

ENGINEERING INVENTIONS.

Mr. Daniel O'Connor, of Little Rock, Ark., has patented a device for changing the position of the target used for signaling purposes. The invention consists in a novel arrangement of a base or stand, a vertical crank shaft carrying the target, a sleeve, a latch, and a lever, whereby several advantages are obtained.

Mr. Orlando H. Jadwin, of Brooklyn, N. Y., has patented improvements in the system of cable traction for street railways, which consist, first, in the improved construction of grip mounted on the car which serves to clutch the traveling cable; and, secondly, in the improved construction of channel guide for the traveling cable and means for arranging the guide pulleys therein.

Mr. Aaron C. Vaughan, of Shaen's Crossing, O., has patented an improvement in T-shaped railroad rails, whereby great saving of steel in the manufacture of the rail is attained without decreasing the strength of the rail, and better joints formed between the rails and fish plates, thus relieving the tension on the bolts which secure the fish plates to the rails; and the invention consists in first cutting away, by a change of the angles, a part of the lower faces of the T-head of an ordinary T-rail, and adding a less amount of metal to the upper faces of the base of the T-rail, and forming curved indentations in the opposite inclined under faces of the rail head and in the opposite upper inclined faces of the base, or in the under face of the head alone. This construction will require less metal than the ordinary rail, and will form, also, much better joints with the fish plates to prevent them from slipping than the ordinary construction.

Mr. Joseph W. Putnam, of New Orleans, La., has patented an improvement in piles, such as are used as a substructure for bridges, etc. It is applicable for building high bridges over deep streams of running water. In such places the proper elevation of the bridge above the water, the depth of the water, and the necessary penetration of the pile into the mud or clay to get a solid support is such that it is not practicable to get piles from single trees of sufficient length and sufficient diameter to give them requisite strength to resist the current. This invention consists in a pile composed of two tree sections, having their larger or butt ends sawed off square and abutting against each other, in combination with two semi tubular metal clamp sections of a slightly smaller diameter than the pile ends. The semi-tubular sections have flanged edges, which, when bolted together, draw the splice sections together, compressing the ends of the piles and covering the joint.

MECHANICAL INVENTIONS.

Mr. Albert Slagle, of London, O., has patented an improved cork extractor having a base or foot provided with a horseshoe-shaped frame or standard, a corkscrew provided with bevel gear wheels for rotating it, and supported by a frame which slides between the branches of the horseshoe frame, and a lever for raising and lowering the frame.

An improved screw conveyer has been patented by Mr. William Walter Hewitt, of Swanscombe, County of Kent, England. This improvement relates to conveyers for carrying cement, grain, shingles, ballast, or other granular substances; and it consists in a U-shaped trough having the hangers with their upper ends resting thereon, and converging at their lower ends to support the conveyer shaft boxes or bearings centrally in the trough.

An improved car coupling has been patented by Mr. Daniel W. Deal, of Toddville, Ia. In this improved car coupling, each drawbar has a bevel head with shoulders behind it for being engaged by beveled hook catches, of which two are attached to each drawbar, so that when the drawheads of two cars come together, four hook catches automatically engage with the shoulders of the heads, said catches being arranged on pivots and suitably provided with springs for enabling them to so engage, and each drawbar is provided with means for disengaging the four catches.

Mr. Charles Drauly, of Carrizo Springs, Tex., has patented an improved wheel composed of sections which can conveniently be taken apart for transportation and united for use. The hub is formed of a tube provided with an annular shoulder, and having its outer end threaded, on which threaded end a nut is screwed, between the wider inner end of which nut and the shoulder of the tube the inner ends of the spokes are clamped, cushion bands and rings and metal bands and rings being interposed between the ends and sides of the spokes and the tube, its shoulder, and the inner end of the nut.

An improvement in sewing machines has been patented by Mr. Thomas J. Le Count, of New York city. The invention consists in a sewing machine in which the power is transmitted from the treadle shaft to the needle bar, shuttle lever, and feed directly by means of shafts and gearing, thereby avoiding the use of belts and pulleys, which rods and gearing are partly contained in an arm hinged on the top plate, which arm can be tilted to facilitate fastening the needle and other sewing attachments. In order to permit tilting this arm, the vertical drive rod is provided with a universal joint, and the part below the joint is squared, and slides in a sleeve with a squared aperture.

An apparatus for coiling wire for making spiral wire springs, or for making coils to be used in manufacturing mattresses or for any other purpose, whereby the coils may be made more easily and rapidly than heretofore, has been patented by Mr. Joseph A. Coultas, of Brooklyn, N. Y. In carrying out this invention two blocks of cast iron are employed, each formed with corresponding semi-cylindrical grooves, and adapted to be bolted together upon a table, so that the grooves will form a cylindrical passage, one of the blocks being formed with an orifice in its front, intersecting the cylindrical passage at about right angles thereto, and at or near its upper side, in combination with suitable rollers placed near the orifice for forcing the wire into the orifice and cylindrical passage.

AGRICULTURAL INVENTIONS.

An improvement in hedge trimmers has been patented by Mr. William F. Throckmorton, of Adair,

III. This improvement relates to hedge trimmers of the class shown in Letters Patent granted to the same inventor June 27, 1882, No. 260,255, in which machine a cutter bar is attached to a handle and fitted for operation by a crank. The present invention consists in the means for attaching and holding the cutter bar with the object to allow of its adjustment for trimming either the top or the sides of the hedge, and also in an improvement in the stirrup or clevis uniting the handle and the adjustable bar carrying the support for the machine.

A combined sulky plow, harrow, seeder, and roller has been patented by Mr. Daniel C. Beaty, of Olympia, Washington Ter. The invention consists of a machine having attachments contrived to perform all the operations at once without allowing the horses to step on the plowed ground.

An improved self-dropping check rower and marking attachment for corn planters has been patented by Mr. David McCansland, of Marshalltown, Ia. In this machine the seed slide is vibrated by means of tappets and cams.

Mr. James D. Patterson, of Competition, Mo., has patented improvements in that class of wheel plows in which the plows are alternately drawn forward by the truck. By these improvements the plow is rendered efficient, and its construction is simplified.

An improved check row planter has been patented by Mr. George W. North, of Burlington, Kan. The invention belongs to the class of planters in which the grain to be planted and the dropping mechanism, which includes an oscillating cup, are located in chambers formed within the wheels.

An improved corn planter, check rower, and drill has been patented by Mr. Simeon Smith, of Graymont, Ill. This invention relates to the construction and arrangement of the mechanism of a combined corn planter or drill, and check rower, the object of which is to simplify the construction and operation of such machines and improve their efficiency.

Mr. Lucien B. Beaumont, of Alexandria, O., has patented a plow or cultivator attachment composed of a single rod or bar coiled to form a fender, and having a portion thereof extended forward for an attaching arm, and the end turned back upon itself to adapt it to be clamped to the beam; the object being to allow fine soil to pass freely around plants, while preventing clods and stones from being thrown against the plants.

Mr. James D. Watters, of Belair, Md., has patented an improved fastening and releasing device for cattle stalls. This invention relates to that class of devices which are adapted to permit the fastening and unfastening individually of any one animal, and also the releasing simultaneously of the entire number, when desired; and it consists mainly in the combination of a sliding locking-bar with a sliding releasing-bar, and the crossbar of a chain.

Mr. John R. Owen of Pulaski, Tenn., has patented a combined cotton planter and fertilizer distributor constructed with an opening plow connected with the seed box by a groove and slotted bar, which serves as a bottom to the seed box. The seed box is supported upon wheels, and is provided with three cylinders having radial arms and with pulleys connected by an endless belt, whereby the cylinders will be operated and the fertilizer and cotton seed removed from the box by the advance of the machine. The machine is provided with a coverer, which also serves as a fastener to keep the seed box and slotted bar in connection.

MISCELLANEOUS INVENTIONS.

Mr. George W. Comee, of Waseca, Minn., has patented an improved burial case corner. The improvement consists in the method of securing the sheet metal in the ends or edges of the side and end pieces of the case.

Messrs. Timothy Kehoe and Joseph A. Bourke, of New York city, have patented a pool bottle constructed with two pins placed at such a distance apart as to receive a ball between them, and operated by a lever and a spring.

An improved fruit washer has been patented by Mr. Charles E. Marshall, of Lockport, N. Y. This invention consists of a vessel having a perforated false bottom, a filler, and a spout, and of a device adapted to regulate the opening of the cover of the vessel.

An improved sulky has been patented by Mr. Jesse C. Boyd, of Rushville, Ind. The invention consists in a seat provided with arms connected to the shafts by clips, and having C-springs interposed between the seat and axle.

An improved ditching and tile laying machine has been patented by Mr. Andrew S. Hughes, of Eldora, Ia. The implement has a cylindrical and pointed opener, diverging blades, and a colter for making the ditch, an inclined chute for receiving the tiles, and scrapers for covering.

A novel music holder for pianos and organs has been patented by Mr. Charles P. Byson, of Yonkers, N. Y. This appliance is to be used in connection with the common piano and melodeon music rack, and will hold music sheets of any size, also music books. It is compact and convenient.

An improvement in the suspender ends for attaching the suspender bands or straps to pants, has been patented by Augusta Netzner, of New York city. The suspender end is formed of crossed bands held together at the crossings by rings which pass over one part or strand of the band and under the other part or strand.

An improved opera chair has been patented by Mr. Bernhard H. Koechling, of New York city. The object of this invention is to provide opera chairs constructed in such a manner that the seats, when not in use, will turn up laterally against the side frames and the backs will swing forward against the seats, leaving a clear space.

An improved bee smoking apparatus has been patented by Mr. Tracy F. Bingham, of Bronia, Mich. This invention relates to improvements on the apparatus for which Letters Patent were granted to the same inventor January 29, 1878, No. 199,611, and reissued under date of July 9, 1878, No. 8,326.

Mr. James P. Winter, of Greenup, Ky., has patented a heat regulating and reflecting attachment for open fire places, calculated to control the draught, lessen the escape of the heat up the chimney, and increase the reflection of the heat into the room, so as to effect a large economy of fuel in open fire heaters.

Mr. Theodore Berteling, of New York city, has patented an improvement in flutes, which consists in novel arrangements of the key valves, whereby the F's can be produced by means of fork fingering, and can consequently be played much more easily and more distinctly and rapidly than in a flute of the usual construction. The volumes of the F tones and nearly all the other tones are greatly augmented.

An improved folding umbrella has been patented by Mr. Patritus F. McGuire, of New York city. This invention consists of a stick or staff having runners, braces, jointed ribs having sleeves and bands, a nut screwed upon said staff or upon a sleeve fitted on the latter, a cover adapted to be detachably connected to the ribs, and a cap nut fitting upon the umbrella and the nut.

An improved watch case has been patented by Messrs. Gustav Speckhart and Bernhard Vogel, of Nuremberg, Germany. The invention consists in a watch case formed of a crystal or front and back held together by an opening provided at the ends with half-pendants which are held together by a screw, so that the ring when closed surrounds the edges of the front and back, which are thus held in place.

An improvement in tricycles has been patented by Mr. John A. Edmonds, of Camden, Del. This invention relates to tricycles and other vehicles designed to be propelled by hand or foot; and it consists in a loose arrangement of the driving wheels on their axle, in combination with pawl and ratchet wheel connections to provide for either separate or joint rotation of the wheels on opposite sides of the vehicle.

An improved mode of manufacturing brackets has been patented by Mr. Alonzo Lambert, of Corona, N. Y. The invention consists in pressing the stock into a grooved die, then bending the turned up edges inward at right angles over rectangular wires placed in the angles of the stock while still in the die, then bending the inwardly projecting edges downward at right angles along the inner sides of the wires, and then bringing the bracket into shape upon an oval mandrel with a bending tool.

An improved automatic pencil holder has been patented by Mr. Joseph H. Wright, of New York city. This is an improvement on the pencil holder for which Letters Patent No. 245,267 were issued to the same inventor August 2, 1881. It consists in a reel provided with an annular groove for receiving cord or tape in its circular side, the outer edges of this groove being flush with the circular side of the reel, whereby a great length of cord can be wound on a reel of small diameter.

Mr. Lewis McLellan, of Gorham, Me., has patented an improved vessel for cooking, boiling, or preparing corn or other articles which it is designed to preserve in hermetically sealed cans. It consists in the peculiar construction of the boiler or vessel, and in the combination, with a steam trap, of the boiler, wherein is placed the corn or other article to be cooked by steam at a temperature higher than 212° Fahr., or by boiling under pressure as may be deemed best for the article to be prepared.

A device for attachment to one of the bars of a grate in an open fire place for the purpose of facilitating the heating of a vessel of water, and for other purposes, has been patented by Mr. John J. Mitchell, of Hopkinsville, Ky. The invention consists in a forked bar, for engagement with the upper bar of a grate, provided with a pivoted latch for holding it in position on the bar, and having a pivot for engagement with a socket on a swinging skeleton plate for holding a vessel to be heated.

A novel combined stereoscope and graphoscope has been patented by Mr. William H. Lewis, of Brooklyn, N. Y. This invention consists in a novel combination, whereby increased facility is afforded for dismembering and closely packing the instrument, for converting it from a standing instrument into one which can be conveniently held in the hand, for supporting and steadying the lazy-tongs frame of the instrument, and for insuring a uniform motion of opposite ends of the frame; likewise for utilizing the bar which carries the graphoscopic lens as an adjustable holder of the stereoscopic lenses.

Mr. Samuel Wilson, of Dallas, Iowa, has patented an improved fishing wheel having nets embraced in four or more sectors, each net having an opening made from the periphery or near it, and from which there is an escape passage from the center of the wheel, leading to a chute connecting with a cage net, all so arranged that the wheel being located in a fishway to be rotated by the water flowing against it or by another wheel attached to the shaft outside of the fishway, the mouths of the passages into the nets of the wheel will open at the rear of the wheel to the fish ascending the stream, to be entered by them as they attempt to pass under the wheel. As that side of the wheel rises the fish will be caught, carried up, and shunted out into the chute, by which they will be delivered into the trap cage.

A novel field stove and kit has been patented by Mr. Walter Clifford, of Fort Buford, Dakota Ter. This invention relates to that class of stoves used in traveling from place to place by soldiers and campers. The object of this invention is to furnish a stove which shall be light, durable, and capable of being packed in the smallest possible space. This is accomplished by constructing the stove body in the form of a parallelepipedon, having removable bottom and top plates; and in attaching to the rear end of said stove a removable extension somewhat less in length and of about half of the depth of said body, said extension having an opening in front coinciding with a like opening in the upper rear end of the stove, a second opening in the back coinciding with a like opening in the stove pipe, and a removable top; and in a stove pipe constructed in two or more sections, said sections decreasing in diameter from the bottom upward, and calculated to fit over each other.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

November 21, 1882.

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Mun & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications, not being printed, must be copied by hand.

Alarm. See Burglar alarm.
 Album clasp, A. R. Bolle..... 267,771
 Amalgamator, Bailey & De Figanere..... 267,768
 Amalgamator, W. H. Leininger..... 267,907
 Animal trap, B. F. D. Miller..... 267,915
 Annunciator, electrical, F. Tanner..... 267,807
 Arches, etc., construction of, J. H. Cruse..... 267,941
 Auger well, E. J. Mulkey..... 267,918
 Ax, W. T. Makepeace..... 267,708
 Axle, vehicle, E. Firth..... 267,698
 Axle, vehicle, Gambillee & Haring..... 267,872
 Bag machine, C. A. Chandler..... 267,774
 Baletie, O. P. Fannin..... 267,853
 Baling press, E. E. Fuller..... 267,971
 Bar. See Claw bar.
 Barrel holder, R. Courter..... 267,677
 Barrel swing and truck, W. Fancboner..... 267,744
 Battery. See Secondary battery.
 Bed bottom spring, W. P. Hennion..... 267,889
 Bed side rail packing block for shipment of bed rails, J. C. Hannett..... 267,982
 Beer, etc., stand for drawing, J. Hinkel..... 267,688
 Bench. See Folding bench.
 Bilge water indicator, J. M. Fennerty..... 267,556
 Bit stock, O. D. Warfield..... 267,732
 Backing stand, boot, M. R. Gannaway..... 267,873
 Block. See Pulley block. Sawmill head block.
 Blotter holder, W. J. Coughlin..... 267,676
 Board. See Electrical switch board.
 Book holder, C. J. B. & E. J. Whitehead..... 267,812
 Boot or shoe, G. S. Cook..... 267,840
 Boot or shoe, J. B. Farrar..... 267,745
 Boot or shoe soles, machine for producing stitch-impressions on, L. O. Makepeace..... 267,702
 Box. See Folding box.
 Bracelet, A. Engelmann..... 267,782, 267,851
 Bracelet, J. C. Harrington..... 267,886
 Brake. See Sewing machine brake. Wagon brake.
 Braking mechanism for machinery, Umer & Fowler..... 267,953
 Brick and tile machine, E. Fales..... 267,852
 Brick machine, R. B. Wilson..... 267,814
 Bronze alloys, marking, P. Dronier..... 267,742
 Brush searing device, J. S. White..... 267,957
 Buffer friction, T. Shaw..... 267,727
 Burglar alarm, electrical, C. A. E. Ruebel..... 267,977
 Button, stud, etc., sleeve, W. Durand..... 267,976
 Buttons from vegetable ivory nuts, forming, J. A. Conley..... 267,974
 Calorifere, Eberley & Richter..... 267,781
 Cap ornaments, manufacture of imitation bullion, E. R. Zalinski..... 267,816
 Car coupling, E. F. Beal..... 267,662
 Car coupling, C. Beebe..... 267,923
 Car coupling, R. T. Bishop..... 267,664
 Car coupling, Eltzroth & Raypholtz..... 267,850
 Car coupling, J. A. Frezier..... 267,968
 Car coupling, N. M. Hale..... 267,881
 Car coupling, E. M. Hobbs..... 267,749
 Car coupling, Y. P. Hudson..... 267,789
 Car coupling, F. C. Lynn..... 267,908
 Car motor, street, L. C. Parker..... 267,922
 Car railway hand, W. J. Brewer..... 267,772
 Car wheel, G. W. Miltimore..... 267,916
 Cars, sheathing and roofing for railway, Fulton & De Lauo..... 267,794
 Carpet renovator, C. Muldner..... 267,917
 Carrier. See Hay carrier.
 Cartridge shells, tool for crimping metallic, W. W. Greener..... 267,980
 Caster, O. Penderson..... 267,712
 Caster for dining cars, table, J. M. Blackburn..... 267,830
 Casting steel ingots, runner for, T. G. Wolf..... 267,960
 Catamenial sack and abdominal supporter, combined, I. Wasserman..... 267,956
 Chain, endless driving, G. B. Brayton..... 267,663
 Chair. See Reclining chair.
 Chimney top and ventilator, E. R. Stasch..... 267,805
 Chopper. See Cotton chopper.
 Churn power, I. V. Jones..... 267,988
 Chute, stock loading, D. E. Hogbin..... 267,891
 Clasp. See Album clasp.
 Claw bar, J. H. Lakey..... 267,695
 Coal box and fire iron stand, combined, F. Kersten..... 267,694
 Coat, A. J. Tower..... 267,729
 Cock and overflow, basin, J. Foley..... 267,923
 Cock, barrel, M. Hogan..... 267,785
 Cock, water, M. Hogan..... 267,787
 Collyrium, W. Schroeck..... 267,789
 Colter fastener, E. C. Eaton..... 267,846
 Commode, F. Mink..... 267,734
 Conduits, method of and apparatus for detecting leakage in, T. J. Bell..... 267,825
 Corset, C. A. Griswold (r)..... 10, 244
 Cotton chopper, scraper, and cultivator, J. P. Dever..... 267,843
 Cough remedy, H. Branch..... 267,738
 Coupling. See Car coupling. Thill coupling.
 Crayon or lead holder, F. W. Brooks..... 267,970
 Crusher. See Ore crusher.
 Crutch, J. A. Crandall..... 267,680
 Cultivator, H. H. Butler..... 267,670
 Cultivator tooth, A. S. Core..... 267,739
 Curtain pole ring, J. Kings..... 267,988
 Damper, stovepipe, L. & W. H. Berger..... 267,827
 Digger. See Post hole digger.
 Dish, table, E. A. Parker..... 267,921
 Disinfectant, F. Petri..... 267,926
 Distillation and purification of alcohol, apparatus for the, P. Claes..... 267,886
 Doors, stay roller for sliding, W. M. Brinkerhoff..... 267,832
 Drier. See Sand drier.
 Drill. See Grain drill.
 Drilling machine, R. M. McDermott..... 267,972
 Drying machine cylinder, A. A. Brigham..... 267,666

Edge setting or burnishing machine, R. Ashe... 267,767. Electric machine regulator, dynamo, J. R. Finney... 267,859. Electrical signaling apparatus, H. W. Southworth... 267,945. Electrical apparatus, commutator for, Peck & Chapman... 267,711. Electrical switch board, J. F. Gilliland... 267,747. Elevator guard, automatic, R. P. Rankin... 267,757. Engine. See Hydrocarbon engine. Locomotive engine. Rotary engine. Fan, exhaust, J. E. Mills... 267,707. Fanning mill, J. Luxem... 267,699. Farm and yard gate, automatic, M. L. Hawkes... 267,888. Faucet, C. Whittaker... 267,734. Faucet, self-closing, C. Whittaker... 267,733. Feed water heater, G. Miles... 267,797. Feeding and watering stock in cars, device for, A. D. Tingley... 267,810. Fence picket, W. Thomas... 267,948. Fence post, E. J. Major... 267,701. Fence post, wire, T. Rogers... 267,758. File holder and binder, newspaper, A. T. Dewey... 267,975. File letter, M. Herzberg... 267,890. Firearm holder, J. C. Petmecky... 267,714. Fire escape, I. W. Lincoln... 267,696. Fire in railway cars, apparatus for extinguishing. Brockway & Watts... 267,667. Fireplug, J. S. Harding... 267,885. Fireplace ash chute, Lord & Sawyer... 267,794. Fireproof material for ceilings, walls, safes, stoves, furnaces, bricks, etc., J. A. Moffitt... 267,755. Float valve, D. Young... 267,736. Folding bench, table, and settee, R. B. W. Pinckney... 267,928. Folding box, H. Ludlow... 267,698. Fountain, A. Hoak... 267,689. Funnel, H. G. Fisher... 267,861. Fur and other goods, ornamenting, A. Mayer (r)... 10,245. Furnaces, feeding device for blast and other, W. H. Allen... 267,819. Gauge. See Saw gauge. Surface gauge. Water gauge. Garden rake, cast steel, C. T. Beebe (r)... 10,243. Gas, apparatus for manufacturing wood, G. Ramsdell... 267,933. Gas burning apparatus, G. H. Burrows... 267,971. Gate. See Railway gate. Swinging and sliding gate. Gate, C. A. Wyman... 267,765. Generator. See Steam generator. Gig tree, Kellar & Ditzel... 267,900. Glass and metallic articles, manufacture of combined, A. W. Paull... 267,924. Glass blowing and shaping apparatus, Wright & Mackie... 267,962. Glass for decorative purposes, H. H. D. Peirce... 267,713. Glass globes, shades, and other articles, decorating, Nichols & Benas... 267,984. Glass mould and manufacture of glass signs, etc., T. B. Atterbury... 267,659. Gluing machine, W. Rabbe... 267,932. Glycerine from fatty matter, extracting, V. Litzelmann... 267,753. Gold and silver from gravel and sand, apparatus for separating, J. T. Long... 267,697. Gold and silver from their ores, extracting, C. A. Schaeffer... 267,723. Gold from its ores, process of and apparatus for extracting, A. De Figniere... 267,842. Governor, F. Anderson... 267,965. Grain binder, automatic, T. M. Rice... 267,984. Grain binder knoter, J. E. Huxton... 267,972. Grain drill and cultivator, J. J. Clayton... 267,671. Grain drill, force feed, C. E. Patrie... 267,985. Grain drying apparatus, F. W. Wiesebroek... 267,813. Grate, L. Bannister... 267,737. Grate, fire, E. F. Johnson... 267,896. Grinding mill, P. Tanvez... 267,763. Guard. See Elevator guard. Thread guard. Gun, concealed hammer, H. Goodman... 267,876. Hane fastener, Minor & Hennessey... 267,708. Hammer, bush, Hood & Reynolds... 267,738. Harrow, B. F. Rix... 267,719. Harrow, sulky, B. F. Rix... 267,718. Hay carrier, A. R. Ex... 267,682. Heater. See Feed water heater. Hinges, making, G. C. Thomas... 267,809. Holder. See Barrel holder. Blotter holder. Book holder. Crayon or lead holder. File holder. Firearm holder. Picture frame picture holder. Hopple, C. J. Gustavson... 267,877. Horses, anti-cribbing attachment for, O. P. Deeds... 267,989. Horseshoe, G. W. Fenley, Sr... 267,855. Hydrocarbon engine, A. S. Stetson... 267,946. Ice boxes, alarm catch basin for, H. Fuhrmann... 267,870. Indicator. See Bilge water indicator. Station indicator. Ingot mould, W. Hainsworth... 267,880. Injector, oil and water, O. H. Jewell... 267,692. Iron and steel, manufacture of ingot, J. Reese... 267,717. Ironingstand, Fields & Mayfield... 267,857. Joint. See Universal angular knuckle joint. Joint wiper, R. Reach... 267,800. Key. See Telegraph key. Key slots, broach for making, W. H. Taylor... 267,808. Kiln. See Stone burning kiln. Knitting machine, M. Marshall... 267,982. Ladder, convertible step, F. V. Phillips... 267,947. Ladder, trussed, F. S. Seagrave... 267,803. Lamp, electric, C. A. Hussey... 267,691. Lantern, J. F. Cranston... 267,740. Line and reeling attachment, safety, W. Mackey... 267,909. Link, W. Burton... 267,834. Liquid vessel, T. Houston... 267,892. Liquors, process of and apparatus for purifying and maturing, J. B. Cushing... 267,779. Lock. See Nut lock. Permutation lock. Locomotive engine, H. F. Shaw... 267,736. Loom, Crompton & Wyman... 267,778. Loom for weaving broad silk goods, Crompton & Wyman... 267,777. Lubricant, J. B. Norris... 267,920. Lumber rafts, landing floating, D. W. McElroy... 267,795. Measuring machine, T. A. Bell... 267,826. Measuring machine, cloth, Kleppinger & Naylor... 267,901. Meats, apparatus for preserving, A. Fowler... 267,685. Meats, curing and preserving, A. Fowler... 267,684. Mechanical movement, W. H. Golding... 267,875. Mechanical movement, A. Warth... 267,955. Metals, plating, C. Haegle... 267,879. Middlings purifier, F. Prinz... 267,716. Mill. See Grinding mill. Rolling mill. Mould. See Glass mould. Ingot mould. Motion, device for converting reciprocating into rotary, J. H. Chase... 267,835. Motion, mechanism for converting rotary into reciprocating, J. J. Kieferle... 267,793. Motor. See Car motor. Water motor. Nails, tacks, etc., facilitating the cutting of, S. R. Foster... 267,864. Nut lock, A. C. Fletcher... 267,862. Orecrusher, W. P. Hammond... 267,687. Packing, metallic rod, L. Katzenstein... 267,750. Paper making machines, method of and apparatus for cleaning the wire web of, J. J. Manning... 267,704. Paper perforating machine, W. C. Utley... 267,790. Paper scoring machine, A. E. Elmer... 267,849. Paper trimming apparatus for the use of paper hangers, P. C. N. Pederson... 267,925. Permutation lock, J. Forsier... 267,977. Permutation lock, O. E. Philard (r)... 10,246. Photographer's dry plates, drying rack for, J. E. Beebe... 267,663. Photographic plaques, device for producing, H. Roher... 267,720. Photographic shield, E. B. Barker... 267,821. Picture exhibitor and receptacle, G. L. Jaeger... 267,895. Picture frame picture holder, M. W. Allen... 267,964. Pipe rings, machine for cutting sewer, R. W. Lyle... 267,700. Planer, split, B. F. Firman... 267,990. Planers, feed roller gear for wood, P. Stoerger... 267,947. Planter, hand corn, L. B. Chipman... 267,775. Planter, potato, E. P. & J. M. Karr... 267,899. Plow, L. Schmidt... 267,724. Plows, etc., adjustable and detachable handle for, J. M. Clark... 267,837. Pocket watch, I. Samuels... 267,942. Polarized ink writer, F. Anderson... 267,967. Polishing device, rotary, W. P. Whittemore... 267,735. Post. See Fence post. Post hole digger, J. J. Armstrong... 267,766. Potato digger, C. G. Witte... 267,959. Power. See Churn power. Press. See Baling press. Pulley block, T. H. Ward... 267,954. Pulp, etc., comminuting wood, G. H. Pond... 267,815. Pump, J. Imier... 267,894. Pumping apparatus, electric, Peck & Chapman... 267,710. Punch, metal, D. Kennedy... 267,751. Railway gate, McC ure & Mitchell... 267,705. Railway signal apparatus, electric, O. Gasset... 267,978. Railway tie, metallic, G. L. Putnam... 267,930. Rake. See Garden rake. Razor strop, J. R. Torrey... 267,950. Reclining chair, D. B. Hartley... 267,748. Reel. See Ribbon reel. Refrigerating and drying machine, G. H. Stoddard... 267,806. Refrigerator, J. C. Blake... 267,770. Refrigerator, C. Zimmer... 267,963. Register. See Telegraphic register. Regulator. See Electric machine regulator. Speed and motion regulator. Relay, polarized, F. Anderson... 267,966. Ribbon reel, A. T. Cook... 267,839. Ring. See Curtain pole ring. Rocking horse and cradle, J. A. Crandall... 267,678. Roofing tile, Lane & Woodworth... 267,904. Rolling mill, L. J. Masterson... 267,983. Rolling shovel blanks, roll for, E. A. Barnes... 267,822. Rotary engine, C. F. Cory... 267,675. Sand drier, W. W. Clark... 267,838. Saw, crosscut, G. W. Wills... 267,958. Saw, drag, J. Russell, Jr... 267,721. Saw filing machine, J. Palm... 267,756. Saw gauge, rip, T. A. McDonald... 267,913. Sawmill head block, D. Parkhurst... 267,923. Scale, M. G. Cook... 267,776. Scraper, road, A. Woolsey... 267,815. Screwdriver, P. Nadig... 267,709. Seat. See Stuffing seat. Secondary battery, J. R. Finney... 267,860. Secondary battery, E. T. Starr... 267,804. Separating and drying apparatus, H. Newlin... 267,919. Sewing machine and musical instrument, combined, Garvie & Wood... 267,874. Sewing machine, boot and shoe, M. H. Pearson... 267,798. Sewing machine brake, automatic, T. E. Baden... 267,968. Shifting seat, G. H. Hutton... 267,893. Shingle, metallic roofing, C. Comstock... 267,674. Shirt, G. A. Dureuil... 267,845. Shoe, G. Haszinger... 267,887. Shoe horn, J. M. Brown... 267,668. Sio, J. W. McKnight... 267,914. Sizing and coloring fabrics, apparatus for, M. Free... 267,869. Slate, folding, J. La Bar... 267,902. Sleigh shoe, J. A. Johnson... 267,981. Speculum, L. C. Law... 267,906. Speed and motion regulator for machines, C. Adler... 267,813. Spring. See Vehicle spring. Stand. See Blacking stand. Coal box and fire iron stand. Ironing stand. Station indicator, J. V. Ryerson... 267,941. Steam boilers, purifying natural waters for use in, C. B. Dudley... 267,743. Steam engine and boiler, portable, S. E. Jarvis... 267,792. Steam generator, J. C. Stead... 267,761. Steam trap, E. Briart... 267,831. Steam trap, Fuller & Mills... 267,746. Stirrup, saddle, S. L. Shallenberger... 267,728. Stirrup, wood, Woolworth & Cowles... 267,961. Stocking supporter, C. C. Shelby... 267,943. Stone burning kiln, artificial, A. Baumann... 267,661. Stone, machine for grinding the surface of, A. Folsom... 267,783. Stove legs, attaching, C. W. McCutchen... 267,911. Stove, magazine drum, Barbour & Mills... 267,769. Stoves, furnaces, etc., grate section and fire bed for, W. McClave... 267,910. Supporter. See Stocking supporter. Surface gauge, H. Avery... 267,660. Swimming suit, cork, F. Plant... 267,739. Swinging and sliding gate, J. Wadleigh... 267,731. Syringe, W. A. Turner... 267,952. Table, G. T. Townsend... 267,811. Tag, animal, E. G. Queen... 267,931. Telegraph key, J. T. Guthrie... 267,878. Telegraph line, underground, C. H. Hansen... 267,883. Telegraph sounder, J. H. Bunnell... 267,833. Telegraphic register, F. L. Pope... 267,929. Telephone exchange and apparatus therefor, H. Lartigue... 267,905. Telephone, mechanical, H. T. Johnson... 267,897. Telephone system, Jackson & Cole... 267,790. Teulurian, G. Rudholzer... 267,940. Thill coupling, W. Johnston... 267,693. Thill coupling, T. M. Richardson... 267,937. Thread guard and cutter, I. Harding... 267,884. Tie. See Bale tie. Railway tie. Tile blocks, process of and machinery for making, G. Eibreg... 267,848. Tile machine, G. Eibreg... 267,847. Tile mills, revolving table for, J. S. Smith... 267,760. Tobacco, manufacture of, S. W. Wood... 267,764. Top, child's spinning, F. A. Fouts... 267,865. Toy spinning, F. A. Fouts... 267,866. Toy gun, J. A. Crandall... 267,679. Toy locomotive, Richter & Stever... 267,959. Toy sleigh, F. W. Carpenter... 267,773. Toywhirligig, H. Thomass... 267,949. Trains, apparatus for controlling the movement of, E. N. Dickerson, Jr... 267,681. Trap. See Animal trap. Steam trap. Trap, R. Clarke... 267,973. Tree. See Gig tree. Truck, W. Z. Brown... 267,669. Truck, A. B. Reeves... 267,801. Type case cabinet, J. S. Hoerner... 267,690. Universal angular knuckle joint, E. Mignault... 267,706. Universal joint, Deyo & Carman... 267,844. Valve. See Float valve. Valve, balanced, M. M. Sanders... 267,802. Valve, balanced steam, S. E. Jarvis... 267,791. Valve gear for oscillating engines, H. F. Shaw... 267,725. Vehicle, side bar, J. A. Snell... 267,944. Vehicle spring, C. W. Saladee... 267,983. Ventilator, M. H. Dorgan... 267,741. Ventilator or chimney cap, L. F. Betts... 267,829. Vise, bench, T. Reno... 267,986. Wagon brake, A. D. Bertier... 267,828. Washing machine, boiler, L. S. Betzer... 267,969. Watch hands, J. W. Bell... 267,824. Water closet, M. Hogan... 267,786. Water cooler ice bumper, J. J. Savage... 267,722. Water gauge and alarm, P. V. Dwyer... 267,780. Water motor, J. Coates... 267,672. Water wheel, J. Comly... 267,673. Water wheel, H. Van De Water (r)... 10,247. Water wheel, turbine, W. B. Farrar... 267,854. Wax from paraffine oil, separating, S. W. Kirk... 267,752. Weather strip, Fields & Mayfield... 267,858. Wells and tanks, safety attachment for oil, M. A. Lanagan... 267,903. 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Malt extract, Kepler Malt Extract Company (Limited)... 9,835. Medical compounds, Kepler Malt Extract Company (Limited)... 9,834. Medicated preparation of cinnamon, B. L. Livingston... 9,823. Needles, Wolf & Knippenberg... 9,833. Paints and painters' supplies, A. W. Strauss & Co... 9,830. Pens, steel and other, Turner & Harrison... 9,822. Pianofortes and parts thereof, Steinway & Sons... 9,820. Pistols, revolving cylinder, Merwin, Hulbert & Co... 9,824. Soap, Procter & Gamble... 9,826. Soaps, candles, oils, and lard, Procter & Gamble... 9,829. Tobacco and cigarettes, chewing and smoking, J. Hancock... 9,818. Wine, champagne, G. H. Mumm & Co... 9,837. English Patents Issued to Americans. From November 7, 1882, to November 10, 1882, inclusive. Bottling machine, J. Mills, Terre Haute, Ind. Cocks for casks, etc., J. Schaefer, New York city. Coupling for hose, E. Nunan, San Francisco, Cal. Electric signal apparatus (2) Standard Time Company, New Haven, Conn. Envelopes, manufacture of, A. C. Fletcher, New York city. Grain cleaning machine, L. Gathman, Chicago, Ill. Insulating compound for electric wires, R. G. Waring et al, Pittsburg, Pa. Paper boxes, manufacture of, H. H. Rogers, Brooklyn, N. Y. Printing press, W. G. Walker, Madison, Wis. Reeling silk, etc., J. M. Grant, Hartford, Conn. Teulurian, J. Spicer, Taylor's Island, Md. Tool holder, J. F. Allen, Brooklyn, N. Y. Wire for fastening bottle stoppers, manufacture of, O. R. Chapin, Boston, Mass. NEW BOOKS AND PUBLICATIONS. LEXIQUE DE LA LANGUE IROQUOISE. Par J. A. Cuq. Montreal: J. Chaplean & Fils \$2. For thirty years the venerable author has been in active service as missionary among the Iroquois and Algonquins of Oka, on the Lake of the Two Mountains, near Montreal. His knowledge of these tongues is full and intimate. The present work embraces; I. Iroquois roots; II. Derivatives and compounds; III. Supplementary notes; IV. Appendices, and many curious and interesting foot notes. It is to be hoped that the author's life may be spared for the completion of a corresponding dictionary of the Algonquin tongue, which he has in hand. REPERTORIUM DER JOURNAL-LITERATUR DER EISENBahn TECHNİK (REPERTORY OF THE TECHNICAL LITERATURE OF RAILWAYS). By Franz Woas. Years 1880 and 1881. Berlin: Julius Springer, 1882. 260 pages. Consists of a general index or reference book to the English, American, French, and German technical periodical literature relating to railways. It is divided into five chapters, named respectively: "The Railway Systems;" "The Building of Railways;" "The Rolling Stock;" "The Repair of Railways;" and "The Running of Railways." Each chapter is divided into sections, and each section into certain subdivisions; so that, for instance, if a person is desirous of finding the current literature on tunnels, he will find all the references thereto in Chapter II., Section B, which contains a complete list of all the articles relating to tunnels in the several technical periodical publications for the years 1880 and 1881, as the repertory comprises only these two years. In the same manner, articles relating to any other subject matter in the railway line can be found in this repertory. This work is of great service to engineers, builders, publishers, and others, as it saves much time in searching reading matter in regard to certain subjects, and facilitates obtaining a thorough knowledge of all that has been published in relation to the said subject. 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 number of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this 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) S. M. B. writes: A common year consists of 365 days 5 hours 48 minutes and 49 seconds. Now, as every fourth year contains 366 days, which is leap year, it is supposed, of course, that the extra day takes up the surplus time over 365 days, which it does, and 44 minutes and 44 seconds over. Now, in a certain number of years this shortage of time would make a day. How is that loss of time accounted for? A. One day is dropped every 400 years. All even centuries are divisible by 4, and would naturally be "leap years;" but to correct the deficiency mentioned the centuries divisible by 400 are not leap years, i. e., 1800 and 1900 are leap years, but the year 2000 will not be a leap year. (2) W. M. B. asks: 1. Is not the violent ejection of sparks from a locomotive caused by the excessive force of the exhaust across the face of the flue sheet? A. Yes. 2. Would not the draught be the same if there were no stack; the stack only serving to carry the steam and smoke above the line of sight? A. No, for very little pressure of air would be produced on the fuel in the furnace. (3) W. L. H. asks: How many horse power is an engine 18x34, 110 revolutions per minute, pressure in cylinder 60 pounds? I say 164 horse power; am I right? A. It is 163 horse power after deducting 20 per cent for losses by friction, etc; 60 pounds pressure in the boiler does not give 60 pounds pressure in the cylinder; this pressure you must ascertain by the indicator. (4) H. D. C. asks: 1. What is the exact formula for calculating the strength of steam boilers, the tensile strength being known? A. P=pounds pressure per square inch; D=diameter of boiler in inches; T=thickness of plates in inches; c=tensile strength of plates in pounds per square inch; then the formula is T = (D^2 P) / (2c) or P = 2Tc / D^2; but if the tensile strength of the iron is taken in the body of the plate or sheet, it must be borne in mind that the single riveted seams are only 0.65 and the double riveted seams 0.70 of the strength of the solid plate. 2. Also are steel boilers preferable to iron boilers, and why? I find it hard to learn anything about boilers in that important direction, as I have not the facilities for getting the information, nor do I know where to seek for it. A. Yes because they are stronger in proportion to thickness of plates, and the plates more homogeneous in their character. Obtain "Wilson on Steam Boilers," or "Nichols's Practical Boiler Maker," for information, or consult the rules of government inspectors. PATENTS. MESSRS. 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