Address some menagerie or dealer in wild animals.

(6257) F. W. W. asks: 1. With a current of 500 volts, how to make an electro-magnet that will lift 1000 pounds. That is, the size of helix and of core, and size of wire. A. You should say "potential of 500 volts"—a volt is not a unit of current. A magnet core two inches thick and two feet long would answer. Wind with 20 or 30 layers No. 24 wire; use at least 20 pounds of wire. For magnetic traction calculations and others see Sloane's "Arithmetic of Electricity," $1 by mail. 2. Suppose a bar of soft iron were to be placed so as to rest as an armature upon two or more electro-magnets, would the bar become a magnet throughout its length of equal power as magnet? I presume this would depend on distance between magnets. If so, how far apart may the magnets be placed and retain uniform power of magnet throughout length of bar? A. By placing two north or two south poles in contact with the bar, you can establish consequent poles in its center; the whole bar will show some polarity, but the center will show the most. 3. At what distance from such a magnet would its power be available? You will confer a favor by answering the above. A. Distance reduces the power of a magnet very rapidly. At an inch the attraction would be greatly reduced. No exact answer can be given.

(6258) J. N. P. asks how to separate gold from rubber and the materials to use. It is pure rubber, used to clean from my work waste gold leaf, that I use. A. We would suggest metallic mercury to remove and save your gold. An amalgamated copper plate might be used. Scrape off the amalgam from time to time, distill off the mercury, and gold will be left.

(6259) W. J. H. asks what effect an inductive load has upon the speed of a Shallenberger meter, such as is used in houses on incandescent light circuits. Westinghouse A. C. system. A. The Shallenberger meter indicates the amperage of the current. Anything which reduces the current will reduce its speed.

(6260) H. S. B. asks: What is the potential necessary to cause a spark of ⅛ inch? A. Perhaps 12,000 volts. No really reliable figure can be given.

(6261) C. B. W. asks: 1. How much No. 26 magnet wire is required to give 50 ohms resistance? A. Allow 2·35 feet to one ohm. Multiply the ohms desired by this, and the product gives the feet—117·5 feet in your case. 2. How many lamps are required to be placed in a circuit to have a motor run from 100 v. 10 amperes if the motor is wound for 50 volts? A. You must give the amperage of the motor. For each ampere required for the motor, use four 100 volt lamps in parallel.

(6262) W. J. W. asks: 1. Why is peroxide of manganese, also chloride of lime, placed around the carbon in the Leclanche cells? A. To act as a depolarizer and dispose of the hydrogen which tends to accumulate on the carbon. 2. Does it make any difference if a zinc rod is used in place of a sheet, and which is best? A. A rod is less liable to corrode and fall into pieces than a sheet. One is as good as the other from the electrical point of view. 3. Why is water so conductive to an alternating current, and offers such great resistance to a continuous one? A. Water is no more conductive, properly speaking, to one than to the other. 4. What is the object in having such great variations in the resistance of telegraph instruments, being all the way from 20 to 200 ohms? A. It depends on the resistance of the line. A line of high resistance requires higher resistance instruments. 5. Please state the number of volts and amperes generally carried on an electric street car line? A. 500 volts; amperes variable, depending on the number of cars operated at once.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 25, 1894,

AND EACH BEARING THAT DATE.

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