

ENGINEERING INVENTIONS.

A patent has recently been issued to Mr. J. B. Hunter, of Ashley, Ill., for an improved motor constructed with sprocket wheels, cog wheels, a driving chain, and two independent fly wheels, of which one is rotated directly from the shaft to which power is applied, and the other is rotated from one of the axles on which the wheels are mounted, whereby the power will be equalized and balanced in the motor.

An improved automatic car coupling has been patented by Messrs. Joseph Rigby and S. S. McHugh, of Ottawa, Kas. In this improved coupling the drawhead is provided with a very large mouth, and the link is held in position to enter the opposite drawhead. The drawhead is provided with a hole passing through it longitudinally, a slotted sliding block being located in this, and actuated by a spring for pressing against the link as held by the pin, so that the link will be held out suitably for entering the drawhead of the other car.

MECHANICAL INVENTIONS.

A new and improved machine for fastening buttons to garments and other articles is the invention of Mr. Albert Hall, of Cypress Hill, N. Y. The invention is very simple in its construction, inexpensive to make, and can be operated by an unskilled person.

Mr. Squire Raymond, of East Venice, N. Y., has recently patented a simple weight power arranged for transmitting rotary and reciprocating motion, and is intended more especially for operating small machinery, such as wood turning lathes, churns, fanning mills, pumps, etc.

Mr. Ephraim R. Kugler, of Kingwood, N. J., has patented an improved turning lathe, which is especially adapted for turning out telegraph pins and brackets. Not only is the entire shaping of the head or bracket accomplished by this machine, but a screw thread of the desired depth and width is cut upon the head of the pin.

A simple and effective jack for use in laying flooring or applying sheathing boards has been recently patented by Mr. J. M. Williams, of East Craftsbury, Vt. The screw is elevated at such an angle as to bring the handle above the floor timbers or studding, so as to enable the operator to force together his floor boards with greater ease to himself than it has been possible to do heretofore.

An improved machine for cleaning fur robes has been patented by Mr. Ferdinand Hosh, of Brooklyn, N. Y. The fur is brought in contact with the rotating brushes by being carried over two rotating feed rollers, and a hood is arranged over these rollers and brushes to carry away the dust and dirt up through a chimney connected with it. The draught which serves to carry away the particles of dust is caused by the rotation of the brushes, and if this is not sufficient fan blowers may be employed.

Mr. Charles Daniel, of Butler, Mo., has patented an improved gate hanger. This invention consists of an improved device for gates which open by both sliding and swinging, and the improvement consists in a bracket for the roller on which the gate slides, reversible for right or left hand attachment. It has guide roller studs for supporting friction rollers to guide the sides of the gate bars, the bracket being a simple device contrived in such form that it may be moulded and cast without the use of cores.

Messrs. R. Cartmell, of Middlebury, Vt., and Albert Ball, of Claremont, N. H., have recently patented improvements in machinery for grinding the wood in the manufacture of pulp. The improvement relates especially to the class of machines shown in the letters patent granted to Mr. Cartmell, in May, 1882, in which the cylindrical casing carrying the grinding cylinder or wheel is provided with radiating chutes or hoppers. The invention further consists in certain features of construction and arrangement for facilitating the setting up of the machine and its convenient operation.

Mr. David F. Pratt, of Gardner, Mass., has patented a guide for rattan splitting machines, which belong to that class of splitting machine which employ a sectional guide, arranged with suitable springs in such manner that it will firmly clamp or grasp the rattan while being forced against the knife, and will always properly center the rattan with respect to the knife, whether the rattan be large or small. The invention further consists in adapting the guide so that both the lateral and vertical adjustment bring the guide orifice into exact alignment with the passage through the knife.

Mr. G. W. Pittman, of Keokuk, Iowa, has patented a wrench having a stock or handle recessed centrally to receive the shank of the movable jaw, and also at its end for the reception of grip devices for holding the movable jaw. The device consists of a pivoted lever having a cam head to gripe one edge of the shank, and acting by its free end upon an angle lever carrying ratchet teeth for engagement with serrations of the opposite edge of the shank. The invention includes, also, a system of movable grip blocks or bits in either the fixed or movable jaw or both jaws of the wrench, for hold upon round objects. These bits work by rollers upon inclines tangent to the seats of the blocks in the jaws of the wrench, so that any slip of the shank of the movable jaw from its lower cam and ratchet grip connections in the handle will be compensated for by the movement of the bit blocks.

AGRICULTURAL INVENTIONS.

An improved potato digger and picker has recently been patented by Mr. Squire Raymond, of East Venice, N. Y. In this machine two plows are arranged in the fore part to throw the soil from the sides of the hills, while a single plow passes beneath and raises the potatoes and the soil in which they are embedded, and the shaker separates the potatoes from the soil, delivering them at the rear while the soil falls through the shaker to the ground.

A cultivator of unique pattern and designed to accomplish a great amount of work with the smallest amount of power is the subject of a patent recently granted to Mr. David Wise, of Cottdendale, Tex.

Mr. W. P. Triggs, of East Portland, Ore., is the patentee of an improvement in harrows. The implement is suspended from a truck frame which is mounted on wheels, so as to be easily transferred from one field to another. By an ingenious arrangement of levers the harrow is raised from the ground at the will of the operator, and when it is wanted for use it is readily dropped to the ground, and the harrow commences its work.

MISCELLANEOUS INVENTIONS.

Mr. J. B. Freeman, of White Hart Lane, Tottenham, England, has patented an improved process of making white pigments from oxide of zinc and sulphate of lead. The process consists in first grinding the oxide of zinc and sulphate of lead together, and then grinding them with oil.

Messrs. Jesse Wasson and Richard T. Hitt, of La Porte City, Iowa, have patented an improved machine for working butter. The object of the invention is to provide a machine or table which will greatly facilitate and expedite the operation of working butter during its preparation for market.

Mr. John D. Blakeman, of Smith's Grove, Ky., has obtained a patent for an improved trace detacher. This invention consists in a whiffletree hook which is adapted to be operated by the driver to detach the traces and thus separate the horse from the vehicle in case the former runs away.

Mr. C. O. Tinker, of Ashtabula, O., has recently received letters patent for improvements for a simple roller die for making auger and bit blanks, the object of which is to improve and cheapen their manufacture, which this invention seems to accomplish in an effective manner.

A two wheeled vehicle has recently been patented by Mr. L. S. Clark, of Doylestown, Ohio. The invention consists of an improved contrivance for applying combined coiled wire and rubber springs to two and four wheeled spring carriages, and an improved joint connection of the shaft of a two wheeled vehicle to relieve the body from the motions of the horse.

An improved stopper for wire rope, etc., has been patented by Messrs. E. M. Stoddard and J. N. Johnson, of Norfolk, Va. The object of this invention is to provide a stop which shall act automatically to prevent a bar, rod, or rope from moving in but one direction, allowing it at the same time to move freely in the other.

Mr. Ezekiel Holman, of Sandy, Utah Ter., has obtained a patent for an improved construction of roasting and smelting furnace for the reduction of silver, lead, and other ores. With this construction of furnace coke and other high priced fuels may be dispensed with, as ordinary coal can be used with good results.

An improved roof for railroad cars has been patented by Mr. John Walter, of Nashville, Tenn. The object of the invention is to provide a readily detachable or portable roof which may be quickly applied in part or whole to the top of the car. This roof also affords greater security to the brakeman in running along the top of the car than the old construction of roof, and provides an efficient means for ventilating the car.

Mr. S. W. Sykes, of Passaic, N. J., has patented recently an improved sweep strap connection for picker sticks of looms, consisting of a jointed metal hanger having a rocking connection with the sweep strap, also in special means for uniting the strap with the pivot or cross bolt of the rocking connection, whereby the durability of both the hanger and the sweep strap is greatly increased.

Mr. W. J. Moore, of Weatherford, Texas, has recently obtained a patent for a light, durable, and strong basket, made of wire, and designed for handling cotton and farm produce. The invention consists in any arrangement of a series of wires, whereby great strength is attained. Diagonal wires or braces connect the top and bottom hoops, and are twisted or wrapped around the upright wires intermediately of their length.

An improvement in suspenders has been patented by Mr. William B. Pratt, of Rahway, N. J. The buckle of the suspenders is provided with a cup-shaped slotted plate, and the ends of the suspenders are provided with a T-shaped shank which serves to unite the ends of the suspender to the buckle. Thus it is seen that the ends may be readily detached from the buckle, and the clothing will not be torn nor the suspenders worn as rapidly as at present.

Messrs. R. H. Dimock and J. A. Robinson, of New Haven, Conn., have recently patented an oil burner suitable for the use of any suitable volatile inflammable liquid, including naphtha, benzene, gasoline, camphene, petroleum, and other like liquids, for producing light and heat, and in which the liquid, that may be supplied under a head or pressure, is conveyed for volatilization and combustion through a block or blocks of non-inflammable absorbent material and burned upon the exposed surface.

Mr. Benj. F. Perry, of West Andover, O., has obtained a patent for an improved fence. This fence is of the style known as zigzag or worm fence, and the great advantage is that rails from old or worn out fences may be used in the construction of the new fence and serve a very good purpose. The rails of the different sections are alternately placed one above the other and are bound in place by wires, the ends of which are secured to posts in the ground. A barbed wire is also proposed to be extended along the top of the fence over the top rail.

Mr. C. L. Dalton, of West Elkton, O., has patented a novel thill coupling spring having an attached latch with a removable and specially constructed joint pin, by which the pole or shaft is united with the coupling, and with which the latch engages; also, in a coupling jaw provided with a tightening screw bolt to

prevent its spreading, likewise in a shaft strap provided with a loop or hook that engages with the screw bolt, and in means for holding the thill coupling spring back when it is required to detach or adjust the shafts or pole of a vehicle.

The Harvey W. Peace Company, of Brooklyn, N. Y., by assignment from Mr. Alexander Sloan, of Newark, N. J., are the patentees of an improvement in cross cut saw handles. The saw handle is provided with a countersunk socket having exterior ribs to prevent it from turning, an interior screw thread to receive the split screw, which is made in two parts, having a hook upon the lower end of one part to pass through a hole in the saw plate, and a recess in the end of the other part to receive the hook of the first part. The connection between the saw plate and handle is provided with a washer placed upon the split screw, between the handle and saw plate, and grooved to receive the edge of the said saw plate. By this invention the plates of cross cut saws are securely held by the handle and may be readily detached therefrom.

An improved incandescent electric lamp is the subject of a patent recently granted in the United States to Mr. Desmond Gerald Fitzgerald, of Brixton, County of Surrey, England. The invention has for its object to produce a more complete vacuum in electric incandescent lamps by effecting the removal of residual oxygen, and, in some cases, residual nitrogen. To this end is employed a supplementary carbon filament, or a wire which may itself be made of oxidizable metal—such as iron or zinc—or be covered with an oxidizable metal—such as magnesium or other suitable substance placed within the bulb—and capable of being temporarily thrown into circuit, so that by the passage of the current, after more or less complete exhaustion by the pump, the carbon filament or oxidizable wire will be heated, and thereby effect the absorption of the residual oxygen, and when magnesium is employed the residual nitrogen contained in the bulb.

Mr. Edward K. Warren, of Three Oaks, Mich., has patented a new stiffening material for corsets, ladies' dresses, and like purposes. The invention has for its object the utilization as a rib or stiffener for corsets and other articles of dress or fabrics of the stalks, stems, or quill portions of feathers after they have been stripped—as for instance, the feathers of turkeys, geese, chickens, and other fowls—which kind of stock have heretofore had little commercial value. The growing scarcity and increased cost of whalebone for the above and other purposes has led to the employment of various substitutes, including bones, horn, rubber, steel, and rattan, but the use of split quills of fowls is believed by the patentee to be the best substitute for whalebone that has been devised for the above named purposes, and for some kinds of surgical appliances. The same inventor has obtained a patent for making whips out of whole or split quills made up in similar manner to the material described for stiffening corsets, etc. The splints are arranged to overlap and break joints, and when bound together form a tapering elastic rod which may be covered in the ordinary way.

NEW BOOKS AND PUBLICATIONS.

MECHANICAL DRAWING SELF-TAUGHT. By Joshua Rose, M. E. Illustrated by 330 engravings. Henry Carey Baird & Company, 810 Walnut Street, Philadelphia. Price \$4.00.

The aim of the book is to enable the beginner to learn to make simple mechanical drawings without the aid of an instructor. The two first chapters are devoted to descriptions of and instructions in the use of instruments. The remainder of the book is taken up with explanations of simple geometrical terms, showing their practical application, shadow lines, and line shading, and examples in drawing bolts, nuts, screws, gear wheels, engine work, plotting mechanical motions, drawing for line shaded engravings, shading, and coloring. The illustrations are well executed, and although all the lines necessary are used, there is not that profusion sometimes seen in works of this character, and which confuses instead of instructs the student. The matter is systematically arranged, that part which teaches the principles preceding and imperceptibly leading up to that part showing their practical application.

THE ELASTICITY AND RESISTANCE OF THE MATERIALS OF ENGINEERING. By Wm. H. Burr, William Howard Hart Professor of Rational and Technical Mechanics at Rensselaer Polytechnic Institute. John Wiley & Sons, New York.

The author states in his preface that the work is the outgrowth of lectures to students on the elasticity and resistance of materials, elaborated and extended so as to cover many details not included in the ordinary technical course of study. The book is divided into two parts, "rational" and "technical," the first being intended to furnish an analytical or rational basis for the second, or practical development. Part I. considers the general theory of elasticity in amorphous solid bodies, thick, hollow cylinders, and spheres and torsion, the energy of elasticity, and the theory of flexure. Part II., in which the mathematical results obtained in Part I. are subjected to the test of experiment, discusses tension, compression, compression of long columns, shearing and torsion, bending or flexure, connections, working stresses and safety factors, the fatigue of metals, the flow of solids, and miscellaneous problems. The plan of the book is admirable, as by the aid of experimental results in a great variety of material, coefficients are established which involve the varied and complicated circumstances of material in actual use, and formulae, which otherwise express ideal conditions only, are thus rendered of the greatest practical value. The experimental results given are very numerous, the author aiming to show variations in products of different mills, and also of the same mill; to show the variations due to difference in size, shape, relative dimensions, and condition of specimens; and to show that specimens apparently identically the same may give different results. The direction in which further investigations may be most profitably pursued is indicated.

Business and Personal.

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Hollar's Safe and Lock Co., York, Pa., manufacturers of improved Fire and Burglar-proof Safes. Bank and Safe Deposit Vaults and Locks. See adv. p. 264.

Improved Skinner Portable Engines. Erie, Pa.

Catalogues free.—Scientific Books, 100 pages; Electrical Books, 14 pages. E. & F. N. Spon, 35 Murray St., N. Y.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

Presses & Dies, Ferracute Mach. Co., Bridgeton, N. J.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

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Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv. p. 266.

Drop Forgings. Billings & Spencer Co. See adv. p. 189

Woodworking Mach'y. Rollstone Mach. Co. Adv., p. 222.

Steam Pumps. See adv. Smith, Vaile & Co., p. 237.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'Frs, 2nd St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv. page 269.

Bradley's Road Card, Syracuse, N. Y. See p. 270.

Diamond Saws. J. Dickinson, 64 Nassau St., N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Gould & Eberhardt's Machinists' Tools. See adv. p. 269.

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For Mill Mach'y & Mill Furnishing, see illus. adv. p. 268.

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Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) J. M. K. writes: Would you kindly inform me the process used in taking the yellow color out of raw paraffine so as to make it white and almost transparent? A. Different solvents are used. Sometimes bisulphide of carbon, benzene, etc. Hübner treats it with sulphuric acid, and then distills the tar, first separated from the acid, mixing the tar in the retort with quicklime. This product is then pressed and treated with benzene.

(2) C. E. W. writes: In this part many farmers are making underground (tile) ditches. Some of these men place smaller tile at the outlet than at the head or throughout the length of the ditch, claiming that more water will flow out than if the outlet is the same size or larger than the main part of the ditch. Is it not merely a smaller stream at a higher speed, and not more water that flows out? A. It is only a smaller stream at a higher velocity. 2. Are lazy tongs a suitable means for doubling the throw of a crank, or had they better be avoided in heavy machinery? A. "Lazy tongs" had better be avoided in all arrangements for conveying power.

(3) J. De W. C. writes: In my business it is sometimes necessary to ascertain the number of gallons in square tanks or cisterns, and in circular. What do you consider a convenient rule for determination of contents in gallons? And what species of gallon is understood? I am confused by certain tables in my possession, which state that "the wine gallon must contain 231 cubic inches" and in another place a gallon is said to contain "277 1/4 cubic inches," although the bushel in same table is put down at "2,150 1/2 cubic inches," and again at "2,150 4/3 cubic inches." A. The United States legal gallon contains 231 cubic inches. To compute contents in gallons of round tanks: Square diameter in feet, multiply by 0.7855, and again by the depth in feet, and multiply by 7.48, this latter being the number of gallons in one cubic foot. For tanks of square or rectangular outline, multiply together the length in feet of both sides and multiply result by depth of tank in feet and again, as above, by 7.48.

(4) D. M. R. writes: 1. If I take nickel plated articles from an electro-nickel bath and place them in an electro-silver bath and silver plate them, is there any amalgamation between the two metals, or would there be with any other two metals? A. No amalgamation will take place. The silver would be simply superposed. 2. What is plating by the Parker process? A. We do not know the Parker process by that name. 3. What is pyro-plating? A. Plating by the aid of heat, the old method before electro plating was introduced.

(5) N. W. H.—A copying ink that may be used without press or water, and will yield one or two fair, neat copies, is made by mixing 3 parts jet black writing ink and one part of glycerine. This ink dries very slowly and must be used on glazed paper. The writing also must be fine.

(6) A. F. R. writes: Please inform me where the best gas engine is made. I want 30 horse power or thereabouts. And can you say if sulphur gas (natural gas) will drive such an engine? A. Gas engines are not made of more than 5 horse power. Sulphurous gas would, we think, not work well in a gas engine. The products of combustion would contain sulphuric acid, which would corrode the cylinder and piston.

(7) A. C. P. asks: 1. How thick should the carbon pencil be made in the simple electric light described in SUPPLEMENT, No. 162? A. 1/8 to 1/4 inch in diameter. It should be pointed. 2. Would a piece of the carbon wire taken from a broken Edison incandescent lamp work well? A. No. 3. How many cells would be needed of the easily made bichromate battery described in SUPPLEMENT, No. 159? A. 10 or 12.

(8) W. W. T. writes: I am building a wind mill 10 ft. diameter; please give me the angle with the plane of motion that the sails should set. Should the sails be set at right angle with the axis, or pitched against the wind a little? A. Rule given by Smeaton is: "The radius is supposed to be divided into 6 parts, and 1/2, reckoning from the center, is called No. 1, and the extremity (of the radius) No. 6. Nos. 1, 2, 3, 4, 5, 6, angles with the axis are 50°, 51°, 52°, 53°, 54°, and 55°."

(9) H. M. asks: How can I create a vacuum in a hollow ball six inches in diameter, without the aid of an air pump? A. The best vacuum you can possibly get without a pump of some kind may be obtained by placing a small quantity of water in the ball and heat the ball and steam the air out. Continue the heat until the steam is also all out, or nearly ceases to be discharged; then seal the ball with a plug or by any means you may see fit.

(10) H. S. M. writes: 1. On the hub of a wagon wheel is a fly and on the felloe is a bee; which of the two rides the farther, the wagon being driven straight ahead for a period of 15 minutes? The bee beats the fly by the difference in the length of the two cycloidal curves which their positions give by the revolutions of the wheel. 2. Does any part of said wheel move backward during said time or trip? A. It does not. 3. Which part of a fly wheel of an engine moves the fastest, the rim or hub? Engine running at same speed for both calculations. A. The rim moves the fastest.

(11) W. & W. ask: Can you inform us if glass sewer pipe has been manufactured anywhere in the United States? If yes, at what place, and has it proved a success? A. We do not know that glass sewer pipe has been used. It certainly cannot be sold for a price that will make it a success. There is no doubt as to its durability and sanitary value, as its smooth, hard surface offers no lodgment for germs or filth.

(12) D. R. C. asks: Is there any difference between an injector and an inspirator for steam boilers? If so, what is the difference? A. Inspirator is only a special name. They are both injectors.

(13) A. M. H. writes: I have a practical treatise on heat by Thomas Box, and on pages 130 and 131, the statement is made that cast iron flue dissipates 335 times as much heat as a sheet iron one under the same conditions. On page 148 it says the loss of heat by contact of cold air is independent of the nature of the surface. Page 146, by table of radiating power of bodies, the radiant power of sheet iron is given as 0.56620 and the radiant power of cast iron is given as 0.64800. This gives cast iron less than 1 more than sheet iron; which is nearest to the truth? Under the same conditions, which gives off the most heat by radiation, cast iron, plain or galvanized, or lacquered, and in what proportions? Can you give me any other cheap method of preparing the surface of cast iron (without polishing) to prevent much radiation from it, at 200° to 500° Fahr.? A. The figures given in Box's treatise are not altogether reliable, for the reason that he does not state the condition of the surfaces, whether smooth or rough, and the color of the radiating surface. This is a material point in the relative value of the radiation from different metals or materials. When the surfaces of sheet and cast iron are exactly in the same condition as to smoothness and color, the radiant power is in favor of the sheet iron. The roughness of cast iron by increasing its surface may give it an artificial advantage as a radiant body. For preventing radiation there is nothing better than a smooth, polished surface. The next best is a good coat of lime (whitewash).

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

G. D. C.—No. 1 is common mica in felspar. No. 2 is a black micaceous schist containing garnets; the red spots being the garnets.—H. S.—Specimen No. 1 is a black slaty serpentine. No. 2 is quartz with calcite (limestone), and No. 3 is a quartz.—J. L. T.—The mineral is pyrite (iron sulphide) of no value.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

October 16, 1883.

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and dates, including Accordion, L. Bernhardt, Agricultural boiler, F. Funk, Air compressor, hydraulic, H. Webster, Alarm, See Burglar alarm, Electro magnetic alarm, Low water alarm, Amalgamator, G. Dean, Animal matter, apparatus for desiccating, H. Breer, Annunciator and alarm system, combined, E. A. Sperry, Auger and bit blanks, roller die for making, C. O. Tinker, Auger, hollow, J. A. Rodman, Bag, See Paper bag, Bag holder, W. H. Dungan, Baling press, D. Boyer.

Table listing inventions with names and dates, including Baling press, W. H. Reynolds, Bandage, suspensory, C. F. Ware, Barber's chair, A. N. Hornung, Basket, wire, W. J. Moore, Bathing apparatus, vapor generator for, H. T. Willis, Bathing garment, L. Weil, Battery, See Galvanic battery, Beer chip, B. Rice, Bell, door, F. Lawson, Bicycle, J. Lewis, Billiard cue, W. Zaehring, Bit brace and washer cutter, combined, I. W. Heysinger, Bit stock, G. C. Paine, Boat knee, D. True, Boiler, See Agricultural boiler, Steam boiler, Boiler cleaner, J. McGinley, Bookbinding, L. R. Goodwin, Bottle cleaning machine, A. C. Weaver, Box, See Game box, Brace, See Bit brace, Ratchet brace, Bracket, See Dental engine suspension bracket, Brake, See Car brake, Brick kiln, C. D. Page, Brick machine, W. Andrus, Brush, H. E. Fowler, Brush, H. B. Williams, Burglar alarm, H. Ferris, Burner, See Oil burner, Butter, manufacture of artificial, A. J. Chase, Butter working machine, Wasson & Hitt, Button, snively, Palmer, Button fastener, H. Howson, Button fastening machine, A. Hall, Button, sleeve or collar, J. H. Booth, Buttons, attaching, G. W. Prentice, Buttons, attaching, F. A. Smith, Jr., Buttons, machine for attaching, F. A. Smith, Jr., Buttons, manufacture of, J. H. Manning, Cable, underground multiple wire, J. F. Martin, Can, See Ink can, Oil can, Shipping can, Can filling machine, J. Colbert, Car brake, G. M. Brill, Car coupling, W. K. Berry, Car coupling, M. E. McDonald, Car coupling, J. F. E. Phillips, Car coupling, Rigby & McHugh, Car coupling, W. S. Thayer, Car roof, J. Walter, Card grinding machine, C. B. Parker et al., Card, picture, C. Schwartz, Carpet cleaner, J. L. Leach, Carpet cleaner, S. B. Ryder, Carpet lining, Bird & PEMBER, Carpet stretcher, J. P. Curry, Carpet stretcher, A. J. Kennedy, Carriage register, wheel, J. E. Tarbox, Carrier, See Cash carrier, Cash and parcel carrier, Parcel carrier, Thrashing machine straw carrier, Cash and parcel carrier and track for the same, G. B. & J. C. Coram, Cash carrier, Allaire & Johnson, Casting apparatus, soft metal, R. J. Howdon, Cattle on vessels, fittings for carrying, T. Utley, Chair, See Barber's chair, Folding, bath, and invalid chair, Turning chair, Channel flaps, machine for flattening and smoothing, G. W. Day, Chart hanging, E. Shepard, Chimney top, W. Faulstich, Christmas tree candle holder, F. Arzt, Clamp, A. W. Davis, Cleaner, See Boiler cleaner, Carpet cleaner, Clothes drier frame, adjustable, M. A. Warren, Copying and printing press, F. D. Belknap, Corset stiffener, E. K. Warren, Coupling, See Car coupling, Thill coupling, Cover, vessel, S. J. & N. T. Wilson, Crayon or lead holder, H. C. Hunt, Creamer, centrifugal, H. F. Bond, Crib, child's, C. S. Comins, Crusher, See Ore crusher, Cultivator, D. Wise, Cupric sulphate, making, H. Rössler, Curtain fixture, M. Medart, Curtain pole ring, W. Lang, Cuspidors, etc., manufacture of and mould for making, W. A. Krouse, Cut-off valve, C. B. Turner, Cutter, See Planing machine cutter, Sod cutter, Tobacco cutter, Cutting die, I. A. Canfield, Damper, automatic, B. Higgins, Dental engine suspension bracket, W. A. Johnston, Dental plate, temporary, G. F. Reese, Desk, school, W. H. Dodge, Die, See Cutting die, Displaying articles in the air, apparatus for, C. B. Linton, Ditching machine, tile, W. S. Hanson, Door hanger, C. Brinton, Door lock, W. D. Hughes, Dramatic effects, apparatus for producing illusory, J. W. Kneil, Drawing knife and attachment therefor, A. W. Crossman, Dredging and excavating apparatus, A. D. Fox, Drier, See Fruit drier, Electric circuit closer, thermometric, M. Martin, Electric conductor conduit, J. F. Martin, Electric conductors, making, T. Eggleston, Electric currents, apparatus for controlling, M. Levy, Electric machine, dynamo, E. J. Houston, Electric regulator for controlling the current in electrical systems, M. Levy, Electric wire conduit, J. F. Martin, Electric wires, distributor for, J. F. Martin, Electric wires, distributing box for, J. F. Martin, Electric wires, underground distributor for, J. F. Martin, Electrical conductor, T. S. Reed, Electro magnetic alarm, A. Wiswall, Electro magnetic motor, S. F. Van Choate, Electrotype plate, S. S. Hoe, Elevator, E. Bachmann, Elevator bucket, S. L. Chapman, Elevator safety appliance, R. A. Chesebrough, End gate, wagon, W. Beckwith, End gate, wagon, P. Smith, Endless band knife, J. A. Kay, Engine, See Rotary engine, Rotary steam engine, Traction engine, Envelope, J. H. Weaver, Eraser, L. Wolf, Escapement, R. J. Clay, Evaporator, E. Slaght, Excavator, See Snow excavator.

Table listing inventions with names and dates, including Extension table, C. N. Karstens, Eyeglass, Wells & Preux, Faucet and barrel bung, E. T. Murphy, Felly jointing machine, L. D. Bullock, Fence, Comstock & Adams, Fence, B. F. Perry, Fence, G. Watt, Fence lock, B. A. Welds, Fence post, J. W. Walters, Fence wire, barbed, W. V. Kay, Fence wires, apparatus for attaching barbs to, Randel & Broekner, Fertilizer distributor, Cunningham & Bickford, Filter for the manufacture of sugar, etc., O. Purvrez, Firearm, breech-loading, L. Nagant, Fire escape, A. N. Sande, Fire escape, Seagrave & Fuller, Fires in buildings, method of and appliance for controlling and preventing, Maxwell & Stearns, Jr., Fishway, C. W. Trammer, Floor jack, J. H. Williams, Folding, bath, and invalid chair, F. A. Ufer, Folding table, C. E. Abbot, Fork guard, G. H. Warren, Forkguard, G. T. Wiswell, Frame, See Clothes drier frame, Mattress frame, Mosquito bar frame, Saw frame, Window frame, Fruit drier, Loughead & Fleming, Fruit jar opener, G. A. M. Liljencrantz, Fur cape and waist, D. Prince, Fur robes, machine for cleaning, F. Hosch, Furnace, See Roasting and smelting furnace, Smelting furnace, Furnace, J. S. Williams, Furnace door, E. Fox, Furnaces, device for promoting combustion in boiler, I. W. Seaveus, Jr., Furnaces, draught pipe for steam boiler, F. Mertsheimer, Galvanic battery, A. Haid, Game apparatus, C. S. Thompson, Game box, combination, J. W. Boteler, Gas machine, L. Taylor, Gas, manufacturing, A. P. Chamberlain, Gate, See End gate, Railway gate, Gate hanger, C. Daniel, Glass grinding, smoothing, and polishing machine, T. Archer, Glass tiles for floors, etc., mould for, L. D. Woodworth, Governor, electric, E. B. Parkhurst, Grain binder, J. P. Bullock, Grain binder, O. Ferguson, Grain binder knotting mechanism, P. F. Hodges, Grain conveyer, F. Bierce, Grain cutting machine, S. K. White, Grain machine for reducing wheat and other, O. H. Titus, Grain meter, automatic, G. W. Sharp, Grain, mode of and mechanism for cleaning, W. L. Teter, Grate, J. Ballou, Grease trap, J. Tucker, Grinding metal plates, machine for, T. Settle, Grinding mill, G. B. Maynadier, Grinding mills, automatic feed regulator for, J. W. Hilliard, Grinding ring, metallic, E. S. Rowland, Guard, See Fork guard, Saw guard, Vulcanizer safety guard, Halter, A. G. Garfield, Halter loop fastening, J. Gibbons, Handle, See Saw handle, Handles to vessels of enameled ironware, attaching, F. G. & W. F. Niedringhaus, Hanger, See Door hanger, Wall paper hanger, Harrow, W. P. Triggs, Harvester, corn, J. S. Briggs, Harvester, corn, S. F. Weaver, Harvester reel, W. F. Olin, Hat brim curing machine, F. Cocker, Hat pressing machine, J. P. Beatty, Hay and cotton press, W. J. F. & W. S. Liddell, Hay rake, horse, E. Wayland, Hinge for vessels of enameled ironware, F. G. & W. F. Niedringhaus, Holder, See Bag holder, Bill holder, Christmas tree candle holder, Crayon or lead holder, Trace holder, Hook, See Safety hook, Horseshoe, F. C. Rollins, Hot air magazine, J. H. Spurrler, Ice blocking, G. W. Goodell, Ice creeper, H. Cottrell, Ice, machine for cutting holes through, E. Fitzgerald, Incubator, C. F. Winkler, Ink can, W. A. Auble, Inkstand, pocket, O. Jansson, Insulating wrapper for grouped electrical conductors, J. H. Kohmescher, Insulator, Fiske & Mott, Insulator, acoustic and electric, W. J. Bowen, Insulator, electric wire, J. F. Martin, Insulator, electrical wire, J. F. Martin, Insulator for underground electric conductors, J. F. Martin, Insulators for electric wires, coupling for tubular, J. F. Martin, Insulators for electric wires in underground conduits, supporting, J. F. Martin, Jack, See Floor jack, Lifting jack, Jeweler's findings, manufacture of, G. H. Fuller, Joint, See Railway rail joint, Journal bearing, D. A. Hopkins, Journal bearing, S. Willis, Kegs, machine for dressing the interior of, L. & J. A. Weindel, Kiln, See Brick kiln, Knife, See Drawing knife, Endless bar d. knife, Ladder, step, C. A. Jones, Lamp chimney cap, E. U. Wiesendanger, Lamp, electric arc, D. J. Hauss et al., Lamp, incandescent, electric, D. G. Fitz-Gerald, Lamp, street, H. S. Belden, Lamp, voltaic arc, O. A. Moses, Lasting machine, M. Brock, Latch door, F. J. Lee, Latch, reversible, C. E. Billings, Lathe stop mechanism, engine, W. H. Coxon, Lathe tool rest, E. S. M. Fernald, Lathe, turning, F. Hanson, Lathe, turning, E. R. Kugler, Lathe, wood turning, F. Hanson, Lead, apparatus for drying white, J. C. Martin, Lead, etc., apparatus for grinding white, J. C. Martin, Leveling instrument, W. & L. E. Gurley.