from one trolley wire to the other, supposing the wires to be cut, and how far would the electricity jump, supposing I extended an additional wire from the trolley wire toward the ground or rail? A. The current on a trolley will not jump across a space until the wires are first placed in contact and then separated so as to form an arc. When the wires are touched and separated, an arc of probably two or three inches might be produced.

(4780) G. T. W. asks: Are there two kinds of electricity? How are the batteries made they use on railroads for telegraphy? They are not gravity batteries. They look white, as if made of some kind of salt. A. The idea of two kinds of electricity was exploded long since, although they are sometimes spoken of now as positive and negative electricity. The batteries to which you refer are probably the Edison Lalande batteries. You will find a description of this battery in SUPPLEMENT, No. 792.

(4781) C. M. asks: 1. Regarding the speed of electricity, how fast does it travel through or over a cable? A. The speed of electricity varies greatly under different circumstances. In the Atlantic cable it is very much retarded, so that it requires two or three seconds to send a signal. The speed of electricity under the most favorable circumstances is about the same as that of light, viz., 185,000 miles per second. 2. Can water be compressed? A. Water can be slightly compressed.

(4782) J. B. asks: What pressure of steam is carried on the boilers of passenger steamers on the ocean, using triple and quadruple expansion condensing engines? A. Steam pressures on boilers of large ocean steamers is 125 to 180 pounds per square inch.

(4783) P. & M. ask: What link in a moving train of 20 cars has the most weight on it? Please answer in order to settle a wager. A. The first link.

(4784) A. W. B. asks the method used in adjusting the cork used in making the joints of certain wood wind instruments, as the clarinet, flute, and others. A. The corks for flutes, clarinets, and other instruments are cut by means of thin tubular cutters. They are secured to the joint of the instrument by means of bichromatized glue or marine glue.

(4785) H. W. R. asks: 1. For recipe for the most durable whitewash for trees. Also for wood fences, if different. A. For a durable whitewash for trees and fences, 1 bushel best white lime, slaked in boiling water. Add to the cream 4 pounds sulphate of zinc and 2 pounds common salt dissolved in water. Make the mixture thin enough to use with the brush. If a light brown color is required, add a little hydraulic cement, ocher for yellow and Venetian red for pink or red. 2. How can we best make cinders from our boilers available for durable walks? If to be mixed with cement, what kind of cement and in what proportion? A. For walks of cinders and ashes use one part of hydraulic cement to equal parts of sifted cinders and fine ashes or sand. Lay coarse cinders on the bottom, roll or ram hard and finish with the cement mixture from one to two inches think, as you can afford.

(4786) W. J. M. asks: What government holds the fastest cruiser and the highest speed attained by the same for certain length of time? A. The Argentine government, 22 knots, six hours.

Replies to Enquiries.

The following replies relate to enquiries published in the SCIENTIFIC AMERICAN, and to the numbers therein given.

(4687) Answering No. 4687, the method of winding Thomson-Houston spherical armatures is as follows: Two shells of cast iron form heads, iron bridges are put from one head to the other and these wound with iron wire, forming an oblate spheroid. An insulating covering is put on and the surface divided into six sections by wooden pegs. Beginning at end of shaft opposite from the armature, one half of No. 1 coil is wound in sections opposite one another. Armature is turned next 120° and ½ of No. 2 coil wound. Turn 120° and wind whole of No. 3 coil. Turn 120° and wind remainder of No. 1. Turn 120° and wind remainder of No. 2. Connect all of inside ends together and carry outside ends to commutator segments. A 9·6 A. 1250 V. dynamo of this make has 10 ohms No. 7 B. and S. wire on field magnets and 12,075 feet No. 12 B. and S. on armature, the resistance of the coils averaging about 13·25 ohms, two always being in series. Such an armature weighs about 520 pounds. J. G. (4693) will, I think, find that article he refers to in the *Electrical World*. It was published in 1889 or thereabout, in the early part of the year.—C. M. D.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

March 14, 1893,

AND EACH BEARING THAT DATE.

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

Acid, monosulpho-dioxynaphthoic, Schmid & Paganini 493,562
Air compressor, C. F. Fogg 493,263
Air heating furnace, R. S. Kent 493,333
Alarm device, pneumatic, S. P. Hasey 493,365
Arm and hand, artificial, W. L. Minzey 493,440
Armature connection for dynamo-electric machines, G. A. Rollins 493,447
Armature, dynamo-electric machine, H. F. Parshall 493,337
Armature for dynamo-electric machines or electric motors and balancing same, balanced, G. S. Dunn 493,375
Armature for motors and generators, N. C. Bassett 493,349
Atomizer, P. J. McElroy 493,512
Bagasse burner, E. H. Robeson 493,522
Baggage carrier, Barry & Cahill 493,348
Bale tie machine, C. O. Mook 493,279
Barrel leveling, trussing, and hooping machine, L. M. Greif 493,329
Bed couch, L. Woerner 493,418
Bed head support, W. S. Seymour 493,303
Bed, spring, O. S. Foster 493,581
Bed, spring, O. S. & W. S. Foster 493,427
Beds, adjustable ventilating canopy frame for, W. N. Sherman 493,305
Beehive, L. A. Aspinwall 493,466
Beer cooler, R. Ledig 493,383
Belt shifting apparatus, F. H. Richards 493,409
Bit. See Bridle bit. Mortising bit.
Bituminous rock, apparatus for disintegrating, B. Hager 493,357
Boat. See Submarine boat.
Boiler feeder, automatic, F. M. Ashley 493,237
Boiler tube, tubular, W. Eaves 493,376
Bookbinding, J. P. Brennan 493,396
Book covering machine, Lovell & Bredenberg 493,553
Book stapling machine, F. P. Rosback 493,298
Box. See Packing box. Tooth powder box.
Box banding implement, T. G. Harding 493,330
Bracket. See Shelf bracket.
Brake. See Car brake.
Brandy mash and composition for same, making, M. Wool 493,460
Brewing apparatus, C. Rach 493,542
Broader, chicken, N. Holloway 493,586
Broom, J. A. Cook 493,433
Bridle bit, C. W. Phillips 493,339
Brush, C. Smith 493,414
Bullet covering machine, C. R. Richards 493,519
Burner. See Bagasse burner. Gasoline burner. Hydrocarbon burner. Vapor burner.
Butter printer, A. H. Reid 493,517
Button, link cuff, W. Ballou 493,468
Cable grip, S. A. & O. Kneedler 493,551
Cable grip, J. S. Patten 493,514
Cake coating machine, D. M. Holmes 493,403
Cameras, ground-glass adjuster for, Low & Shakespeare, Jr 493,365
Can body forming machine, R. D. Hume 493,588
Cane and stool, combined, J. A. Nixon 493,285
Cap making machine, H. Schaake 493,525
Car brake, G. J. Ferguson 493,491
Car buffer and end sill, J. Timms 493,311
Car coupling, H. D. Clark 493,481
Car coupling, F. M. Cox 493,251
Car coupling, Hinchman & Hille 493,268
Car coupling, C. W. Hinton 493,402
Car coupling, J. H. Talpey 493,534
Car, dumping, E. A. Trapp 493,317
Car heater, G. W. Rodgers 493,388
Car heating apparatus, J. F. McElroy 493,443
Car mover, S. C. Chase 493,615
Car, non-telescopic railway, J. E. Page 493,597
Car replacer, J. N. Stein 493,308
Car, street, G. B. Bolton 493,242
Carding engine, revolving flat, O. L. Owen 493,408
Carpet fastener, N. M. Harrison 493,401
Carriages, sleigh runner attachment for baby, W. P. Tarrant 493,416
Carrier. See Baggage carrier.
Cash indicator, J. P. Smith 493,306
Cash register, W. K. Nichols 493,557
Cash register and indicator, F. L. Bailey 493,571
Cement, compound for retarding the setting of, E. A. Bronson 493,613
Chair. See Dental chair.
Chair and brace, combined, C. H. Read 493,386
Checkrein, A. W. Cox 493,353
Checkrein attachment, J. Perkins 493,515
Chimney top, revolving, Iwan & Reiferscheid 493,430
Chronograph, personal-equation, L. D. Wells 493,546
Chuck, Hoggson & Bement 493,562
Churn, J. M. Tedlock 493,535
Churn power, C. W. Patton 493,288
Cigar moistener, A. Alford 493,347
Cigar mould, J. Prentice 493,292
Cigarette mouthpieces, machine for making, P. Blache 493,472
Clamp. See Floor clamp. Loom warp clamp.
Cleaner. See Dish cleaner. Flue cleaner. Grain cleaner.
Clothes drier, A. M. McLeran 493,596
Clothes pin, movable, W. C. Popplewell 493,516
Clutch, friction, Wells & Tidmarsh 493,108
Coal moving apparatus, E. D. Johnston 493,272
Coffee roasting apparatus, H. Trillich 493,686
Coin receiving apparatus, C. C. Clawson 493,544
Collar coupling, breast, R. C. Tambs 493,311
Collar fastener, horse, A. T. Osbron 493,513
Collar, horse, H. W. Ross 493,299
Combination lock, J. W. Estes 493,259
Commutator for dynamo-electric machines and constructing same, A. W. Meston 493,439
Cooler. See Beer cooler.
Copying press, H. M. Hoyt 493,271
Coupling. See Car coupling. Collar coupling. Thill coupling.
Cresting, roof, G. M. Vance 493,344
Crupper, Baker & Doris 493,572
Cultivator, B. F. Coon 493,398
Cut-out and lightning arrester, combined, E. F. Hammarstrom 493,380
Cut-out, multiple terminal, L. P. Bonebrake 493,328
Cutter. See Fabric or paper cutter. Vine cutter.
Damper for household stoves, A. Flechtner 493,580
Damper, furnace pipe, F. S. Lang 493,363
Damper, stove, F. O. Farwell 493,548
Dental chair, A. P. Gould 493,379
Dental engine attachment, Peck & Allshouse 493,289
Dental work, electric motor for, J. Keller 493,431
Desk, adjustable, C. M. Childs 493,480
Digger. See Post hole digger.
Dish, butter, L. Beard 493,326
Dish cleaner, R. G. Ferguson 493,261
Display shelf and carpet elevator, Bessing & Barker 493,542
Door check, W. H. McCoy 493,442
Door frames, setting gauge for, R. Steedman 493,566
Draught and advertising coupon, combined demand, G. H. Drew 493,619
Draught attachment, spring, H. Barber 493,469
Draught device, spring, F. J. Blanke 493,240
Draught equalizer, I. T. Williams 493,323
Draw bar, G. D. Wadley 493,319
Drier. See Clothes drier.
Drilling machine, A. Betts 493,471
Dry closet system, F. G. Ward 493,320
Dust collector, E. W. Hoover 493,504
Dust collector, H. Seck 493,565
Dye, blackish-blue azo, J. Schmid 493,563
Dye from alpha oxyuvitic acid, B. R. Seifert 493,415
Dye, gray-black, tetrazo, J. Schmid 493,564
Dye, pink, H. Boedeker 493,241
Dye, red, Gnehm & Schmid 493,583
Dyeing black, C. F. X. Noroy 493,286
Eaves trough, W. S. Harris 493,497
Electric controlling device, T. W. Shepherd 493,602
Electric light bracket base, J. T. Robb 493,411
Electric machine, dynamo, E. Thomson 493,313
Electric motor switch, M. Immisch 493,361
Electric search light, K. M. Hunter 493,358
Electric switch, W. F. Bossert 493,243
Electric switch, A. M. Coyle 493,485
Electric switch, A. Stromberg 493,369
Elevating mechanism, hydraulic, T. F. Rowland 493,301
Elevator controlling device, A. & F. E. Turner 493,607
Elevator shafts, safety device for, A. D. Caywood 493,423
Embroidering machine, E. & R. Cornely 493,374
Emulsion and making the same, W. S. Barnard 493,610
Engine. See Carding engine. Locomotive engine. Steam engine. Traction engine.
Exercising and strength testing machine, L. R. Schaeffer 493,561
Extractor. See Stump extractor.
Fabric or paper cutter, G. A. Burbank 493,351
Fastening device, M. Frisen 493,377
Feedwater purifier and heater, L. V. Lewis 493,406
Feeding house, hog, P. E. Erickson 493,355
Fence, W. P. Sharp 493,527
Fence, C. C. Wheeler 493,458
Fender. See Plow fender.
Fifth wheel, J. S. Young 493,324
File, bill, C. H. Kilmer 493,433
Fire escape, Beck & Levitt 493,574
Fire escape, V. H. Felt 493,490
Fire escape, Murray & Scott 493,556
Fire escape, C. A. Sturtevant 493,391
Firearm, D. Conner 493,352
Floor clamp, M. Lutgen 493,506
Floor, fireproof, C. F. Terney 493,568
Flue cleaner, boiler, C. E. Poor *et al.* 493,290
Fluid distributer, W. S. Barnard 493,611
Flush tank, J. T. McDonough *et al.* 493,281
Folding seat for schools, theaters, etc., W. Shriver 493,452
Folding table, J. & H. A. Carl 493,479
Fruit bleacher, C. J. Wheeler 493,576
Fruit gatherer, L. Olmsted 493,287
Furnace. See Air heating furnace
Game apparatus, coin-controlled, W. Boardman 493,395
Gasoline burner, Williams & Cummer 493,540
Gate. See Railway gate.
Gate, E. Cahill 493,477
Gate, W. R. White 493,538, 493,539
Gearing, worm, C. W. Fowler 493,493
Gig mill, N. H. Grosselin 493,549
Glassware, apparatus for the manufacture of, H. Schulze-Berge 493,302
Glove fastening, C. A. Pfenning 493,559
Governor, steam engine, J. W. Hayes 493,624
Grain cleaner or oat sifting machine, N. B. Higbie 493,429
Grain cleaning machine, T. A. Seip 493,451
Grain scouring machine, D. E. Sibley 493,603
Grinding, crushing, or disintegrating grain, etc., machine for, S. Straker 493,531
Gun, multicharge, G. J. Hilder 493,382
Hansom doors, device for opening, C. J. Rishor 493,520
Harrow, T. J. Mann 493,507
Harrow attachment, J. R. Storie 493,310
Harvester, self-binding, O. O. Storle 493,530
Harvesting, husking, and separating machines, roller for corn, C. H. Taylor 493,453
Hat stand, O. S. & E. F. Conklin 493,248
Hatch plate moving device, A. McDougall 493,282
Hay loader, T. J. Snyder 493,307
Hay sling, W. Louden 493,276
Hay stacker, A. M. Corbit 493,576
Head rest, W. O. Crain 493,486
Heated vessel, electrically, J. V. Capek 493,422
Heater. See Car heater.
Heating apparatus, H. J. Wattles 493,537
Hook. See Snap hook. Whiffletree hook. Wire hook.
Horse power, Terrell & Frasier 493,370
Hose couplings, manufacture of, E. L. Townsend 493,316
House. See Feeding house.
Hub attachment, wheel, J. T. Bressler 493,474
Hydrocarbon burner, W. L. Miller 493,555
Index, J. F. Laning 493,552
Indicator. See Cash indicator.
Injector, steam and air, S. R. Earle 493,257
Insect powder distributer, A. S. Hotchkiss 493,587
Insulator pin, F. M. Locke 493,434
Jack. See Lifting jack.
Journal boxes, means for supporting, J. F. Hey 493,499
Knitting machine, circular, E. R. Branson 493,575
Ladder, fire, J. M. Wallace 493,345
Lamp, J. H. Purdy 493,341
Lamp, electric arc, R. M. Hunter 493,359, 493,360
Lamp socket, Ball & Metzger 493,609
Lamp support, electric, J. R. Protzman 493,446
Lamp supporter, electric, A. G. De Witt 493,578
Lantern, J. Funck 493,495
Lap ring, G. Bobb 493,543
Last block fastener, G. E. Belcher 493,394
Lawn sprinkler, G. H. Thoma 493,312
Lifting jack, quick-return, Mead & Johnson 493,333
Light. See Electric search light.
Lightning arrester, E. Thomson 493,314
Loading apparatus, J. H. Runyan 493,343
Loading device, wagon, A. Psota 493,598
Lock. See Combination lock.
Locomotive, electric, T. A. Edison 493,425
Locomotive engine, J. Richards 493,599
Loom picker stick, J. Johnson 493,331
Loom warp clamp, J. F. Kieswetter 493,405
Lubricator, F. Brunbauer 493,475
Mantel, A. W. House 493,404
Metal plates, machine for cleaning, S. A. Sague 493,560
Metal ribbons and strips, apparatus for edging, H. E. Procunier 493,294
Metals, electro-depositing, O. Lugo 493,277
Mill. See Gig mill. Stamping mill.
Mining machine, M. Hardsocg 493,381
Mitering machine, W. W. Abbott 493,541
Mitering machine, W. R. Fox 493,494
Mould. See Cigar mould.
Mop wringer, M. E. Prescott 493,340
Mortising bit, L. O. Orton 493,444
Mortising machine, S. J. Hicks 493,501
Motion, apparatus for transmitting, J. Hunt 493,589
Motor. See Water motor.
Mower grass box, lawn, J. F. Braun 493,612
Nautical signal, McGregor & Perry 493,283
Nozzle, exhaust, F. Mertshelmer 493,510
Nut lock, E. L. Arnold 493,393
Ornamentation, F. Schmalz 493,450
Packing box, Cohen & Gaskill 493,545
Painting fabric materials, machine for, E. Armitage 493,463
Paper bag machine, J. Sabold 493,524
Paper board drying apparatus, S. E. Baker 493,467
Pencil, A. J. Arthur 493,464
Pencil, lead, A. J. Arthur 493,465
Photographs of moving objects, apparatus for exhibiting, T. A. Edison 493,426
Pianoforte mute, F. W. Hale 493,622
Piano hammer covering machine, M. Koeniges 493,274
Pill holding and dipping apparatus, A. D. Stearns 493,604
Pin. See Clothes pin. Insulator pin. Safety pin.
Pipe. See Tobacco pipe.
Pipe covering, Edwards & Blackladge 493,489
Plant protector, L. Gruetzmacher 493,400
Planter, check row corn, J. B. Jarmin 493,362
Plow, A. M. Chavez 493,246
Plow fender, M. L. Adams 493,236
Plow shovel, J. F. Shultz 493,389
Post hole digger, J. Tipton 493,536
Power. See Churn power. Horse power.
Power transmitting and stopping device, J. H. Ward 493,457
Press. See Copying press.
Protector. See Plant protector.
Pulley, split, G. D. Rowell 493,523
Pump, foot valve, J. H. Gibson 493,378
Pump plunger, A. D. Cook 493,249
Punch, check, L. L. Driggs 493,547
Radiator, J. H. Hutchinson 493,590
Railway conduit and contact, electric, Davis & Huntington 493,618
Railway elevated cable, W. R. Heylmun 493,500
Railway express robberies, means for preventing, Schmid & Kinkel 493,600
Railway gate, E. Currier 493,577
Railway system, electric, T. Harris 493,623
Railway tie, metal, Fitzhugh & Babbitt 493,492
Railway torpedo signal, H. F. Clark 493,482
Railways and shippers against loss of freight, means for securing, J. B. Mockridge 493,595
Ratchet wrench, M. F. Killinger 493,273
Reel attachment, E. Reynolds 493,518
Reflector and bracket, lamp, W. S. Nevins 493,284
Refrigerator, J. L. Fitz Gerald 493,262
Refrigerator, P. J. Vanderlinda 493,410
Refrigerator building, A. I. Dexter 493,256
Register. See Cash register.
Regulator. See Watch regulator.
Rein holder, A. Rosenthal 493,412
Retort lid catch or lock, J. P. Clark 493,424
Rice, polishing, J. Menge 493,508
Ring. See Lap ring.
Safety pin, D. H. Warner 493,372
Sash fastener, E. & H. S. Ensminger 493,258
Sash fastener, M. Posz 493,291
Saw filing device, M. J. Page 493,445
Sawmill carriage, W. S. Dodge 493,546
Saw swage, S. U. Lockwood 493,435
Saw tooth holder, insertible, A. Krieger 493,334
Scale and bristle detaching machine, J. Tobin 493,454
Scale, automatic grain, M. B. Lloyd 493,275
Scraper, R. G. Butler 493,421
Screw, jack, C. Johnson 493,332
Screw, wood, Herzberg & Norman 493,585
Seat for agricultural machines or vehicles, G. Banks 493,573
Sewing machine bobbin, C. E. Wilkinson 493,417
Sewing machine hemstitching attachment, M. E. Hall 493,496
Sewing machine needle, S. M. Creteau 493,399
Sewing machine thread controlling device, R. G. Woodward 493,461
Shears, ●. Steinen 493,415
Shelf bracket, T. Corscaden 493,484
Signal. See Nautical signal. Railway torpedo signal.
Signal valve for pneumatic signals, H. R. Mason 493,438
Signaling apparatus, train, H. R. Mason 493,437
Snap hook, H. W. Ross 493,300
Sodawater apparatus, J. B. Herron (r) 11,313
Soldering machine, J. A. Steward 493,309
Sorting and separating loose substances into various grades of fineness, machinery for, J. M. Rishworth *et al.* 493,521
Spoke washer, wheel, R. W. & T. J. Cave 493,397
Spring. See Watchcase spring.
Spring forming machine, ●. S. & W. S. Foster 493,428
Sprinkler. See Lawn sprinkler.
Stamp, ore, J. W. Marshall 493,385
Stamp, registering or counting hand, S. A. Harrison 493,498
Stamping mill, ore, J. W. Marshall 494,384
Stand. See Hat stand.
Steam engine, G. A. Covyeow 493,250
Still, N. W. Condict, Jr 493,247
Stool, piano, C. W. Munz 493,441
Store service apparatus, J. H. Goodfellow 493,621
Stove, C. H. Melvin 493,594
Stove for smoothing irons, gas heating, H. Strassner 493,532
Stump extractor, B. Mattress 443,593
Submarine boat, J. R. Haydon 493,266
Sulky, H. H. Garrard 493,582
Surgical irrigating basin, J. H. Morrison 493,280
Suspending device, M. M. Wood 493,459
Switch. See Electric switch. Electric motor switch.
Syringe, C. A. Kenner 493,591
Table. See Folding table.
Tables, adjustable support for bracket, J. N Tiffany 493,605
Tag machine, W. M. Little 493,592
Tank. See Flush tank.
Telegraph relay, S. P. Freir 493,620
Telegraph, signaling, W. E. Decrow 493,253
Telephone, acoustic, T. B. Rogers 493,297
Telephone ear attachment, G. M. Brown 493,245
Telephone index, S. L. Shaffer 493,304
Telethermometer, Norton & Hoffman 493,588
Thermostat, T. W. Shepherd 493,601
Thill coupling, C. Andrew 493,462
Thill coupling, Rideout & Merritt 493,587
Thill support, W. E. Derrick 493,487
Thrashers, folding straw carrier for, G. W. Parsons 493,368
Thrashing machine band cutter and feeder, G. W. Parsons 493,367
Thrashing machine bundle feeder, F. Robertson 493,296
Ticket holder, G. J. Borgstrom 493,473
Ticket holder, Moore & Willett 493,511
Tie. See Railway tie.
Tile, illuminating, J. Jacobs 493,550
Tile machine, ridge or gutter, W. Ludowici 493,366
Tiles, apparatus for ornamenting architectural, I. Broome 493,244
Tire, pneumatic, C. E. Duryea 493,488
Tire, pneumatic, C. M. Lungren 493,554
Tobacco, machine for applying labels to plug, D. J. Burr 493,476
Tobacco pipe, C. S. Bailey 493,325
Tongue support, H. Barber 493,470
Tooth, artificial, J. M. Twilley 493,318
Tooth powder box, W. A. Spalding 493,528
Torpedo holder, E. P. Turner 493,455
Toy microscope, H. E. Stauffer 493,529
Trace fastener, J. H. Gibson 493,264
Traction engine, H. C. Hicks 493,267
Transferring or stenciling upon transparent or other material, apparatus for, G. H. Tietjen 493,315
Tricycle, L. Kurtz 493,505
Trough. See Eaves trough.
Trunk fastening, F. N. Violet 493,456
Tube. See Boiler tube.
Tube bending machine, A. Stirling 493,390
Tube for viscous substances, D. W. Clark 493,616
Type distributing machinery, J. Hooker 493,270
Type setting machine, A. V. Ruckmich 493,448
Typewriting machine, A. Davidson 493,252
Typewriting machine, A. Densmore 493,254, 493,255
Typewriting machine guide shield, R. E. Hooper 493,503
Urinal bowl, P. J. Madden 493,278
Valve for air brakes, quick-release, H. R. Mason 493,436
Valve, packingless, F. Storar 493,567
Vapor burner, illuminating, A. Prier 493,293
Vehicle, Capwell & Fuller 493,614
Vehicle side guard, F. O. Blackwell 493,327
Vehicle steering device, F. E. Degenhardt 493,354
Vehicle step, J. A. Alexander 493,373
Vehicle wheel, M. R. Wolcott 493,419
Velocipede saddle, E. Petrini 493,358
Vending machine, J. W. Crites 493,617
Ventilator, J. G. Lucas 493,407
Ventilator, L. Robinson 493,295
Ventilator, J. B. Weis 493,321
Vine cutter, J. H. Wheeler 493,322
Vise, M. T. Henson 493,625
Vise, bench, M. G. Lewis 493,364
Vitreous wares, ornamenting, F. Schmalz 493,449
Wagon, dumping, O. R. Becker 493,350
Washer. See Spoke washer.
Washing machine, P. H. Lambach 493,335
Watchcase spring, N. J. Felix 493,260
Watch regulator, W. M. Matheson 493,506
Watch, stem-winding, D. Gruen 493,584
Water column, safety, F. M. Ashley 493,238
Water motor, J. Toohey 493,569
Water wheel, S. L. Berry 493,239
Watering device, stock, A. Carey 493,478
Well tubing, machine for raising or lowering, E. A. Wanamaker 493,392
Wheel. See Fifth wheel. Vehicle wheel. Water wheel. Wind wheel.
Whiffletree hook, Wood & Hare 493,420
Whip socket, R. & J. Falkenrath 493,579
Wind wheel, B. J. Sykes 493,533
Winding machine, cop, C. Friederich 493,356
Wire hook, G. Kingston 493,626
Wire stretcher, G. P. Kidd 493,432
Wrench. See Ratchet wrench.
Wringer. See Mop wringer.
Yoke, neck, W. H. Holt 493,269

DESIGNS.

Box, H. J. Burnworth 22,290
Calendar case, Brumby & Clarke 22,299
Curtain pole bracket, C. W. Smith 22,296
Dividers, fork for, H. Esser 22,295
Fur collars, head for, B. Cohen 22,284
Gimp, C. E Hertlein 22,279, 22,280
Glass dish, ornamental, T. Singleton, Jr 22,287
Glass vessels, ornamentation of, B. Davies 22,286
Heel or sole plate, G. J. Davison 22,294
Ice mould, J. A. Smith, Sr 22,298
Lace fabric, E. Cope 22,281, 22,282
Last, lap, H. L. Heine 22,289
Paper knife, W. E. Allen 22,278
Picture or analogous frame, C. J. Jorgensen 22,292
Rope hook, W. A. Perry 22,293
Rug, W. T. Smith 22,285
Rug fastener, G. B. Shellhorn 22,288
Siding plate, P. A. Deslauriers 22,297
Stay, dress, D. H. Warner 22,283
Toy money safe, M. J. Shimer 22,291

TRADE MARKS.

Bicycles, Kenyon Bicycle Manufacturing Company 22,661
Biscuit and crackers, L. A. Goudy 22,634
Boots and shoes, N. F. Tucker 22,629
Cathartic, Eli Lilly & Company 22,650
Coffee, J. Aparicio & Co 22,635
Coffee and spices, Wheeling Coffee and Spice Company 22,636
Complexion powder, Tetlow Manufacturing Company 22,644
Composition for cleaning wood, marble, tilings, ceilings, etc., C. J. Jorgensen 22,655
Confections, H. Williamson 22,632
Corn in the form of flakes, alimentary products from, Indianapolis Hominy Mills 22,637
Corsets, H. B. Claflin Company 22,628
Disinfectant, H. B. Platt 22,653
Drilling, Minot, Hooper & Co 22,630
Engraving plates for making relief-cuts, T. M. Bell *et al.* 22,660
Gum, chewing, S. B. Lafferty 22,633
Hair dressing, M. T. Hickey 22,645
Hams, bacon, and shoulders, Swift & Company 22,638
Lace pins, scarf pins, studs, ear drops, and similar articles, R. L. Moorhead & Co 22,627
Lotions for remedial purposes, D. A. Bowker 22,646
Medicinal plasters, G. M. Dorrance 22,652
Medicines and remedies, homeopathic and other, Munson's Homeopathic Family Medicine Company 22,647
Metal and antifriction journal bearings, Babbitt, T. Hiertz & Son 22,658
Mineral water and beverages into which it enters as a constituent, Waukesha Hygeia Mineral Springs Company 22,643
Oil, lubricating, Reliance Manufacturing Company 22,654
Oysters, W. L. Ellis & Co 22,540
Paints, stains, varnishes, and similar articles, Harrison Bros & Co 22,656
Pork products, pig, McDowell Packing Company 22,639
Pumps, Red Jacket Manufacturing Co 22,663
Pumps, wood, C. S. Burlingham 22,664
Remedy for hog cholera and other diseases, E. C. Rosenzi 22,649
Remedy for neuralgia, E. B. White 22,648
Salves and liniments for animal use, Reliance Manufacturing Company 22,651
Sewing machines, Chicago Sewing Machine Company 22,662
Sheeting, Minot, Hooper & Co 22,631
Steel and iron, soft, Wilmot & Hobbs Manufacturing Company 22,659
Steel hardening and tempering compound, W. F. Altemus 22,657
Whisky, D. L. Bleyer & Co 22,641
Wines and brandies, Germain Fruit Company 22,642

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Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of $40 each. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

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