

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

SLEEPING CAR BERTHS.—Simon Cullen and Carver C. Brown, Alexandria, La. This invention provides a ladder attachment for such berths, by means of which a person can readily get into and out of a berth, while it can be used as a guard to keep one from falling out of a berth, and folded up out of the way when not in use.

ELECTRIC TRACK ALARM.—Theodore Taylor, Cedarville, Cal. Combined with the railway rails are conductors connected therewith by suitable fastenings, insulated and arranged to form a complete electric circuit, including a battery and an alarm device, for indicating when the track is broken or displaced.

PNEUMATIC TRACK ALARM.—This is a further invention of the same inventor, with a similar object, to give an alarm when any of the track rails are broken or displaced, the invention consisting of pipes extending along the flanges of the rails and connected with an air pump and a signal for denoting when a rail and pipe break.

Mechanical.

PIPE CUTTER.—Vernon B. Stevens, Bridgeport, Conn. This invention is designed to cheapen and improve the construction of cutters employing circular cutting blades pivoted in a jaw and stock adjustably connected together, the stock being recessed and the lower cutter blade placed therein and directly connected to the handle, avoiding all connection of the cutter block with the outer curved jaw.

BALING PRESS MECHANISM.—George Ertel, Quincy, Ill. The special object of this invention is to provide a simple, efficient, and inexpensive power mechanism for giving two effective strokes of the plunger in the baling box for each complete rotation of the sweep, one bale being pressed behind another as the tied bales are discharged from the contracted open rear end of the press case.

BOX FOR SHAFTS.—Edward H. Bridgman, Pittsfield, Mass. This invention relates to adjustable boxes for slitter shafts, in order that when the dekle straps on a paper-making machine are not set correctly, the slitters on the shafts running in these boxes may all be moved with the shaft, forward or backward, to properly cut or divide the sheet of paper, or trim both edges alike.

BASKET MAKING MACHINE.—Isaac J. W. Adams, Laurel, Del. In this machine a form is used comprising semicircular metallic plates registering to form rings of varying diameter, provided on their inner faces with hoop-receiving spaces, semicircular spaced hinged ribs, to the inner faces of which plates are secured, and semicircular bars securing the ribs of each section together.

WELL BORER.—Benjamin Andrews, New Orleans, La. A boring head is journaled to the well tube, while a water tube is connected with the boring head and constructed to fit snugly therein, whereby water forced down the water tube will be prevented from passing up between it and the boring head, with other novel features, the invention being an improvement on a former patented invention of the same inventor of apparatus for boring artesian wells.

PRINTING MACHINE.—William O. Nelson, Baltimore, Md. This is intended for the hand stamping of dates, addresses, etc., and particularly adapted for desk use in offices, a rubber type plate being preferably used, attached to a type carrier that reciprocates vertically and descends into contact alternately with the inking pad and the surface to be printed, the pad being attached to a horizontally reciprocating platen.

Miscellaneous.

KITCHEN SAFE, ETC.—David Pentz, Shippingport, Pa. This invention provides a combined article, adapted for use as a bread raiser as well as a bread safe or table, consisting of a box with a double hollow bottom, in communication with which is a lamp chamber, the box being metal lined, and embracing various novel features in its construction.

GATE.—Thomas Tyson, Mound City, Mo. This is a gate especially adapted for farm use, being of simple and durable construction, and of such design that it may be opened from either side by the weight of the vehicle or by a person walking or riding along the road.

CAMPAIGN BUTTON.—Leon Winterdorf and August Reymond, New York City. The button head is made hollow and fitted with a slide, on the face side of which is to be delineated the desired portrait, which is adapted to be drawn out when desired, the portrait slide when released being automatically returned to its normal position within the button again.

LACE PIN FASTENING.—Milton E. Oppenheimer, New York City. In this fastening is a tube having a pin slot, a sleeve surrounding the tube and adapted to close the slot therein, and mounted on the body of the pin in position to engage and secure it against accidental unfastening.

LOOP TIE.—Josephine Muller, New York City. This is a tie for decorative scarfs or similar articles, and consists of a broad ornamental loop, with a relatively long cord attached thereto at one end, and with an ornamental appendage attached to its free end, being especially adapted for use in draping decorative scarfs applied to sofas, lounges, etc.

SAFETY SCAFFOLD.—John Carmichael, Brooklyn, N. Y. This is a scaffold for use by painters, masons, etc., and consists of adjustable back railing and end railings, all adapted to be secured to the ordinary scaffold, or detached therefrom and folded up when not in use.

WIRE FENCE.—William H. Mitchell, Horse Cave, Ky. This invention covers a novel construction and combination of parts whereby the several

wires of a fence are kept at the same tension, and any strain thrown upon a single wire will be distributed between all the wires, while the wires will be kept tight in both hot and cold weather, and the tension on them may be adjusted as desired.

BEER ENGINES.—James A. Bigelow, Melbourne, Australia. This invention covers an apparatus for drawing beer or other liquids from a receptacle in a cellar or store room, and delivering it to a bar counter, whereby also the beer or liquids may be cooled as desired, and several kinds of beer may be mixed before delivery.

DUMPING WAGON.—William Jachmann, New York City. Two nuts are connected with each other by a rod passing through recesses in the wagon body, upright screws being also held to turn in suitable bearings, on which screw the nuts and a turning mechanism located under the wagon body operate to impart a rotary motion, whereby the body can be quickly and easily raised to an inclined position to dump its contents.

BUILDING PAPER.—George Manahan and Henry Gade, New York City. This invention covers a composition for waterproofing and preparing sheathing and building paper, in which are used glue, amber mineral oil, and other ingredients, prepared and applied as specified.

WATER GATE.—Thomas A. Niswonger, Cleveland, Tenn. This gate is intended for use on small streams, and also as a flood fence, stout posts being sunk into the ground on opposite sides of the stream, supported by inclined braces, while the inner side of each post and brace has an inclined strip which forms a bearing for the axis of the gate.

DESK AND DRAWING BOARD.—Henry L. Keith, Stockton, Cal. This is a simple and inexpensive construction designed to serve as a writing desk, drawing board and easel, being capable of being readily adjusted for either of these uses, and so made that when not in use it can be folded up in small space.

SCIENTIFIC AMERICAN
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TABLE OF CONTENTS.

1. Plate in colors showing elevation in perspective and floor plans for a dwelling costing about four thousand dollars. Sheet of details, etc.
2. Elegant plate, in colors, of a residence of moderate cost, with floor plans, details, etc.
3. Perspective and floor plans of a modified Queen Anne cottage, at East Orange, N. J. Cost, six thousand five hundred dollars.
4. A cottage at East Orange, N. J. Plans and perspective.
5. Page engraving of a stairway in the Chateau de Chantilly. By Mr. H. Daumet.
6. Scenes at Zaandam, Holland, where the Czar Peter the Great learned shipbuilding in 1697.
7. Engraving of the new station and offices of the Great Indian Peninsular Railway, Bombay.
8. Perspective and plans of the new Biological Laboratory, Princeton College, New Jersey.
9. A residence at Roseville, New Jersey, costing five thousand dollars. Plans and perspective.
10. A cottage at Roseville, New Jersey, costing seven thousand dollars. Perspective elevation and floor plans.
11. The Orange Valley Church. Cost, sixty thousand dollars. Perspective and ground plan.
12. A residence at Fordham Heights. Cost, thirty-four thousand dollars. Elevation and floor plans.
13. Perspective view of the new Trinity Methodist Episcopal Church, Denver, Colorado.
14. Designs for wall paper decorations. Flower scroll, designed by A. F. Brophy. Strap ceiling, designed by G. A. Audsley. Arabesque panel decorations, paper for staircases, designed by Lewis F. Day.
15. Perspective and floor plan of an attractive carriage house in the Queen Anne style. Cost, nine hundred and fifty dollars.
16. Miscellaneous Contents: Something for architects and builders to remember.—Interior finish.—Sketch of Nathaniel J. Bradley.—Colored decoration of churches.—On estimating.—Crushing of masonry.—The oldest architectural drawing.—Mahogany.—Flexible foundations.—Treatment of the ceiling.—The teredo.—The oldest timber.—Compressive strength of bricks and piers.—Repetition of ornament.—The Thomson-Houston electric system for street railways, illustrated.—An excellent system of heating.—The Ball high speed engine.—Beading, rabbet, slitting, and matching plane, illustrated.—The Sturtevant system of heating and ventilating, illustrated.—H. W. Johns' liquid paints.—Soapstone laundry tubs and kitchen sinks, illustrated.—Carpenter's vice, illustrated.—Metallic hip shingles, illustrated.—Corrugated iron lath.—Weather vanes, roof ornaments, etc.

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Screw machines, milling machines, and drill presses. E. E. Garvin & Co., Light and Canal Streets, New York.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

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Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(759) L. A. V.—The chipping off of the porcelain lining on iron kettles is of no possible harm in the cooking of vegetables. Acid fruits stewed in such kettles turn dark in color and often taste of the iron, which injures the flavor only. Granite ware is the same as porcelain-lined in its cooking properties, but with chipped ware the flavor of the article cooked in it will be damaged. There is nothing unhealthy in the use of chipped porcelain-lined or granite ware.

(760) F. & M.—Cement for filling brass and zinc signs is made by mixing asphalt, shellac, and lamp black about equal proportions, or black sealing wax may be used. Apply by heating the plate and melting the cement in and evening the surface with a warm iron. Then carefully scrape off the excess and hold a hot iron over the letters to glaze the surface. Any ordinary sheet brass or zinc is suitable for signs. They are engraved, etched, or stamped. Nitric acid 1 part to 1, 2, or 3 parts parts of water is used for etching. There are no books on the subject of sign making. "The Etcher's Guide," by Bishop, we can mail for \$1.

(761) J. W. B.—"Crawley" root is a corruption of coral root, the popular name of the plant *Corallorhiza obovata*. The plant is an orchid and grows in rich woods from New York to Michigan, and especially southward. The generic and popular names

refer to its much-branched and coral-like rootstocks, the shape of which has given it also the name of dragon's claw. Medicinally (mostly in eclectic and domestic practice) the root has been used as a diaphoretic in fevers and inflammatory affections. The plant is small, yellowish, with a rather fleshy, leafless, purple sheathed stem, 8 to 12 inches high. The flowers, 10 to 20 in number, grow in a long spike, are small and purplish and spurless, and the lip, which is dilated and white, is finely spotted with purple. These are the main botanical features.

(762) G. H. M. asks: What would be the lifting power of a propeller 10 feet in diameter on a vertical shaft running six hundred revolutions per minute in air, also the best pitch for blades of propeller, and how much power would it require? A. You may obtain a lifting pressure of from 15 to 20 pounds per square foot if the fan is arranged for the best blast. The pitch should be about 35° to the plane of motion—15 to 20 horse power will be required.

(763) E. T. H. writes: I have an engraved copper plate and wish to print the same on my photographic mounts. Please inform me how to do this. A. It will probably have to be done by a regular copper plate printer. The plate must be perfectly clean and highly polished. It is warmed, and inked while warm, the ink being applied with a dabber or roller. The surface is then wiped with a cloth in two directions, and finally with the palm of the hand sprinkled with a very little whiting. The edges are then wiped off, the paper or card is put on it, and covered with some thicknesses of cloth or blanket, and the whole resting on a steel plate is passed through the rollers of a copper plate press. The ink in the grooves of the plate is transferred to the card. A very intense pressure is needed to effect the printing.

(764) Q. A. S. asks: 1. Will you give me the receipt for a fireproof cement? I wish to pour it into a complicated mould, then have it harden, take it out of mould, and submit to intense heat. A. You can use clay, introducing it into the mould by pressure. You will have much difficulty in obtaining a mixture that will pour and give any satisfaction. Plaster of Paris mixed with silicate of soda and water might answer, but would not stand really intense heat. 2. If two copper pipes (1/4 inch diameter) were brazed together with a 90° miter joint, would the joint stand 300 pounds cold pressure? A. Yes. 3. If the pipes were of steel and I had the joint electrically welded, would they then stand the same pressure? A. It would be stronger than a brazed joint between the same metals.

(765) J. G. I. asks: 1. Have the attempts which have been made at working the typewriter by electricity (so that letters might be printed at any given distance apart) proved successful? A. Yes. 2. If so, is there a wire to carry the current of electricity, for each letter, numeral, and point represented on the keyboard of the typewriter, or does one wire furnish the current for the working of the whole instrument or instruments? A. One wire is sufficient for all of the operations.

(766) J. P. S. asks: Does the current or message sent over a telegraph line with ground wires at each end pass through the earth to the starting point the same as if a return wire is used instead of the earth? A. The earth becomes practically a common reservoir of electricity. It does not act as a return wire, as the current becomes diffused. The separate impulses are lost.

(767) J. W. F. asks: 1. How gilt edging is put on scolloped cards? A. In gilding the edges of cards, bronze powder is used, which is applied to the cards in packs by first brushing the edges with a thin size, and when nearly dry the powder is applied with a piece of soft chamois or fur. 2. What is the composition that is put on tablets in the place of glue, and which is flexible? A. The tablet composition is glue, with a little glycerine added to keep it from hardening. The glue is sometimes colored with aniline purple or red. We can send you Holbrook on "How to Strengthen the Memory" for \$1.

(768) F. S.—The pressure of the steam on the piston is not equal through the stroke, and the pressure on the crank pin is also variable with its position at various points in its revolution. The office of the flywheel is to equalize these variable forces as much as possible. In practice the flywheel and attached machinery has a perceptibly increased speed when the crank pin is near the point represented by the middle of the piston stroke. Centrifugal force has much to do with the vibration of machinery. Unequal balancing is the direct cause. See the "Practical Steam Engineer's Guide," by Edwards, which we can mail for \$2.50.

(769) J. Z. G. asks how to mix plum-bago in order to make a mould for casting small articles in lead. A. Mix with 10 per cent pipe clay and water to make a stiff putty. Shape the mould and dry in an oven. If to be much used, bake at a red heat.

(770) E. M. C.—Bagging or bulging of boiler plates over the fire is in nearly every case traced to the use of oil in the boiler. Oil is sometimes inadvertently fed to boilers by the false economy of turning the exhaust steam into the water tank, where the engine oil is caught and pumped into the boiler. Oil gathers the scum and dirt into a cake, which may settle on the fire sheet and thus prevent contact with the water. The intense fire heats the iron red hot and the pressure bulges the plate. Scale, if allowed to accumulate in large quantities, may possibly also cause bulging, but we have yet to see the first case in a cylinder boiler that was not traced to oil.

(771) B. S. T.—For belting the wooden pulley gives the best friction, or allows the least slip.

(772) J. S. B.—Steel tapes have the divisions and figures printed with an acid resisting ink and are then immersed in weak acid to etch the background, which leaves the figures bright after the ink is cleaned off.

(773) J. H. S. asks: 1. What is the national air of America; if America, is it not the same as "God Save the Queen," and who was the composer? A. Probably "America" and the "Star Spangled Banner"

would be about equally considered national airs. The music of the former is substantially the same, as that of "God Save the Queen," or "God Save the King," as it was first known. There is every reason to believe that the tune was composed in the time of James I., by Dr. John Bull, but it was not by him used for a national hymn. One Anthony Young, organist of All Hallows, Barking, adapted it to a "God Save the King," for James II., at the time when the Prince of Orange was hovering over the coast, but it was not so used until the time of George II. A letter from Victor to Garrick, October, 1745, mentions that it was sung at both theaters nightly amid great applause. It is a singular coincidence that Young's daughter was married to Arne, who composed "Rule Britannia." Mrs. Arne received a pension of £30 a year. In 1789 Mrs. Henslowe, who was grand-daughter of Mrs. Arne, received £100 from the government as "the accumulated amount of a yearly pension of £30 a year, awarded to Mrs. Arne as the eldest descendant of A. Young, the composer of 'God Save the King.'" The tune is almost a literal translation of a cantique sung by the Demoiselles de St. Cyr, when Louis XIV. attended morning prayer at that chapel. The words were by M. De Brion, and the music by the famous Sully. The "Star Spangled Banner" was first applied to the flag of the United States in a poem written by Francis S. Key, on the morning after the British attack on Fort M'Henry at Baltimore in 1812. The bombardment, which took place during the night, was witnessed by Mr. Key, who with some friends watched with intense anxiety for the return of day. At length the light came, and they saw the American flag still flying from the fort, the attack having failed. In the excitement of the moment he wrote the now famous song, the first verse of which so graphically describes the scenes of the night and morning. 2. Will a No. 3 pump, on a two inch pipe, throw water faster, than a No. 2 pump on same piping (well 20 feet deep)? If so, why? A. There are similar proportions in the steam and water pistons of most pumps. The water pressure would be nearly the same in No. 2 and No. 3 pump of the same make. The only gain a No. 3 pump would have is to throw more water with less speed. The piping should be of the assigned sizes due to the size of the pump for a proper proportion of work. 3. When a tree is felled, what force draws it in falling away from the stump? A. The manner in which a tree falls is largely due to the skill of the woodman, who takes advantage of the wind, the way the tree stands, etc.

(774) H. A. M.—Brick tiling on flat roofs cannot be made tight with cement. The tiles will absorb water. The cement will also open a little by the sudden shrinkage from the heat of the sun to the temperature of falling rain. We can only recommend a coat of coal tar, which allow to dry and then put on a thick coat of coal tar and asphalt, put on hot, and spread over with clean coarse sand, thick enough to keep the tar and asphalt from running by sun heat. See answer to Query 601, in our issue of April 13.

(775) B. V. G. asks (1) how a cable car rounds a curve. A. The cable is kept in place by flat-faced pulleys on vertical shafts, arranged around the curve, so as to just clear the grip in its passage around the curve. The grooved pulleys carry the cable just below the bottom of the grips, so that the cable in the grip is raised out of the pulley groove when passing. 2. Why the steamboats using electric headlights have the headlight glass cut in strips about 3/4 inch or 1 inch wide. A. The glass in the headlights is cut into strips to prevent breakage from the high heat of the arc.

Books or other publications referred to above can, in most cases, be promptly obtained through the SCIENTIFIC AMERICAN office, Munn & Co., 361 Broadway, New York.

NEW BOOKS AND PUBLICATIONS.

MAY TIME. A compilation, by Marcus Benjamin, of sundry poems. 84 pp. 25 cents. New York: De Witt Publishing House.

EXAMINATION OF WATER FOR SANITARY AND TECHNICAL PURPOSES. By Henry Leffmann, Ph.D., and William Beam, M.A. Philadelphia: P. Blakiston, Son & Co. 1889. Pp. 106. Price \$1.25.

This convenient little manual contains within small compass an excellent resume of methods of water analysis. The determinations of solid matter, of nitrogen in its various forms, of phosphates and oxygen required to oxidize organic matter are all treated. The all-important subject of interpretation of results has devoted to it a special chapter. A chapter giving analytical data and an index close a very useful work.

INDEX OF PUBLICATIONS ON METHODS OF COMMUNICATION IN THE FIELD AND ON TORPEDO WARFARE. By R. Von Fischer-Treuenfeld. London: Alabaster Gatehouse & Co.; New York: D. Van Nostrand. Pp. v, 71.

The title of this book tells its story. From military telegraphy, through signaling, both audible and visible, ballooning, carrier pigeons, dogs and velocipedes, torpedo service, electric light apparatus, and many other subjects, down to cryptography, the literature is indexed in twenty-nine divisions. This gives the titles of the papers and publications. An index of authors' names, referring back to the main work, completes it, giving an excellent presentation of the subject.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

April 16, 1889,

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers, including items like Acid, alizarine green sulpho, R. Bohn; Air brakes, flexible piping for, D. M. Legat; Alarm, C. Agerskov; Alizarine-blue green, R. Bohn; Anchor, folding, T. S. Laughlin; Armature, dynamo, C. O. C. Billberg; Atomizer, G. Kneuper; Axle oiling device, locomotive, T. J. Rogers; Bag, See Paper bag; Baling presses, power mechanism for, G. Ertel; Barrel cover, G. W. Lindsey; Barrels, etc., apparatus for shaving, Gibson & Ray; Basin or bath waste and overflow, W. H. Newell; Baskets, machine for making, I. J. W. Adams; Batteries, automatic cut-out for secondary, S. C. C. Currie; Batteries, therapeutic attachment for galvanic, C. V. Osborn; Battery, See Secondary battery; Battery zincs, making, H. G. Farr; Beer engines, construction of, J. A. Bigelow; Bell, pneumatic, R. P. Garsed; Belting, R. Dick; Belts, making flat, R. Dick; Bicycle, R. H. Fletcher; Bicycle gearing, W. J. Fitzpatrick; Blacking, shoe, C. D. St. Pierre; Blast furnace, E. Walsh, Jr.; Blast furnaces, charging apparatus for, E. Walsh, Jr.; Block, See Flooring block. Paving block. Snatch block; Board, See Trimming board; Boiler, See Steam boiler; Boiler, E. W. Poorman; Boilers, low water indicator for steam, P. J. Grau; Bolts, machine for cutting the screw threads on, J. M. Simpson; Bonbons, making soluble, L. Oberhaeuser; Books, carbon paper attachment for receipt or note, H. C. Seely; Bottle washing and brushing machine, C. B. Inman; Box, See Cock box. Dredge box. Miter box; Box cover, W. Sharnweber; Brace, G. T. Sutterley; Bracket, See Scaffold bracket; Brake beam, W. A. Pungs; Buggies, stop plate for, Stewart & Chambers; Burner, See Gas burner. Hydrocarbon burner. Vapor burner; Buttonhole strip, H. W. Lyon; Button setting machine, J. H. Vinton; Calculating machine, E. M. Rosenthal; Calendar, S. W. Balch; Can, See Oil can; Candlestick, A. Roelofs; Car berths, ladder and guard for sleeping, Cullen & Brown; Car, combined sleeping and day, H. M. Jones; Car coupling, J. O. Bryant; Car coupling, Case & Preston; Car coupling, D. U. Graveline; Car coupling, A. W. McKenzie; Car door fastening, P. H. Murphy; Car, electric alarm advance, H. Riesenbergh; Car for live stock, H. Baines; Car frame, railway, M. A. Zurcher; Car, hand, F. A. Staser; Car, railway, M. A. Zurcher; Car, railway, E. Wenigmann; Car, sleeping, T. W. Moore; Car starter and brake, combined, S. B. Fyler; Car wheel, H. W. Libbey; Cars, ticket box for street railway, S. H. Caughy; Carbazol yellow, R. Bohn; Carbon filaments, manufacture of, E. P. Thompson; Carbon filaments, manufacture of incandescing, E. P. Thompson; Carriage curtain fastener, S. P. Scott; Carrier, See Cash carrier. Egg carrier; Cart, hand, A. Schubert; Cash carrier, D. Lippy; Cash indicator and register, W. W. Wythe; Center of attraction in polarized bodies, determining the, A. Gipperich; Chair, See Iron chair; Chairs, spring attachment for rocking, W. I. Bunker; Check spreader, overdraw, S. E. Harsh; Cigar bundling machine, A. E. Pye; Cigar making machine, W. M. Steine; Clamp, See Wood working clamp; Clasp, See Corset clasp; Clasp, F. B. Spooner; Clip, See Wagon clip; Clock, A. Jungmans; Clothes pounder, L. N. Martin; Cock box, stop, P. H. Gundermann; Cock or faucet, F. B. Ray; Coffin fastener, W. A. Sparks; Coin assorter, J. Roggy; Colter attachment for plows, W. J. Edwards; Commode, J. A. Bell; Concrete pavement and floor, P. M. Bruner; Cooking apparatus, H. H. Boggs; Copying writings, apparatus for, F. A. C. Zabel; Corkscrew, Alvord & Brown; Corn cob pipes, manufacturing, A. Ruth; Corpse dressing table, C. Green; Corset clasp, J. H. Haviland; Coupling, See Car coupling. Tube coupling; Coupling pin, F. L. Remington; Crane, traveling, J. Walker; Cultivator, J. Shoolbred; Cultivator, H. Staggs; Cultivator, cotton, J. Marion; Curtain pole socket, H. Reubel; Cutter, See Feed cutter. Pipe cutter; Dampers for fireplaces, etc., device for operating, A. V. Bay; Dental vulcanizers, regulating valve for, I. Stuck; Desk, drawing board and easel, combined writing, H. L. Keith; Dial, timepiece, M. V. B. Ethridge; Display rack, R. Kaufmann; Door check, W. S. Barlow; Door check, M. H. Bassett; Dredge box, J. W. Ivory; Dredging bucket, R. Horsford; Drill, See Ratchet drill; Drilling tool, A. E. Brown; Drum and gripper, combined, H. Fletcher; Duplex engine, direct-acting, C. C. Worthington; Dust collector, Leduc & Weeks; Dye, crimson, T. Diehl; Easel and sheet music cabinet, combined, O. Stoddard; Egg carrier, C. F. A. Eddy; Electric currents, distribution of, E. Thomson; Electric lighting, system of, T. A. Edison; Electric lighting, wiring structures for, Johnson & Greenfield; Electric locomotion, system of, F. Wheeler; Electric machine, dynamo, E. Weston; Electric wire nail, C. A. Gildemeyer; Electro-magnetic motors, operating, N. Tesla; Electrotypes, forming curved, Benedict & Furlong; Elevator, W. H. Milliken; Engine, See Duplex engine. Gas engine. Motor engine. Steam engine; Envelope machine, A. A. Rheutan; Envelope machine, F. H. Richards; Fan, suspension fly, W. C. Whitner; Farm gate, C. M. Gitt; Feculent matter receiver, O. D. McClellan; Feed cutter and cornhusker, combined, A. Rosenthal; Fence, wire, J. N. & N. Lehman; Fence, wire, W. H. Mitchell; Filter, oil, A. C. Darragh; Fire escape, S. H. Sprague; Fire escape ladder and truck, A. Frederick; Fires in passenger cars, device for extinguishing, S. H. Harrington; Flooring block, W. Boelling; Flushing device for urinals, Murphy & Atkinson; Flushing device for water closets, etc., Murphy & Atkinson; Frame, See Car frame. Umbrella frame; Fuel, artificial, A. E. & C. M. Murray; Funnel apparatus, jar holding, M. Ellis; Furnace, See Blast furnace; Furnace, M. A. Foster; Furnaces, indicating device for charging, E. Walsh, Jr.; Gauge, See Water gauge; Gas, apparatus for the manufacture of, C. M. Gearing; Gas, apparatus for the manufacture of, T. S. C. Lowe; Gas burner for heating purposes, P. Lesser; Gas engine, L. H. Nash; Gas engines, fuel mixing device for, L. H. Nash; Gas governor, H. J. Bell; Gate, See Farm gate. Tilting gate. Watergate; Grain binder, Eastman & Potter; Grain clipping machine, R. W. Welch; Guard, See Snow and ice guard; Hair holder, J. L. Hackett; Hammer, drop, F. M. Leavitt; Hand motor, C. E. Bromwell; Handle, See Tool handle; Handle, L. M. Devore; Hanger, See Spring hanger; Harvesting machine, corn, J. F. Steward; Harvester reel, J. F. Steward; Hay rake and loader, J. E. Shinn; Heater, See Tank heater. Water heater; Heating apparatus, H. Heim; Heating system, W. W. Canfield; Heeling machines, top lift carrier for, H. W. Winter; Heeling machines, top lift holder for, H. W. Winter; Hoes and shovels, machine for making, H. E. Marchand; Hoisting and loading machine, D. S. White; Holder, See Hair holder. Lamp holder. Pen holder. Refrigerator holder; Hook, C. O. Buell; Hub and axle, vehicle, J. R. Cole; Hydrant, J. Kaiser; Hydrocarbon burner for furnaces, Griffith & Miller; Indicator, See Cash indicator; Inhaling apparatus, E. Krull; Injector, steam, A. Lambert; Iron, See Waffle iron; Iron chair, A. M. Gjestvang; Iron ore, treating magnetic, G. Conkling; Knife, See Surgeon's knife; Knife for printer's use, L. J. Dus; Jack, See Lifting jack; Jetty, W. M. Douglas; Ladder, fire, L. Harris; Ladder, fire truck, C. Albert; Lamp, D. W. Parker; Lamp bulbs, exhausting electric, J. W. Packard; Lamp holder for vehicles, C. L. Ellicott; Lamp, incandescent, Lemp & Wightman; Lamp, incandescent electric, T. A. Edison; Lamp shade or reflector and guard, combined, C. A. Cooley; Lamp suspension device, Hammond & Merriam; Lamp with annular burner, oil, A. Cautius; Lamps, cut-out for incandescent electric, E. R. Whitney; Lamps, etc., extension fixture for, L. F. Griswold; Lamps, heating attachment for, J. W. Zinn; Lantern, electric, Cox & Van Dyke; Lantern, tubular, E. C. Glazier; Latch and lock combined, J. A. Campbell; Lath turret, C. I. King; Lathing, machine for forming sheet metal, J. Weichart; Lead, making white, J. Baldwin; Ledger or similar account book, J. W. Horne; Leg, artificial, C. A. Frees; Levers, foot for sand, C. Vezie; Lifting jack, W. M. Piper; Lifting jack, A. A. Strom; Liquids, apparatus for delivering, J. Jenkins; Liquids, device for agitating, R. S. Williams; Loom lease rod, Hobbs & Whelan; Looms for weaving fabrics having end borders, shuttle box pattern mechanism for, F. Hebden; Lumber piles, device for launching, H. Rich; Magnetic separator, G. Conkling; Marker, land, W. H. Boggs; Match, F. Leiss; Measurement apparatus, electrical, A. C. White; Measuring siphon, J. M. Clark; Mechanical movement, F. H. Richards; Medical compound, F. Kruger; Metal wheel, A. Keith; Mill appliance, H. Aiken; Miter box, W. H. Englehard; Motor, See Hand motor; Motor engine, Newall & Blyth; Mower, lawn, F. Enos, Jr.; Musical instruments, picking thimble for, N. E. Barnes; Nail, See Electric wire nail; Neckscarf, L. Cole; Necktie fastener, W. H. Glines; Net, fisherman's, J. F. Marsters; Nipple, nursing, R. Lockwood; Oil can, H. Muller; Ore concentrator, J. H. Pemberton; Ore separator, magnetic, C. C. Coats; Organ, O. C. Whitney; Oven for vapor or gas stoves, J. Stubbers; Oven, portable, J. Middleby; Padlock, G. Brambel; Panel raising machine, J. Green; Paper bag, E. E. Clausen; Paper folding machine, W. Downing; Pavement, laying artificial, J. W. MacKnight; Paving block, G. M. Graham; Paving block, W. & J. W. McReynolds; Pen holder, L. M. Hopkins; Photo-engraving, translucent film for use in the art of, C. A. Muller; Photographing instrument, G. A. Cooke; Pianofortes, sheet music support for, E. J. Snow; Pin, See Coupling pin; Pipe cutter, V. B. Stevens; Pipes, leak detector for, A. H. Brown; Plane, bench, F. M. Bailey; Planing machine feeding device, Welch & Auterrieth; Planing machine, wood, Wetherell & Jones; Planing machines, belt tightener for, E. F. Auterrieth; Plate, name and letter drop, W. Graham; Plow, S. Kauble; Plow, J. W. Webster; Pole or tower, J. W. Davy; Portraits, mounting, P. G. Kramer, Jr.; Press, See Printing press. Tobacco press. Press for bundle wrapping, self-locking, E. E. Porter; Printing machine, hand, W. O. Nelson; Printing machines, stop mechanism for cylinder, S. D. Tucker; Printing press, A. B. Carty; Printing presses, ink fountain for, A. B. Carty; Propeller and governor, chimney or stack, J. A. Robb; Propeller for vessels, current, E. Lotze; Pulley, H. J. Gilbert; Pulley changing device, Burbank & Church; Pulley, split, J. M. Pollard; Pulp board bending machine, wood, C. B. Jameson; Pump gearing, E. H. C. Oehlmann; Pump, mercury air, J. W. Packard; Punch, shears, and saw gummer, combined, J. Schofield; Rack, See Display rack; Rail spiking machine, Roberts & Caldwell; Rails, cast metal brace chair for girder, W. M. Brown; Railway alarm apparatus, automatic, W. Rymer; Railway spikes, finishing, H. Greer; Railway street, L. M. Hosea; Railway switch, E. Gordon; Railway switch stand, C. Alkins; Railway switches, interlocking signal apparatus for, F. H. Treacy; Railway systems, electric heating apparatus for, M. W. Dewey; Railway track alarm, electric, T. Taylor; Railway track instrument, G. C. Steenbergh; Railway vehicles, brake apparatus for, Cowburn & Tentschert; Railways, pneumatic alarm for, T. Taylor; Railways, underground conduit for electrical, F. H. Reed; Rake, See Hay rake; Ratchet drill, H. M. Glines; Ratchet drill, Rogers & Jones; Ratchet drill, T. N. Scott; Reapers and mowers, cutter bar for, J. I. Murray; Record, H. C. Seely; Reel, See Harvester reel; Refrigerator car, W. H. H. Sisum; Refrigerator ice holder and water escape, U. Reiffer; Register, H. S. Ross; Rheostat, N. Benardos; Riveting machine, H. S. Maxim; Rod, See Loom lease rod; Rolling bulb webbed slot rails, rolls for, F. Colley; Rolling machine, tire, J. Munton; Rolling three-flanged slot rails, rolls for, F. Colley; Rolling Z-shaped slot rails, rolls for, F. Colley; Ruler, N. Vermehren; Sail, ship's, J. Roberts; Sash fastener, R. A. Reisse; Scaffold bracket, E. A. Brace; Scaffold, safety, J. Carmichael; Scraper, E. L. Lefebvre; Scraper, road, H. C. Langebartels; Scraper, wheeled, F. A. Rathbun; Screw cutting machine, J. H. Sternbergh; Screw cutting machine, Sternbergh & Pemberton; Secondary battery, J. S. Sellon; Seeder, hand, T. R. Parry; Separator, See Magnetic separator. Ore separator; Separator, C. Hallett; Sewage purifier, J. J. Powers; Sewing machine thread cutting mechanism, C. F. Wilcox; Shaft, flexible power, O. J. Brown; Shaft support, E. Clark; Shafts, adjustable box for, E. H. Bridgman; Shaping irregular forms, self-feeding machine for, W. & G. M. Reid; Sheet metal vessels, mechanism for forming and sizing, A. Slaysman; Ships, machine for bending ribs or frames of, J. S. Mitchell; Shirt, H. W. Messer; Shirt, fannel, F. D. Renshaw; Shoe, C. H. Pearsall; Sifter, J. C. Fredericks; Slates, etc., composition of matter for the production of artificial school, H. Gallinowsky; Snatch block, B. H. Naves; Snow and cleaning streets, machine for melting, A. Hentschel; Snow and ice guard, S. R. Hawthorne; Soda, making, F. H. Gossage; Sole for rubber foot wear, protective, T. Regan; Spectacles, electro-therapeutic, C. Brust; Spinning frames, etc., guide tube for, S. Henderson;