

The New Kachin and Acetone Developer.

In the Photogram Mr. W. Ethelbert Henry gives the following formula for a single combined developing and fixing solution :

A.—Sodium sulphite crystals.....	30 grammes, or	3 ounces 6 drachms.
Distilled water.....	75 c. c.	" 9 " 3 "
Caustic soda, pure.....	7 grammes,	7 drachms.
Kachin.....	7 "	7 "
B.—Hypo.....	20 "	2 ounces.
Water.....	100 c. c.	" 10 "

For use, take twelve parts of A, 20 parts of B, and 30 parts of water. The mixed solutions form a combined developer and fixing bath which works with great rapidity, fixation and development taking place at the same time. It is well to bear in mind, however, that plates must be fully exposed for this treatment, which is quite unsuitable for under-exposures. A few trials will also be necessary in order to determine the most suitable quantity of hypo solution for the particular brand of plates in use, some requiring more than others to give the best results. The negatives produced by this means are quite brilliant and free from any indication of fog. The next formula is one that I have found gives better results in a shorter time than any other yet worked out. It is open to improvement, no doubt, but it works so rapidly and excellently that I give it as it stands, leaving any improvement that may be made for publication in the future.

Three solutions are requisite as follows* :

A.—Water.....	250 grammes, or	10 ounces.
Sodium sulphite.....	25 "	" 1 ounce.
Kachin.....	5 "	" 96 grains.
B.—Lithium oxide.....	3 "	" 58 "
Water.....	250 "	" 10 ounces.
C.—Acetone.....		

If very rapid development with extreme contrast is desired, take A, 1 part; B, 1 part; water, 1 part. This developer is very energetic, and is not suitable for over-exposure; development starts in about three seconds, and is generally complete in less than a minute. For the development of snapshots with detail and density the following is highly recommended: A, 3 parts; B, 3 parts; C, 2 parts. This combination works very rapidly, giving complete development in from 60 to 90

* The following being for development only, it is, of course, necessary to fix the negatives in a 20 per cent solution of hypo.

seconds. The addition of 2 parts of water to the foregoing slows development to a slight extent, but gives a brilliant negative in less than two minutes in most cases.

I find "Kachin" particularly suitable for "stand" development, the following being the proportions: A, 3 parts; B, 3 parts; C, 2 parts; water, 50 parts. This is the strength that so far has given the best results, development of under-exposures being completed in about 40 minutes. There is no doubt that the time of development may be materially governed by increasing or decreasing the added water; for instance, with 100 parts of water instead of 50, two hours were necessary to effect the development of a snapshot. With this long development there was no stain or fog, and the plate fixed rapidly. On the other hand, I have left a plate to develop itself in a solution containing only 20 parts of water, yet the negative (developed in 15 minutes) was quite free from sootiness.

The Production of Gold for 1899.

The world's production of gold for 1899, if Australia and South Africa maintain the rate with which they began the year, will probably reach \$340,000,000, or about \$50,000,000 more than in 1898. At the end of the current year the three principal countries will rank in the following order in the list of gold-producing districts :

South Africa.....	\$106,000,000
Australia.....	78,000,000
United States.....	74,000,000

The State of Washington, it is thought, will far exceed its usual production; and the Klondike, which in 1897 and 1898 produced respectively 6,027,000 and 13,700,000 dollars' worth of gold, it is estimated will yield in 1899 at least \$20,000,000 in yellow metal.

Arctic Food.

A company was recently formed for the breeding and raising of reindeer in eastern Norway, for the purpose of supplying southern markets with reindeer meat. There is a growing market for this meat in France and Belgium. Reindeer are quite cheap in this part of Norway, and 2,400 animals were purchased for \$7,500. In a short time it is believed that 1,000 deer can be

killed a year without diminishing the herd. A slaughtered deer is worth about \$7.50. In order to prevent the market from being flooded with fresh deer meat, a canning plant will be attached to the farm. The company controls about 60 miles of mountain land. The reindeer is the real Arctic venison and is a highly approved article of food in the northwestern part of Europe. A considerable part of the supply comes from lands far north of the Arctic circle. Russian bears have also been on the market in London and Paris, where they are much esteemed. The business of importing frozen game from the far North is a comparatively new one, but it is rapidly developing into an important industry.

The Current Supplement.

The current SUPPLEMENT, No. 1233, has many articles of more than usual interest. "The Automobile Race 'Tour de France'" describes this most important race. "Elevators," by Charles R. Pratt, illustrates several of the leading types of elevators. "Life on the Schoolships of the German Navy" describes the instructions in seamanship which are given. "The Electrical Protection of Safes and Vaults" is an article by Clyde J. Coleman. Probably the most interesting article in the entire paper is "Variations in Human Gait," by Dr. E. H. Bradford. It is most profusely illustrated and is a highly important paper on the subject.

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RECENTLY PATENTED INVENTIONS.

Bicycle-Appliances.

DRIVING GEAR FOR BICYCLES.—ARTHUR DOYLE, Seattle, Washington. The gear consists of a pair of toggles suitably pivoted upon the bicycle frame and connected to a gear wheel or sprocket which is in gear with the driving sprocket of the machine. A pedal is mounted upon the primary toggle and the necessary power is transmitted through it by means of a short vertical motion. A hand lever is also arranged to be used when auxiliary power is needed. By means of this driving gear, a short up-and-down movement of the rider's feet is said to develop a large amount of power and to run the machine at a high rate of speed.

BICYCLE DRIVING GEAR.—CHARLES H. SPERLE, Third and Sixth Avenue, Williamsbridge, New York, N. Y. This device consists of a lever pivoted at one end to the bicycle frame near the rear wheel, and carrying a pedal on the forward end. The lever is connected by a pitman to a gear wheel, also fastened on the frame and meshing with the driving pinion on the rear wheel.

Engines and Valves.

ENGINE.—GABRIEL P. B. HOYT, Jamaica, Borough of Queens, New York, N. Y. The object of this invention is to provide an engine capable of running at a high rate of speed without much vibration. It seems especially applicable to explosive engines as a means of reducing vibration. A transverse elongated slot extends across the center of the piston, and in this slot travel the wrist pins of two crank arms, which rotate two transverse shafts in opposite directions. The shafts are connected to each other at both ends by gears and each carries a flywheel at one end. By means of this arrangement the piston is always perfectly balanced, as the wrist-pins, revolved oppositely by the gears, are at all positions of the stroke equally distant from the center of the piston on opposite sides of the center line.

ROTARY VALVE.—JOSEPH BRADLEY STAGE, Tabor, Mich. The invention provides a rotary valve for the steam feed for sawmills so constructed as to automatically shut off the steam in case of a break in the connections that operate the valve. The valve core has a Y-shaped opening running through it from one side to the other. The top of the Y connects with the main inlet pipe and allows of the bottom part being shifted from one side to the other in order to send the steam through either of two ports to the cylinder. When the Y is in a vertical position, the bottom end is between the two ports, and the valve is closed. A weight is arranged on the shaft to bring the valve to this position in case the connecting rod that operates the valve becomes broken. Exhaust ports are also provided in the valve core.

Railway-Appliances.

ROLLING PLATFORM.—HENRY P. JOHNSON, Dillon, S. C. The invention consists in providing the platform of a freight house with a movable section for use in transferring freight with convenience and dispatch. The movable section is flush with the stationary platform and is arranged to move at a right angle to the edge of the latter out over one track, so that a car on the outer track can easily be unloaded.

Electrical Apparatus.

ELECTRIC MOTOR FOR BRAKES.—RICHARD A. J. EVANS, Chicago, Ill. The motor comprises field pieces extending upward from field magnets and con-

nected at their top with a brass yoke and at their bottom with an iron one. The armature is placed between these field pieces and is mounted on a vertical shaft having bearings in the two yokes. A lever fastened on the end of the shaft projects backward a short distance and is kept in an open position by a horizontal spring pressing against the short end. The ends of the armature are curved slightly to fit around the field rods. When current is applied, they are attracted to these rods and move the lever horizontally.

Mechanical Tools.

SELF-FEEDING HAMMER.—CLARENCE H. CRAIG, Boulder, Col. The handle of the hammer contains a longitudinal slot into which the tacks or nails are inserted from the outside. By means of a simple spring arrangement they are fed one at a time into place before a small driving head, and held there till started into the wood by a single stroke, the springs which hold them in position then releasing them as the hammer is withdrawn. At the same time another nail is automatically slipped into place. The first nail is then driven in with the regular hammer head.

MAGAZINE TACK HAMMER.—LEWIS W. SAMMIS, 936 Manhattan Avenue, New York, N. Y. The hammer has a magazine containing tacks attached to the handle. A curved chute extends from the lower corner of the magazine to the tack-inserting head of the hammer. The tacks slide down this chute by gravity and are held between two spring clips while the first blow is given, after which the tack is freed from the hammer by pulling the latter bodily away from it.

Agricultural, Lumbering, and Mining Apparatus.

POTATO DIGGER.—MATHIAS G. BEAN, Rice Lake, Wis. This potato-digging machine is light and durable in construction. It is intended to be drawn by a team and can be operated by one person only if necessary. The digging fork is adjustable and may be set to enter the ground to any desired depth or adjusted at will. The potatoes, dirt, and vines are received upon the fork and separated at that point. The vines are carried to one side of the machine and there discharged, the dirt is sifted and returned to the ground, and the potatoes are raised on an endless belt elevator and fed into bags.

APPARATUS FOR TRANSFERRING SUGAR CANE.—AUGUSTUS BARBAY, Plaquemine, La. This apparatus was designed for the purpose of transferring bundles of sugar cane from the carts to the railway cars. It consists of a slightly inclined upright pole, having a cross-arm or sweep. The wagon containing the cane is driven under the sweep at its lower end and the bundle fastened to a rope or chain. A suitable lever arm is then run out from the base of the pole and fastened to the cart. The horses are driven around to the other side, thus turning the pole and sweep. Since the pole is inclined, the end of the sweep is raised higher on this side and thus the bundle of cane is brought to the level of the car.

RAKE ATTACHMENT FOR HARVESTERS.—JOHN PEGG, Bloomington, Ind. The attachment is simple and durable in construction, effective in operation, and readily applied to a harvesting machine so as to work automatically. It is so arranged as to effectually carry the straw or clover from the front to the rear of the platform behind the cutter, and to drop it in bundles behind the latter. When not in use it is carried by one of the wheels of the harvester in a fore-and-aft

position, parallel to the sides of the frame. It will, therefore, not wear to the usual extent, since it is in operation only when actually required.

SHOCK-BINDER.—GEORGE YOUNGS, Fayetteville, Mo. The binder consists of a single shaft or rod pointed at one end and having a T handle at the other. Two bent pins are fastened in the shaft at about the middle, to which the rope to be tautened is fastened. A second pointed shaft or prong runs parallel to the main one and has its top bent at right angles and fastened around it as a collar. A ratchet-wheel fastened to the main shaft just above this horizontal arm and a pin passing through just below it hold it in place on the shaft, while a pawl fastened to the arm engages the ratchet-wheel. A small thumb piece disengages the pawl from the ratchet when the shock is bound. All that is necessary to do this is to stick the two prongs in the bundle, fasten the cord to one of them, and turn the handle.

LOG-LOADING APPARATUS.—HORACE B. PHILLIPS, Halifax, N. C. This apparatus consists of a platform and framework on which is mounted a derrick, and a steam engine and boiler for operating it, as well as a pump or compressor for air or liquids. The platform is made to fit the top of an ordinary flat car and have its edges extend slightly over the sides of the latter. Near each of the four corners of the platform guideways are fastened to it and extend upward to the framework. Movable legs containing hydraulic rams which bear directly upon the platform slide in the guideways and permit of raising it so that the car can be withdrawn.

ORE PULVERIZER.—JAMES H. STEELE, Butte, Mont. The invention consists of a large drum having a cog gear around it adapted to be engaged by a small pinion, so that the drum will turn slowly. The drum contains three crushing rollers made up of solid disks, one edge of each of which is beveled. The rollers are arranged in such a manner that they are in peripheral contact with each other and with the sides of the drum. The material is fed through the shaft in the end of the drum (which is hollow), going in at one end and coming out at the other.

Miscellaneous Inventions.

TOY PARACHUTE.—JOAB Q. BROWN, Bethany, Mo. The parachute is hung from the point of an arrow or dart, so that when the latter is shot into the air, the parachute will be released at the end of the arrow's upward flight and descend slowly to the ground.

ANIMAL PEN OR TRAP.—JOSHUA D. FOX, Frankfort, Ind. The pen is constructed for the purpose of holding the head of an animal while it is being operated upon. It consists of a cage having two neck-holding parts, one of which is carried by the side of the pen, which is fulcrumed at its rear end to swing inward. An operating lever swings the side inward, and the lever is held at any desired point by a suitable locking bar.

ACETYLENE GENERATOR.—ROBERT L. DOHERTY, Palmyra, Mo. This generator is of the type in which the water falls upon the carbide. It has a gasogen in two parts, the upper one of which contains water and the lower one carbide. The walls of the upper compartment project downward some distance below the bottom and terminate in a water seal at the side of the lower compartment. Two cones, one inside the other, project downward from the bottom of the water compartment. The outer one has a small hole near its top part, and the inner a hole in its apex. A valve regulates the supply of water flowing into the cones and dropping from them on the carbide. A second valve in

the end of a short pipe is connected with the gasometer bell and is opened when the bell falls in the usual manner. The gas generated passes through a cooling coil in the water chamber before entering the gasometer.

HOG-TRAP.—JOHN P. TARR, Augusta, Ill. The trap consists of a simple box with a drop floor in each end. The doors are held open by catches connected by suitable levers with a slightly raised trap door in the bottom. When the animal enters and treads on the trap, the doors are released and fall by their own weight. Provision is also made for inserting a neck-holding frame in which to hold the animal's head while it is being operated upon.

PORTABLE CRADLE AND CARRIAGE.—MARK I. KNAPP, 280 Broome Street, New York. The invention provides an improved cradle and baby-carriage which can readily be taken apart and packed away in small space for storage or transportation purposes. The cradle is hung from each end on two uprights that are fastened to a suitably braced folding frame mounted on small wheels, so that it can easily be rolled about and used as a carriage as well as a cradle.

FORM FOR HULLS OF VESSELS.—MILLARD F. MITHOFF, New Orleans, La. The object of this invention is to so form the hulls that they will be fully adapted to the action of the displaced water in their immediate vicinity when the vessel is under way, thus reducing to a minimum the resistance to the movement of the vessel. The inventor found by experiment that the waves made by the bow of a boat describe parabolic branches and the motion of the water caused by the stern is also in parabolic branches running in the opposite direction. Consequently he constructs the hull so that a horizontal section through it at the water-line or at any point below will show two parabolas facing each other and joining in a center section about a third of the way from the bow.

SCHOOL FURNITURE.—WILHELM H. METTING, Trenton, N. J. The invention consists in a new method of firmly fastening the wooden backs of school seats to the iron supporting framework. The backs are made of wooden slats with dovetailed grooves crossing them near each end. The iron supports have a rib of the same cross-section to fit into the grooves, but this rib is formed of two parts, one of which is cast with the support, the other being separate. A semicircular groove runs in the face of each of them, and after the slat has been slipped on, a flexible rod is driven through the hole, thus firmly fastening the slat in place.

COPY-HOLDER.—LOUIS HUDGIN, Lochiel, Arizona. This holder is intended to be fastened to a typewriter desk for the purpose of holding the copy in an inclined position over the machine and directly in front of the eyes of the operator. It consists of a rectangular vertical support frame hinged to foot pieces which are fastened to the desk, and having two pairs of hinged arms projecting out at an angle from its front face, one pair being at the center of the frame and the second or shorter pair projecting from the top. These arms carry the copy-holder, which is a frame having spaced rods. The holder may be adjusted by raising or lowering the longer pair of arms, which are held by a ribbon.

PROCESS OF RENDERING WRITING INERADICABLE.—STANLEY J. MORROW, Peoria, Ill. This process consists in writing on specially prepared asbestos paper with an acid ink, and then carbonizing the writing by means of heat. The asbestos fibers in the paper prevent it from falling apart in the places where the writing occurs.

DEVICE FOR ATTACHING HOOKS, ETC., TO STRAPS.—HERMAN D. DETERT, Faribault, Minn. The device consists of a box casing designed to receive a strap having a longitudinal slot down the center of one side and several holes in the center of the other. A metal tongue with pegs on it a proper distance apart is placed beside the strap with its pegs through the holes in the latter, and the tongue and strap are then slipped into the receiving box. The tongue is grooved on the sides in order to be held firmly on the slotted side of the box, and its pegs project through into the holes on the opposite side, thus holding the strap securely. A hook is fastened to the box piece so as to fasten it to the breast collar.

PENHOLDER.—WILLIAM THURMAN, Denton, Tex. The penholder consists of a hollow barrel with a telescopic upper end formed of two telescopic sections, the larger one of which contains a spring placed between the end of the smaller section and the end of a plunger movable in the main barrel and carrying the pen in its lower end. By this arrangement freedom of movement to the thumb and fingers is secured, and cramping of the hand is avoided.

NAIL.—BERNHARD SCHNITZLER, 10 to 14 Bleecker Street, New York, N. Y. The invention is a T-shaped lath nail, in which the head of the T is about half the length of the shank and slightly curved, so that if the nail is driven in at an angle, there will be no sharp corners of the head projecting.

FISH-SCREEN FOR ARTIFICIAL WATERWAYS.—GEORGE D. BRID, Gunnison, Col. A cylinder covered with wire gauze is placed across the flume and is turned by a paddle wheel to which it is connected by a chain. A board is fastened to the bottom of the flume with its upper edge fitting tightly against the cylinder, so that fish are stopped from going any farther, while leaves or debris are carried over by the revolving cylinder.

PNEUMATIC PROPULSION MEANS.—JAMES C. WALKER, White Cliff Springs, Tenn. The propeller shaft is made hollow to be used as an air tube. The jet of air passes through the propeller shaft, and the air thus discharged will fill any space which may be created directly at the rear of the propeller blades.

STORAGE BATTERY.—CHARLES and HARRY LINDENBERGER and WILLIAM B. TEAL, care Lindenberger, Teal & Co., 354 Century Building, St. Louis, Mo. The invention consists of an improved battery cell or box made of hard rubber. A perforated partition is placed inside the cell, which is a low, flat box, and a small space is left between the partition and walls of the cell in which to place the electrolyte. The active material is placed inside the center space in the form of blocks which are pressed into contact with lead plates extending along the top and bottom of the cell. The blocks which form the positive and negative plates are separated by a layer of charcoal wrapped in asbestos paper. The ease with which these blocks can be renewed constitutes the main feature of the battery.

THREAD CUTTER.—BERT NEWSOME, Minonk, Ill. This device consists of a circular spring ring to slip over the finger. Pivoted in trunnions on one end of the ring is a short cutter blade which is sprung outward by a slight pressure of the finger in order to be used for cutting thread.

Designs.

DESIGN FOR A SAW-BLADE.—DOUGALD McEAHERN, Erie, Canada. The teeth of the blade are very nearly the shape of a boot with a sloping leg portion, and the alternate teeth are tapered on their opposite sides, gradually becoming thinner near their rear ends.

DESIGN FOR A BUFFER-SPRING.—ZERAH H. TATE, Erlanger, Ky. The shape of the spring resembles somewhat a pair of tongs, one prong being bent outward and then parallel with the other and having a rectangular plate fastened to it at the end and the other being slightly curved and having a hole near its outer end.

DESIGN FOR A TICKET BLANK.—FERDINAND KRONENBERGER, 1147 Tinton Avenue, New York, N. Y. The design consists of a rectangular blank having perforated lines extending diagonally across its four corners. The four rows of perforations practically form a square, and arranged within this square is an outline rectangular panel, in the center of which is a circular row of perforations.

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

NEW BOOKS, ETC.

ENGINE ROOM PRACTICE. A Hand Book for Young Marine Engineers. By John G. Liversidge, Chief Engineer R. N. London: Charles Griffin & Company, Philadelphia: J. B. Lipincott Company, 1899. Pp. 292. 12mo. Price \$2.50.

The volume before us impresses us as being a really practical book on marine steam engineering. It is filled with valuable information and hints which will probably not come amiss to even the engineer who has actual charge of a marine engine. The diagrams are most of them clear and significant. The tables are also valuable. Although the book is written by an Englishman and is devoted to English practice, at the same time marine engineering is very much the same in vessels of all nationalities.

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Business and Personal.

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Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated: correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(7709) P. H. L. writes: A trolley car is running on wire notches and the overhead wire becomes he negative and the track positive; what result to the car or motors? I claim the car will run ahead as before. The other gentleman claims it will reverse and run backward. By deciding this argument you will greatly oblige. A Reversing the current on the line has no effect on the motor. To reverse the motor, the current must be reversed either in the armature or in the field magnet, but not in both. The motorman does this when he backs the car.

(7710) W. B. writes: At what longitudinal point does Sunday begin? A Sunday like all the days of the week begins at midnight following the preceding day, at the meridian of 180 degrees east or west of the meridian of Greenwich, England. The line is in the Pacific Ocean, running from Behring Straits west of the Aleutian Islands and the Hawaiian group and east from New Zealand.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending AUGUST 8, 1899, AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Table listing inventions with patent numbers, including: Acid by electrolysis, producing chromic, Le Blanc & Reisenberger, 630,612; Advertising means, A. L. E. Caspar, 630,486; Aerating apparatus, liquid, H. Hirzel, 630,506; Air brake, W. B. Mann, 630,376; Air brake operating apparatus, W. B. Mann, 630,381; Air compressor, R. L. Dunn, 630,382; Andron, grate, and fender combined, Hickson & Wood, 630,695; Animal trap, G. U. Hall, 630,346; Anvil, D. Buel, 630,323; Arc rupturing device, E. J. Berg, 630,318; Autographic register, Egry & Schirmer, 630,491; Atomizer, C. O. & E. E. Billow, 630,329; Automatic lubricator, J. H. Piburn, 630,405; Axle and reach for vehicles, rear, G. F. Thompson, 630,425; Back pedaling brake, E. M. Wildey, 630,451; Badge, A. H. & G. B. Adams, 630,581; Badge, Liebmann & Toussaint, 630,547; Bag. See Mail bag; Bag holder, H. C. Goldsmith, 630,684; Bail, J. B. Mowry, 630,393; Bale fastenings, winding tool for, D. M. Campbell, 630,825; Bale supporting device, G. A. Lowry, 630,372; Bale supporting device for presses, G. A. Lowry, 630,371; Battery. See Storage battery; Bearing, axle, I. Osgood, 630,556; Bearing, end thrust, V. Belanger, 630,581; Bearings, means for supporting, S. C. Davidson, 630,529; Beestead, folding or collapsible, J. Russell, 630,744; Beehive, J. Hartman, 630,828; Beet pulper, I. Gobie, 630,535; Bicycle, C. S. Ambruster, 630,436; Bicycle, L. De Ramo (reissue), 17,64; Bicycle grip, F. A. Briggs, 630,649; Bicycle pedals, removable toe clip for, T. J. Rush Binder, H. E. Dade, 630,743; Bit. See Bridle bit.

Table listing inventions with patent numbers, including: Blow off protector, E. Mather, 630,386; Board. See Dough board; Boiler. See Steam boiler; Boiler flue cleaning device, G. C. Kitchen, 630,545; Bolt and nut, E. Conant, 630,534; Boot or shoe, J. F. Sharpe, 630,570; Bottle closing device, J. D. Roche, 630,564; Bottle, non-refillable, S. Penny, 630,737; Bottles, machine for filling screw stoppered, Adcock & Lytle, 630,790; Bow holding device, H. L. Oothout, 630,734; Bowling alley, McIntire & Holden, 630,728; Box. See File box. Paper box. Toy money box; Box machine, C. H. Bump, 630,528; Box machine, G. Patureau, 630,403; Brake. See Air brake. Back pedaling brake. Vehicle brake. Wagon brake; Brake, W. D. Ross, 630,742; Brake, W. Wirtz, 630,434; Brick making, A. Niedringhaus, 630,397; Bridge, W. A. Gunn, 630,809; Bridge bit, A. M. Pennington, C. W. Hills, 630,515; Bronzing apparatus, V. Bauer, 630,440; Brush, bottle washing, M. Kaefer, 630,699; Brush handle, E. W. Durant, 630,600; Buffer, stationary, F. Westmeyer, 630,577; Bungy shade, F. Geiger, 630,497; Car apparatus, R. R. Kinney, 630,459; Burner. See Cactus burner. Gas burner. Hydrocarbon burner. Oil burner; Button for cushion seats, tufting, F. A. Neider, 630,553; Button making machinery, R. H. Beck, 630,645; Cable coupling, E. S. Decker, 630,806; Cactus burner. See Cactus burner; Water can. See Guarded can. Oil can; Water can; Canal, ship, A. Hogeland, 630,457; Candle holder for Christmas trees, H. Stolze, Jr., 630,423; Candy cleaning machine, W. S. Foster, 630,356; Cap, N. Jacobson, 630,707; Car coupling, J. J. Caton, 630,655; Car coupling, run, G. M. Oros, 630,617; Car fender, W. P. Tucker, 630,757; Car for coke, self dumping, J. M. Maris, 630,385; Car heating system, J. F. McElroy, 630,627; Car, railway, J. Nash, 630,552; Car step, extension, Wrede & Saunders, 630,564; Carding machine, S. Beran, 630,479; Carriage washing and automatic water level regulating device, combined, W. H. Rawe, 630,740; Carriage windows, means for holding and raising, C. B. King, Jr., 630,716; Carrier, and other vehicles, E. W. Fairbanks, 630,463; Case. See Convertible case. Pipe case. Syringe case; Caster, Higgins & Oneil, 630,696; Case guard, R. C. Cummings, 630,323; Cattle guard, E. C. Cummings, 630,608; Centrifugal cooler, W. Muller, 630,727; Centrifugal machine, T. L. Patterson, 630,736; Chains or belts, device for tightening endless, E. A. Johnston, 630,833; Chair. See Revolving chair; Chisel, 630,417; Churn, J. E. Benjamin, 630,768; Churns, washing machines, etc., operating mechanism for, L. H. Nutting, 630,398; Chute, E. L. Messler, 630,623; Cigar bunch making machine, E. Pisko, 630,520; Cigar and cigar holder, A. K. Grant, S. J. Smith, 630,534; Cigarette making machine, continuous, J. H. Venners, 630,786; Circuit breaker, automatic, E. M. Hewlett, 630,539; Clamp. See Colter clamp. Pipe clamp; Clamp for pipes, shafts, etc., C. B. Albee, 630,641; Clamp, spring, 630,430; Clothes rack, W. Wilderboth, 630,430; Clutch, friction, E. V. Faucett, 630,532; Coffee pot, J. K. Cummings, 630,666; Coffee pot, A. A. Wilmot, 630,761; Colter, C. J. Gaylor, 630,680; Colter, automatic, C. Gaylor, 630,679; Comb. See Gurrycomb; Concrete carrying and mixing machine, J. W. T. Stephens, 630,420; Conduit or pipe, H. M. & H. A. Gordon, 630,605; Convertible case, E. M. Turner, 630,427; Cover, for crabs, 630,804; Conveyor and bucket therefor, E. S. Decker, 630,739; Conveyor, endless, E. S. Decker, 630,803; Conveyor, endless, T. O. Terhune, 630,800; Conveying apparatus, E. S. Decker, 630,801; 630,805; Cooking vessel, S. Schwartz, 630,414; Cooler, for beer, 630,414; Cooler, for liquid, 630,414; Corset fastener, S. R. Mills, 630,389; Cotton, etc., apparatus for compressing, G. A. Lowry, 630,369; Cotton, wool, etc., press for, G. A. Lowry, 630,370; Cotton, wool, hair, etc., press for, G. A. Lowry, 630,368; Couch, for combing, S. J. Smith, 630,415; Counting and detecting apparatus, F. L. Wilder, 630,578; Coupling. See Cable coupling. Car coupling; Pilot coupling. Shaft coupling. Yoke harness coupling; Cover and detachable pad, H. S. King, 630,717; Crank crusher, 630,417; Cultivator, A. Wilkinson, 630,788; Current motor, alternating, M. Deri, 630,498; Current motor, alternating, C. P. Steinmetz, 630,419; Current system of distribution, combined alternating and continuous, M. Deri, 630,491; Curry comb, J. A. C. Grant, et al., 630,415; Curtain pole, M. A. Harter, 630,348; Cutter. See Cigar tip cutter. Thread cutter; Cutter head, trapezoidal, S. J. Shimer, 630,749; Cycles, attaching inflating pumps to, R. Reid, 630,561; Cylinder, headed, W. E. Hill, 630,497; Dan, for support, E. H. Pooley, 630,735; Dies, forming, H. F. Blackwell, Jr., 630,771; Digger. See Post hole digger; Disinfecting by means of formaldehyde, A. Schmidt, 630,782; Disk drill, F. H. Hoyt, 630,535; Disk drill, E. H. Kingsland, 630,513; Door check, S. Wilson, 630,762; Door fastening, sliding, M. E. Kanaly, 630,610; Door hanger and track, R. Oliver, 630,753; Dough board, E. Sargent, Jr., 630,746; Draught equalizer, J. Kramer, 630,362; Drawer, furniture, Bankman & Lebard, 630,314; Dressing and doubling machine, F. L. T. Meats Drill. See Disk drill. Pneumatic drill; Dropper. See Seed dropper; Drying kiln, F. R. Morris, 630,392; Dumb bell, J. Robinson, 630,741; Dynamometer, 630,507; Dynamo, H. B. Schneider, 630,498; Egg tester, W. Upton, 630,820; Electric cables, machine for making armored, E. T. Greenfield, 630,502; Electric cables or wires, protective casing for, Douglas & Sundh, 630,599; Electric cables or wires, protective casing for, A. Sundh, 630,534; Electric conduits and armoring flexible tubes and electric cables, method of and mechanism for constructing, E. T. Greenfield, 630,503; Electric machine and operating same, dynamo, M. Deri, 630,498; Electric machine, dynamo, H. G. Reist, 630,409; Electric machines, arrangement for exciting magnets of dynamo, M. Deri, 630,492; Electric motor, dipbase, S. W. Dietrich, 630,358; Electric motors, automatic regulator for, A. T. Marshall, 630,618; Electric switch, H. H. Curtis, 630,467; Electric wires, metallic conduit for, E. T. Greenfield, 630,501; Electrical conducting main, Highfield & Cater, 630,697; Electrically driven spindle, Sawyer & Robb, 630,567; Elevator, W. F. Sanderson, 630,417; Elevator, H. R. Tracy, 630,473; Elevator safety device, Terry & Grissom, 630,424; Embossing machine die plate, J. Eberhard, 630,672; End gate, wagon, J. W. Brubaker, 630,651; Engine. See Gas or vapor engine. Locomotive engine. Pump engine. Reciprocating engine. Rotary engine; Engine igniter, gas, Morse & Hobart, 630,624; Engraving machine, M. Kruse, 630,546; Eraser attachment, R. B. Brown, 630,774; Exhibiting stand for price lists, W. N. Stephan, 630,755; Eye, R. E. Smith, 630,573; Fabric tufting and embroidering machine, J. Henry, 630,456; Fasteners, tool for setting, R. C. Annand, 630,476; Faucet and scale, automatic liquid weighing, E. Gruening, 630,508; Faucet, automatic, P. Brelay, 630,481; Felly trough, F. S. Briggs, 630,451; Fence, combined hedge and wire, L. W. Young, 630,440; Fence device, wire, C. A. Burnham, 630,653; Fences, device for making wire, W. McCloskey, 630,465; Fencing, etc., machine for spooling and taking up wire for, J. W. Sanderson, 630,745; Fender. See Car fender; Fibrous or other material, apparatus for compressing, G. A. Lowry, 630,374; File, H. W. Conrad, 630,487; File box, cashier's, J. T. Hicks, 630,505; File, C. M. Gibbs, 630,375; Filter, A. E. Krause, 630,363; Filter, Scott & Holmes, 630,569; Filter attachment for centrifugal machines, U. Laplace, 630,365;

Table listing inventions with patent numbers, including: Filter, heater, and cooler, water, E. S. Clower, 630,327; Fire alarm system, automatic, G. C. Hale, 630,345; Firearm, B. Behr, 630,478; Firearm, W. J. Turnbull, 630,758; Fire escape, 630,534; Fire hose support, C. R. Robinson, 630,563; Fish screen for artificial waterways, G. D. Bird, 630,769; Fishing reel, H. J. Smith, 630,632; Flour chest or bin, M. F. Brown, 630,322; Flushing tank, C. J. Ball, 630,437; Flushing tank, D. B. Buick, 630,586; Fruit picker, R. W. Casler, 630,446; Fuel, apparatus for manufacturing and pressing artificial, H. C. B. Forester, 630,676; Fuel, artificial, H. C. B. Forester, 630,677; Fuel blocks, apparatus for manufacturing, W. B. Hartrich, 630,691; Furnace. See Glass furnace. Ore roasting furnace. Smoke consuming furnace; Furrow opener, disk, F. R. Packham, 630,629; Fuse, H. P. Merriam, 630,620; Fuse for projectiles, H. P. Merriam, 630,621; Game, J. J. Johnson, 630,482; Game, O. Browne, 630,625; Game, W. K. Clark, 630,657; Garment clasp, W. G. Bertram, 630,319; Garment fastening device, M. L. Perrottet, 630,616; Gas apparatus, E. Gobbe, 630,683; Gas burner, acetylene, E. R. Dojan, 630,483; Gas generating apparatus, acetylene, H. Daut, 630,827; Gas generator, acetylene, J. G. Kerr, 630,824; Gas generator, acetylene, Mace & Gerard, 630,722; Gas lighting device, automatic electrical, S. M. Meyer, 630,814; Gas manufacturing, F. A. Paik, 630,692; Gas or vapor burning apparatus, T. Clarkson, 630,658; Gas or vapor engine, H. J. Perkins, 630,738; Gate. See Cattle guard gate. End gate. Lever actuated gate; Gate, W. D. Wilson, 630,435; Gear changing mechanism, A. Meyers, 630,512; Gear generating machine, bevel, H. W. Cheney, 630,325; Gearing, R. W. Jamieson, 630,709; Gearing, angle, R. W. Jamieson, 630,710; Generator. See Gas generator; Glass furnace, J. M. Miller, 630,464; Globe and mounting therefor, W. M. Goldthwait, 630,604; Governor, centrifugal, P. Brotherhood, 630,773; Grate for cooking apparatus, fire, J. H. Goodfellow, 630,807; Grater, nutmeg, J. B. Baily, 630,313; Grater, soap, J. L. Ryan, 630,413; Grinder, 630,487; Grinder, mowing machine sickle, E. V. Green, 630,688; Grinding machine, T. Delahay, 630,451; Grinding machine, drill, L. S. & J. N. Heald, 630,536; Grinding mill, T. L. & T. J. Sturtevant, 630,574; Guarded can and can guard, H. Bitner, 630,443; Hair brush, 630,489; Hammer, pneumatic, C. K. Pickles, 630,818; Hammock support, W. F. Parmelee, 630,735; Handle. See Brush handle; Handle for metal ware, T. L. Ferrall, 630,675; Hanger. See Door hanger; Harrows, 630,484; Harness machine, J. G. Eicholtz, 630,335; Harrow, C. Christianson, 630,556; Harvester, Pettingill & Sanders, 630,404; Hat sizing tanks, strainer for, G. Wells, 630,429; Hay and stock rack, combined, Cook & Shannon, 630,663; Hay press, I. O. Stewart, 630,785; Heater. See Hot water heater; Heater, R. Bigley, 630,822; Heel rubber, J. H. Morrow, 630,726; Hemp disintegrating machine, P. W. Reinshagen, 630,408; Hinge, E. Breuning, 630,480; Hinge, B. J. Riley, 630,430; Hoe, M. W. V. Green, 630,460; Hoop trimming nippers, J. D. Decelle, 630,670; Hook. See Whitetree hook; Hoop. See Metal hoop; Horse detacher, A. L. Wilkie, 630,432; Horse shoe, rollers, H. G. & Eds., 630,440; Hose, knitted fabric for hydraulic, G. E. Stevens, 630,783; Hot water heater, tubular, Evans & Curtis, 630,674; Hydrocarbon burner, J. J. Anderson, 630,580; Hydrocarbon burning apparatus, D. Simmons, 630,751; Incubator or brooder tank, M. M. Johnson, 630,545; Intrenching tool, A. S. Hoffmann, 630,829; Ironing cabinet, C. Millard, 630,515; Joint. See Rail joint; Kaleidoscope, D. A. A. Buck, 630,652; Kettle lifter, C. J. Berg, 630,317; Key. See Watch key; Kiln. See Drying kiln; Kin or furnace, O'Connell & Hilery, 630,732; Knitting machine, G. E. Stevens, 630,784; Knobs, machine for securing shanks to carriage curtain, F. A. Neider, 630,554; Label, medicine, F. W. Bates, 630,822; Labeling machine, G. F. Gipner, 630,347; Lamp, electric arc, J. E. Moran, 630,515; Lamp, electric arc, A. Stuttmann, 630,470; Lamp, electric headlight, H. P. Wellman, 630,475; Lamps, vaporizer for hydrocarbon, J. Moscovitz, 630,549; Land roller and pulverizer, R. Newton, 630,467; Lathes, tool support for metal turning, W. L. Guise, 630,778; Lawn sprinkler, W. Quayle, 630,468; Lease rod, F. L. Hammond, 630,347; Leather cutting machine, H. Parsons, 630,402; Lemon squeezer, C. Morgan, 630,391; Letter, detachable sign, C. F. Johnson, 630,398; Lever, 630,442; Lifter. See Kettle lifter; Lightning rods, machine for making, W. Dodd, 630,394; Limb, artificial, M. E. Rice, 630,585; Linotype machine, B. Nadall, 630,596; Liquid cooler, 630,414; Lock. See Bolt lock. Nut lock; Lock, R. Luckenbach, 630,610; Locomotive engine, C. J. Mellin, 630,619; Loom shuttle, A. Aube, 630,793; Lubricator. See Automatic lubricator; Machinist's tool, J. Beach, 630,816; Magnetic method of measuring for inducing magnetism in, C. Steinmetz, 630,418; Mail bag or pouch, D. R. Hering, 630,694; Mail pouch fastener, W. E. Griffin, 630,504; Marker, stock, J. H. Harvey, 630,549; Measuring and registering device, E. S. Clayton, 630,659; Mechanical drawing apparatus, S. C. Houghton, 630,380; Metal hoop, W. Goldie, 630,683; Metals, preparing cathodes for electrodepositing of, H. Becker, 630,796; Metallic carbids, manufacturing, H. L. Hartenstein, 630,690; Mill. See Grinding mill; Mining machine, C. W. Miller, 630,388; Moistening and sealing envelopes, machine for, Sichel & Riell, 630,571; Mortising machine, W. D. Herschel, 630,538; Motor. See Current motor. Electric motor; Motor, G. M. Stock, 630,422; Nail, B. Schnitzler, 630,747; Necktie fastener, A. F. James, 630,708; Nut lock, B. F. Keyser, 630,715; Oil burner, A. J. Blackford, 630,770; Oil can, non-explosive, G. A. Mentel, 630,723; Oilier, air pump, piston rod, W. Cooper, 630,528; Ore roasting furnace, J. F. Keiper, 630,510; Pad. See Wax pad; Paper applying device, wall, A. W. Foster, 630,678; Paper box, G. R. Wyman, 630,739; Paper box machine, W. G. Cowell, 630,536; Paper cutting machine, Rouss & Senghaer, 630,626; Paper folding apparatus, McDowell & Bengough, 630,626; Paper pulp cleaning apparatus, A. Aberg, 630,363; Pedal and pedal bearing, M. Matthews, 630,468; Pedal attachment for automatic playing devices, R. W. Parls, 630,557; Pen, self-inking fountain, W. Stewart, 630,528; Perforating machine, electromechanical, G. H. Davis, 630,598; Petroleum, cleansing purifying agent employed in purifying, H. Frasch, 630,496; Phosphate, apparatus for mining, transporting, washing, and drying pebble, L. R. McLain, 630,395; Photographic drawing table, H. J. Kimball, 630,357; Graeme, 630,500; Photographic shutters, time regulator for, H. Bate, 630,644; Pianola guide, H. W. Pain, 630,548; Picker, See Fruit picker. Hat picker; Pilot coupling, T. E. McPherson, 630,575; Pipe case, smokers', J. H. Tierney, 630,556; Pipe clamp, H. A. Wahlert, 630,428; Pipes by freezing, apparatus for preventing bursting of water, N. M. Hopkins, 630,700; Planter, R. R. Twinn, 630,759; Planter, for H. J. Dooley, 630,452; Planter, potato, A. J. Colburn, 630,862; Plow, W. F. Hartig, 630,454; Plow, Muehr & Frerich, 630,816; Plow and cultivator, J. L. Hodges, 630,552; Plow attachment, disk, J. I. Lovett, 630,367; Pneumatic drill, portable, H. J. Kimball, 630,357; Pneumatic propulsion means, J. C. Walker, 630,821; Pocket safety attachment, D. T. Kissam, 630,544; Post hole digger, R. W. Brooks, 630,483; Pot. See Coffee pot; Power driven tool, W. F. Barrett, 630,439; Power driven tool, H. C. H. Chubb, 630,589; Press. See Hay press. Printing press;

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