

## RECENTLY PATENTED INVENTIONS.

## Bicycle-Appliances.

**CHAIN-CLEANER.**—JOSEPH C. CONN, Ilion, N. Y. The chain-cleaning mechanism comprises a base surmounted by an adjustable standard carrying brushes upon which standard wheels are mounted. A well in the lower part of the device is adapted to contain a cleaning material, such as gasolene. The chain after having been removed from the wheel, has its ends united and is then hung upon the wheel, with one side between the brushes. The wheel is then turned, and the chain passed through the brushes and the gasolene. After having been thoroughly cleaned, the gasolene-well is removed, and an oil-well substituted. The chain is then again passed through the well and thus thoroughly lubricated.

## Engineering Improvements.

**STEAM-BOILER.**—BENJAMIN T. STAUBER, Jewell, Kan. This steam-boiler has both an inner and an outer shell; the inner shell is entirely open at the bottom and is designed to collect the steam. The space between the inner and outer shells is filled with water. The inventor claims for his boiler an ability to raise steam rapidly and to make large and rapid increase or reductions of steam without blowing off.

## Mechanical Devices.

**ROPE-MEASURING MACHINE.**—HUDSON G. CHILTON, Canton, Miss. To indicate the length of rope, cord, wire, automatically, while running off from a coil, a machine has been devised consisting of a frame to which a standard is vertically secured; a grooved measuring-wheel which has a face-pin, and which is journaled on the upper end of the standard; a toothed and numbered slide vertically arranged and movably and elastically held in guides on the standard adjacent to the wheel, its toothed side being adapted for engagement with the pin of the wheel, as the pin revolves around the journal; and a spring to hold the slide in any adjustment. The length of the wheel-periphery being known, each rotation of the wheel caused by paying off the rope will be indicated by adjusting the slide one tooth higher, and the numeral shown on the slide above the top of the standard will indicate the number of rotations and hence the length of rope.

**ORE-GRINDER AND AMALGAMATOR.**—JACOB GERSTLE, Portland, Ore. The pan-bottom of this ore-grinder is curved in section, so that the pulp gravitates to the middle line between the grinding surfaces. In order that the pulp may be kept in motion so as to come under the shoes and into contact with the quicksilver, plowshare-like scrapers are provided for each shoe, one of which scrapers loosens and brings down the pulp that generally collects near the center of the pan and around the middle of the hub, and the other one of which draws the pulp back from the outer edge of the pan. The shoe-arm is yieldingly constructed and made to drag, thus allowing the shoes to be used until quite thin and obviating the necessity of constantly substituting others. The shoes form a detachable bottom to the pan and are seated in recesses with their upper faces flush with the curved bottom. They are so joined that a section may be removed at one time, in order to facilitate cleaning.

**RAZOR STROPPING AND HONING APPARATUS.**—JOHN A. PLATT and FERNANDO C. DOS PASSOS, Augusta, Ga. In this apparatus for sharpening razors, the blade is securely held, so that its edges are subjected to the sharpening action of parallel rollers, each provided with a spirally-arranged leaf of leather for stropping the blade. The rollers are driven by gearing through the medium of a crank.

**WIRE-STRETCHER.**—SPENCER S. SANDERS, Hemlock, Ohio. On the frame of this wire-stretcher a nut moves in guides and is engaged by a screw. Tongs grip the wire. Connections between the nut and the two arms of the tongs are provided whereby, when the nut is moved in one direction, the tongs will be tightened on the wire, and when the nut is moved in the opposite direction, the tongs will be released from the wire.

**BENDING-MACHINE.**—CHARLES SEYMOUR, Defiance, Ohio. This invention is an improvement in bending-machines, and is more especially designed to provide a means for bending wagon and carriage felloes and the like. Upon the frame of the machine swinging, connected bending-arms are mounted, which carry a master-strap superposed by a minor strap for receiving the straight timber to be bent. On the main frame is arranged a form having a segmental rim and inclined guideways and movable rim sections at the ends of the form-rim, sliding in the guideways. The peculiar construction of the form enables the bent timber to be conveniently removed.

**MOTOR.**—CARROLL M. BELL, Greencastle, Ind. To provide a simple motor, arranged to utilize the motive agent to the greatest profit, and designed to drive various machinery and to act as an air or water pump, are the purposes of this invention. The motor comprises wheels in mesh with each other; weighted arms carried on the peripheries of the wheels; and mechanism for giving the weighted arms a movement in opposite directions. The arms are adapted to operate pumping machinery carried by the wheels.

## Railway-Contrivances.

**RAIL AND TIE PLATE.**—JOSEPH F. DIONNE and JOSEPH A. GUY, Edmundston, Canada. The object of this invention is to provide a tie-plate which is cheap and which will firmly hold the spikes in position, and thus perfectly maintain the gage of the rails. The plate has a flat body provided with portions at two diagonally opposite corners offset or bent upward to cover the spike-heads, these portions opening oppositely toward the sides of the plate. Notches in the corners of the plate receive locking spikes.

**MEANS FOR ALTERING GAGES OF RAILWAY ROLLING-STOCK.**—LOUIS PEARCE, Fremantle, Western Australia. This invention seeks to provide means whereby the difficulties incidental to the various breaks of railway-gages may be overcome, so that the same rolling-stock may be used on all lines, even though of different gage. With these ends in view, the inventor forms a screw-thread on the axle and a corresponding screw in the eye or boss of the wheel. To retain the

wheels upon the axle in their correct positions, distance-collars are employed, which may be changed in position to comply with different gages. Underneath the carriage-floor, hinged pawls are suspended, which prevent the axle's turning during the time the wheels are being screwed outwardly or inwardly on the axle, and which engage ratchets on the axle. These pawls securely hold the axle in place.

## Electrical Contrivances.

**ELECTRIC PROPULSION FOR VEHICLES.**—FRIEDRICH W. SCHNEIDER, Trübing, Germany. In this improvement for the propulsion of vehicles by accumulators, a main battery when starting is put in circuit parallel with a small auxiliary battery, constructed for quick discharge, the purpose being to supply the additional current required at the start essentially from the auxiliary battery, thus avoiding a high rate of discharge from the main battery and thus increasing the efficiency of the battery. By this construction the inventor avoids the excessive discharge incidental to the use of the mixed system of accumulators.

**ELECTRIC SWITCH.**—OSCAR H. SCHUCK, Philadelphia, Penn. In the ordinary arrangement of door-alarm, a switch is placed in the circuit near the door, which switch may be turned to break the circuit when it is desired that the door shall remain open without ringing the bell. It sometimes happens that such switches are carelessly left open when the door is closed, thus rendering the alarm inoperative. In order to overcome this difficulty, this invention provides a switch having a spring normally holding the switch-arm in connection with the contact-brush. At the free end of the switch-arm a lug is located. A lug on a spring-pressed sliding plate is designed to engage the arm-lug in order to hold the arm in open position when the door is open. Upon closing the door the plate, acting through the medium of the lugs, causes the switch to return to its circuit-closing position.

## Miscellaneous Inventions.

**SINGLE TREE-HOOK.**—ARTHUR R. SULLIVAN, Rome, Ga. The hook is provided with a pivoted link or bar. When the hook gravitates to a vertical position, the link gravitates to a similar position directly across the mouth of the hook, and is locked there against lateral displacement by an interned link on the hook. In this position the hook is closed, and the trace-chain cannot become displaced.

**REVOLVING SHOW-CASE.**—ROBERT W. LEVITT and CHARLES W. HUNT, Somerset, Ohio. The purpose of this invention is to provide a revolving show-case which can be readily cleaned. With this end in view, the show-case is made with a series of detachable compartments, any one of which can be taken out, cleaned and refilled, without disturbing the rest of the case. The case operates on the general principle of a central standard, turning in a seat or step-bearing in a base.

**ACETYLENE GAS GENERATOR.**—JACOB L. GEBHART, Hot Springs, Ark. This generator consists of a carbide-chamber, a generating tank communicating with an external float-tank, and a gasometer. A float within the float-tank is connected by rods and levers with the valve of the carbide-chamber, and its position depends upon the pressure of gas in the generator. When this pressure sinks, the float descends and causes the valve of the carbide-chamber to open, in order that a quantity of carbide may fall into the generator. When the pressure becomes excessive, the float rises and stops the further generation of gas. The apparatus has been so constructed that it will comply with the demands of the insurance companies.

**METHOD OF AND APPARATUS FOR EXTRACTING BITUMEN FROM SAND.**—AUGUSTUS S. COOPER, San Francisco, Cal. In various parts of the United States large quantities of sand, the grains of which are cemented together by bitumen, are found. The principal object of the present invention is to obtain this bitumen free from impurities at a low cost. The method employed consists in subjecting the material to crude petroleum in order to dissolve the bitumen, in subjecting the mass to the action of a benzol solvent for the bitumen, in mechanically agitating the mass, separating the solution from the sand, evaporating the solvent from the asphalt and returning the solvent in vaporized form to fresh portions of the oil sand.

**HOLDER FOR FLY-PAPER.**—CHARLES F. FERNALD and FRANK J. KARTEN, Santa Paula, Cal. The holder comprises a base-plate, upon which a standard is mounted. Upon the standard a top plate slides. Between the plates the fly-paper is held. The top-plate may be lifted off the standard and the fly-paper bent into the form of a tube and secured at its edges by pins. The holder may be suspended from the ceiling by a string or wire.

**DEVICE FOR USE IN WRITING.**—EDWARD H. LANIER, 530 Walnut St., Cincinnati, Ohio. This device is intended to be worn on the hand for the purpose of securing a proper position of the thumb in writing. As the correct position of the thumb in a measure insures the correct position of the fingers, the device thus operates to attain a correct position of the hand. The device comprises a bow having its bore formed to correspond with the correct bend of the thumb, and an adjustable connection for the free ends of the bow.

**TIRE-HEATER.**—EDWARD G. FERGUSON and JOHN P. HOLMEN, Kamsert, Iowa. The tire-heater has an annular heating-chamber and doors to open and close the front face thereof. To a central vertical frame-bar attached to the back, a bracket-bar is secured with its body parallel therewith and extending across the upper portion of the annular chamber. Tire-supporting pins or rollers are journaled in the frame and bracket-bar and extend across the heating chamber. Intermeshing gears upon the pins or rollers enable all the pins or rollers to be simultaneously revolved.

**NECK-YOKE.**—CYRUS COOPER, Tiverton, Ohio. The neck-yoke is designed to be attached to the poles of two-horse vehicles, and is constructed so that it can be readily connected with and disconnected from a notched head formed on a block swinging in the pole. The construction prevents the accidental displacement of the yoke.

**CLOTHES LINE TROLLEY.**—ELLA GILON, New York city. This invention seeks to provide a trolley which

can be applied to a line in order to support the lower run thereof from the upper run, and at the same time permit an easy manipulation of the line. The trolley comprises a frame made of a single piece of wire, which frame has its lower portion formed into a loop for the reception of the lower run of the line. One member of the loop extends diagonally, with the ends of the frame terminating at the diagonal member. The pulley is journaled in the upper portion of the frame.

**WAGON.**—CHARLES W. HEMM, Kendall, Ill. An ordinary farm-wagon, by means of this inventor's device, can be transformed into a hay-wagon. The device is a fixture having a body-portion adapted to lie vertically against the side beam of the wagon. A head at the upper end of the body-portion extends transversely thereto to project over the top of the wagon-beam. Two perpendicular flanges stand on the head and carry a cross-bar.

**DOOR-CLOSER.**—DENIS HOGAN, 682 Marcy Avenue, and FRANK McMAHON, 947 De Kalb Avenue, Brooklyn, New York city. The purpose of this invention is to provide a door with means whereby it can be readily swung in and out; and whereby on its release from either position it may swing automatically into a closed position without the use of expensive double hinges. The door has a bearing in the form of two pulleys spaced apart and journaled in the top of the door. A rope passes over the pulleys and is weighted at one end. The weight rises and falls in a bore in the door. A pin secured to the door-frame is engaged by the outer end of the flexible connection. When the door is swung, the pulleys in moving with the door engage the rope. As the rope is fastened to the pin, the weight is drawn up by the action of the corresponding pulley. When the door is released, the weight closes the door.

**BRACKET.**—FRED S. JEWETT, Laconia, N. H. This bracket, designed to be applied to a window-frame so that a shelf may be removably held and adjusted, has a body-plate, the upper portion of which is provided with a vertically-extending slot having an enlarged lower end, and with a notch extending to the upper edge of the body-plate. Horizontal flanges secured to the lower portion of the body-plate receive between them a shelf. A transverse lip is attached to the outer edge of the body-plate and engages the front of the window-frame.

**THAWING-APPARATUS.**—RAYMOND A. LACKMAN, Earlring, Iowa. In order readily to thaw frost in the ground, this inventor has devised a heater mounted on a sled, the top of which is formed like a grate. A hinged front door and a rear door are provided for the heater. A boiler is mounted on the heater, and the steam generated therein is conveyed to a hollow ground-boring tool by means of a flexible pipe.

**VEHICLE.**—JOHN LINDSEY, Sandersville, Miss. To provide a vehicle especially adapted for hauling logs, this inventor has devised a wagon so constructed that the trucks will be enabled to yield vertically and laterally without losing in stability or strength. The vehicle consists of pivotally connected trucks, each of which comprises a frame with which axles are loosely connected, whereby the frame is capable of movement upon the axles; a reach having rocking movement upon the axle; and a bolster mounted to rock upon the frame and reach, whereby the bolster is enabled to move vertically on the frame.

**BUCKLE.**—JACOB POLKA, Smith Centre, Kan. This buckle is especially designed to be used on traces, the construction being such as to permit the trace to be held firmly and securely without injury. The buckle has a main frame, a tongue-frame mounted removably on the main frame, a tongue carried by the tongue-frame, and coacting therewith, and a spring attached to the main frame and engaging the outer end of the tongue in order removably to hold the tongue.

**FASTENING FOR FLOOR-COVERINGS.**—JAMES K. THOMAS, Winfield, Kan. To provide an improved means for holding down carpets, oil-cloths, and the like, this inventor has devised a fastener provided with a base-plate having at one end an upwardly-extending flange, on which is pivoted a top plate, between which and the base-plate, the floor-covering is passed and held in place. Spikes extend down from the base-plate and are adapted to be driven into the floor so as to secure the fastener in place. Pins on the base-plate pass through the covering and hold it on the fastener.

**TOOL-HANDLE.**—JACOB TRUIT, Stockard, and OLE OVERSEN, La Crosse, Wis. The handle provided by these inventors is designed to fit hoes, rakes, forks, and the like, so that the tool held can be readily removed and can be adjusted either vertically or laterally. The handle has a bifurcated shank, the members of which are provided with opposing socket-faces adapted to receive between them a ball connected with the tool. A bolt passes loosely through the members of the shank and is provided with a head at one end and a nut on the opposite end, in order to clamp the ball in place. A lever is pivoted on the shank at the rear of the bolt, and by its means the ball is more securely clamped between the shank-portions.

**MAGAZINE CAMERA.**—ANDREA ANGEL, Liverpool, England. This invention provides improvements in cameras in which are used a series of sensitized films separated by backing-cards alternated with the films in the usual manner. The invention consists principally of mechanism whereby the films are prevented from buckling and are held perfectly flat during exposure, and whereby the release of the films in succession and the disposal of the exposed films and their backing-cards are effected. A special object of the invention is to dispense with notching the films, or otherwise adapting them for the action of the releasing mechanism.

**GRID FOR COTTON-GINS.**—MANCHERSHAH DORABJI DAROOVALA, Bombay, India. In the present gins used in India, the fingers of the fixed grids are merely plain fingers attached to a base-plate, and the outer ends of the fingers are in no way secured from movement. As a result, small stones or other obstructions, during the process of ginning, very often bend the fingers and destroy the equal spaces between them. To overcome this difficulty, the inventor of the present grid employs a strap rigidly connected with the outer end of its fingers, the top of the strap being inclined downwardly and rearwardly. A moving grid co-operates with the fixed grid.

**METHOD OF AND DEVICE FOR PRESERVING FRUIT FROM DAMAGE DURING SHIPMENT.**—SILAS R. DIVINE, Loch Sheelake, N. Y. In order to preserve strawberries and other fruit during transportation, this inventor provides a method of packing fruit which consists in embedding each stem, calyx, or cap of the fruit in a plastic compound (such as plaster-of-Paris or sugar) capable of hardening. With such a method of packing, the fruit will not be dislodged under ordinary conditions.

**PROCESS OF TREATING BLAST-FURNACE SLAG FOR CEMENT.**—ALEXANDER D. ELBERS, Hoboken, N. J. To adapt slag for use as a silicifying ingredient for hydraulic cements, a method has been devised which consists in superficially desulfurizing pulverized blast-furnace slag by a weak solution of nitric acid, and in rendering alkaline the superficially-desulfurized slag by impregnating it with a solution of sodium carbonate.

**SHIRT.**—BENNETT BERNSTEIN, New York city. To make a shirt as economically as possible, and, at the same time, to reinforce the material and thus produce a durable garment, are the purposes of this invention. The shirt has a body across the back of which a sleeve-back section extends, is fastened, and has its end portions projected beyond the body to form the backs of the sleeves. Two sleeve-sections joined to the edges of the ends of the sleeve-back sections have their inner ends overlapping the body edges at the armholes to reinforce the body at these points. The sleeve-front sections terminate at each side of the throat.

## Designs.

**WALL-PAPER.**—CHARLES RUFFLY, Rixheim, Germany. This design consists in a bouquet of flowers and foliage, in the composition of which a group of hibiscus, gloxinia, and achimenes flowers, together with foliage and sprays, constitutes the body-portion of the bouquet. From the body-portions morning-glory vines trail down.

**BORDER FOR WALL-PAPER.**—CHARLES RUFFLY, Rixheim, Germany. The leading feature of this design consists in a festooned fabric and bunches of flowers at the ends of the festoon.

**DOCTOR BLADE FOR PRINTING-PRESSES.**—GEORGE UDELL, Providence, R. I. Doctor-blades, when forced into their holders, frequently become convex in form at their edges, thereby considerably impairing the efficiency of the blade. This design provides a blade concave in form at its edges, so that the blade when forced into its holder assumes a straight edge.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for 10 cents each. Please send the name of the patentee, title of the invention, and date of this paper.

## NEW BOOKS, ETC.

**RIVERS OF NORTH AMERICA. A Reading Lesson for Students of Geography and Geology.** By Israel C. Russell. New York: G. P. Putnam's Sons. London: John Murray. 1898. Pp. xv, 327.

This is an admirable book and is filled with valuable and reliable information which is told in a popular manner without destroying its scientific value. If students would read books of this nature, it is certain that the science of physical geology and physical geography would take on a new meaning for them. We now have works which compare with this one on volcanoes, earthquakes, oceans, earth-sculpture, etc., and all students in our colleges and scientific schools should be required to read at least half a dozen good books on the various subjects noted. The present volume is admirably illustrated and the bibliographical references are excellent.

**CORONA AND "CORONET."** By Mabel Leomis Todd. With illustrations. Boston and New York: Houghton, Mifflin & Company. Cambridge: The Riverside Press. 1898. Pp. 383. Price \$2.50.

The present volume is a narrative of the Amherst eclipse expedition to Japan in Mr. James' schooner yacht "Coronet," to observe the sun's total obscuration, August 9, 1896. It is a tasteful volume dealing with the events of the trip. The volume is most interesting and will appeal to all who care for unconventional traveling. It should not be supposed that it is interesting only to the scientist. On the contrary, it appeals to the general reader and will be a welcome addition to any library. The illustrations which fill it are excellent and have considerable scientific value.

**DIE TINTEN-FABRIKATION.** Von Sigmund Lehner. With three illustrations. Vienna: A. Hartleben. Pp. 245. 8vo. Price, paper, 90 cents.

Sigmund Lehner's work needs no introduction to the maker of inks; for the four editions through which the work has already passed have long been favorably regarded by every maker of writing-fluids. In the present fifth edition of this monograph on the manufacture of inks the author has thoroughly revised his work, and added many formulae. The directions given and the processes described are the result of careful experiment on the part of the author, so that any one who carefully follows the directions given and employs pure materials should obtain good results.

**STEAM NAVIGATION.** By James Croil. Montreal. With illustrations and portraits. Toronto: William Briggs. Montreal: The Montreal News Company, Limited. 1898. Price \$1.50.

This volume is a decided addition to the literature on this ever popular subject. The historical work is particularly good, the most essential links in the history of steam navigation being pieced together in some very readable chapters. The author is well qualified to speak of pioneer days, for he introduces some personal reminiscences of a voyage made in a sailing vessel fifty-seven years ago. The time, forty-two days, was "excellent," being faster by two days than the time of the "packet-ship," the latter being the equivalent of the express-steamship of the present day. It is shown that the paddle

wheel antedated the steam engine, being driven by horse power variously applied. Denis Papin is given credit for the first steamboat, and the Scotchmen Miller and Symington are duly recognized as having built steamboats in 1788 and 1802. Fulton's "Clermont" on the Hudson River and Bell's "Comet" on the Clyde are shown and described, the description, by the way, being much superior to the woodcuts. The whole of the book is freely illustrated with woodcuts and half tone engravings of the various notable steamships of the age. The great steamship companies are taken up in their order, a brief sketch of the origin of each being followed by a description of the leading vessels. Portraits of the founders and chief promoters of the various companies accompany the various chapters. Particular attention is given to the development of steam-navigation on the great lakes. The text is written in a clear, concise style, well adapted to the subject.

GRAMMAIRE FRANÇAISE. By Baptiste Méras and Sigmon M. Stern. New York and Chicago: Henry Holt & Company. 1898. Pp. 312. 12mo. Price, cloth, \$1.25.

FIRST LESSONS IN GERMAN. By Sigmon M. Stern. New York and Chicago: Henry Holt & Company. 1898. Pp. 292. 12mo. Price, cloth, \$1.

FIRST LESSONS IN FRENCH. By Baptiste Méras and Sigmon M. Stern. New York and Chicago: Henry Holt & Company. 1898. Pp. 321. 12mo. Price, cloth, \$1.

Perhaps there is no branch of pedagogy which has witnessed such remarkable changes in method within so brief a period as the teaching of modern languages. Prominent among the institutions in the United States which have introduced the new analytic method of teaching a foreign tongue may be mentioned the Stern School of Languages, in New York city. The three volumes which lie before us embody the principles of teaching which have earned for this institution an enviable position among language-schools.

In the "First Lessons" in German and French the foreign language is directly taught without the assistance of the native tongue, and, at first, without the intervention of grammatical rules. The language is learned by imitation and by constant use of the idiomatic forms brought forth in each lesson. Grammar is learned by induction, not by the memorizing of long rules and the innumerable exceptions to those rules. In the "First Lessons" the chapters are divided into a language division, oral exercises, grammatical exercises, and "Woerterktaerungen" in the German book, "Explication de mots" in the French book. For Americans who are not as yet familiar with either language, the "First Lessons" will be of immense service in acquiring that much desired familiarity.

Of the little Grammaire Française, written primarily for those having an elementary knowledge of French, much can be said in praise. Its information is presented so attractively, and its explanations are so clear and concise, that no difficulty should be experienced in studying a subject usually presented in a form repugnant to the average student.

ARMAGEDDON: A TALE OF LOVE, WAR, AND INVENTION. By Stanley Waterloo. New York: Rand, McNally & Company. 1898. Pp. 259. Price, cloth, \$1.

Armageddon was the famous battlefield of the Hebrews, upon which, thousands of years after, Napoleon gained a victory over the Turks. The author of "The Story of Ab" lets his imagination travel through the first years of the coming century and gives a vivid picture of the conditions of the world, especially as regarding love, war, and invention. One of his characters invents an airship from which missiles can be thrown that end a war at once. The special interest centers in the reasons for an Anglo-American, in fact, an Anglo-Saxon alliance. A detailed description is also given of the working of a Nicaraguan canal by English and American money and engineers.

THE METRIC SYSTEM OF WEIGHTS AND MEASURES. Hartford, Conn.: Issued by the Hartford Steam Boiler Inspection and Insurance Company. 1898. Pp. 196. Tables. Price \$1.25.

This little volume is convenient in size for the pocket and for general reference. It is printed on excellent paper with red edges and is bound in sheepskin with the title in gold. It is a very neat little volume and should command a considerable sale, as it contains everything that a more expensive book would have. The metric system is now so universally employed in foreign books and periodicals that much time is consumed by the American reader in transferring these units into their English and American equivalents; therefore a work of this kind will facilitate comparisons and enable the reader to work out problems, calling for the use of the metric system, in the shortest possible space of time. The first part of the book is devoted to the history of the metric system. This is the best history of the system that we have seen. We hope the time will soon come when the metric system will be compulsory in the United States. When its use has become obligatory, it will undoubtedly work a hardship to some, but in the end it will prove of great benefit to everyone, and the amount of time which it will save will be simply incredible.

PRACTICAL CARRIAGE AND WAGON PAINTING. By M. C. Hillick. Chicago, Ill.: Western Painter. 1898. Pp. 161. 8vo. Price \$1.

This work is a full treatise on the painting of carriages, wagons, and sleighs, by a thoroughly practical man. The work embraces full and explicit directions for executing all classes of work, including painting, factory work, lettering, scouring, ornamenting, finishing, etc., with many tested receipts and formulas. The value of a tested formula cannot be overestimated. While we are not familiar with the subject of the book ourselves, we can judge the book sufficiently to say that it is a thoroughly practical and up-to-date book which no carriage painter should be without.

Business and Personal.

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Wanted made on royalty. Vehiele Tire illustrated on p. 421. Dec. 31, 1898, issue. O. Ramsey, El Campo, Texas.

Wanted—Capital to introduce Automatic Fly Trap. Application granted December 3, 1898. Immense sale assured. M. S. Featherstone, Goshen, California.

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

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.

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(7558) R. J. S. asks: Which is the better—Toepler-Holtz or Wimbhurst machine? A. It is difficult to say which is the better, a Holtz or a Wimbhurst machine. Both are good. The Wimbhurst is the simpler machine. It is described in SCIENTIFIC AMERICAN SUPPLEMENTS 584, 647, 914, 948. Price 10 cents each, by mail. The Holtz machine is described in SUPPLEMENT, Nos. 278, 279, and 282. Price 10 cents each, by mail.

(7559) J. B. R. says: There is a paint made of coal tar which is a good paint for iron, tin, and felt roofs. Can you give me any information as to its good or bad qualities, or the effect it has on metal roofs? I would like you to give me the formula for making such paint out of coal tar. I want to manufacture and use such paint. A. After the paper is put on take coal tar and lime (burnt, but not slaked), boil them together in the proportion of 15 lb. lime to 100 lb. tar. Put it on hot. To avoid the tar boiling over, stir the lime in the boiling tar very slowly. The mixture must always be heated before putting on. The lime and tar form a chemical connection, which is fireproof, cannot be melted by sun heat or dissolved by steam or hot water, and makes a smooth, glazed roof.

(7560) C. P. E. asks: What strength of current is required to light one 16-candle power incandescent light, and what is the most economical chemical battery which will furnish the required current? A. 16-candle power lamps are made for 50 to 110 volts. No primary battery gives as much pressure as 2 volts per cell; hence about 30 cells will be required to run a 50 volt lamp. The cost of such a battery and the labor of cleaning and recharging it frequently entirely prevents any use of batteries for lighting so large a lamp.

(7561) H. L. B. writes: I have diagrams for a 1,000 watt alternator which call for a field built up of disks of sheet iron with 8 internal poles. I cannot get punchings of this shape or size. Would several thicknesses of cast iron, 1/4 inch thick, do? A. To use cast in place of wrought iron in a dynamo or motor will reduce the magnetic flux by about one-half. You would better make the sheets for field by hand than to sacrifice efficiency so much.

(7562) G. N. W. says: Please state a composition to coat the inside of tin cans to prevent the action of sulphuric and nitric acids on the tin. A. Use equal parts of gutta percha and paraffine melted together and used hot. The tin must be very clean and free from grease. Melt the gutta percha first over a water bath.

(7563) W. W. H. asks: 1. How far apart should condensing lenses in a magic lantern be placed relative to their foci? A. Place them nearly in contact. 2. Can acetylene gas be used for brazing, the same as other gas? A. We are not aware that such use has been made of acetylene.

(7564) F. W. B. says: I wish to be informed as to the process of bleaching tallow or making it white. A. In a copper boiler put 1/2 gal. water and 100 lb. rendered tallow; melt over a slow fire, and add, while stirring, 1 lb. of oil of vitriol, previously diluted with 12 lb. of water; afterward 1/2 lb. bichromate of potassa, in powder; and lastly, 13 pt. water, after which the fire is suffered to go down, when the tallow will collect on the surface of the dark green liquid, from which it is separated. It is then of a fine white, slightly greenish color, and possesses a considerable degree of hardness.

Cleanliness is the great point in treating lard. The fat is freed from all adhering fleshy or discolored matter by cutting. It is then cut up into small pieces and washed until the water runs off clear. It is next melted by direct fire or steam coil until it becomes perfectly clear. It is run through close linen filters into the barrels, in which it is stirred until white and opaque, but only thickly fluid. The great point is when to cease stirring. It is then cooled and tightly covered. Air makes it rancid.

(7565) P. L. H. writes: I want to light one sitting-room with electric light means of a storage battery and primary batteries (chemical). Would you kindly inform me what type of storage battery and what kind of primary batteries you consider most suitable for such a purpose? I should like to have three or four lights of about 4 candle power or more if possible. A. The chloride accumulator is regarded as among the best forms of storage cells. To charge them by a primary battery is a slow process. Probably the gravity battery is the best for the work, since it is most constant in current. Salomon's "Management of Accumulators," price \$1.50, gives much information on this subject.

(7566) P. A. M. writes: I have made the eight-light dynamo described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 600, and would like to know how much and what size German silver resistance wire to use for regulating purposes, it being shunt connected. A. The field regulator for dynamo of SUPPLEMENT 600 should contain 10 ohms resistance, or 200 feet of No. 16 A. W. G. German silver wire.

(7567) B. O. B. asks: 1. Electricity is generated by means of alternators at a power house—water power, for example. This electricity is to be conducted to a place about fifteen miles distant. Suppose it is generated with a pressure of 4,000 volts; would it be well to step it up to 11,000 or 12,000 volts? A. Yes. 2. Could wire be insulated and still carry such a high voltage, and, if it could not, would harm come to birds which came in contact with it? A. Insulated wire should be used, of course, but even then, no one should come in contact with the wire. It would be bad for the bird which should bridge a wire to the earth. 3. Where can I find any information in regard to the Keely motor? Can you give me the names of any scientific or engineering men who have seen said motor work? A. It is supposed that Mr. Keely took the secret of his motor with him when he died. We cannot tell where you can obtain information about it.

(7568) W. H. D. writes: 1. In SUPPLEMENT No. 641, in "How to Make a Simple Motor," by Hopkiss, it says in one place to use No. 18 magnet wire on armature and in another place it says No. 16. Which is the wire to be used, and, if No. 18, how much is to be used? A. In SUPPLEMENT No. 641 the size of wire in armature is No. 18. In one place it is misprinted. 2. What size storage battery would it require to run two of these motors? A. Use the same number of cells storage battery as of bichromate. The size of cell is determined by the length of time you wish to run your motor.

(7569) F. S. G. asks: Can you inform me how many feet of No. 18 B. & S. gauge iron wire it will take to make the core of an induction coil 10 1/2 inches long by 1 inch in diameter? A. About 460 pieces of No. 18 B. & S. bare wire are required to form a round bundle 1 inch in diameter, if all the pieces are perfectly straight. This makes a little over 400 feet.

(7570) R. McK. asks: Please inform me what size German silver resistance wire to use in making a rheostat for six cells of Edison-Lalande battery, type Q, 3 amperes and 7 volts? A. The maximum current capacity of type Q, Edison-Lalande cells is given as 95 amperes. If you wish to use 3 amperes, you will require 14 ohms in the external circuit. This includes the resistance of the rheostat and the apparatus, whatever it may be that you are using. We cannot tell you definitely what to use without knowing what you wish to do; but you will be about right if you take 10 or 12 feet of No. 20 bare German silver wire for the rheostat.

(7571) J. H. C. asks for the best receipts and manner of tempering springs, such as gun springs, for main spring and such like. Also receipt for tempering mill picks. A. To Temper Steel Springs. Heat to an even red heat, rather low, to prevent cracking; quench in lukewarm water. Place in ladle with enough tallow to cover it; heat until tallow burns with a large flame extending beyond ladle, then set the ladle aside and allow it to cool.—To Temper a Revolver Spring. Heat the spring to a cherry red, and plunge in linseed oil. To draw the temper to the desired degree, hold the spring over the fire and allow the oil to burn away; take away from the fire, put on more oil, and let it burn away. Burn the oil off three times and plunge in the oil again. The spring is then ready for use. Do not overheat the steel. Test the temper frequently with a file.—To Temper a Small Spring. Heat the spring to a light red, plunge in cold water; hold the spring over the flame of a small fire of shavings until it becomes black, then hold in the fire until the black disappears. Cool the spring by swinging it in the air.—There is nothing peculiar in hardening mill picks, only that they should be as hard as possible and moderately tough. The greatest care should be taken to avoid burning the steel. Where there is much of this work to be done, the picks can be heated in a pot of cherry red hot lead, then dipped plumb into clear water at about 60 degrees. Do not draw the temper. The hardening by the ordinary smith's fire can be well done if charcoal is used and not hurried through the fire. Hurry burns the corners. Much also depends upon the shape of the pick, as to whether it is a sectional or leaf pick, or a thick, solid pick, the last being the most difficult to manage on account of the sharp edge and thick back. They should be laid across the fire so as to heat the eyes as fast as the edge.

(7572) J. S. asks: 1. At 104 volts, 7,200 amperes, how many amperes does the high tension transformer take in the Tesla-Thompson high frequency coil as described in SUPPLEMENT, No. 1085? Can I wind this transformer so as to take only 2 amperes and still use No. 31 wire on secondary coil and step up to 10,000 or 15,000 volts? A. We regret to say we have not the data for variations of the transformer and coil of SUPPLEMENT, No. 1085. Any other ratio of stepping up the voltage

can be employed. It is simply the ratio of the number of turns in primary and secondary. The number of amperes which will flow is influenced largely by the self-induction of the turns of the primary. 2. Please give me dimensions for a static machine that will give an 18-inch or larger spark if possible. A. For static machines, see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 548, 584, 647, 914, 948, price 10 cents each. For an 18-inch spark, you will require plates 36 inches to 40 inches in diameter. 3. Can the length of the spark be doubled by using a large condenser? A. The mere length of spark of a static machine is decreased by the addition of a condenser, but its intensity is increased.

(7573) G. L. asks: What effect will a shrill whistle or any ordinary noise have on a gas light? Will it cause any commotion to the flame in any way? A. A shrill whistle or other sharp sound will produce a strong vibration in a flame which is pitched so as to vibrate in unison with the sound. See Tyndall's "Sound," price \$2.50, for much interesting information on sensitive flames.

(7574) Buffon writes: I see in the SCIENTIFIC AMERICAN the description of an oxide of copper battery. I would like to know if this battery is capable of furnishing light to say ten or more incandescent 16 candle power lamps. A. No primary battery of any kind can be used to light 16 candle power lamps with economy. The labor of caring for the battery and cost of materials is prohibitory. The entire time of an intelligent workman would be needed for your plant, and a new set of materials every few days, varying with the number of hours of use per day. We can safely say no such outfit is in existence.

(7575) C. F. W. asks: 1. What advantage have telephones with bridging bells over those with series bells? A. The inductance is greatly reduced by putting the bells in parallel with the line, or bridging them, as it is called. 2. How many instruments having 10,000 ohm generators and series bells can be used on one short line? A. We do not know what the practical limit is. 3. How many with bridging bells? A. More than thirty bridging bells have been worked successfully across one line. 4. Can series and bridging bells be used on the same line. A. To an extent they can be, but it would be very poor economy. 5. What should be the resistance of ringer coils in series with 10,000 ohm generator? A. Ordinarily about 100 ohms. 6. Of bridging coils? A. About 1,000 ohms. Webb's "Telephone Handbook," price \$1, and Poole's "Practical Telephone Handbook," price \$1.50, are indispensable to everyone engaged in telephone work.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

JANUARY 10, 1899,

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and patent numbers. Includes items like Adjustable chair, Alarm, Alcohol from aldehyde, Annunciator, Ash can, Automatic gate, Automatic regulator, Axle, Baling press, Banage machine, Bed folding, Bell bicycle, Bicycle, Bicycle alarm, Bicycle attachment, Bicycle coin controlled lock, Bicycle drive chains, Bicycle frame, Bicycle gear, Bicycle gear chainless, Bicycle mud guard, Bicycle or similar machine, Bicycle propelling mechanism, Bicycle propelling mechanism, Bicycle saddle, Bicycle support or rest, Bicycle valve, Bit, Blind slat tennon, Blow overs, Blow overs device for removing, Boat canopy, Boiler, Boiler furnace, Boilersupporting lug, Boiler tube cleaner, Book manufacturing check, Boring and mortising machine, Bottle, non-refillable, Bottle washing apparatus, Bottles, etc., closure for preventing refilling, Box, Box fastener, Brake, Braking and feeding apparatus, Bridge and locking device, Bridge and wharf floor construction, Broom sprayer, Brush, Bulkhead doors, Bulletin board, Burner, Bustle, Calendar, Camp chair and cane, Can, Can filling apparatus, Can and folding chair, Car brake, Car door, Car engine, reciprocating, Car gran door, railway, Car hand, Car, portable horse stall for railway, Car, Young, Carving apparatus, Carpet stretcher and tacker, Cash register and indicator.