Size has no connection with voltage. 2. What is the E. M. F. of an ordinary phonograph cell? A. Two kinds of primary battery are used. One is the bichromate cell, giving 1·75 to 2 volts. The other is the Lalande-Edison cell, giving 0·5 to 0·75 volt. 3. Will you name a treatment for tartar on the teeth? A. Let a dentist clean them once a year. Use best quality of tooth powder. It is an excellent practice to rub the teeth with a stick of wood the end of which has been chewed to a brush.

(4687) L. G. asks: What changes will be necessary in the 8 light dynamo described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600, to change it to a motor of at least 1¼ horse power, to run on a 110 volt circuit? How are spherical armatures wound? Have you a SUPPLEMENT describing same? A. We think the dynamo to which you refer is too small for 1¼ horse power. In the construction of a machine to run on a 110 volt circuit, we advise you to consult SUPPLEMENT, No. 844, containing a description of the small Edison dynamo and motor. We believe spherical armatures are wound on the open circuit plan. Nearly all the books on electric winding describe this winding.

(4688) W. E. P. & A. F. K. ask: Do rivers which flow toward the equator, by reason of the centrifugal force, of a necessity flow up hill? and Why the Nile runs north and the Mississippi runs south? A. All rivers run down hill by the force of gravity. The spheroidal form of the earth is due to gravity, modified by its centrifugal force, and of which the surface of the ocean is the fixed datum or level. All streams, whether running north or south, that are above the datum of the sea level run by virtue of theses two forces to a lower level. The fact of streams running farther from the earth's center is no paradox, when the true relations of the forces that hold the earth's surface to its spheroidal form are considered. The conditions of gravity and centrifugal force apply equally to running water and to the general form of the solid surface of the earth.

(4689) L. B. says: I wish to put a stern paddle wheel in a flat bottom boat, 15 feet long, 3½ wide, for shallow water. I have a 50 pound fly wheel, 30 inches diameter. How many paddles, what size, what diameter of wheel, and how many revolutions per minute would be best? What is limit of speed in such a boat, power same manner as in bicycle? A. Make your wheel 2 feet wide, 4 feet diameter, 12 buckets 6 inches wide, 50 revolutions per minute. Will give you a speed of about 5 miles per hour. Doubtful if you can get this speed in the way you propose to work the wheel.

(4690) F. T. R. asks: What would probably be the result if a channel were cut into the crater of Vesuvius below sea level and the water allowed to flow into it? A. Probably it would become an extinct volcano if the quantity of water were sufficient.

(4691) E. A.—For information on electroplating machines we refer you to the SCIENTIFIC AMERICAN SUPPLEMENT. Glass after being ground to a smooth surface is polished by means of rouge or putty powder. Coffee grows on bushes to a height of from 9 to 15 feet.

(4692) C. S. J.—Tabby is a shell concrete, made of equal parts of lime, broken shells and sand. The old tabby buildings along the Southern coast derive their strength from good work and age. Have no literature on this subject.

(4693) J. G. asks: Was the subject, "The Human Body as a Maguet," ever discussed in the SCIENTIFIC AMERICAN? A. We do not call to mind any scientific articles on the human body as a magnet. We do not think magnetism was ever discovered in the human body.

(4694) R. L.—You can use four cells of Crowfoot battery to each cell of storage battery for charging. Gravity batteries, which are not expensive, can be purchased from any of the dealers in this city.

(4695) P. & D. ask: Does the upper part of a wheel move faster than the lower in rotating? A. The upper part of a carriage wheel in traveling on the ground moves much faster than the lower part of the wheels. It has several times been explained in SCIENTIFIC AMERICAN.

(4696) S. A. C.—The best single book for the study of armature winding is Thompson's "Dynamo Electric Machinery," which we can furnish by mail for $9.

(4697) M. J. K. writes: My brother is going to start a brass foundry. What I wish to know is, what height and width (or area) will the stack or chimney require to be for two or three fires for melting brass. We have the furnace for small crucibles which has a grate surface of 14×14 inches=196 inches or 1⅓ square feet nearly. We want the other fires to be larger, say 2 feet square for large crucibles. If you can furnish or give paper on the same would be very thankful. A. You will seldom run more than two furnaces at once, which will indicate a good sized business. A chimney 16 inches square inside and 50 feet high should give ample draught for your furnaces. We have no paper on brass foundry plant, but have an excellent book, "Brass Founders' Manual," by Graham, $1 mailed. Larkin's "Brass and Iron Founders' Guide," $2.25 mailed.

(4698) W. C. M. writes: Kindly tell me of a preparation that I can use, not to be costly, that I can form or press in a plaster flask like accompanying sample. Also tell me if you know of any attempts to make locomotive boilers return tubular and what was the objection to them. About what is the difference in saving of fuel between a straight flue boiler and a triple return tube? Would not half the number of flues that are in a locomotive boiler be sufficient to carry off the smoke and gases? A. The sample appears to be blotting paper saturated with a composition of tallow, beeswax, and a little oil to soften the mixture. We know of nothing cheaper that has the properties you require. The area of the tubes of a locomotive is not large enough in the present construction to allow the gases of combustion to move slow enough to have their heat absorbed. There will be no gain by returning the tubes unless the shell is made larger.

(4699) C. C. P. asks: Can very hot air be pumped into a boiler with an air compressor so as to do one-third of the work? Will it not all be condensed? If it can be done, is there any economy in using air with steam? Is it safe to use air mixed with steam? Is it practical? A. Air, hot or cold, can be pumped into a steam boiler for useful work. There is no danger nor is there any profit. It condenses according to the pressure and does not give out as much work as it costs to put it in the boiler.

(4700) H. A. G. asks how to temper twist drills uniformly, that is to temper the whole drill at once. A. Twist drills should be packed in sand in an iron box and heated slowly to a cherry red, then dipped vertically in water. Brighten the surface and heat the drills evenly till an orange brown color appears on the bright surface.

(4701) H. H. B. asks: 1. Is a coil of a magnet the same resistance as the wire before it is wound on the coil? A. The resistance of the wire after it has been coiled on the magnet is slightly greater than it is in the original coil, on account of the hardening of the wire by bending. The difference however is very small and is negligible. 2. Would it release a building from danger of being struck by lightning if it were well insulated from the earth? A. No. 3. What can you put in sorghum so that it won't melt down in warm weather? The taffy is for making popcorn balls. A. Boil it for a longer time. Do not put in anything additional.

(4702) D. B. says: The purpose for which the answer is required is for a system of water works, distance from inlet to outlet of pipe 6 and 10 miles respectively; height or fall from inlet to outlet 100 and 125 feet respectively; size of pipe 4 and 6 inches. Question: Number of gallons that would flow through the outlet of a 4 inch pipe with a fall of 100 feet? Also from a 6 inch pipe with a fall of 125 feet? A. The 4 inch pipe, 6 miles, 100 feet head, will deliver 63 gallons per mmute. The 6 inch pipe, 10 miles, 125 feet head, will deliver 151 gallons per minute.

(4703) C. E. H.—Aluminum weighs 163 pounds per cubic foot, pure, casting. Much that is called pure weighs 165 to 170 pounds per cubic foot.

(4704) L. C. asks: 1. What is the proper oil to use in coloring hard pine floors? A. Use boiled linseed oil for floors. 2. Is there any coloring matter which you can put in the oil which will make them darker? A. A little burnt umber in the oil for darker shade. 3. What is the best method to apply the oil? A. Apply by rubbing the oil stain on the floor with a coarse woolen cloth. As little excess of oil as possible, so that it will dry quickly. For a new pine floor nothing is better than shellac varnish.

(4705) Constant Reader.—For a general description of the process of zinc etching, see SUPPLEMENT, No. 656. For fuller information, see Schraubstadter's "Photo Engraving," price $3. We can also supply Wood's "Modern Methods of Illustrating Books," by mail for $1.50.

(4706) H. P. R. asks: Why are coil pipes used on some steam gauges and not on others? A. Every steam gauge should have an inverted siphon in the connecting pipe to prevent the steam reaching the interior of the gauge to its injury. This may be a small coil or the pipe may drop enough to prevent the water returning to the boiler and the steam from reaching the gauge.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 14, 1893,

AND EACH BEARING THAT DATE.

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

Accumulator, W. A. Macleod ... 491,726
Advertising device, A. G. Macdonell ... 491,900
Air engines, heater for compressed, R. C. Smith ... 491,859
Air motor for propelling wheeled vehicles, compressed, J. Kames ... 491,892
Alarm. See Gas alarm.
Album, easel, W. A. Holman ... 491,942
Amalgamator, ore, F. O. Norton ... 491,686
Ammonium chloride, apparatus for volatilizing, L. Mond ... 491,741
Armature and means for supporting the same, E. Kolben ... 491,568
Armature conductor, E. Kolben ... 491,567
Axle box, car, J. S. Speer ... 491,819
Axle lubricator, L. E. Atkinson ... 491,671
Badge, pencil, and bouquet holder, combined, H. O. Thomas ... 491,614
Baling press, W. H. Kenner ... 491,967
Ball throwing device, J. P. Hill ... 491,558
Band cutter and feeder, J. C. Brash ... 491,522
Barrel heading press, B. S. Miles ... 491,847
Battery. See Secondary battery.
Bearing, ball, S. Elliott ... 491,938
Bearing, roller, Berry & Oliver ... 491,867
Bearing, roller, A. Petterson ... 491,585
Beehive, G. W. Stephens ... 491,619
Belt, endless carrier, L. Z. Preston ... 491,953
Belt tightener, J. J. Miller ... 491,728
Bending roll, W. Lewis ... 491,968
Bicycle tilting seat, W. R. Mercer ... 491,578
Bird warbler, E. F. Long ... 491,571
Boiler. See Cooking boiler. Steam boiler.
Boiler furnace, steam, L. Lawton ... 491,570
Boiler furnace, steam generating, R. H. Alexander ... 491,918
Block. See Musical block. Thrust block.
Bolster plate, H. A. Moyer ... 491,783
Bolt, O. C. Little ... 491,660
Boot or shoe slip sole, G. W. Dixon ... 491,731
Bottling machine, E. T. Jones ... 491,753
Box. See Letter box.
Brace. See Gate brace.
Brake shoe, M. Y. Baldwin ... 491,667
Breast drill, W. H. Wilkinson ... 491,624
Breast strap, H. D. Stoddard ... 491,964
Brick machine, V. F. Lanouette ... 491,657
Brick or tile cutting machine, J. Thompson ... 491,747
Brick press, automatic, T. B. Lewis ... 491,712
Broom rack, W. C. P. Jones ... 491,891
Brush mould, sectional, W. Morrison ... 491,757
Bucket dumping apparatus, F. B. Wineland ... 491,958
Buckle, cast off, G. E. Adams ... 491,630
Butter moulding and cutting machine, P. O. Andreasen ... 491,792
Button fastener, E. L. Torsch ... 491,788
Buttons, device for removing shoe, P. H. Nielsen ... 491,948
Cable grip, Babendreier & Davis ... 491,934
Camera. See Photographic camera.
Camera shutter, Blair & Kelley ... 491,921
Car brake adjuster, F. & J. W. Cyr ... 491,535
Car brake handle, C. D. Lyon ... 491,969
Car brake mechanism, Roberts & Wheater ... 491,664
Car coupling, A. Carlson ... 491,668
Car coupling, W. P. Clark ... 491,835
Car coupling, I. David ... 491,924
Car coupling, T. E. W. Fay ... 491,839
Car coupling, D. R. Jones ... 491,562
Car coupling, C. A. Pooley ... 491,589
Car coupling, J. W. Steele ... 491,862
Car coupling, F. Stenger ... 491,929
Car coupling, W. W. Swank ... 491,612
Car coupling, W. J. Walker ... 491,823
Car dranght rigging, P. M. Reagan ... 491,785
Car for transporting horses, railway, W. A. Caswell ... 491,936
Car hook, stock, B. C. Hicks ... 491,803
Car roof, Veronee & McInerney ... 491,909
Car seat, Aze & Glifillan ... 491,761
Car, tram, J. Stephenson ... 491,608
Cars, directly connected motor for, S. H. Short ... 491,667
Carpet sweeper, S. H. Raymond ... 491,964
Carriage top crate, B. B. Breed ... 491,869
Cash register, J. Pfeifer ... 491,587
Cash register and indicator, H. J. Gilbert ... 491,548
Cash register and indicator, H. C. Pritchard ... 491,583
Cash register and till, A. L. Crawford ... 491,876
Caster, P. J. Lennard ... 491,710
Chains, shield or covering for drive, S. Elliott ... 491,750
Chair. See Convertible chair. Dental chair.
Chair, C. B. Halsey ... 491,724
Chair and table, combined, B. Poulson ... 491,590
Chimney, door, J. Hohenreiner ... 491,735
Chimney top, E. Finch ... 491,678
Chimneys, flues, etc., cap for, H. Moeller ... 491,848
Chlorine, preparing liquid, E. B. Cutten ... 491,699
Churn, H. C. Alexander ... 491,917
Churn, A. C. Fell ... 491,677
Churn, T. W. Hambric ... 491,644
Churn, J. A. Kernodle ... 491,737
Chute, ash, T. Connor ... 491,960
Cigar or cigarette holder, Baumgartner & Dreifuss ... 491,631
Cigar and cigarette holder, M. C. Roebel ... 491,744
Cinder and smoke consuming apparatus, F. Little ... 491,738
Circuit closer, time, R. H. Twigg ... 491,692
Clamp. See Colter clamp.
Clamp, P. E. Bourassa ... 491,633
Clay to make ballast, etc., burning, W. & H. G. Butler ... 491,764
Cleaner. See Flue cleaner. Oat cleaner.
Clock, self-winding electric, E. Klahn ... 491,945
Clothes pounder, A. C. McKinney ... 491,685
Clover hulling machine, A. Miller ... 491,740
Coloring matter from logwood and preparing same, P. T. Austen ... 491,972
Colter clamp, plow, G. A. Lambert ... 491,895
Combination lock, W. A. Schenck ... 491,598
Convertible chair, C. Schulte ... 491,602
Cooking boiler, sectional, C. W. Wynn ... 491,866
Cork mat for bath rooms, A. Morton ... 491,851
Coulomb counter, G. Hummel ... 491,560
Counting register, W. N. Durant ... 491,537
Counting tickets, gauge for, C. H. Farnham ... 491,800
Coupling. See Car coupling. Locomotive coupling. Thill coupling. Whiffletree coupling.
Crane, H. Aiken ... 491,933
Crimping machine, J. Zeh ... 491,913
Cultivator, C. Bizi ... 491,632
Cultivator, A. W. Butt ... 491,797
Cultivator, M. Casey ... 491,873
Cultivator, W. A. Wagner ... 491,822
Cultivator, J. F. Waltrous ... 491,618
Cultivator hoe attachment, Eriksen & Day ... 491,676
Cup. See Oil cup.
Current generator, alternating, O. Patin ... 491,811
Curtain holding device, Piper & Davis ... 491,588
Cutter. See Band cutter. Vegetable cutter.
Cyclometer, E. J. Merry ... 491,739
Dental chair, D. Stuck ... 491,611
Dental chair bracket, D. Stuck ... 491,610
Dental forceps, C. E. Blake, Sr ... 491,514 to 491,519
Dental forceps, A. Whitlock ... 491,932
Desk support, F. W. Tobey ... 491,615
Dice throwing machine, coin-controlled, Williams & Roovers ... 491,971
Draught regulator, C. D. Howard ... 491,752
Dredges and sand pumps, agitator for suction, W. T. Urie ... 491,748
Dredging apparatus, W. M. Douglas ... 491,723
Dredging apparatus, J. E. Kauser ... 491,843
Drill. See Breast drill.
Drill sharpening device, A. Campbell ... 491,766
Egg beater, J. M. O'Neill ... 491,583
Electric machine, alternating current dynamo, J. J. Wood ... 491, 5
Electric motor, A. W. Meston ... 491,970
Electric motor and dynamo mica insulator, C. W. Jefferson ... 491,708
Electric motor regulator, J. A Williams ... 491,829
Electric signal, F. H. Clarke ... 491 874
Electrodes, manufacture of secondary battery, R. M. Lloyd ... 491,684
Elevator and carrier, combined, C. M. Bates ... 491,511
Elevator door opening or closing device, E. M. T. Boddam ... 491,832
Elevator gate, automatic, P. J. Schreiber ... 491,601
End gate, W. K. Wagner ... 491,617
Engine. See Gas engine. Traction engine.
Envelope, A. R. Spear ... 491,928
Envelope machine, J. Ball ... 491,935
Evaporating liquids, S. M. Lillie ... 491,659
Excavator, M. C. Meigs ... 491,577
Feedwater apparatus, W. V. Walker ... 491,825
Feedwater heater and purifier, F. Goodfellow ... 491,547
Feeding animals, receptacle for, N. J. Felix ... 491,702
Felly boring and spoke tenoning machine, G. W. McAlister ... 491,582
Felting machine, J. W. Millet ... 491,901
Fence machine, hand, M. F. Connett, Jr ... 491,770
Fence, metal, W. Warner ... 491,826
Fence wire reel, S. Moore ... 491,849
File, bill, A. Quortrup ... 491,905
Filter, H. Lieberich ... 491,674
Fishing reel, J. Singer ... 491,955
Floor, O. Hetzer ... 491,647
Flower pot, Schurig & Prufer ... 491,786
Flue cleaner, J. R. Wilson ... 491,791
Flypaper holder, J. H. Smith ... 491,860
Flypaper, machine for manufacturing, Smith & Knowlton ... 491,861
Folding table, H. A. Stevens ... 491,760
Furnace. See Boiler furnace. Pottery kiln furnace. Roasting furnace. Smoke consuming furnace.
Furnace grate blast pipe, E. J. Gordon ... 491,549
Furnaces, apparatus for charging and discharging annealing, J. M. Chatfield ... 491,768
Gauge. See Surface gauge.
Galvanizing iron, apparatus for, G. Retterer ... 491,720
Gas alarm, escaping, C. J. Milligan ... 491,580
Gas burners, self-closing cut-off for, C. H. Keeney ... 491,943
Gas engine, J. W. Raymond ... 491,855
Gate. See Elevator gate. End gate.
Gate, J. L. Chadwick ... 491,637
Gate, B. Miller ... 491,579
Gate brace, C. C. A. Sienknecht ... 491,906
Gearing, variable transmitting, H. C. Behr ... 491,986
Generator. See Current generator. Steam generator.
Grain securing machine, R. W. Welch ... 491,623
Grinding machine, J. H. Crane ... 491,530
Grindstone, emery wheel, etc., D. F. Walker ... 491,789
Guitar arm rest and support, H. E. Le Valley ... 491,755
Gun, magazine, L. M. R. Daudeteau ... 491,772
Handle. See Wire handle.
Harvester, O. O. Storle ... 491,746
Harvester, corn, P. R. Hunt ... 491,889
Harvester elevating and packing mechanism, A. Gardner ... 491,680
Harvester, grain binding, A. Gardner ... 491,641
Hat expanding and contracting apparatus, P. Noe ... 491,853
Hay loader, E. B. Cartmell ... 491,636
Head rest, A. P. Jordan ... 491,651
Heading and reaping machine, Abel & Daly ... 491,629
Heat regulator, J. J. Schrag ... 491,600
Heater. See Feedwater heater.
Heating apparatus, P. Mancheron ... 491,806
Heel pad, I. Levy ... 491,756
Hinge and check, spring, R. E. Lowe ... 491,898
Hinge, stop, G. P. Hart ... 491,645
Hog trap, F. R. Patchett ... 491,810
Hook. See Car hook. Snap hook.
Horse detacher, J. H. Garner ... 491,734
Horsedetacher, I. A. McCaslin ... 491,807
Horse detacher, G. Riley ... 491,815
Horse power, E. H. Condit ... 491,528
Horseshoe with auxiliary flanges, J. Gutmann ... 491, 3
Hose washer, J. E. Taber ... 491,821
Hot air apparatus, R. H. Yeoman ... 491,627, 491,628
Hot air register, F. Burmeister ... 491,524
Household implement, O. Avery ... 491,919
Hub, vehicle, J. T. Hart ... 491,925
Hub, wheel, J. S. Copeland ... 491,987
Ice cream freezer, E. M. Thompson ... 491,930
Ice cream freezer and packer, J. Joralemon ... 491,650
Ice tongs, making, J. S. Field ... 491,540
Implement, combination pocket, A. A. Low ... 491,780
Inhaler, J. E. Lee ... 491,778
Inkstand, E. Davis ... 491,640
Insulating conduit, electrical, C. W. Jefferson ... 491,707
Insulator, A. L. Johnston ... 491,890
Insulator, R. McCarthy ... 491,729
Ironing machine, Braley & Stewart ... 491,634
Kettle lid lifting attachment, C. J. Hafey ... 491,552
Knife. See Mitering knife.
Knitted undergarment, combination, G. O'Brien ... 491,950
Knitting machines, dial cam operating device for, L. N. D. Williams ... 491,911
Ladder, step, W. P. Stibbs ... 491,820
Lamp, Argand, W. C. Homan ... 491,965
Lamp chimney attachment for medical vaporizing and heating purposes, J. E. Wenman ... 491,827
Lamp cut-out, arc, C. E. Scribner ... 491,605
Lamp, duplex electric arc, C. E. Scribner ... 491,603
Lamp, electric arc, W. H. Akester ... 491,915, 491,916
Lamp, electric arc, F. D. Gould ... 491,548
Lamp, electric arc, C. E. Scribner ... 491,604
Lamp, electric head, W. Main ... 491,713
Lamp fixture or bracket, electric, J. T. Robb ... 491,596
Lamp, pocket, W. R. Fearn ... 491,963
Lamp socket, incandescent, J. Hutchinson ... 491,561
Lamp sockets, bushing for incandescent, C. A. B. Halvorson ... 491,682
Lampblack, manufacture of, G. L. Cabot ... 491,923
Lasting machine, L. Lake ... 491,894
Latch, L. E. Jacobus ... 491,706
Latch and lock, J. E. Armstrong ... 491,793
Latch and lock, J. D. Perkins ... 491,742
Lathe, wood turning, L. L. Hill ... 491,941
Lead, manufacturing white, P. Bronner ... 491,635
Letter box, Cushing & Mitchell ... 491,533
Letter box, house door, H. E. Aldrich ... 491,569
Letter box, house door, Cushing & Mitchell ... 491,534
Liquid cooler, W. J. Fletcher ... 491,964
Liquids, device for handling, S. R. Mace ... 491 844
Lock. See Combination lock.
Lock, J. D. Bowley ... 491,968
Lock, A. K. Leitch ... 491,779
Lock nut, G. C. Richards ... 491,814
Locking device for suspending lines, J. R. Fletcher ... 491,541
Locomotive coupling, T. L. McKeen ... 491,903
Locomotive coupling, W. P. Prendergast ... 491,719
Locomotive, electric, F. B. Rae ... 491,857
Locomotive, electric, S. H. Short ... 491,666
Loom reed, L. F. Liotard ... 491,575
Loom reversing mechanism, G. F. Hutchins ... 491,776
Loom take-up mechanism, R. J. Risk ... 491,816
Loop, garment, C. G. Meyer ... 491,661
Lubricator. See Axle lubricator.
Malt, making caramel, R. Rahr ... 491,813
Manual recorder, J. Pfeifer ... 491,784
Mat. See Cork mat.
Match safe and cigar cutter, G. F. H. Hicks ... 491,841
Measuring and dispensing apparatus, liquid, W. M. Fowler ... 491,705
Measuring device, horse, J. K. Foster ... 491,733
Mechanical horse, L. A. Rygg ... 491,927
Mechanical movement, R. D. Layton ... 491,896
Metal bars, machine for rounding, straightening, and planishing, W. Steel ... 491,668
Metallization, E. Denorus ... 491,799
Mill. See Sawmill.
Milling machine tail stock, J. W. Boynton ... 491,521
Mirror frame, H. & J. Caro ... 491,526
Mitering knife, A. Dodds ... 491,773
Mould. See Brush mould.
Money drawer, electric alarm, W. J. Walker ... 491,824
Money tray, O. Hofmann ... 491,649
Mooring apparatus, Thompson & Dishart ... 491,613
Motion, mechanism for converting, W. W. Virtue ... 491,910
Motion reversing apparatus, W. J. Walsh ... 491,722
Motor. See Air motor. Electric motor. Sewing machine motor.
Mower, lawn, B. D. Adams ... 491,914
Mowing machine, F. S. Jackson *et al.* ... 491,736
Music leaf turner, M. L. Smith ... 491,907
Musical block, A. S. & G. S. Bowen ... 491,833
Musical instruments, mouthpiece for, T. Henninger ... 491,646
Net making machine, G. W. Price ... 491,592
Nut lock, C. Starz ... 491,908
Nut lock and bolt tightener, J. G. Perry ... 491,718
Oat cleaner, G. H. Rich ... 491,594
Oil cup, Althoff & Stokesbary ... 491,830
Oils, compound of blown, W. D. Field ... 491,880
Opera glass holder, L. W. Levy ... 491,711
Ore dressing apparatus, W. J. Bartsch ... 491,672
Ores, process of and apparatus for obtaining metals from their, S. H. Cochran ... 491,538
Organ, pedal bass, K. Klar ... 491,566
Packing, steam, G. W. Fetner ... 491,539
Pad. See Heel pad.
Paper bag machine, W. Liddell ... 491,573
Paper holder and cutter, E. J. Gillespie ... 491,883
Paper, making safety, A. Schlumberger ... 491,858
Paper trimming and pasting machine, O. Peterson ... 491,586
Peat, treatment or desiccation of, J. M. A. Gerard ... 491,545
Pen, fountain, D. Beaumel ... 491,795
Pencil sharpener, G. Diez ... 491,536
Photographic camera, Blair & Kelley ... 491,920
Photographic fixing and washing tank, A. R. Ward ... 491,619
Piano, G. Steck ... 491,607
Piano agraffe, P. J. Duggan ... 491,877
Piano attachment, J. R. Lomas ... 491,943
Piano hammer, F. W. White ... 491,749
Pianos, stringing, L. A. Kindler ... 491,652
Pile fabric, woven, A. Webb ... 491,935
Pipe. See Furnace grate blast pipe.
Pipe core, P. Clifford ... 491,527
Pipe wrench, G. W. Morrill ... 491,850
Pipes, etc., material for covering, J. L. Covel ... 491,896
Pitman, J. C. Maloney ... 491,727
Planter and cultivator, seed, T. F. Bard ... 491,510
Planter, seed, G. A. Stine ... 491,863
Planting machine, potato, G. Hoffmann ... 491,887
Plow, E. S. Cook ... 491,529
Plow, N. B. Pumphrey ... 491,904
Plow, H. G. Schmitt ... 491,599
Plow, adjustable double, J. B. Darby ... 491,675
Plow standard, H. J. & J. F. Washburn ... 491,621
Pneumatic regulating device, A. Barker ... 491,794
Pot See Flower pot.
Potassium chlorate, electrolytically producing, E. B. Cutten ... 491,701
Pottery kiln furnace, L. Lawton ... 491,569
Power. See Horse power.
Power transmitting device, E. Prouty ... 491,759
Press. See Baling press. Barrel heading press. Brick press.
Printer and recorder, check, W. W. & W. H. Wythe ... 491,626
Printing colors with aniline black, W. Browning ... 491,873
Printing colors with aniline black, G. Donald ... 491,961
Printing colors with aniline black, F. P. Pearson ... 491,951
Pulp drying or paper making machine, H. Parker *et al* ... 491,717
Pump, H. A. French ... 491,801, 491,802
Pump, oil well, G. D. Bumpus ... 491,674
Pump rod coupler, E. C. Guerrant ... 491,551
Pump, vacuum, W. H. Worthen ... 491 912
Pump valve, H. F. Friable ... 491,543
Rack. See Broom rack. Stock rack.
Railway, automatic aerial, H. W. Libbey ... 491,572
Railway crossing plate, C. Vogt ... 491,616
Railway frog, D. Horrie ... 491,842
Railway joint box, E. E. Smith ... 491,787
Railway rails, removable cap for street, J. A. Eno ... 491,538
Railway series system, G. L. Thomas ... 491 1
Railway signal, E. N. Kelsey ... 491,754
Railway signaling apparatus, J. K. Byler ... 491,796
Railway tie, metallic, Bronson & Armstrong ... 491,922
Railway train order and signaling device, L. T. Crabtree ... 491,837
Railways, means for mounting pulleys in curves of cable, E. A. Hovey ... 491,559
Rake, N. J. Felix ... 491,703
Recorder. See Time recorder.
Reel. See Fence wire reel. Fishing reel.
Register. See Cash register. Counting register. Hot air register.
Registering device for textile fabric machines, etc., M. Keeney ... 491,564
Regulator. See Draught regulator. Electric motor regulator. Heat regulator. Windmill regulator.
Rein holder, A. Foisy ... 491,542
Retort lid, J. P. Clark ... 491,769
Roasting furnace, revolving, C. Fellner ... 491,704
Saddle, side, B. P. Blood ... 491,831
Safe, W. Corry ... 491,875
Sanding drum, W. F. Larish ... 491,658
Sash balance, H. K. Brown ... 491,762
Sash balance, H. L. Craig ... 491,539
Sash cord fastener, S. Jenkinson ... 491,966
Sash fastener, G. Gibson ... 491,881, 491,882
Sash holder, R. K. Brown ... 491,763
Sawmill, band, G. M. Hinkley *et al* ... 491,688
Sawmill feed mechanism, T. J. Reamy ... 491,856
Scaffolding, device for suspending, C. Heinemann ... 491,885
Scraper operating apparatus, H. G. Butler ... 491,765
Scraper, road, J. F. Kimball ... 491,565
Screwdriver attachment, J. R. Quimby ... 491,987
Secondary battery, N. H. Edgerton ... 491,979
Sewage, etc., apparatus for cleansing, W. Birch ... 491,706
Sewing machine, W. H. Hanna ... 491,554