Mesopotamian Medicine.

Until recently the only evidence as to the state of medical knowledge in ancient Babylonia and Assyria was derived from the list of ailments preserved in the so-called magical cuneiform tablets, which consist of conjurations against various diseases or injuries and the respective demons supposed to be responsible. Now, however, that the study of cuneiform writing has advanced and the number of texts published becomes much greater, documents are coming to light appertaining to medical matters. An American student, Dr. Christopher Johnston, has paid some attention to them, and from his researches the following notes are mainly derived. From Assurbannipal's library have come several letters from physicians, of which four or five are from one name. Arad-nana. One of these is a report to the king of his brother's health. A more interesting relic is a tablet regarding a person who seems to have been suffering from facial erysipelas, though it may have been a case of ophthalmia. The letter, omitting the customary address to royalty, is as follows: "All goes well in regard to that poor fellow whose eyes are diseased. I had applied a dressing covering his face. Yesterday, toward evening, undoing the bandage which held it, I removed the dressing. There was pus upon it the size of the little finger tip. All is well. Let the heart of my lord the king be of good cheer. Within seven or eight days he will be well." Another letter runs thus: "With regard to the patient who has a bleeding from the nose, yesterday there was much hemorrhage. Those dressings are not scientifically applied. They are placed upon the alæ of the nose, oppress his breathing, and come off when there is hemorrhage. Let them be placed within the nostrils, then the air will be kept away and the hemorrhage restrained. If it is agreeable to my lord the king, I will go to-morrow and give instructions; meantime let me know how he does." This is evidently an instance of a patient suffering from epistaxis. External compression had been tried and failed, whereas plugging the nares is recommended. The name of another Assyrian physician, Iquisa-Aplu, is known because he was by royal command sent to minister to a famous general named Kudunu, who lay ill at Erech, and he was able to report that he had cured his patient.—Lancet.

The Unveiling of Franklin's Statue.

At last Philadelphia has erected an adequate memorial to the great Benjamin Franklin. The bronze statue which was presented to the city by J. S. Strawbridge was unveiled on June 14. The statue is the work of Sculptor John J. Boyle. The ceremonies were very imposing at the presentation, and were attended by the representatives of several important institutions and societies. Addresses were made by the United States District Attorney James M. Beck and Major Josiah Quincy, of Boston.

Casting Steel in a Vacuum.

Prof. Dewar's success in liquefying hydrogen is bearing fruit. A company has been formed with a capital of $150,000 to determine whether steel can be cast in a vacuum or not. It is hoped, if the plan is successful, that the air bubbles that now cause flaws and weaknesses will be done away with, and that the metal which is produced will be wonderfully homogeneous. The practicability of the process is to be then tested on a large scale.

The Current Supplement.

The current SUPPLEMENT, No. 1225, is of unusual interest both on account of the variety of the articles and their interest. "Boston's Free Municipal Bathing Plan" is a most interesting article by J. A. Stewart, and was referred to editorially in our last issue. It describes a remarkable system of summer and winter baths in use in Boston. "The Physiological Basis of Mental Life" is a paper by Professor Hugo Munsterberg. "Women Inventors" is an article by G. E. Walsh. "Mechanical Influence in Architecture" is a profusely illustrated paper by G. W. Percy. "The Forest Tent Caterpillar," is an illustrated article by Clarence M. Weed. There are a number of other articles on "How to Figure a Chainless Gear," "A New Primary Battery Cell of Large Capacity and High Economy," and "Plan for the Widening of the East Side New York Streets." The usual notes and consular matter are published.

Contents.

(Illustrated articles are marked with an asterisk.)

RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

CIRCUIT AND APPARATUS FOR BRIDGING TELEPHONES.—CHARLES T. MASON, Sumter, S. C. The present invention is a multiple-station telephone-circuit having at each station a normally-closed bridge of the main line, including both bell-ringing magnets of low resistance and the armature-coils of the generator. The bell-magnets are permanently in series with the generator and are adapted to be shunted in signalling. The combination of generator and ringer parts produces in the permanently-bridged circuit at the unemployed stations, a high coefficient of self-induction of great impedence to the rapidly-alternating voice-currents, preventing them from short-circuiting or becoming materially weakened by passing through the permanently-bridged circuit of the stations not in use.

TELEGRAPH RECEIVER OR RELAY.—JOSE GALLEGOS, San José de Guatemala, Guatemala. Connected with an electromagnetic core is an eccentric pole-piece mounted to turn about the longitudinal axis of the core. An armature is pivoted about an axis perpendicular to that about which the pole-piece may turn. A circuit-closer is controlled by the movement of the armature. By swinging the eccentric pole-pieces on the axes of the respective cores, not only are the distances of the pole-pieces from each other adjusted; but the distance of the pole-pieces from the armature is varied, thus enabling the leverage of the magnetic force exerted upon the armature to be increased or decreased.

Engineering-Improvements.

STOP-MECHANISM FOR ENGINES.—JOSEPH MATTHEWS, New Bedford, Mass. The stop-mechanism comprises a novel arrangement of a movable cylinder having a diaphragm against the sides of which pressure can be applied from pipes communicating with a main pressure-pipe provided with a number of relief-valves. Should it be desired to stop the engine in case of an accident, one of the relief-valves is turned to close the main pipe to permit water to escape in order to reduce the pressure on one side of the diaphragm. The pressure on the other side will move the cylinder, thus causing the engine valve to close, the parts being held in this position until it is desired to start the engine again.

ROTARY ENGINE.—EDWARD W. COLLINS, Coalville, Iowa. The cylinder of the engine has oppositely-arranged sets of inlet and exhaust ports. The concentric piston rotating in the cylinder is provided with oppositely-arranged, lozenge shape piston-heads. Oppositely-arranged sets of spring-pressed abutments extend into the cylinder, and are adapted to be pressed apart or opened by the heads. Sliding cut-off valves control the inlet of the motive agent to the cylinder. Cams on the piston-shaft control the movement of the cut-off valves. A rotatable reversing-valve is provided for each set of cylinder ports.

Mechanical Devices.

LOCK.—OSCAR KATZENBERGER, San Antonio, Tex. Although tumblers are used in this lock, set according to a predetermined combination of figures with letters, the bolt and the latch can be operated from the same knob-spindle when the proper combination has been found. The tumblers may be placed in such combination that they will not act upon the bolt. The lock and latches may be operated from the same spindle. The lock is so constructed that no key is required, or it may be so made that a key can be used to operate the tumblers from the outside of the door, the key in such instance being used instead of a knob.

SCALPER, GRADER, PURIFIER, AND BOLTER FOR FLOUR.—ADAM W. HAAG, Reading, Penn. In the upper portion of the frame of this machine a casing is mounted containing a scalping-screen. A purifying-casing below the first-mentioned casing, communicates therewith and contains a screen. A rotary fan is mounted above the screen to collect the fine screenings. The casings have all a gyratory motion. The flour, in passing from screen to screen and from casing to casing, is very effectually scalped, graded, purified, and bolted, the material too coarse for one screen being passed to another, so that at the end of its course the flour is uniformly refined.

APPARATUS FOR WEAVING.—LÉON DESMARAIS and LOUIS CANAL, Paris, France. The loom has a means for holding the warp-threads and a series of movable heddles or needles for individually raising and lowering the warp-threads, the heddles being carried in the same plane to form a longitudinal row or series. This series of needles is mounted to turn bodily about the axes of rotary cylinders standing at an angle to the plane of the warp threads; whereby the series of needles may be caused to assume a line more or less oblique relatively to the direction of the warp-threads. The combination of the movements of the needles and of the cylinders enables fabrics to be manufactured which, up to the present, could be produced only by the Jacquard mechanism.

PRINTING-PRESS.—JOHN C. MOLLOY, Cincinnati, Ohio. The inventor has endeavored to simplify the construction of job-printing presses. His press is so constructed that a sheet can be simultaneously printed upon opposite sides, and that the feed of the paper from a continuous roll may be regulated to suit any size of sheet. After leaving one form printed upon one side, the sheet is automatically delivered to the second form, which will print upon the opposite side. While the second impression on the first sheet is being made, the first impression on a second sheet is simultaneously made.

WIRE FENCE MACHINE.—MILES H. STARLING, Lowell, Ohio. This machine has a base-frame which supports a main frame. The main frame in turn carries wire supporting and stretching devices, and a post-driving frame having a guide for the wires leading from the stretching devices. The main frame can be adjusted on the base frame whereby the wire stretching and guiding devices may be kept in vertical alinement regardless of the character of the ground-surface.

CENTRIFUGAL MACHINE.—FRANK L. DEPEW, Brookline, Mass. Mounted in a gyrating bearing is a spindle to which a basket is attached. A pulley is provided, the hub of which has a flange held to the basket. Below the basket and above the pulley, a pulley-shield is mounted having a central orifice through which the spindle extends, whereby the spindle can gyrate with the basket. The pulley-shield has an upwardly-extended flange around the opening, running up near the flange on the hub of the pulley.

MECHANICAL DEVICE.—FRANCIS K. GAFF, Hamilton, Ohio. This invention is an improvement in devices having jaws, the object being to provide an arm or jaw of simple construction. The device comprises a bar on which a jaw is movable. A yoke engages around the bar and the movable jaw; and upon the yoke a clamping-head is eccentrically mounted, engaging with a projection upon the movable jaw.

Railway-Appliances.

TIE.—SAMUEL MCELFATRICK, Princeton, Ky. It is the purpose of this invention to provide a tie which holds the rails in place without the use of spikes. The tie comprises two similar sections having vertical members arranged to abut and formed with recesses to receive the rails, and overhanging lugs for engagement with the rail flanges. The vertical members are further provided with elongated slots between the rail-receiving recesses. The slots are adapted to receive a bolt whereby one section may be slidably held upon the other section when the tie is being adjusted to the rails.

TIE-PLATE.—ALEXANDER B. B. HARRIS, Bristol, Tenn. The tie-plate has four spike holes or seats arranged in pairs, one pair of which is offset from the alinement of the other pair. The plate is provided with means for fixedly anchoring it to the tie, so that when the plate is thus anchored to the tie, the rail may be adjusted laterally by drawing the spikes from one pair of holes, shifting the rail laterally, and then driving the spikes in the other or offset pair of holes.

SAFETY RAIL-BRACE.—JOHN A. MCCANN, Quincy, Ill. This combined metal brace and tie is composed of a flat plate having an integral tongue formed of a bent-up portion of metal cut out of the tie. A spike is driven through the opening beneath the tongue and is engaged thereby. The device, it is claimed, maintains a perfect gage, preserves the wooden ties by preventing the rails from cutting into them, and prevents the wear of the rails by the lateral motion of the rolling-stock.

HOSE-COUPLING.—WALTER G. MILLER and WILLIAM L. HARRIS, Lodi, N. Y. It is the purpose of this invention to provide a hose-coupling so arranged that when a train parts, the brakes in the rear section are gradually applied to bring that section slowly to a stop; while the brakes in the forward section remain under the control of the engineer. Each member of the coupling has a valve, means being provided for holding the valves open when the members are locked together, and also means for allowing the valve in the forward portion to close completely, and the valve in the rearward portion to close partially upon separation of the members.

TRIPLE-VALVE.—JAMES H. FARRELL, Harrisburg, Penn. This triple valve for air-brake systems has a slide-valve with a graduating-valve therein, a slide-valve piston, and two auxiliary valves. One auxiliary valve is carried by the slide-valve and the other by the stem of the slide-valve piston. These auxiliary valves control a communication between the train-pipe and the auxiliary reservoir to recharge the latter to full train-pipe pressure at the time the brakes are applied.

RAILWAY-INDICATOR.—MARK MORROW, Percival, Iowa. The indicator is designed to be used to display announcements of changes in ticket-rates, schedules, and the like, at railway-stations. The apparatus is provided with an apron or sheet of canvas attached to and held stretched between parallel rollers, so that it may be wound from one to the other in order to bring into view cards or sheets bearing the announcements.

Miscellaneous Inventions.

SHOE-LACE FASTENING.—MORRIS H. LIPMAN, Manhattan, New York city. The invention provides a shoe that may be quickly and conveniently fastened with a single lace, manipulated with one hand. This ready manipulation is effected by means of a peculiarly-constructed eyelet, serving to receive and hold the end of the lace, thus avoiding the necessity of tying a knot.

TENSION DEVICE FOR TWINE-BINDERS.—OTIS B. LOFSTEDT, Rippey, Iowa. The device is adapted to be carried on the cover of the twine-box of binding-machines, and is designed to regulate the tension of the twine, irrespective of variations of strain and of form. The means by which these ends are attained comprise essentially a grooved wheel around which the twine is passed, the wheel being provided with a spring-pressed brake-bar actuated by a stop on a guide-plate. By means of this device the twine may be drawn from the box with uniform regularity, despite the variations of the strain due to the action of the knotter.

VALVE-REGULATOR.—GEORGE W. LAMBERT, Orange, Mass. This valve-regulator for water-power wheels, has a cylinder in which is mounted a piston connected with the valve to be regulated. A valve controls the inlet of a motive agent to the cylinder and is operated by an electric circuit. A governor operates a circuit closing and opening device. The speed of this governor is regulated by mechanism controlled by the piston.

LET-OFF AND TAKE-UP FOR LOOMS.—AUSTIN J. HANKS, Wilmington, Ohio. To provide a let-off and take-up for looms whereby the warp is properly unwound or fed from the warp-beam, and the woven cloth is wound up on the cloth-beam as fast as required at a uniform tension, is the purpose of the present invention. With the warp and cloth beams is connected a lay provided with an angularly-extending arm rigidly secured thereto and independent of the operating mechanism. A shaft geared with each beam is operated by a pawl-and-ratchet mechanism. Flexible connections between the arm of the lay and the pawl-and-ratchet mechanisms are secured to the free end of the arm of the lay at different points, whereby the beams will be simultaneously and positively operated from the lay, and one beam will be turned a greater distance than the other.

STEERING MECHANISM.—REUBEN H. FREEMAN, Fergus Falls, Minn. Above the vertical shaft of the rudder a horizontal shaft is mounted, having right and left hand screws which receive nuts. With these nuts the rudder is connected. By rotating the horizontal shaft through the medium of a hand-wheel, the nuts will be either brought together or separated, turning the rudder accordingly.

COUPLING AND DRAFT-CUSHIONING DEVICE.—MATHIS FINK, Chaska, Minn. This invention is concerned with means for connecting a traveling power device with the load to be drawn, and provides a simple device which can be readily connected with the source of power (a portable steam-engine or horses attached to a draft-truck) and also with the movable load (a heavy threshing-machine or a hay-loading device). The coupling device is so constructed that a spring-cushion will be introduced between the motive agent, such as a traction engine, and the load which it is to pull, whereby the inertia of the heavy load will be gradually overcome and danger of injuring or breaking the coupling-device be obviated.

INSECTICIDE.—ELIUS F. EICHHOLTZ, Conway, Wash. The insecticide consists of flour of sulfur, carbonate of iron, charcoal, and blue-stone. The compound is placed in a hole bored into the infected tree or plant; and the outer end of the hole is then plugged. The insecticide, it is claimed, will be dissolved by the sap and circulated to all parts of the plant.

PNEUMATIC PROPULSION OF VESSELS.—WALTER CARR, London, England. The vessel to which this system of propulsion is to be applied has air-emission passages terminating in orifices extending across the bow and stern. The air is uniformly distributed across the full breadth of the propelling surface and can be conducted either to the bow or stern-emission orifice for either forward or backward movement, and for steering. There are also provided induction steam and air jet apparatus, steam-generators, means of reducing the steam-pressure at a point between the generator, and a superheater, whereby the heat necessary is supplied to maintain the temperature of the steam or to increase it, notwithstanding the loss of sensible heat incidental to the reduction of pressure.

CHAIR.—WINDSOR O. and EVA K. CAMPBELL, Sulphur Springs, Ark. This chair is a piano-chair comprising a frame in which levers connected with the seat are mounted to rock. A rack is secured at its upper end to the frame, and on the rack a sleeve is mounted to move and has a handle extended from its lower end. By moving the sleeve down on the rack, the outer ends of the levers will be swung upward and the seat will be elevated. By moving the sleeve upon the rack, the seat will be lowered.

LOG-THAWING APPARATUS.—SAMUEL W. BUTTERFIELD, Three Rivers, Canada. The present invention provides an apparatus especially designed to thaw logs used in making paper-pulp. The apparatus has a casing through which the logs pass. A conveyer in the bottom of the casing carries the logs through the casing. Apertured steam-pipes discharge jets of steam upon the logs as they pass through the casing. Self-closing doors retain the heat within the casing after a log has passed.

CARBONATING-MACHINE.—FREDERICK W. ZINGSEM, Brooklyn, New York city. The machine comprises a cylinder in which a mixing chamber is suspended inclosing a propeller-beater which mixes the gas and liquid. Water-supply and gas-pipes lead into the cylinder. In operation the liquid under pressure will run through its pipe and at the same time the gas will be discharged into the water discharged from the water-pipes. The discharged water and gas will strike the beater and cause it to rotate. This rotation will mix the gas and water and throw the solution outward against screens, so that the globules will be finely broken up in order to produce a more thorough mixture.

BELT-HOLDER.—SOLOMON SCHWARZ, Manhattan, New York city. To a strip adapted to be secured to the inside of the belt, wires are secured forming longitudinal

guideways for a holder in the form of a plate provided with a slot, jaws, and a tongue. The holder is slipped longitudinally to engage the button so that the jaws clutch the edge of the button and prevent an up-and-down movement thereof and of the belt. The tongue locks the button and holder together to prevent longitudinal movement of the holder, but allows the holder to move longitudinally with the button on its guideways.

SYRUP-JAR.—JOHN ORMEROD, Brooklyn, New York city. This invention provides a pivoted or drop syrup-jar especially adapted for use on soda-water fountains. The jar is pivoted at its faucet so that it may be moved inward and outward with the least possible exertion. The center of gravity is so placed that when the jars are in an upright position they will not be liable to drop down.

RUBBER COMPOUND.—JOSEPH C. PETMECKY, Austin, Tex. This compound for repairing pneumatic tires consists of pure rubber dissolved in a quick-drying solvent, ground and slightly vulcanized rubber, and cotton fibers, the whole being thoroughly mixed together in proper proportions.

DUMPING-VEHICLE.—THOMAS HILL, Jersey City, N. J. The object of this invention is to protect the vehicle when it comes into contact with the ground from the usual sudden blow. To accomplish this object, the inventor provides a compensating curved upper bearing partially overhanging the lower curved bearing on the vehicle-frame. A rolling-shaft is attached to the body, the ends of which shaft are adapted to revolve or slide in the upwardly-curved bearings, so that while the body is in the act of dumping and changing its center of gravity on the lower curved portion of the frame, it will travel up the overhanging portion above and prevent the possibility of the body's sliding on the lower curved portion of the frame and striking the ground with a sudden jar.

STYLE OF MANUFACTURED TOBACCO.—WILLIAM A. FRETWELL, South Boston, Va. The present invention is designed to enable the tobacco-grower to market his tobacco without the need of a manufacturer's plant and the expense and tedious operation ordinarily incurred. The inventor omits the stemming, the alternate drying and drawing of the moisture of the lumps, and the pressing. Instead, after the tobacco is dipped and flavored, it is at once completely dried while the stems are still intact, and then ordered by steam or dampness. The leaves are then folded and wrapped into neat packages.

JUG CARRIER.—FREDERICK O. BALCH, Neillsville, Wis. The carrier is composed of a band adjustable so that it can be clasped upon jug-necks of different sizes. Hanger-rods are connected with the band, one of the rods having a sliding connection with the band whereby it may be adjusted to correspond with the adjustment of the band.

DEVICE FOR OPENING OR CLOSING GATES.—PATRICK C. and ANTHONY J. GIBBONS, Edina, Mo. The improvements in gates provided by these inventors are concerned chiefly with means for opening and closing a gate at a distance. The means consist primarily in peculiarly-constructed hinges on which the gate is mounted to swing so that its free end may be tilted upward, swung into open position, and subsequently back into closed position.

WINDMILL.—ORED OLSSON, Ord, Neb. This windmill has no rudder. The wheel itself acts as a rudder, being mounted behind the pivot upon which it swings. A peculiar manner of connecting the blades is employed, to swing their edges to the wind. A governor is provided which controls the speed by automatically shifting the vanes. The parts of the mill are all made of iron, so that they will not readily wear out or break, the general construction being also such that any blacksmith can substitute new parts for those which have been worn out or broken.

COMBINATION ARTICLE FOR HOUSEHOLD USE.—CHARLES E. MCLAUGHLIN and ELMER H. WILLIAMS, Kanawha City, W. Va. The combined article comprises a step-ladder, an ironing-board, and a clothes-rack, the various parts being so constructed and arranged that they may be compactly folded together when not in use and easily and quickly arranged in proper position when required for use.

BOWLING-ALLEY LIGHT AND PIN-INDICATOR.—GUSTAVE BURKHARDT, Chicago, Ill. This appliance for reflecting the light and indicating the set of pins on bowling-alleys has its reflector-walls so arranged relatively to the light that the rays can be positively concentrated within a desired radius and the burner held invisible. The reflector has a supplemental portion or triangular pin set face, with light-openings for numerals corresponding in number and arranged with the set of the pins of the alley, so that the bowler can see how every pin is numbered.

APPARATUS FOR CONTROLLING HORSES.—ALEXANDER WHELAN, Washington, D. C. The apparatus consists essentially of a band adapted to inclose the legs of a horse. The band is suspended by lines from a frame forming a support and provided with individual guides for the lines by which the band is suspended. By operating certain mechanism in the carriage or wagon, the band can be lowered to embrace the legs of the horse so that he cannot run away.

Designs.

TERMINAL MEMBER FOR EXERCISING MACHINES.—EZRA R. GOODRIDGE, Manhattan, New York city. This design provides a unique terminal member for exercising machines, by means of which the cords can be effectively secured in place.

VISIBLE PITCH MUSIC-STAFF.—ALBERT R. PARSONS, Garden City, N. Y. The leading feature of this design consists of variously-spaced parallel lines, certain of which are heavy and continuous, others of which are light and continuous, and still others of which consist of dots. Of the dotted lines, certain are nearer to the full lines above them than to the full lines below them; and certain are nearer to the full lines below them than to the full lines above them.

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.

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.

(7677) M. B. writes: 1. I have made the Wehnelt's electrolytic current breaker described in SCIENTIFIC AMERICAN and SUPPLEMENT of April 15. I used platinum wire of several different sizes (20, 22, 26) with the invariable result that the wire was destroyed, before my coil had been in operation ten minutes; I varied the distance between platinum wire and lead plate and the strength of the acid, with same result. The current used was the 52 volt alternating, and a one ampere fuse in circuit was intact. Can you tell me where the fault lies? A. The platinum wires were probably destroyed by heat, melted. They were too fine for the purpose. 2. What is the insulating material used in the Wydts-Rochefort transformer described in the SUPPLEMENT of January 7, 1899, or what easily procurable oil or fluid will answer the same purpose? A. We do not know the material used as an insulating paste. Paraffine oil would serve the same purpose.

(7678) J. K. asks: 1. In series wound dynamo, is the resistance of field magnet same as that of armature? Is it in shunt wound? A. The field winding of a dynamo is based upon the magnetic flux needed in the machine. 2. How long at one time will ten Bunsen cells connected in series run a motor? A. Till the sulphuric acid has formed all the sulphate of zinc it can; in other words, till the liquid is exhausted. The time required for this depends on the external resistance. 3. How long will the large plunge battery run the simple electric motor described in "Experimental Science"? A. Perhaps 6 hours, but not in a continuous service. 4. I have one Leclanche and three carbon cylinder batteries connected in series. They produce only a very slight current. Are they polarized? If so, how could I remedy them? A. Probably polarized. Rest is the cure.

(7679) W. J. P. asks: 1. What is the best kind of battery to use with a Ruhmkorff coil, in order to get the largest possible spark from coil? A. The potassium bichromate battery is, on the whole, the best primary battery for use with an induction coil. A very convenient form is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, price 10 cents. 2. How would you connect two Ruhmkorff coils up to get a combined effect, or can it be done, one coil having a condenser and the other not? I have tried various connections but I could not make it work properly. A. Two coils should be joined in series to use them together, but this is a case where two are not twice as good as one. 3. My coil is insulated by a ⅛ inch Fullerboard tube between primary and secondary and by paraffined bond paper between each layer of silk C wire of secondary. The edge of the paper between layers being turned up at opposite sides to prevent any possibility of the high tension wires of each layer getting together. With this insulation how large a current could I use without injury to coil? A. You tell nothing about your coil which can help toward an answer to your question. The primary will carry any current which does not overheat it, and that can be guarded against by trying it with the hand. Begin with a small current and increase slowly till you realize maximum effects for the coil.

(7680) M. S. L. asks: What is the best way to exhibit lantern slides (or other transparencies), without a lantern, I mean by placing a large number in a frame with diffusing media between the slides and source of illumination, to use with or without magnifying lenses? A. Transparencies, including lantern slides are exhibited in a frame by diffusing the light through ground glass. If you have not the ground glass, you can make one by careful and patient work, by rubbing a plate of glass with fine sand and a piece of wood. An excellent substitute can be made with starch as follows: Put into 3 fluid ounces of water, 35 grains of starch, and dissolve the starch by boiling. Then let it cool. Pour a suitable quantity of the solution upon the glass, and spread it over the glass. Lay the glass level to dry.

NEW BOOKS, ETC.

STARS AND TELESCOPES. A New Hand Book of Popular Astronomy. By David P. Todd. Boston: Little, Brown & Company. 1899. Pp. 419. 12mo. Illustrated. Price $2.

The volume before us is founded on the ninth edition of Lynn's Celestial Motions. The former book already covered the ground thoroughly. Dr. Todd has however rewritten the book and has made it one of the most interesting and valuable books which has ever appeared on the subject. We note with pleasure the fact that the time-honored and fossilized cuts of astronomical instruments have been entirely displaced by modern illustrations. There are many portraits of varying excellence of execution introduced through the book, adding greatly to its interest. We do not know of any book which is so well adapted to give the average reader and the student such a readable and practical knowledge of astronomy and astronomical methods as this volume, giving a welcome relief from the time-honored and inexpressibly dry methods of presenting the subject that beget a horror of the science.

VON LÖBELL'S JAHRESBERICHTE UEBER DIE VERÄNDERUNGEN UND FORTSCHRITTE IN MILITÄRWESEN. Ueberblick der Entwicklung von 1874–1898. Erste Theil: Berichte über das Heerwesen der Einzelnen Staaten. Berlin: Ernst S. Mittler und Sohn. 1899. Pp. xxxix, 546. Large octavo. Price paper $3.10.

Von Löbell's annual reports have long been recognized as the most authoritative reference-books on military affairs. In the accuracy and trustworthiness of their information they constitute a worthy companion to Brassey's Annuals. The present issue is a "jubilee volume," in which the development of the world's armies during the last twenty-five years has been described. The changes which have taken place during this period, the new methods which have been adopted, and the experience which has been gained in war, have all been carefully noted. This last volume will occupy an important position, for upon it will be based all future reports.

REPORT OF THE UNITED STATES COAST AND GEODETIC SURVEY FOR YEAR 1897. Washington. 1899. Pp. 784. Maps and charts.

This annual report gives an account of the work done in various sections of the country up to June, 1897. Some of the reports give illustrations of recording apparatus for measuring the height and duration of tides, others describe the recent photographic surveying instruments and their use. They are commended for topographical work. Still another report deals with the subject of accurately measuring the Great Salt Lake basin base line and includes photographs of the apparatus used, constructed in such a way as to secure measurements through three differently constructed metal bars, each acting as a check on the other. Differences of temperature are thus equalized and an average is obtained which is quite accurate.

INDEX OF INVENTIONS

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

JUNE 13, 1899,

AND EACH BEARING THAT DATE.

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

Advertising apparatus, H. Woinke ... $26,952
Advertising wagon, L. L. Cornell ... $27,055
Agitating apparatus, C. S. Wheelwright ... $26,950
Air compressing and cooling apparatus, R. Berg ... $26,883
Alarm. See Burglar alarm.
Alarm mechanism for bank vaults or prison cells, Wybro & Danley ... $27,037
Annealing wire or rods, apparatus for electrically, J. H. Preston ... $26,769
Automobile, J. Schnepf ... $27,066
Axle cap, vehicle wheel, J. Day et al ... $26,677
Back pedaling brake, C. O. Barnes ... $26,850
Back pedaling brake, V. E. Doremus ... $26,679
Bag, R. M. Ellis ... $26,680
Bag holder, E. D. Hoag ... $26,701
Bag holder, L. Kleiber ... $26,788
Battery. See Storage battery.
Bearing, roller, A. F. Warren ... $27,029
Bed frame corner connection, W. S. Plummer ... $26,796
Beer cooler, H. Reininger ... $26,934
Bell, call, S. Nafew ... $26,793
Bench stop, B. Phelps ... $27,082
Bicycle, F. P. Bemis ... $26,852
Bicycle, R. H. Heinemeier ... $26,756
Bicycle, F. W. Smith ... $26,875
Bicycle seat post, A. Johnson ... $26,811
Bicycle shoulder brace, D. M. Taulbee ... $26,736
Bicycle support, W. H. Hart, Jr. ... $26,693 to $26,697
Binder for magazines, etc., E. S. Glover ... $27,076
Bird call, H. H. Draughon ... $26,827
Boiler. See Steam boiler. Water tube boiler.
Bolt extractor, Walsh & McArthur ... $27,028
Book cover, E. M. Page ... $26,794
Book, index, J. L. C. Montague ... $26,712
Book, manifolding, F. Bentel ... $26,665
Booth, portable, J. W. Ernest ... $26,753
Bottle, non-refillable, H. Weil ... $26,741
Bottle stopper, L. H. Broome ... $26,885, $26,886
Box. See Oil box.
Brake. See Back pedaling brake.
Brake beam, F. G. Susemihl ... $27,020
Brake magnet clutch, J. B. Stewart ... $26,942
Brake pipe coupling F. E. Tanney ... $26,778
Bridge gate, draw, J. P. Cowing ... $26,970
Brooch or ornamental breastpin, J. M. Rossi ... $27,013
Broom handle, reversible, H. Thompson ... $26,820
Buggy top attachment, A. Peikert ... $26,719
Bung, beer barrel, F. C. Opper ... $26,716
Burglar alarm, electrical, C. Coleman ... $26,670
Burglar alarm system, electrical, C. Coleman ... $27,054
Burglar alarm system, electrical, H. O. Megaard ... $27,006
Burner. See Vapor burner.
Button, D. M. Winans ... $26,744
Buttonholes, means for finishing, Dahl & Illingworth ... $26,888
Cabinet and indexer, rate, F. E. Coates ... $26,805
Calipers, micrometer, Spalding & Thurston ... $26,876
Candlestick, miner's, A. W. Powell ... $26,817
Car, hopper, M. Brosnan ... $26,748
Car seat, H. S. Hale ... $26,831
Cars, means for operating foot boards or steps of open or side entering street, R. Emory ... $26,892
Carbon, electric arc, D. Bacon ... $26,661
Card ornament, F. I. Walker ... $26,880
Cart or wagon, dump, J. Prinz ... $26,721
Case. See Memorandum case.
Cash register, J. W. Whitney ... $27,032
Caster, S. H. Raymond ... $27,012
Cellulose tetracetate, making, Weber & Cross ... $27,031
Chalker, line, J. J. Gavin ... $27,057
Chandelier, H. J. Hewitt ... $26,907
Checkrein hook or fastener, J. Mealey ... $27,005
Chopper. See Cotton chopper.
Chuck for V shank drills, drill, C. O. Muehlberg ... $26,841
Churn, A. J. Slonecker ... $26,874
Cigar bunch moulding or pressing apparatus, A. Woolf ... $26,954
Cigar holder, H. H. Coote ... $26,968
Clamp. See Vehicle clamp.
Clay cutting machine, H. B. Camp ... $26,887
Clothes pin, Flesher & Crisler ... $26,894
Cobbling apparatus, N. Mikkelsen ... $26,920
Cock, gas burner, A. Streubel ... $27,019
Coking process and apparatus, J. Bowing ... $27,043
Compass card, J. W. Gillie ... $26,686
Composition of matter, G. Olney ... 627,008
Conveyer attachment for blast or suction pipes, pneumatic, Miller & Nilander ... $27,080
Cooler. See Beer cooler. Milk cooler.
Copying press, B. Phelps ... $27,081
Corset side steel, P. W. Ziegler ... $26,957
Corset stay, L. Luckhardt ... $26,916
Cot, folding, J. Hock ... $27,061
Cotton chopper and cultivator, combined, R. L. Parker ... $26,816
Coupling. See Brake pipe coupling. Pipe coupling. Thill coupling.
Cover, cooking utensil, J. B. Gurney ... 626,808
Creel frame, J. P. Cronin ... $26,974
Crusher. See Rock or ore crusher.
Cultivator, C. D. Carter ... $27,048
Cultivator, E. Children ... $26,857
Cupboard or refrigerator, window, V. F. Lutz ... $26,917
Curtain fixture, E. Gabel ... $26,830
Curtain support, B. Bannon ... $27,041
Cycle, C. Lippens ... $26,706
Cycle support, Witte & Luick ... $26,849
Dental appliance, C. J. Underwood ... $26,737
Digger. See Post hole digger. Potato digger.
Display rack for measuring goods, M. Burton ... $27,045
Display rack, necktie, L. J. Burdick ... $26,782
Door check, N. A. Chase ... $26,804
Draught rigging, E. C. Washburn ... $26,881
Drill. See Grain drill.
Dust pan, C. W. Richardson ... $26,843
Dye and making same, black sulfur, Fuchs & Gussman ... $26,897
Dye and making same, brown-yellow azo, E. Konig ... $26,913
Dye and making same, disazo, Scholl & Hess ... $26,935
Dynamo, self regulating, M. Moskowitz ... $26,713
Electric cable, W. S. Smith ... $26,940
Electric meter, E. S. Halsey ... $26,832
Electric metering system, E. S. Halsey ... $26,833
Electric motor, R. Lundell ... $26,708
Electric motor fields, dust or waterproof casing for, J. H. Nagle ... $26,922
Electric traction, combined alternating continuous current system for, W. Deri ... 626,984
Electrical switch, P. Medary ... $26,918, $26,919
Electrical switch, E. J. Wade ... $26,798
Electrode, W. E. Irish ... $26,787
Embroidering and edging machine, E. & R. Cornely ... $26,671
Engine. See Rock drilling engine. Rotary engine. Traction engine.
Engines, apparatus for injecting fuel into combustion chambers of internal combustion, P. F. Maccallum ... $26,840
Engines, apparatus for regulating admission of motive fluids to, A. B. Wilson ... $26,800
Envelop, C. Magnuson ... $26,710
Evaporating and condensing apparatus, P. B. Viele ... $27,026
Evaporating device, O. T. Joslin ... $26,759
Evaporator, brine, T. Craney ... $26,971
Excavating machine operated by traction, J. W. & E. A. Scott ... $26,725
Extractor. See Bolt extractor.
Eyeletting machine, J. Pusey ... $26,722
Fastening, separable, W. G. Crimmin ... $26,973
Feeding mechanism, L. C. Crowell ... $26,675 $26,676
Fence rail support, metallic, R. C., Jr. & W. A. Stewart ... 626,733
Fertilizer distributer attachment for cultivators, W. A. Sears, Jr. ... $26,726
Fifth wheel, R. G. Lohda ... $26,789
Filter, M. Cusick ... 626,977
Filter, J. A. Maignen ... 627,079
Filter and cleaner, W. B. Benham ... $27,071
Filter, pressure, G. Eberhard ... $26,991
Firearm stock, A. Hanson ... $26,905
Fire escape device, G. Kirschenhofer ... $26,812
Fire extinguisher, Cary & Saarbach ... $26,855
Fire extinguisher, W. E. Forster ... $26,683
Fire extinguisher, chemical, W. H. Douglas ... $26,988
Fire resisting window, G. Hayes ... $26,698
Fish hook, T. A. Schlaebitz ... $27,015
Fishing, collapsible snag hook for, H. Slotterbeck ... $26,777
Flatirons and linen, polishing pad for, S. J. Beckwith ... $26,884
Flushing tank, closet, E. B. Badlam ... $26,882
Folding and wrapping machine, L. C. Crowell ... $26,674
Furnace. See Straw burning furnace.
Furnaces, feeding device for steam boiler, J. Davies ... $26,981
Furnaces, method of and apparatus for burning coal without smoke in, A. Heberer ... $27,060
Fuse for shells, percussion, A. B. Markham ... $27,003
Game, C. Buttgenbach ... $27,046
Game, J. B. Flack ... 626,863
Game, W. C. Haigh ... 626,995
Game apparatus, J. H. Boig ... $26,853
Garment fitter, J. B. Peyry ... $26,795
Garment holder, portable, F. C. Beal ... $26,781
Garment hook, J. M. Guilbert ... $26,691
Garment supporter, F. Soady ... $26,845
Gas burner incandescing mantle, C. F. Armington ... $26,958
Gas generator, acetylene, Briggs & Elliott ... $26,824
Gas meter, W. Fiddes ... $26,893
Gas, process of and apparatus for dehydrating, J. S. Smith ... $26,720
Gas, process of and apparatus for manufacturing, R. H. Laird ... $26,866
Gate. See Bridge gate.
Gate, A. Field ... 626,682
Gearing, H. B. Binsse ... 626,884
Generator. See Gas generator.
Glass tumblers, manufacture of, J. B. Fondu ... $26,895
Glass working machine, I. W. Colburn ... $26,859
Grain drill, E. Baseman ... $26,822
Grain drill shoe, T. Brennan ... $26,803
Grain meter, E. A. Crum ... $26,975
Grain separator, C. E. Bird ... $26,746
Grain separator, H. E. Koch ... $26,705
Grain separator, J. H. Sturgeon ... $26,818
Graphophone blanks, making, T. H. Macdonald ... $26,709
Grate, W. Black ... $26,963
Grinding stone hanger, F. M. Bird ... $26,962
Guns, sight mechanism for disappearing, C. F. Jeansen ... $26,809
Gutter stay and hanger strap, J. H. Horan ... $26,757
Hame attachment, J. Gallogly ... $26,784
Hammock, I. E. Palmer ... $26,842
Hammock or swing support, R. Linkletter ... $26,763
Handle. See Broom handle. Tool handle.
Handle bar, G. S. Webb ... $27,030
Handle bar adjusting device, I. Larsen ... $26,836
Hat body marking machine, B. F. Dunham ... $26,889
Hearing instrument, R. C. M. Bowles ... $26,823
Heater. See Hot air and hot water heater. Tubular heater.
Heddle making machine, W. H. Gibbs ... $26,900
Hoe and rake, combined, A. A. Peart ... $26,926
Hoist, A. B. Roney ... $26,868
Hook. See Checkrein hook. Fish hook. Garment hook. Log hook.
Hook, Z. Hand ... 626,904
Hoop, G. M. Depew ... 626,678
Hopple, P. W. Amlie ... 627,040
Horseshoe, E. W. Powers ... $26,768
Horseshoe calk, F. D. Wilt ... $26,743
Hose nozzle, E. Cliff ... $27,073
Hot air and hot water heater, E. & V. P. Adams ... $26,660
Hotel register, J. G. A. Wunder ... 627,036
Husking knife, J. C. Burton ... $26,854
Ice cream freezer, T. Sands ... 626,869
Inhaling and spraying apparatus, J. H. Casford ... 626,751
Inkstand, J. L. Otero ... $26,925
Insect powder gun, W. W. Newberry ... $26,765
Insecticide, W. L. Eaton ... $26,890
Ironing device, G. A. McLane ... $26,792
Ironing machine, Walker & Rasmussen ... $26,948
Jacquard machine bottom board, G. W. Stafford ... $26,941
Knife. See Husking knife.
Knitting machine, A. Weimar ... $27,083
Lace fasteners, automatic machine for feeding, inserting, and setting, J. S. Goldberg ... $26,687
Lace fasteners, automatic machine for feeding, inserting, and setting, Heinemann & Goldberg ... $26,700
Lace fasteners, machine for inserting and setting, E. D. Heinemann ... $26,699
Ladder, step, W. P. Lyke ... $26,839
Lamp, P. B. Curran ... $26,976
Lamp, M. Dreyfus ... $26,990
Lamp, electric arc, H. R. Ottesen ... $26,717
Lamp for incandescent lighting, hydrocarbon vapor, W. S. Proskey ... $26,930

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