work any better than the jet. We use the city water works for cleaning out the pipe when it gets dirty. There are no elbows in the pipe except where it turns down in the well; all other turns were made by bending the pipe. Do you know of any way that we can convey power to the river, such as compressed air or some other way, by which we can force the water up to factory without too much outlay? A. The obstruction in the pipe that prevents the jet pump from working satisfactorily, would also interfere with the action of a pump. If the pipe is of wrought iron, not galvanized, it is liable to rust and form nodules on the inner surface throughout its length, which decreases the area and increases the friction. By raising the pipe at the river end and connecting with the water works pipe at the factory end, giving the full pressure on the pipe would show by the stream at the river end whether the pipe is permanentiy obstructed. If found to be obstructed, the pipe should be taken up and cleaned by pushing a smaller pipe through with a sharpened coupling on the end, a little smaller than the bore of the 1½ inch pipe. If there should be a full, strong flow from the pipe, the next possibility will be air leaks. To ascertain the fact, arrange the steam jet so as to discharge from an open pipe and start the jet. If there is air in the pipe or airleaks, the discharge will sputter, or become intermittent, possibly stop altogether. This is supposing that the start is made with the pipe fully charged with water. There is also a possibility that the separation of the air from the water by the partial vacuum in the siphon suction pipe may cause some trouble by accumulating at the apex and separating the water in the pipe. By your statement, your siphon has a probable lift of 26 feet or nearly its limit, and it may be that this is the source of your trouble. You can transmit power to drive a pipe pump by a wire rope system from a pulley in the factory to a pulley at the river with a couple of supporting pulleys at proper distances to keep the wire rope from vibrating.

(4519) G. J. asks: 1. Is there in existence a perfectly working long-distance pneumatic tube system? A. No; probably a mile or less. 2. What is the longest electric railway in existence? A. 5 or 6 miles. 3. What are the prospects of a near adoption of electricity on the steam railroads? A. The prospect is very distant. The system of wiring would be too intricate for the immense traffic and yard switching of our great railways.

(4520) Reader writes: Some years ago I saw at this place an exhibition wherein apparitions were made to appear on the stage by what was said to be the manipulation of mirrors under the stage of the theater. A form of a woman would appear, first in a transparent mist, and then would assume a perfectly lifelike appearance. A. The illusion to which you refer is produced by a plate glass mirror erected upon the stage at such an angle as to reflect the image of the figure below the front of the stage, a strong light being thrown upon the figure. This illusion is known as "Pepper's Ghost."

(4521) W. G. S. asks: For bathing purposes is artesian well water healthful or unhealthy? A. Artesian well water is healthy for bathing as much so as for household purposes. The wells that furnish hard water do not afford the satisfaction to bathers as the soft water wells. A little ammonia in the hard water makes a satisfactory and healthy bath. The mineral constituents of the hard water from artesian wells are principally lime and magnesia, with their various combinations. Some wells furnish water of decided sanitary properties.

(4522) E. G. A.—The following is a receipt for berb beer: Pour boiling water on 2½ ounces sassafrass; 1½ ounce wild cherry bark; 2½ ounces allspice; 2½ ounces wintergreen bark; ½ ounce hops; ½ ounce coriander seed; 2 gallons molasses. Let the mixture stand 1 day. Strain, add 1 pint yeast, enough water to make 15 gallons. This beer may be bottled the following day.

(4523) C. C. asks how to harden a chisel for chipping casehardened iron. A. Heat the chisel after sharpening to a low cherry red and then plunge it in a saturated solution of chloride of zinc. The chisel must be rebardened whenever it is sharpened.

(4524) F. S. B. writes: 1. It is said that if balls of wax and lead are dropped from the top of a building, they will fall together. Do you think this is wrong? A. There would be a difference, but it would be almost imperceptible. In a vacuum, both bodies would fall in the same time. 2. How do scientists explain that capillary attraction is not a case of work being done without an apparent loss of energy? A. In rising in a moisted tube water obeys the force of cohesion exercised over space, which represents the expenditure of energy. To extract the water from the tube, an exact equivalent of work would have to be done. Potential energy is represented by the separation of the water in mass from the water wetting the walls of the tube, or by the separation of the water in mass from the dry walls of the tube, if we assume a dry tube to be used, and adhesion to be one of the actuating forces.

(4525) W. E. P. asks: How should the 8-light dynamo be connected for the best results, when used for charging storage batteries, and how many will it *fill;* batteries to be connected in series, and using a 1-horse power Shipman engine for power? Dynamo is now connected as shown in Fig. 1 (large cut) in SUPPLEMENT 600. A. The 8-light dynamo should be connected in series for use in charging storage cells. You should connect your cells in series. The dynamo will charge from 10 to 20 cells. The rapidity of charging diminishes with the increase in the number.

(4526) J. M. writes: 1. Please give some antiseptics for a gelatine emulsion for dry plates? A. SUPPLEMENT No. 541 contains full instructions for making emulsons. 2. Where may the wooden valves used in the air pump, Experimental Science, p. 92, be bought? A. These valves are not on sale. They are easily made, and with very little effort you can make them yourse'f. 3. How could the motor, on p. 498 of the same book, be best converted into a dynamo, and what would be the power of the same? Also name books containing instructions for making simple dynamos, without the need of lathes or special tools. A. Make the field magnets of cast iron, and wind the field magnet and armature with No. 20 or No. 22 wire. 4. I have a lantern which is identical with the one described on p. 594, but have not changed it in any way. It shows colored slides quite well, but will not show a good picture off a photo, slide. How could I change it? A. Modify the lantern in the manner described in Experimental Science, that is to say, replace the front lens of the objective with a meniscus of the same focus.

(4527) J. F. R. asks: Is it safe to fasten a lightning rod to a wooden house with staples, without insulator glasses? A. Yes.

(4528) W. C. Moore writes: I inclose, you will find, a leaf of a plant found in west North Carolina the natives call "gall of the earth" or "rattlesnake's king," the milk white juice of which is said to be an immediate and sure cure for rattlesnake bites. I have made some notes on the subject. So please let me know if it is generally known to the scientific world, and what its analysis is, and I will be pleased to furnish you specimens and what information I can procure. Answer by Prof. C. V. Riley: The leaf accompanying Mr. Moore's letter is what is known as rattlesnake root, *Prenanthes altissima*, Hook. It is referred in the botanies to the genus Nabalus, and is popularly known as white lettuce, rattlesnake root, etc. There may be some foundation for the belief your correspondent refers to, and the common name of the plants of the genus would indicate such a property. I cannot find, however, any authorities which accord to it this power of curing rattlesnake bites. It is used as an astringent in dysentery, and an analysis of the plant which has been made indicates that it contains tannin and various inert properties.

(4529) G. C. H. writes: I send you by mail to-day, under a separate cover, two bullets which were picked out of the snow after a target shoot February 22. The projectiles were fired from the best breech loading target rifles with heavy charges of powder, and, after flight of (200) two hundred yards, passed through a paper target backed by one thickness of cotton cloth (sheeting), then entered the snow, penetrating but a few inches, and were picked up with the points marked as you now see them. The feature to which I specially desire to call your attention is this peculiar marking upon the point. It is a reproduction of the surface of the cloth, in which you can trace every thread of the fabric. It is possible that the tremendous velocity of the bullet made the impact equivalent to the blow upon a stationary and immovable object, or that a small piece of the cloth may have been punched out, and, going forward with the bullet, was impressed between the bullet and the snow. The matter may be sufficiently interesting for you to express an opinion upon. A. Your first explanation appears reasonable.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

August 30, 1892,

AND EACH BEARING THAT DATE.

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

Addressing machine, F. D. Rettich 481,639
Air, apparatus for heating compressed, R. A. Parke 481,623
Air brake coupling, J. T. Hayden 481,651
Air compressor, M. Dillenburg 481,650
Air ducts, sheet metal, J. N. Lake 481,620
Alarm. See Door alarm.
Anchor, R. S. R. Chrietzberg 481,782
Animal shears, C. & H. Burgon 481,844
Animal trap, C. B. Trumble 481,707
Armatures, device for removing, S. H. Sharpsteen 481,833
Axle bearing, S. S. Arnold 481,545
Axle bearing, T. J. McGee 481,911
Azimuth circle, E. S. Ritchie 481,625
Baby walker, P. Wiberg 481,609
Balance, proportional, O. H. Jadwin 481,618
Balance, recording, C. F. Ames 481,543
Band cutter and feeder, Johnson & Phillips 481,570
Barrel stand, C. Rettig 481,640
Basic lining, J. Recse 481,869
Battery. See Galvanic battery. Secondary battery.
Bedstead brace, J. Gribben 481,628
Bedstead, folding, F. Hamblin 481,757
Beer, ale, etc., chip for, J. J. Wolf 481,774
Bicycle, F. Jewett 481,569
Bicycle, L. J. Phelps 481,734
Bicycle carrier attachment, M. E. Blood 481,890
Bicycle supporting frame, R. A. Engler 481,751
Board. See Keyboard.
Boarders and distributing oil, apparatus for repelling, F. Eyle 481,615
Boat. See Life boat.
Boiler. See Steam boiler.
Boiler, G. E. Dixon 481,898
Bookbinding machine, R. Burnet 481,894
Boring machine work holder, F. Scheidt 481,737
Bottle stopper, W. J. Ferris 481,616
Bottle stopper and cover, automatic, C. Weinedel 481,644
Box. See Butter box. Letter box. Mail box.
Box board matcher and jointer, E. Fischer 481,752
Brake. See Magnetic brake.
Brace. See Bedstead brace.
Brick, P. S. Loveridge 481,700
Bullets, machine for swaging and creasing, J. F. McGrail 481,731
Bureau and washstand, combined, H. Couillard 481,848
Burial apparatus, J. B. Beugler 481,840
Burner. See Lamp burner.
Butter box, Meloney & Criswell 481,801
Button and lacing hook, combined, A. J. Miller 481,767
Button attaching machine, C. M. Platt 481,587, 481,588
Buttons, sale card for, C. F. G. R. Schwerdt 481,832
Calendar, C. N. Hoyt 481,563
Camera plate attachment, G. L. Minear 481,802
Can. See Roving can.
Can testing machine, Kendall & Schaake 481,764
Capping machine, J. F. Wittemann 481,626
Car brakes, slack djuster for, F. J. Cole 481,784
Car coupling, T. J. Booz 481, 1
Car coupling, E. Brockway 481,660
Car coupling, J. S. Hunter 481,567
Car coupling, D. W. & G. Jewell 481,906
Car coupling, J. Kindelberger 481,907
Car dump, J. Odorizzi 481,811
Car motor, street, J. G. Lightford 481,715
Car step, extensible, W. H. Voss 481,658
Car, street, J. A. Mehling 481,800
Car, vestibule, G. Hancock 481,902
Car wheel, H. Guels 481,862
Carpet sweeper, G. S. Sanford ..... 481,826 to 481,829
Carriage wrench, J. A. Corey 481,749
Carrier. See Reel carrier.
Cart, dumping, W. H. & H. S. Bowler 481,843
Cartridge loading tool, W. N. Beardsley *et al* 481,887
Case. See Watch case.
Cash register and indicator, E. F. Roberts 481,824
Cash register, indicator, and recorder, W. F. Beck 481,777
Casting and working metals, apparatus for use in, W. E. May 481,799
Casting machine, type, T. K. Kinshillwood 481,760
Ceiling, cohesive combined lintel, R. Guastavino, Jr 481,755
Ceiling, metallic, W. W. & R. H. Old 481,813
Celery digging machine, M. M. Ranney 481,819
Chains, machine for making sheet metal, Austin & Lewis, Jr 481,776
Chair. See Rail chair.
Chair, J. W. McDonough 481,582
Chandelier, extension, F. Overholt 481,814
Chopping machine, G. W. Mason 481,766
Churn, G. S. Agee 481,542
Churn vent, F. E. Huggins 481,564
Cigar bunching machine, F. & E. H. Thompson 481,722
Cleaner. See Gun cleaner.
Clock, electric central, N. Prokhoroff 481,916
Closet. See Water closet.
Clothes drying machine, F. Schilz *et al* 481,738
Clothes line support, R. McNab 481,806
Clutch, friction, W. Kershaw 481,794
Coal, electrically driven machinery for cutting, L. B. & C. W. Atkinson 481,775
Coal screen, S. Griffiths 481,754
Coffee pot, R. F. Randall 481,769
Coffee pots, etc., sediment gatherer for, J. C. W. Boice 481,547
Coin-controlled mechanism, H. E. Perry 481,816
Combing machine, Offermann & Ziegler 481,812
Compound engine, G. S. Strong 481,773
Conveyer, P. C. Wilson 481,837
Cooking vessels, fume drainer for, B. F. Fowler 481,901
Corn popper, D. Swenson 481,877
Counter rail, foot bracket, and cuspidor, combined, W. C. Huss 481,568
Coupling. See Air brake coupling. Car coupling. Universal coupling.
Cultivator attachment, A. S. Gilkey 481,667
Curtain fixture, C. M. Banks 481,684
Curtain rod, S. R. Scottron 481,720
Cut-off, rain water, W. C. Maxfield 481,635
Cut-out, ceiling rosette, Pass & Seymour 481,624
Cutter. See Band cutter. Meat cutter. Potato cutter.
Cutter head and knife, C. Grotz 481,861
Cutter or drill applicable to coal, etc., H. Renold *et al* 481,656
Cyclometer, F. C. Weston 481,608
Dental burring tool, R. G. Stanbrough 481,740
Digger. See Post hole digger. Potato digger.
Door alarm, electric, M. W. Bessey 481,711
Door closer, A. D. Lodge 481,798
Drainage trap, E. E. Gold 481,727
Drawer pull, R. Eichstaedt 481,853
Dress pad, E. Goldman 481,788
Drill. See Rock drill.
Dyeing with alizarin, H. N. F. Schaeffer 481,591
Election booth, J. Jones 481,571
Electric circuit connection, A. Noll 481,914
Electric conducting wires, safety attachment for, R. Furgang 481,666
Electric conductor conduit, A. Noll 481,912, 481,913
Electric conductors, safety attachment for, R. Furgang 481,665
Electric lighting system, P. Cravath 481,785
Electric lighting system, E. Huber 481,904
Electric machine, dynamo, Andrews & Spencer (r) 11,266
Electric motor and regulating device therefor, F. J. Sprague 481,739
Electric motor or dynamo-electric machine, R. Lundell 481,701
Elevator, T. Mason 481,577
Elevator controlling mechanism, E. S. Matthews 481,580
Embroidering machines, fabric holder for, T. D. Elsner 481,553
Engine. See Compound engine.
Envelope machine, L. P. Bouvier 481,779
Evaporating apparatus, portable, T. E. Richard 481,675
Exercising machine, C. G. Miller 481,730
Fan, electric, F. H. Beers 481,646
Fence wire tightener, B. C. Wickers 481,880
Fencing, die for use in machines for making metallic, T. V. Allis 481,918
Ferrule, W. H. Gaskill 481,753
Fifth wheel, H. Olsen 481,655
File, document, E. A. Sharp 481,593
File, revolving paper, R. E. Ferguson 481,857
Filter, J. M. Wasson 481,606
Fire alarm system, auxiliary, J. Sachs 481,590
Fire escape, Bergeron & Bedard 481,888
Fire escape, C. M. Fowler 481,668
Fire escape, A. B. Cruickshank 481,849
Fire escape, J. A. Hunt 481,565
Fishing reel, J. Borchardt 481,743
Flush tank, Williams & Poore 481,710
Fly trap, mechanical, E. Rathgeb 481,820
Frame. See Bicycle supporting frame.
Furnace. See Open hearth furnace. Smelting furnace.
Furnace grate, E. C. Sooy 481,596
Furnaces, air supply for boiler, I. V. Scholfield, Jr 481,831
Galvanic battery, W. J. Engledue 481,664
Game apparatus, J. W. Buck 481,548
Game apparatus, A. Scholz 481,830
Game counter, Sturgis, Jr., & Peck 481,657
Game, parlor, S. George 481,859
Gas governor and burner, H. Schrader 481,771
Gas heater or radiator, A. Wolff 481,742
Gas mixer, S. K. Wagner 481,604
Gases, impregnating liquids with, U. Bachmann 481,838
Gate, G. W. Spidel 481,876
Glass tube, multiplex, P. J. McElroy 481,805
Glycerine, apparatus for rectifying, R. O. Unglaub 481,879
Gold and silver from their ores, method of and apparatus for extracting, Aylsworth & Payne 481,683
Grain drier conveyer, E. M. Parker 481,672
Grating, jail, G. L. Norrman 481,915
Grinding mowing machine knives, machine for, M. Baines 481,886
Guest call, electric, F. Benner 481,919
Gun cleaner, W. H. Ferris 481,858
Guns, apparatus for moderating the recoil of, L. Denoyelle 481,647
Gymnastic apparatus, C. C. Neily 481,807
Hame fastener, R. G. Armstrong 481,725
Hand rake, T. Coldwell 481,895
Harness, hanger for swinging, R. G. Armstrong 481,627
Harrow for listed corn, R. Lyons 481,634
Harvester and binder, J. M. Trier 481,706
Hay and grain loader, F. J. Lovell 481,699
Heater. See Gas heater.
Heater for food, etc., G. L. Hinderer 481,759
Hinge, C. Osborne 481,732
Holder. See Paper holder. Paper roll holder. Sash holder.
Honey cells and combs, making artificial, Mason & Moskovits 481,578
Horse boot, J. Hoar 481,790
Horseshoe, H. Olson 481,716
Hub attaching device, I. Van Winkle 481,605
Indicator. See Valve motion indicator.
Inkstand, Foster & Farrell 481,649
Inkstand, C. R. Straughn 481,600
Instruction in reading and calculating, device for, W. W. Hallett 481,728
Insulator, pipe, G. E. Dixon 481,899
Iron and steel, manufacture of, J. P. Witherow 481,881
Jack. See Wagon jack.
Joint. See Railway joint. Railway rail joint.
Keyboard, transposing, R. E. Bell 481,778
Kiln. See Malt drying kiln.
Kiln, P. J. Handel 481,562
Knife blade machine, T. R. Moore 481,804
Knitting machines, electrically controlled stop motion for, V. S. Clute 481,726
Knitting machines, stitch holding mechanism for, F. Lasher 481,631
Labeling machine, can, P. Crittenden 481,896
Lamp, argand, F. Rhind 481,674
Lamp burner, B. P. Luce 481,729
Lamp burner, R. A. Wentworth 481,607
Lamp, duplex arc, C. E. Scribner 481,677
Lamp, electric cigar lighting, W. J. Eastman 481,892
Lamp wick lift, H. L. Clark 481,748
Lamps, wick raiser for central draft, W. L. Upson 481,741
Latch, Gangnon & Lefebvre 481,557
Latch, C. W. Monroe 481,910
Lathe, C. G. Richardson 481,717
Laundry drying room, J. E. Chappell 481,845
Letter box, J. Spear 481,772
Letter press and cabinet, G. Paul 481,586
Life boat, W. H. Taylor 481,602
Lifter. See Pickle lifter. Transom lifter.
Lightning arrester cut-out, J. P. Freeman 481,617
Liquid dispensing apparatus, R. H. Little 481,698
Lock, W. H. Blaney 481,889
Lock, J. Roche 481,736
Lock, N. G. Sorensen 481,597
Magnetic brake, A. de Bovet 481,842
Mail bag catcher, G. W. Moore, Jr 481,654
Mail bags, crane for suspending, E. A. Ray 481,673
Mail box, G. S. Light 481,621
Malt drying kiln, C. G. Bosch 481,687
Match safe, automatic, G. W. Heffner 481,686
Measuring device, liquid, J. Roos 481,872
Measuring machine, fence, F. Hutchinson 481,792
Meat cutter, O. D. Woodruff 481,882
Medical compound, Page & Apfel 481,815
Merchandise, apparatus for dispensing articles of, R. H. Little 481,908
Messenger's picket, J. C. Hays 481,867
Metal plate fastening, W. C. Hunter 481,566
Mining cage or car, E. Schillo 481,592
Mole trap, Oerther & Dillingham 481,585
Motor. See Car motor. Electric motor. Spring motor.
Music leaves, tab for, C. F. Pidgin 481,735
Musical instrument, J. B. Galloway 481,694
Musk and making the same, artificial, A. Baur 481,685
Nailing machine, box, B. M. Gunston 481,863
Oil upon water, device for distributing, S. I. Prescott 481,818
Oiling device, loom, J. S. Giles 481,558, 481,559
Open hearth furnace, H. Aiken, *et al* 481,885
Ore washer and concentrator, A. L. Dana 481,550
Ozone generating apparatus, C. C. Sharp 481,676
Packing metallic rod, J. C. Chapman 481,662
Pad. See Dress pad.
Paddle wheel for steamers, J. Howard 481,868
Padlock, combination, H. H. Daniels 481,551
Pantograph tracing and engraving machine, Bryce & Knox 481,893
Paper bag machine, A. C. Getten 481,650
Paper holder, toilet, M. A. Brown 481,612
Paper roll holder and cutter, knockdown, Beach & Booth 481,839
Paper, safety, A. Schlumberger 481,770
Pavement, brick, J. R. Haldeman 481,756
Pickle lifter, J. A., Jr., & J. W. Currie 481,691
Pin. See Safety pin.
Pin sticking machine, E. A. Burgess 481,746
Pipe. See Stove pipe.
Pitcher, ice, R. Arnold 481,544
Planter, corn, H. H. Dougherty 481,852
Planter, potato, S. C. Schofield 481,642
Plow, O. T. Jensen 481,630
Plow, J. F. B. Lorentzen 481,633
Plow, E. L. Ward 481,708
Pole tip, vehicle, T. J. Houghton 481,791
Pole, vehicle, J. P. Johnson 481,619
Post hole digger, W. Z. Brown 481,688
Pot. See Coffee pot.
Potato cutter, F. Jackson 481,629
Potato digger, P. J. Wilborg 481,645
Press. See Letter press.
Pressure regulator, fluid, W. B. Mason 481,579
Printing and adding machine, check, C. W. Weiss 481,709
Puller. See Sprout puller.
Pulley, split, D. G. Reitz 481,871
Punch, perforating, H. H. Norrington 481,583
Punching machine, J. Long 481,574
Puzzle, J. W. Hale 481,561
Puzzle, A. C. Proctor 481,589
Quoin, C. W. Waldron 481,605
Race horses, device for starting, J. J. Sullivan 481,835
Radiator, graduating steam, J. T. Hawkins 481,789
Radiator shield, G. E Dixon 481,900
Rail chair, C. E. Mark 481,575
Rail joint, roll for forming connecting plates for, Lentz & Thompson 481,697
Rail sanding apparatus, G. Lentz 481,797
Railway, electric, R. M. Hunter 481,905
Railway joint, H. T. Hey 481,758
Railway rail joint, C. E. Mark 481,576
Railway signal, automatic mechanical block, Young & Willever 481,884
Railway time signal, W. D. & E. L. Mitchell 481,581
Railway time signal, A. H. Thorp 481,723
Rake. See Hand rake.
Rakes, making, W. H. Cowdery 481,663
Ratchet wrench, P. Cossette 481,690
Record, diary, and ledger, combined, H. Meyer 481,670
Reel. See Fishing reel.
Reel carrier, J. F. Schneider 481,641
Refuse of cities, apparatus for treating the, J. J. Storer 481,680
Register. See Cash register.
Regulator. See Pressure regulator.
Rheostat, C. E. Carpenter 481,781
Rock drill, steam actuated, S. & W. R. Lloyd 481,632
Rock drilling machine, W. X. Stevens 481,598
Rock drilling machine, N. Widman 481,610
Rod. See Curtain rod.
Roller. See Shade roller.
Roller mills, adjustable scraper for, J. Harvey 481,866
Roofing and siding screw or fastening, R. B. I. Westover 481,724
Roving can, A. B. Fisher 481,554
Saddle, harness, D. F. Maine 481,765
Safety pin, A. T. Snell 481,834
Sail, A. S. Comstock 481,614
Sash fastener, C. O. Birney 481,546
Sash fastener, E. L. King 481,569
Sash holder, S. B. Morss 481,622
Saw filing and setting machine, J. Richardson 481,823
Saw, swinging, B. Bronson 481,744
Saw tooth, J. W. Todd 481,836
Sawing machine drag, L. Forsman 481,555
Sawing machine, rail, Smith & Brady 481,874
Screen. See Coal screen.
Seal, E. J. Brooks 481,892
Seat. See Window seat.
Secondary battery, W. W. Griscom 481,560
Sewing machine tuck creaser, H. P. Steward 481,599
Shade roller, spring, J. C. Perkins 481,733
Shears. See Animal shears.
Shoe fastening, H. S. Pullman 481,638
Shutter worker, N. Saltmarsh 481,705
Signal. See Railway signal. Railway time signal.
Signal sounding device, coin, C. W. Holbrook 481,903
Signal timing apparatus, H. A. Chase 481,613
Sled, bob, S. F. Sparr 481,643
Smelting furnace, reverberatory, H. Mathey 481,703
Smoke consumer, J. Sargent 481,719
Soap, Gray & Simmons 481,860
Sole, H. W. Merrill 481,909
Sole, H. Wooding 481,682
Spectacles, M. W. Davis 481,552
Spinning and twisting machines, traverse motion for, R. Dawes 481,787
Spraying machine, F. Salisbury 481,718
Spring. See Vehicle spring.
Spring motor Lang & Roper 481,714
Sprinkling device, J. L. Sardy 481,873
Sprout puller, G. F. Cull 481,897
Square, separable, F. F. Poole 481,637
Stairs, etc., tread for, Mason & Codner 481,702
Stand. See Barrel stand.
Stapling machine attachment, H. E. Cunningham 481,786
Steam boiler, G. Lentz 481,796
Steam trap, C. Taylor 481,601
Stitching with staples, machine for, R. Burnet 481,747
Stopper. See Bottle stopper.
Stove and draft regulator therefor, heating, Riepe Jr., & Hilgeman 481,870
Stove, cooking, heating, and illuminating lamp, J. F. Myers 481,768
Stovepipe, T. S. Evans 481,856
Sulky, E. S. Frazier 481,556
Tablet, writing, F. Bentel 481,686
Tacking implement, hand, N. Lombard 481,653
Tank. See Flush tank.
Tap, collapsible, W. W. Doolittle 481,648
Telegraph, fire alarm, A. J. Coffee 481,847
Telephone exchange, C. E. Scribner 481,679
Telephone exchange system, multiple switch board, C. E. Scribner 481,678
Telephony, system of, E. Thomson 481,878
Thill couplings, anti-rattler for, C. A. Carman 481,549
Thrasher, bean, P. Bourgin 481,841
Thrashing cylinder, S. Hamilton 481,864
Time lock attachment, J. X. Kaiser 481,572
Time pieces, calendar attachment for, Johnson & Hamill 481,793
Tire, pneumatic, Wellstein & Maxfield 481,681
Toe weight for horses, H. Armstrong 481,611
Tool, C. E. Harris 481,865
Toy mortar, G. B. Nichols 481,808
Tracing tool, T. E. Sipe 481,721
Track sanding apparatus, C. W. Sherburne 481,594
Transom lifter, J. F. Wollensak 481,917
Trap. See Animal trap. Drain trap. Fly trap. Mole trap. Steam trap.
Trolley carriage for conduits, S. L. Platt 481,817
Trolling spoon, H. Loftie 481,652
Truck gear, car, E. Peckham 481,704
Truss, J. M. Oakey 481,584
Tube. See Glass tube.
Turning machine, handle, W. D. Snyder 481,875
Type machine, wood, J. D. Carey 481,661
Type bars, machine for producing, J. C. Fowler 481,920
Type writing machine, L. P. Diss 481,750
Type writing machine, A. M. English 481,855
Unicycle, A. & F. Yost 481,883
Universal coupling, R. S. Brown 481,780
Urn, coffee, F. Doering 481,851
Valve for pneumatic tires, Ives & Colman 481,762
Valve, globe, F. M. Moore 481,803
Valve motion indicator for steam engines, J. Millis 481,671

© 1892 SCIENTIFIC AMERICAN, INC.