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To Manufacturers.—I wish nut lock patent, No. 30,385, manufactured on royalty. See notice and cut on another page. J. A. Campbell, care "Banner," Brenham, Texas.

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If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

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Curtis Pressure Regulator and Steam Trap. See p. 93. Woodwork'g Mach'y, Rollstone Mach. Co. Adv., p. 94.

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Brass & Copper in sheets, wire & blanks. See ad. p. 92.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 20,000 Crank Shafts and 5,000 Gear Wheels now in use, the superiority of their Castings over all others. Circular and price list free.

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Lane's Patent Self-measuring Faucets for molasses, oil, varnish, etc. Lane Bros., Box 276, Poughkeepsie, N. Y.

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Catalogue of Books, 128 pages, for Engineers and Electricians, sent free. E. & F. N. Spon, 35 Murray Street, N. Y.

The best Steam Pumps for Boiler Feeding. Valley Machine Works, Easthampton, Mass.



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 This is for our information, and not for publication.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.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) J. H. C.—The developer which has been found to work well on plates coated with Mr. Henderson's emulsion is as follows:

- No. 1. Sal soda... 4 oz. Sulphite soda... 3 oz. Water... .32 oz. No. 2. Pyrogallol... 1/4 oz., 218 grs. Oxalic acid... 35 grs. Water... 5 oz.

Dissolve the oxalic acid in water, then add the pyro. To develop a large plate, take 2 1/2 oz. of No. 1, add 3/4 oz. of water, and 1 drachm of No. 2.

(2) J. D.—The anthracite coals vary from 39 to 42 cubic feet to the ton. The bituminous coals vary from 41 to 49 cubic feet to the ton.

(3) J. C. C. writes: Suppose a cannon one mile long is put on car wheels and placed on a railroad track, the cannon being loaded with powder sufficient to drive a ball one mile a minute; attached to the car wheels at the breech of the cannon is an engine, with power sufficient to draw the load one mile a minute. Supposing it possible to start them both at the same instant, the powder driving the ball one way, and the engine drawing the cannon in the opposite direction. How far will the ball be at the end of the first minute from where it started—one mile or two miles—with relation to the cannon? A. If the gun backs down a mile in one minute, and the ball moves along the gun at the rate of one mile in one minute, the ball will remain stationary in regard to the earth; in fact, the gun runs away from the ball. The ball will be in the mouth of the gun at the end of a minute.

(4) E. S. N.—Steam follows the same law as the atmosphere and gases relative to sudden compression and expansion.

(5) W. G. W. asks: 1. How to grind out the mouths of vials and bottles, so that the corks will fit tightly for holding alcohol and other volatile things? A. Glass stoppers can be made to fit tightly by grinding with emery. This operation can be performed either by hand or on the wheel. 2. Is there any known solvent for charcoal? A. Charcoal is described by Storer as "insoluble in water, alcohol, ether, or in dilute acids or alkaline solutions."

(6) "Steam Fitter" writes: A few days back I had a controversy with an engineer in charge of a steam heating plant. A No. 3 Blake pump is used to return water from hot well to boilers; hot well about six feet above pump; pump would jerk a little as it started back on its stroke; to remedy this, engineer puts on what he calls an "air chamber" on suction pipe, and contends that said air chamber—vacuum chamber I call it—will be full of air, and that as the water floods the pump it will cushion on the air and stop the jerk in the stroke. I contend that the air will be exhausted from the chamber, and as the cylinder fills with water a partial vacuum is formed in the chamber, provided the pump is running fast, and that the shock is relieved by the water filling the vacuum. The jerk in the stroke I think is caused by the water being very hot and partially vaporizing as it flows into the cylinder. Which, if either of us, is right? A. "Steam Fitter" is correct, and engineer may also be said to be correct, as air chamber is a common designation for these appliances.

(7) S. B. G. writes: It is said the Old Liberty Bell was cast in London about the year 1751; but when it reached Philadelphia it was found to contain too much copper, and a second casting was necessary; after which, in the first week of June, 1753, it was hung in the belfry. Please inform me whether it was cast the second time in Philadelphia or in London; and was the same metal used? Also, what was the cause of it being cracked? A. The now famous "Liberty Bell" was imported from England in 1752; it was cracked on trial by a stroke of the clapper, and recast in Philadelphia under the direction of Isaac Norris, to whom is attributed the putting on of the inscription from Leviticus xxv., 10: "Proclaim liberty throughout all the land, unto all the inhabitants thereof." Immediately beneath this is added: "By order of the assembly of the province of Penna. for the State House in Phila." Under this again, "Pass & Stow, Phila., MDCCLIII." In 1777, during the occupation of Philadelphia by the British, the bell was removed to Lancaster. After its return it was used as a State House bell, but was finally removed to Independence Hall. Its last ringing, when it was cracked, was in honor of a visit of Henry Clay to Philadelphia.

(8) J. H. D. asks how the periods of maturity of people inhabiting the different tropical, temperate, and arctic zones compare. In which section is average longevity the greatest? A. Temperate zone.

(9) C. A. S., Jr., asks how to make a dip for brass buttons to darken them, say shade nearly same as dark bronze or Florentine bronze? A. One part oxide of iron, one part white arsenic, twelve parts

hydrochloric acid. Clean the brass well to get rid of lacquer or grease, and apply with a brush until the desired color is obtained. Stop the process by oiling well, when it may be varnished or clear lacquered.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 10, 1885,

AND EACH BEARING THAT DATE.

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

Table listing inventions such as Aerial navigation, vessel for, E. F. Falconnet, Amalgamator, R. J. Atherley, Animal trap, R. Jesse, Atmospheric brake, W. O'Herin, Axes, etc., blank for, J. W. Bowers, Bar, See Grate bar. Locomotive draw bar, Barrel drying machine, G. Miller, Basket, wire, W. H. Elliott, Basket, etc., splint for, S. Friend, Bearing, friction, G. W. Shoemaker, Bedstead, M. O'Neill, Bell attachment, sleigh, W. E. Barton, Belt coupling, J. England, Belt, safety, E. J. Claghorn, Belt, waist, L. Sanders, Bit. See Bridle bit, Blind slat, window, H. E. Willer, Boat. See Life boat, Boiler. See Steam boiler, Boiler furnace, J. Collis, Bolts, rivets, etc., machine for making, Fischer & Busek, Book, account, A. Synold, Boot or shoe, J. Hansen, Boot or shoe counter stiffener, J. Kiefer, Bottle stopper, G. D. Corey, Bottles with aerated beverages, filling, J. Matthews, Box. See Feed box. Shipping box, Box fastener, H. F. Moeller, Brad driver, W. P. Ginter, Brake. See Atmospheric brake, Brick machine, H. L. Balson, Bridle bit, Brott & Andrews, Bronze plates for book covers, furniture panels, etc., manufacture of imitation, C. Wagenfohr, Brush machine, M. Hellwig, Bucket handle, G. W. Knapp, Buckle, J. Lines, Buckle, C. A. Mann, Bushings into casks, expander for expanding and securing metal bung, H. Cottrell, Button and scarf holder, combined collar, W. J. Dunn, Button fasteners, machine for manufacturing, H. N. Hemingway, Button, surface attaching garment, P. H. Walsh, Buttons, machine for turning pearl, E. May, Buttons, manufacture of pearl, G. Carlyle, Can. See Milk can. Oil can, Cane mill, J. Bennyworth, Car coupling, J. W. Ferguson, Car coupling, W. J. Hadden, Car coupling, A. S. Neal, Car coupling, J. W. Nunamaker, Car coupling, P. J. Payn, Car pedestal, railway, Briody & McHale, Car safety device, W. L. Robinson, Car signal, F. P. Day, Car wheel and spraying bar, spraying, A. A. Smith, Car window shade, G. B. Massey, Carbureting air and gas, apparatus for, J. S. Butler, Card or print hanger, A. H. Stetson, Carding engine feeding mechanism, W. C. Bramwell, Carpets, etc., fabric for, Priestley & Kunkler, Carriage dash frames, die for, F. T. Smith, Carriage wheel lock, R. P. Cowles, Carrier. See Cash carrier, Cart, dumping, M. Bows, Cartridge shells, machine for finishing metallic, G. P. Salisbury, Cash carrier, automatic, D. K. Hill, Cement, manufacture of hydraulic, D. Griffiths, Chair. See Convertible chair. Reclining chair, Check rower, L. D. Benner, Chopper. See Cotton chopper, Chuck, lathe, C. W. Crary, Chute, coal, M. D. Jones, Cleaner. See Cotton cleaner, Clock cases, statuary, vases, etc., from plastic materials, manufacture of, R. P. Coughlin, Clock pallets, machine for finishing, E. Horton, Clutch, friction, F. M. Blake, Clutch operating mechanism, J. H. Wright, Coal vase, H. Adler, Cock box, stop, J. K. Clark, Cock, stop, W. Ricketts, Cock, water, P. A. Bowen, Coffee and tea pot stand, C. Gracey, Coffee pot, E. H. Judkins, Coffee roaster, T. B. C. Burpee, Collar and sweat pad clamp, horse, R. Brownson, Collar, horse, R. Brownson, Convertible chair, A. Sawyer, Corset fastening, L. Hill, Corset fastening, P. Laffin, Corset fastening, C. H. Williams, Corset steel fastening, L. Hill, Corset steel fastening, P. Laffin, Cotton chopper, J. D. Faulkner, Cotton cleaner and feeder, J. S. Daniell, Coupling. See Car coupling. Thill coupling, Cuff and sleeve holder and adjuster, Sourwine & Carpenter, Cuff fastener, J. J. Fay, Cultivator, M. B. Parks, Cultivator, J. Wherry, Jr., Cultivator attachment, W. I. Fish, Cultivator, hand, J. J. Butler, Cultivator, tongueless, E. E. Whipple, Cultivator, wheel, G. W. & S. Taylor, Curtain ring fastening, Tucker & Godfrey, Cut-off for cisterns, J. S. Heaton, Decoy, J. Danz, Jr., Dental tool, T. Cogswell, Deoxidizing the surface of sheet metal, E. V. McCandless, Desk, school, J. H. Talbott,

Table continuing list of inventions such as Dials, machine for ruling, R. L. Taft, Ditching machine, S. F. Welch, Dock, J. S. Vanness, Door check, T. M. Kenney, Draughting, perspective delineator for, W. E. Speir, Drawer handle, C. M. Burgess, Drill. See Rock drill, Electric apparatus cut-out, S. H. Short, Electric arc light cables, joint for, W. R. Patterson, Electric machines, armature for dynamo, F. K. Fitch, Elevator. See Hay elevator, Engine reversing mechanism, R. Scheidler, Envelope, A. A. Bishop, Envelope, K. H. Pedrick, Explosive compounds, protected nitrate of ammonia for use in, R. S. Penniman, Eye water, M. M. Lamontagne, Fan, automatic, G. Schmidt, Fanning mill, E. H. Pease, Feed actuating mechanism, J. H. Wright, Feed box for animals, L. Doty, Fence making machine, G. Q. Adams, Fender. See Flow fender, File holder, W. H. Phelps, File, paper, W. Bright, File, paper, W. H. H. Clague, Filter, A. C. De los Rios, Firearm, magazine, J. D. Greene, Firearm, magazine, W. Mason, Fire escape, Farrar & Powers, Fire escape, automatic, F. A. Bone, Fire front, P. McCauley, Fire place heater, G. L. Morrison, Flour bolt, Cochrane & Smith, Flour mills, disintegrating apparatus for, A. C. Nagel et al., Flower pot stand, A. H. Perkins, Folding table, E. Tucker, Fork. See Hay fork, Frame. See Window frame, Furnace. See Boiler furnace, Furnace grate, S. D. Fisher, Furrower, marker, and coverer, D. E. Darnell, Gas meter, G. Fajen, Gas, method of and apparatus for enriching and burning water, C. J. Eames, Gas pipe holder, C. G. Duffy, Gearing, G. H. Ashby, Generator. See Steam generator, Glass through the annealing oven, apparatus for conveying sheets of, B. Mayer, Governor, W. B. Mason, Governor, steam, T. Malcolmson (r), Grain binder, F. Ogden, Grain separator and cleaner, L. Lockwood, Grate bar, W. J. Sibley, Grease cup, automatic, J. A. Houck, Gun, magazine, J. M. & M. S. Browning, Guns in turrets by electricity, system of firing battery, T. R. Timby, Guns, loading device for breech-loading, R. J. Gating, Handle. See Bucket handle. Drawer handle, Handle, W. W. & F. H. Chilton, Hanger. See Card or print hanger, Harnessmaker's stitching horse, J. F. Best, Harrow, T. W. Robinson, Harrow, rotary, H. H. Monroe, Harrow, sled, and marker, adjustable, W. R. Locke, Harvester, grain binding, Marsh & Blood, Hasp, J. S. Williams, Hay elevator and carrier, R. H. Morris, Hay fork, horse, R. L. Short, Hay tedder, J. Keller, Heater. See Fireplace heater. Stove and range water heater, Hoe, G. W. Perrine, Hoisting machinery, external friction brake band for, D. H. Merritt, Holder. See File holder. Gas pipe holder. Sash holder, Hook. See Snap hook, Hook, R. Ely, Horse and mule shoes, manufacture of toe calks for, C. H. Perkins, Inhaler, U. K. Mayo, Jib furler, W. P. & A. M. Cutler, Jug, stone, J. B. Brackett, Jute machine, J. C. Delavigne, Ladder and truck, fire, L. Harris, Ladder, step, C. Brand, Ladle stopper, D. D. Lewis, Lamp, J. Hinks, Lamp, automatic feeding and wick raising, T. A. Fitzsimons, Lamp, electric arc, C. F. Brush, Lamp, extension, J. A. Everts, Lamps, feed regulator for electric arc, S. H. Short, Latch, gate, R. Magruder, Lathe and planer tool, H. B. Steele, Lathe tool, T. & T. E. Ryan, Lead pipe, boxing, Euston & Neville, Life boat, A. B. Boyles, Lifter. See Transom lifter. Wagon bed lifter, Link for clothes or harness, A. C. Faivre, Lock. See Nut lock, Lock, N. A. Hull, Lock, A. Kohlhof, Locomotive draw bar, T. C. Craven, Log boom, J. R. Allen, Loom for weaving double pile fabrics, C. Coup-land, Loom take-up mechanism, F. Kesselring, Lubricating bearings, device for, G. De Laval, Lubricator, F. L. McGahan, Marker, land, W. H. King, Match card, R. G. Britton, Mattresses, material for filling, R. Stilwell, Measuring jacket, H. Lingren, Measuring vessel, G. C. Smith, Meat tenderer, S. Kesner, Mechanical movement, J. G. Meyers, Medical compound, J. Weller, Medicine, cough remedy, M. M. Lamontagne, Medicine for croup, diphtheria, etc., Erickson & Lindblom, Metal shears, G. McDonald, Meter. See Gas meter, Milk can, N. Gerber, Mill. See Cane mill. Fanning mill. Roller mill. Rolling mill. Windmill, Mirror stand, C. Zornow, Monocycle, F. E. Mills, Motions of two or more bodies may be varied in any required manner independently of their actual motions, apparatus whereby the relative, H. S. H. Shaw, Motor. See Steam motor.

Mowing machine pitman, D. C. Markham... 311,996
Music, books, etc., device for holding, G. H. Northrop... 312,153
Music leaf turner, J. M. Branig... 311,950
Music rack or holder, E. Tucker... 312,040
Musical instruments, key board attachment for, Bishop & Down... 311,947
Necktie, Haulenbeek & Brown... 312,118
Nut lock, W. H. Dinsmore... 311,879
Nut trimming machine, T. Snape... 312,031
Oil can, A. L. Day... 311,965
Oiler, car axle, J. Gibbons... 311,893
Ordinance, breech-loading, R. J. Gatling... 311,973
Oven and radiator, warming, J. G. Mechem... 311,908
Pad. See Saddle pad.
Pan. See Patty pan.
Pants, attachment for, I. Stark... 312,033
Paper for roofing felt, etc., C. W. Armour... 311,938
Paper for sheathing, etc., C. W. Armour... 311,939
Patty pan, J. Chaumont... 312,187
Pavement, street, K. Kuhn... 311,994
Pavements, etc., stamping margins for, C. Sutton... 312,225
Pills, making, W. E. Upjohn... 312,041
Plane, W. Tidgewell... 312,229
Planing and shaping machines, shipping device for metal, J. H. Wright... 312,060
Platform and platform shifting mechanism, double, O. P. Bushnell... 311,956
Plow, T. A. Blanchard... 312,075
Plow fender, G. C. Miller... 311,909
Plowshare attachment, S. Hamilton... 311,980
Pot. See Coffee pot.
Press. See Wine and cider press.
Printing machine, G. C. Gill... 311,976
Printing machine, W. Scott... 312,022
Printing press receiving table, A. Overend... 312,217
Propeller for boats, hand, M. Batz... 312,071
Protector. See Telegraphic and telephonic instrument protector.
Pulley, friction clutch, H. W. Hill... 312,122
Pump, magma, G. Dinkel... 311,878
Pump, sand, W. H. Birge... 311,945
Pump, sand and water, V. G. Barney... 312,069
Rack. See Tobacco transporting rack.
Railway, J. H. Pendleton... 312,009
Railway and car truck for the same, elevated, D. Moulton... 312,004
Railway signal, pneumatic, E. M. Chase... 311,959
Razor strop, W. D. Evans... 312,104
Reclining chair, J. P. Ellacott... 311,882
Reed, J. B. Hamilton... 312,115
Roaster. See Coffee roaster.
Rock drill, core, Conner & Peebles... 312,093
Roller mill, J. Warrington... 312,048
Roller mill pressure indicator, E. Strong... 311,927
Rolling axles, spindles, and other metal articles, machine for, M. E. Shay... 311,924
Rolling irregular forms, machine for, L. D. Farra... 312,107
Rolling mill for rails, A. J. Moxham... 312,213
Rolling mill for rods, J. T. Rowley... 311,920
Rolling mills, automatic feeding table for, Hunt & Suppes... 311,899
Roofing cleats, machine for bending tin, S. A. Phillips... 312,013
Rotary engine or pump, Heenan & Froude... 312,116
Saddle pad, harness, E. E. Armstrong... 311,940
Sash cord guide, D. Shealy... 312,025
Sash fastener and lift, combined, F. W. Seymour... 312,023
Sash holder, N. Clark... 311,872
Saw, J. Ledward... 312,133
Saw, drag, J. H. Hulbert... 312,205
Saw swage, L. B. Young... 312,061
Scarf, necktie, or cuff holder, L. F. Ward... 312,047
Scarf shield and pin, neck, L. Eschner... 312,102
Sealing milk bottles, J. W. Wilder... 311,932
Seeder, H. H. Monroe... 312,149
Seeding machine, G. W. Miskimen... 312,148
Separator. See Grain separator.
Sewer cleanser, W. Jenks... 312,206
Sewing machine, W. F. Beardslee... 311,943
Sewing machine bobbin winding attachment, C. Hosh... 311,988
Sewing machine guide setter, C. T. Freeman... 312,196
Shaft, flexible, M. G. Farmer... 312,241
Shaft, vehicle, J. S. & A. S. Scott... 312,021
Shears. See Metal shears.
Sheet metal cutting machine, C. Wais... 312,236
Shipping box or crate, B. Shunk... 312,173
Shoe, C. H. Winter... 312,056
Shutter, window, H. E. Willer... 312,053
Sifter, A. L. Henry... 311,896
Signal. See Car signal.
Skate, roller, L. M. Wisewell... 311,936
Snap hook, F. Armstrong... 311,941
Speculum, rectal, F. B. Ives... 312,123
Spring. See Vehicle side spring. Watch case spring.
Square and miter, combined drawing, J. Muller... 311,911
Stand. See Flower pot stand. Mirror stand.
Steam and utilizing exhaust, generating, C. Heinslering... 311,984
Steam boiler and furnace, Randall & King... 312,163
Steam generator, Kangley & Cherry... 311,900
Steam jet apparatus, L. Schutte... 312,170
Steam motor, C. Heinslering... 311,983
Steam wheel, R. Powers... 312,015
Steel trap, E. A. Cook et al... 312,094
Steering apparatus, F. H. Cathcart... 311,889
Stereotype matrices, machine for producing, O. Mergenthaler... 312,145
Stone, composition for the manufacture of artificial, J. L. Wray... 312,057
Stone gathering machine, B. A. Weatherbee... 312,237
Stone sawing machine, V. G. Barney... 312,068
Stop motion for hemp spreaders, etc., measuring, J. Good... 311,978
Stopper. See Bottle stopper. Ladle stopper.
Store service apparatus, Clark & Cowley... 312,067 to 312,091
Stove and range water heater, J. A. Price... 312,017
Stovepipe thimble, D. B. Robins... 312,018
Stoves, removable oven for combined coal and gas burning, H. H. Sheldon... 312,172
Suspenders, A. Brown... 312,080
Suspenders, Cadbury & Rollason... 312,083
Suspenders, T. O. Potter... 311,918
Switch signal, automatic, A. L. Wilkinson... 312,239
Table. See Folding table.
Tapping metal pipes and fittings, machine for, T. G. Morse... 312,212
Teeth, machine for forming spring, E. P. Burns... 311,954
Telegraph cables, apparatus for filling lead pipes of, W. R. Patterson... 311,913
Telegraphic and telephonic instrument protector, G. A. Cardwell... 311,957
Telephone boxes, memorandum holder for, J. F. Gilliland... 311,977
Telephone receiver, C. A. Randall... 312,162
Telephonic transmitter, J. H. Guest... 311,979
Telephone transmitter, C. A. Randall... 312,161
Telephonic circuit and apparatus, L. A. Berthon... 311,944

Thermostat, G. R. Williams... 311,933
Thill coupling, A. A. Dalley... 312,097
Thill coupling, Galatian & Taets... 312,112
Thill coupling, W. Katon... 312,125
Thrasher band cutter and grain feeder, G. Neukomm et al... 312,006
Tile for sidewalks, roofing, etc., illuminating, C. E. Furman... 311,891
Tiling, illuminating, C. H. Ross... 312,222
Till recording and registering apparatus, H. Pottin... 312,014
Time lock mounting, W. B. Hayden... 312,119
Time register for seats, C. W. Allen... 312,176
Tobacco transporting rack, W. Sternberg (r)... 10,560
Tower and shield system of fortifications, T. R. Timby... 312,230
Tower and shield system of fortifications, revolving, T. R. Timby... 312,232
Toy swing, electro-magnetic, M. Bacon... 312,178
Transom lifter, J. H. Shaw... 312,024
Transom operator, S. Strong... 312,224
Trap. See Animal trap. Steel trap.
Truck and bag holder, combined, Price & Stevenson... 312,016
Trunk, M. R. Redmond et al... 311,919
Trunk catch, J. O. Ford... 312,195
Tubes, sectional non-conductive covering for, W. M. Suhr... 312,037
Tug, T. Jacoby... 311,989
Type writing machine, G. C. Garrison... 312,113
Valve, T. L. Rankin... 312,164
Valve, automatic air, W. Vanderman... 312,042
Valve, balanced, D. Mercer... 312,000
Valve, balanced slide, P. McDermott... 312,144
Valve, disk and cone, T. Barber... 311,942
Valve, steam engine reversing, A. Freeman... 311,820
Valve, steam oscillating, J. M. Kells... 312,126
Valve burner attachment, A. P. Avery... 312,065
Vapor burner valve, D. E. Bangs... 312,067
Vehicle side spring, J. H. Snodgrass... 312,174
Vehicle, two-wheeled, E. G. Seitz... 311,922
Velocipede saddle, C. E. Pratt... 312,219
Ventilator, J. M. Ayer... 312,177
Wagon bed lifter, W. H. Thomas... 312,038
Wagon loading machine, A. L. Slawson... 311,926
Wall paper cutting machine, J. C. Van Horn... 312,043
Washing machine, B. & J. Wing... 311,935
Watch case spring, A. Grandjean... 311,894
Watch cases, machine for turning, J. Frossard... 312,198
Watchmaker's tool, H. P. Pruim... 312,221
Water closet apparatus handle, J. H. Hawley... 311,982
Water distribution, main for, S. B. Peeney... 312,158
Water tower, J. B. Logan... 311,905
Weather strip, T. Weaver... 311,929
Well fixture, J. T. Senn... 311,923
Wheel. See Steam wheel.
Whip socket and rein holder, combined, G. M. Custer... 311,876
Windmill, J. Q. Adams... 311,937
Windmill, E. F. Lester... 312,134
Window, J. W. Naughton... 312,006
Window frame, H. E. Willer... 312,052
Wine and cider press, G. Wager... 312,235
Wire, annealing copper, Wallace & Wood... 312,045
Wire fabric, loom for weaving, T. Patterson... 312,008
Wire, machine for screw threading, A. Cavall... 312,084
Wire, spool for barbed, G. Case... 312,188
Wrench, J. Gibbons... 311,892

DESIGNS.

Bracket, E. T. Harris... 15,788
Carpet, M. F. Beal... 15,782, 15,783
Carpet, J. Pegel... 15,801 to 15,806
Carpet, A. Petzold... 15,793 to 15,795
Platter, E. Haviland... 15,789
Rug, W. Gilmour... 15,788
Rug, A. Petzold... 15,796 to 15,800
Spoon handle, C. T. Grosjean... 15,785
Spoon handle, G. W. Shiebler... 15,808
Spoon or fork, C. T. Grosjean... 15,784
Statuary group of, J. Rogers... 15,807
Stool, J. Hofmann... 15,780
Type, font of printing, J. Guildenstine... 15,787
Type, font of printing, H. Ihlburg... 15,791
Type, font of printing, W. W. Jackson... 15,792
Washboard, M. A. Smith... 15,809

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Cigars and cigarettes, A. Shire... 11,945
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Flour, wheat, S. Samper & Co... 11,942
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Soap for laundry and toilet purposes, Procter & Gamble... 11,922
Soap for toilet and general purposes, Procter & Gamble... 11,919
Soap in cakes for laundry and general purposes, Procter & Gamble... 11,939
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