

How may each be obtained separately? A. If there is nothing else in solution with these, the following method may be employed: concentrate the solution and precipitate together the alkaloid quinia and the iron as ferrous sulphate, by the addition of a sufficient quantity of solution of caustic soda, and filter. Wash the precipitate with spirit of wine in which the alkaloid and adhering alkali (soda) are both soluble. Dry the oxide of iron thus freed from the quinia, dissolve it in the least quantity of dilute sulphuric acid, with the aid of heat, and crystallize out the sulphate by evaporation. Evaporate the alcoholic solution carefully to dryness, and wash out the soda quickly with a little cold water, in which the quinia is scarcely soluble. Dissolve the purified quinia in a small quantity of sufficiently dilute sulphuric acid, and crystallize out the sulphate by evaporation. Add to the solution containing the phosphoric acid as ortho-phosphate of soda together with sulphate of soda, solution of barium chloride, until no further precipitate forms. Filter, wash the precipitate with plenty of water, digest it for a short time with a little strong, warm nitric acid to dissolve out the basic phosphate, and filter from the accompanying insoluble basic sulphate. Then stir into the solution, a drop at a time, strong sulphuric acid until a precipitate no longer forms. Filter the solution and crystallize out the phosphoric acid by evaporation.

(26) J. C. says: I have an engine of 2 inches bore and 4 inches stroke, the boiler of which is 40 inches high and 20 inches in diameter, with twelve 1 inch tubes. Boiler is bolted to a cast iron firebox, 20x20 inches. Could I use said engine on a boat 15 feet long and of 4 feet beam, with a three-bladed propeller 30 inches in diameter, and attain the speed of six miles an hour, the engine running at 200 revolutions a minute? A. The machinery will probably answer, but we think it might be better to use a smaller screw.

(27) E. O. asks: What is meant by a balanced valve of a steam engine? A. A valve that is relieved of the excess of pressure in its back.

(28) L. S. C. says: 1. I have an oscillating engine, cylinder $2\frac{1}{4}$ inches, steam pressure 100 lbs., revolutions 325; and also a boat 18 feet 6 inches long, drawing 22 inches water when loaded light. Can I use a screw of small pitch, and couple direct from engine, or must I reduce speed by gearing? A. You can couple directly to the screw. 2. If coupled direct, what should the pitch be? A. Pitch from $2\frac{1}{2}$ to 3 feet.

(29) E. A. C. asks: What is the proper proportion of length to breadth in the American flag? A. Flag makers say that it should be as 3 to 5. A flag 10 feet long should be 6 feet wide. There should be 13 stripes (7 red and 6 white) and 38 stars. The blue ground should extend down to the sixth stripe, and in length should be proportioned to that of the flag.

(30) J. T. says: Please give the proper angle that a groove in a pulley should have to be suitable for a round band? A. It is considered good practice to make the groove with a curved section, having greater depth than width, so that the belt will not bottom as it wears.

(31) N. S. says: We are told that, when a top is spinning in an inclined position, it is its centrifugal force which holds it up and keeps it from falling. Please explain this: In a perfect top, one in which the quantity of matter is equally distributed on all sides of its axis, is not the centrifugal force on all sides equal? Hence, does not the centrifugal force operate just as much in favor of gravitation as against it? Where, then, is there any balance of centrifugal force to counteract the attraction of gravitation? A. Quackenbos says, in his "Natural Philosophy": "The center of gravity is not over the point of support all the time the top is spinning, but is constantly moving round the axis of motion, and, before the top can fall, in consequence of its being on one side of the axis, it reaches the other side, and thus counteracts the previous impulse. Hence, the faster the top revolves, the steadier it is; as its motion slackens, it gradually reels more and more, and finally falls."

(32) W. T. says: I have a steam yacht of the following dimensions: Keel 18 feet 6 inches long, breadth 6 feet 3 inches, least depth 2 feet 5 inches. The engine is $3\frac{1}{2} \times 4\frac{1}{2}$ inches, and the propeller is of 22 inches diameter and 3 feet 6 inches pitch. With 75 lbs. steam, the speed of the boat is satisfactory; but the engine runs at a speed so high that I fear it will wear out fast. Could not I put on a larger propeller and obtain the same or a greater speed of the boat? If so, what style and diameter had I better try? There is sufficient clearance to put in a 24 inch propeller without altering anything about the boat. A. The data sent are so incomplete that we do not feel able to offer you much advice. We see no particular objection, however, to the use of a screw 24 inches in diameter, with a slight increase in pitch.

(33) W. J. M. says: Our water reservoir is located about 1 mile from my office at an elevation of about 140 feet. I want to locate a gauge in my office which will show the depth of water in the reservoir. I arranged a column of mercury 11 $\frac{1}{2}$ feet long; but when the water was turned on the mercury was forced out in a jet a foot above the top. I estimated that 140 feet would give a pressure of about 61 $\frac{1}{2}$ lbs., which would sustain a column of mercury only about 123 inches. What is wrong about it? A. If you have estimated the height correctly, we imagine the trouble was caused by opening the cock suddenly, or perhaps you did not have enough mercury in the tube. It seems to be high enough under the conditions stated.

(34) B. & W. ask: How can we deodorize benzine? A. Properly speaking, benzine cannot be deodorized. Much, however, of the disagreeable odor of commercial benzine may be removed by redistilling it with a quantity of good lime, and rejecting the first and last portions of the distillate.

(35) F. B. S. says: I have a refrigerator with wooden shelves, which, by standing in a damp cellar during the winter, has become tainted to such an extent that it affects food placed in it. How can I cleanse it? A. Rub the parts over well with a strong solution of chloride of lime (calcium hypochlorite); and after letting stand a short time, rinse first with water containing

a little carbonate of soda, and then with plenty of clean water. Dry, and expose to the air and sunlight, if possible.

(36) J. K. asks: 1. How many years will wrought iron water pipe, plain, with $\frac{3}{4}$ inch internal diameter and $\frac{1}{2}$ inch shell, last if buried underground in clay say 20 inches deep? A. If the water is pure, it may last from 10 to 15 years. 2. Is galvanized iron pipe as good as tin lined lead pipe as far as health is concerned for conveying water for general house use? A. No. See p. 244, vol. 36.

(37) V. says: A. asserts that, by placing the large wheels in front and the small ones behind on a carriage, it will be running up hill. B. says it will not. What is the difference? A. As the axles are generally arranged, the disposition of the wheels would make the front of the wagon the highest, but it would not necessarily act as when running up hill.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Blue Glass. By J. M.
On Locusts. By H. J. L.
On Accidents to Mechanics. By G. S. W.
On a Nervo-Mental Force. By J. R. D.
On the Carolina Lizard. By C. F. S.
On Canceling Postage Stamps. By W. K. P.
On a Torpedo Feeler. By F.
On the Occult Sciences. By J. B.
Also inquiries and answers from the following:
W. E.—S. R. H.—D. W. W.—D. S. F.—H. F.—H. M.—
C. F. S.—J. K. B.—J. F. L.—P. J. W.—C. B. J.—
F. B.—C. R.—N. T. W.—A. K.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells the best filter for domestic use? Who is the best oil stove? Who makes a three-way machine for cutting threads on wrought iron pipe? Who makes malleable iron castings? Who sells the best screw-cutting tools? Whose is the best steam pressure gauge? Who makes the best steam whistles?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were

Granted in the Week Ending

May 29, 1877,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Addressing machine, A. H. Longly, Jr. 191,449
Adhesive composition, A. C. Fox 191,430
Air cooling apparatus, E. Fixary 191,292
Air or vacuum brake, W. J. Stevens 191,261
Amalgamator, T. Walker 191,272
Animal releasing device, C. G. House 191,431
Animal trap, E. B. Beach 191,298
Animal trap, S. B. Fisher 191,329
Animal trap, J. M. Gleichman 191,234
Animal trap, L. F. Stevens 191,290
Anvil and vise, combined, P. B. Hillyer 191,427
Apple-paring machine, etc., G. Bergner 191,300
Atomizer, J. J. Essex (r) 7,705
Aul handle, G. W. Phenix 191,463
Bale band connection, wire, S. L. Thorne 191,269
Bale fastener, E. P. Morong 191,248
Bale tie, T. D. Hannon 191,337
Bale tie, D. A. Tompkins 191,291
Bank check book, M. C. Johnson 191,436
Barrel washer, A. Zoller 191,506
Bearing for vertical shafts, etc., L. Webber 191,390
Bed bottom, spring, H. W. Ladd 191,244
Bedstead frame, J. M. Farnham (r) 7,704
Belting rope, rawhide, H. Royer 191,374
Bench plane, W. Wood 191,293
Bisulphide of carbon power, Fell & Bunster 191,327
Boiler, R. Excell 191,326
Boiler covering, F. B. Stevens 191,262
Boiler water tube, E. Cope 191,225
Book, J. M. Harper 191,434
Boot tree, J. Miller 191,247
Boot heel stiffeners, shaping, J. Kimball (r) 7,708
Boots, making, J. S. Turner 191,387
Bosom form, A. H. Pike 191,365
Bottle-closing device, W. H. Hicks 191,283
Bottle stopper fastener, J. H. Parkhurst 191,251
Box, wooden, G. Harrington 191,236
Brick kiln, J. A. Schultz 191,376
Bricks, etc., from slag making, J. Woodward 161,504
Broom, J. & T. Roney 191,373
Brush, G. S. Snell 191,259
Brush, J. Waddell 191,388
Buckle, J. Fenton 191,330
Buckle, B. C. Young (r) 7,712
Burglar alarm, I. Hogeland 191,343
Button for carriage curtains, Trinks & Pramann 191,492
Can opener, D. F. Fetter 191,416
Car berth, sleeping, Alley & Fancher 191,218
Car bumper, railway, R. D. Chatterton 191,404

Car coupling, D. M. Campbell (r) 7,703
Car spring, A. Middleton 191,361
Car starter, J. Marsden 191,355
Car wheel, N. Washburn 191,292
Car wheel and axle, N. Washburn 191,293
Carding alarm, W. A. Hathaway 191,237
Carriage jack, C. Duecker 191,410
Carriage thill and pole, A. Moffitt 191,459
Carriage canopy, child's, C. E. Fosburgh 191,233
Cartridge, metallic, B. B. Hotchkiss 191,430
Cartridge shell, I. Kinney 191,243
Cement for steam joints, S. Otley 191,249
Chair, folding, I. N. Dann 191,408
Chair, nursery, L. I. Adams 191,294
Chaudelier, extensou, J. T. Bruen 191,399
Cheese cutter, A. Beauoleil 191,396
Chimney cowl, Barry & Lane 191,297
Chimney top, L. K. Dutton 191,229
Chimney top, T. B. Entwisle 191,230
Cigar box, C. Gluid (r) 7,707
Cigar box, J. H. Preatner 191,466
Cigar machine, F. W. Feigner 191,231
Cigarettes, manufacture of, A. Willis 151,501
Clamp for tubing, M. Mattson 191,356
Clothes wringer, J. Young 191,274
Coffee pot, R. L. Nelson (r) 7,716
Coffee, preparing, F. Silver 191,373
Coin holder, E. H. Guild 191,336
Corn planter, F. B. Hunt (r) 7,717
Corrugating pipe sockets, M. Blakey 191,220
Corrugating metal, G. F. KISSAM 191,441
Corset clasp, G. W. Reynolds 191,467
Cotton chopper, G. W. Banks 191,219
Crane, B. Jones 191,437
Crate, folding, G. Robinson, Jr. 191,371
Cultivator, J. Jones 191,347
Cultivator, Lynch & Wright 191,451
Cultivator, T. F. McNair 191,453
Deodorizing compound, etc., H. Seligman 191,476
Desk, J. R. Richardson 191,263
Draft rod for tenders, W. R. Cross 191,227
Dust pan, S. M. Rennie 191,368
Eccentrics, securing and adjusting, J. Mason 191,453
Electro-magnetic motor, R. J. Sheehy 191,478
Engine, carding, R. F. Barker 191,395
Engine, road, B. F. Cornish 191,407
Engine, rock drilling, W. H. Elliot 191,509
Engine, rotary, M. Nordmann, Jr. 191,250
Envelope, A. C. Fox 191,419
Excavator, J. G. Stafford 191,484
Expansion joint, fire bar, F. R. Ellis 191,325
Feed trough, T. L. Block 191,398
Feed water heater, F. B. Rice 191,471
Felt fabric, E. Sealy (r) 7,718
Fence, A. Gosnell 191,422
Fence, K. S. Johnson 191,240
Fence wires, etc., splicing, W. B. Hayden 191,339
Fence, barbed, L. P. Judson 191,348
Fence, barbed, M. C. Richards 191,468
Fence, barbed wire, J. F. Steward 191,263
Fence Post, W. Langham 191,445
Fence post, G. B. St. John 191,485
Fire escape, A. McCambridge 191,455
Fire escape, W. H. Sissum 191,490
Fire extinguishing compound, F. Budy 191,306
Flour, bolting, P. B. & A. B. Sprenkle 191,482
Flying top, E. Metz 191,246
Fountain, aerated water, J. C. Johnson 191,346
Friction clutch, W. H. Clark 191,214
Fruit dryer, R. B. Blowers 191,303
Fruit dryer, W. M. Eddelman 191,324
Furnace door, T. W. Rogers 191,474
Furnace, glass, D. Bennett 191,507
Furnace, hot air, J. Magee (r) 7,710
Furnace, kettle, J. F. Prath 191,465
Furnace, ore roasting, H. G. Livermore 191,351
Furnace, steam boiler, C. F. Hunt 191,433
Furnace, steam and air blast for, E. J. Jones 191,438
Furniture spring, Dusan & Akin 191,323
Game apparatus, W. E. Briggs 191,223
Gas burner, H. A. Whitney 191,493
Gas burner, oil, C. G. Spengler 191,381
Gas regulator, A. F. Chase 191,402
Gate, H. W. Goodwin 191,334
Glass shades, making of, H. Brooke 191,224
Glove fastener, H. Texier 191,226
Glue, composition, J. H. Craig (r) 7,714
Grain binder, J. F. Steward 191,264
Grain dryer, L. S. Chichester (r) 7,713
Grain drill, B. Kuhns (r) 7,709
Grain headers, etc., raising reels of, C. A. Weed 191,497
Grain separator, J. Shilling 191,377
Grain tally, P. S. Wiseman 191,503
Graining machine, J. R. Cross 191,318
Grasshoppercatcher, S. Godard 191,421
Grindstones, sharpening, H. F. & M. L. Bush 191,308
Harness, water hook for, R. Lowell 191,353
Harvester, D. Strunk 191,486
Harvester reel, H. A. Adams 191,217
Hay elevator, G. Hersman 191,282
Holdback, safety, C. H. Dow 191,228
Hoopskirt, A. Benjamin 191,277
Horse collar, M. Turley (r) 7,711
Horse detacher, G. A. Hildebrand 191,284
Horse-hitching device, O. S. Hosmer 191,429
Horse power, J. & H. Kolling 191,442
Horseshoe nail, A. W. Kingsland 191,242
Hose reel, automatic, W. Neracher 191,461
Ice, manufacture of, C. L. Riger 191,256
Insect destroyer, J. C. Melcher 191,360
Journal box, G. W. Sweeney 191,489
Knobs for spindles, attaching, J. Naylor 191,363
Ladder, H. L. Ennes 191,413
Lantern, Cash & Baron 191,401
Latch and roller, J. T. Foster 191,417
Leather, whitening, etc., J. G. Buzzell 191,400
Lock and key, A. H. Palmer 191,462
Loom shed, Ashworth & Hanson 191,296
Loom shed, Crompton & Wyman 191,317
Loom shuttle-driving mechanism, W. B. Willard 191,392
Lubricating compound, G. W. Sweeney 191,488
Lubricating compounds, P. Sweeney 191,490
Lubricator, J. Harper 191,425
Meat cutter, A. R. Gillis 191,281
Meat holder, S. Poole 191,367
Meat, curing, Simonds & Stevens 191,510
Monument, A. Smith 191,290
Motor, G. E. E. Bozerian 191,508
Mucilage bottle stopper, J. Tilghman 191,386
Nail cutting machine, W. N. Severance 191,477
Nut lock, S. Caldwell 191,309
Oil and filter cup, A. J. Stevens 191,380
Oil still, J. T. Coleman 191,406
Ore washer, J. Richards 191,370
Oysters, opening, T. W. Temple 191,384
Packing engine, E. C. Johnson 191,434
Painting laths, W. Roberts 191,372
Pantalons, I. Zoellner 191,505
Pantograph, E. T. Pearl 191,253
Paper box, M. Backes 191,276
Paper collar, E. E. Mack 191,354
Pavement, Z. Waters 191,273
Pen rack, H. W. Forman 191,331

Pianoforte, Kranich & Bach 191,444
Pipe elbows, cutting out, G. Choate 191,311, 191,321
Plow, W. S. Lawrence 191,446
Plow, F. Rick 191,469
Plow, J. W. Thom 191,332
Plow, rotary, W. Freeborn 191,332
Plow, sulky, F. A. Hill 191,342
Pneumo-electric bath, Huffman & Huff 191,432
Post hole digger, T. S. Disston 191,320
Potato digger, M. Dargitz 191,409
Preserving wood, etc., Roge et al 191,257
Printed sheet delivery, S. D. Tucker 191,494
Printing, press, C. Potter, Jr. 191,289
Propulsion of vessels, T. Seabury 191,475
Pump and engine, S. D. Simmons 191,258
Pump force, C. H. McKeehan 191,457
Pump, oil or other deep well, D. L. Lewis 191,448
Pump plunger, H. H. Tuttle 191,271
Pump reel, sand, W. J. McKee 191,353
Pump rod adjuster, D. L. Lewis 191,447
Pump, sand, W. H. Birge 191,302
Pump, steam vacuum, E. S. Blake 191,397
Pyrometer, E. Brown (r) 7,702
Railway frog, J. T. Richardson 191,470
Railway ticket, E. G. Johnson 191,435
Road scraper, L. F. Jefferson 191,287
Rock drill, expanding, W. R. Burt 191,307
Roofing scaffold, J. A. Goodnough 191,333
Sadiron heater, W. H. Haylock 191,340
Sail hank, A. Mehu 191,359
Sash fastener, A. Chamberlin 191,403
Sash fastener, T. Stuart 191,338
Sawing machine scroll, J. H. Hopkins 191,239
Screw thread counter, C. C. Coleman 191,315
Seal, metallic, F. A. Ferris 191,323
Seeddrill and fertilizer, Kuhns et al 191,443
Seeding machine, D. Strunk 191,487
Sewing bobbin winder, T. McGrah 191,456
Sewing books, Heyl & Brehmer 191,426
Sewing needle clamp, J. V. Morton 191,362
Sewing machines, shuttle, G. H. Thomas 191,265
Sewing, preventing back motion in, G. M. Conover 191,316
Shoe fastenings, F. G. Farnham 191,414, 191,415
Shutter worker, W. P. McCobb 191,454
Skate, roller, Leggo & Ireland 191,350
Skiving machine, E. J. Foss 191,418
Sled, coasting, C. R. Van Hoesen 191,496
Sleeve button and stud, J. S. Horton 191,544
Sleigh runner, C. Smith 191,481
Smoothing iron chisel, J. F. Bless 191,221
Snap hook, J. Hall 191,423
Snap hook, Robinson & Ellis 191,472
Soldering process, Clark & Harris 191,405
Spark arrester, J. N. Weaver (r) 7,717
Spirit level, Ward & Bedworth 191,389
Stamp, hand, E. L. Tarbox 191,265
Station indicator, J. Mantell 191,452
Stone, etc., dressing, H. A. Kimball 191,241
Stopper attachment, B. Arnold 191,295
Stove, C. Dior 191,319
Stove, heating, T. White 191,499
Stove fire extinguisher, J. M. Van Dyke 191,495
Straw cutter, W. Kachin 191,288
Stud fastening, M. Zacharias 191,294
Sugar machine, cube, Westermann & Mursch 191,291
Syringes, tube holder for, M. Mattson 191,257
Target, D. W. Hoshall 191,345
Telegraph, copying, L. Pickering 191,464
Telegraph printing, R. J. Sheehy 191,479
Telegraphs, quadruplex, F. W. Jones 191,439, 191,440
Thill coupling, C. C. Hinkley 191,285
Thrashing machine, R. Durand 191,280
Thrashing band feeder, I. H. Green 191,335
Three horse equalizer, W. McClelland 191,245
Tickets, printing, etc., B. C. Cole 191,254
Tile machine, Clark & Purcell 191,313
Tire heater, P. W. Cassil 191,310
Tobacco, drying, C. Losee 191,450
Tobacco pipe, S. H. Thurston 191,385
Toy velocipede, J. E. Conklin 191,278
Transplanter and fertilizer, Nolan & Fitzpatrick 191,364
Trigger for firearms, M. Heuser 191,341
Truck and bag holder, D. S. Wing 191,502
Truck, barrel, E. E. Blinn 191,222
Type writer, C. Stanton 191,282
Valve, S. L. Wiegand 191,500
Valve for steam engines, J. F. Allen 191,275
Valve for twin engines, P. Lohmeyer 191,252
Valve, steam, E. Cope 191,226
Valve, steam, S. Curtis 191,279
Vapor burner, L. Fischer (r) 7,706
Vapor burner, R. W. Park 191,252
Vegetable slicer, F. Schmitt 191,375
Vegetable slicer, etc., J. P. Dunwald 191,222
Vehicle running gear, Drew & Robinson 191,321
Vehicle spring, C. J. Holman 191,423
Ventilator, car, P. T. Kester 191,349
Wagon axle, W. F. Buckelew 191,305
Wagon brake lever, J. P. Outson 191,366
Wagon, dumping, J. G. Stafford 191,483
Washing machine, D. Best 191,301
Watch key, G. W. Harris 191,338
Water wheel, turbine, B. D. Holmes 191,238
Water wheel, turbine, J. H. Smith 191,379
Wheel axle, J. Humphrey 191,286
Whiffletree fastening, S. M. Hamblin 191,235
Whiffletree, eyebolt for, C. S. Ellis 191,411
Wind instrument, E. P. Needham 191,460
Windmill, L. H. Bennett 191,299
Window glass ornamented, R. M. Tudor 191,270
Window screen, S. Roebuck 191,473
Wire screw and nut, J. T. Brunen 191,304
Woven fabrics, making, E. Posselt 191,255
Wrench, S. C. England 191,412
Wrench, A. V. Trust 191,493

DESIGNS PATENTED,

10,009.—CARPETS.—F. E. Allen, Yonkers, N. Y.
10,010, 10,011.—CASSIMERES.—F. S. Bosworth, Providence, R. I.
10,012.—CARPET.—J. Campbell, London, England.
10,013.—CASSIMERES.—F. Carpenter, Glendale, R. I.
10,014 to 10,017.—SPIRIT LEVELS.—L. L. Davis, Springfield, Mass.
10,018.—CIGAR PIPES.—W. Demuth, New York city.
10,019.—DRINKING FOUNTAINS.—J. W. Fiske, New York city.
10,020.—CHAIN.—G. F. Gleason, Newark, N. J.
10,021.—TASSELS.—G. S. Hensel, Philadelphia, Pa.
10,022.—TYPES.—J. Herriet, New York city.
10,023, 10,024.—MONUMENT.—J. Morgan, Brooklyn, N. Y.
10,025.—BILLIARD TABLES.—C. Schulenburg, Detroit, Mich.
10,026.—BRACELET.—M. Sternheimer, New York city.
10,027.—STOVES.—N. S. Vedder et al., Troy, N. Y.
10,028.—SHOW CARDS.—J. C. White, New York city.
10,029.—DOOR KNOBS.—L. Widmayer, New Britain, Conn.

[A copy of any one of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]