

Table. See Kitchen table.  
 Tap valve for barrels, Murray & Cooney..... \$87,802  
 Telephone conductors, insulation for mechanical,  
 F. E. Clark..... 387,969  
 Telephone, mechanical, M. Garl..... 387,616  
 Telephone support, N. W. Hartwell..... 387,718  
 Tensioning machine, W. H. Doane..... 387,949  
 Tension device, thread, A. W. Mathewson..... 387,984  
 Thill coupling, F. S. Blackman..... 387,620  
 Thill coupling, G. Brownlee, Jr..... 387,762  
 Thill coupling, W. B. Folsom..... 387,972  
 Thrashing machine, D. J. & J. F. Devane..... 387,627  
 Tire bender, J. F. Bender..... 387,548  
 Tobacco box, J. G. Pierson..... 387,694  
 Toboggan or coasting hill, artificial, J. Pusey..... 387,733  
 Tooth crown, artificial, C. E. Diehl..... 387,774  
 Toy spring gun, top spinning, O. P. Briggs..... 387,761  
 Truck, E. F. Scholder..... 387,741  
 Truck equalizers, die for forging, J. Reilly..... 387,886  
 Trunk lid support, S. Jones..... 387,866  
 Type writing machine, W. J. Barron..... 387,673  
 Type writing machine attachment, C. W. Thayer..... 387,752  
 Umbrella, W. B. Dimon..... 387,638  
 Vacuum apparatus coupling, H. N. D. Parker..... 387,904  
 Valve for rotary engines, reversing, A. L. Case,  
 Jr..... 387,858  
 Vaporizer and burner, hydrocarbon, W. F. Steele..... 387,929  
 Vehicle, W. H. Weston..... 387,638  
 Vehicle, side bar, E. D. Olin..... 387,987  
 Vehicle spring, W. M. Eccles..... 387,677  
 Vehicle wheel, H. G. Lane..... 387,685  
 Velocipede, C. E. Duryea..... 387,631  
 Velocipede, E. G. Latta..... 387,979  
 Velocipede, H. Thresher..... 387,700  
 Velocipede, ice, Rihble & Spencer..... 387,814  
 Vending apparatus, R. Whittaker..... 387,670  
 Vessels, combined bitt and deck pipe for, F. S.  
 Manton..... 387,894  
 Vessels, means for buoying up, W. D. T. Travis..... 387,933  
 Wagon, J. A. Ruth..... 387,816  
 Wagon fender, C. E. Wagner..... 387,702  
 Wagon jack, E. A. Redford..... 387,735  
 Wall paper hanging machine, J. F. McAfee..... 387,798  
 Wash stand and bracket, combined, G. W.  
 Schooley..... 387,922  
 Wash stand, combination bracket, Tolman &  
 Roberts..... 387,832  
 Watch balance, C. K. Giles..... 387,973  
 Water closet, W. F. North..... 387,804  
 Water elevator, pneumatic, J. B. Erwin..... 387,711  
 Water meter, J. Thomson..... 387,828  
 Water meter, disk, J. Thomson..... 387,831  
 Water tower, extension ladder, and fire escape,  
 combined, A. Kalinski et al..... 387,887  
 Water wheel, I. P. Lambing..... 387,791  
 Well curb, H. L. Beach..... 387,759  
 Well packers or tubing, anchor or support for  
 deep, S. R. Dresser..... 387,675  
 Wheel. See Axle wheel. Car wheel. Vehicle  
 wheel. Waterwheel.  
 Wick raiser, Z. Davis..... 387,864  
 Windmill, D. A. Whinery..... 387,938  
 Window clearing apparatus, D. G. Richards..... 387,919  
 Window screen, G. H. Gould..... 387,761  
 Wire for the market, preparing spools of, W.  
 Wallace..... 387,836  
 Wire machine, barb, L. J. Creelius..... 387,710  
 Wire netting, B. Scarles..... 388,001  
 Wire netting, machine for the manufacture of,  
 B. Scarles..... 387,739  
 Wood, marbled, W. S. Ingraham..... 387,977  
 Wood, marblizing, W. S. Ingraham..... 387,885  
 Wrench, H. G. T. Glazebrook..... 387,873  
 Zinc from ores, extraction of, A. H. Low..... 387,688

TRADE MARKS.

Beverages, nutrient, Phillip Best Brewing Com-  
 pany..... 15,777, 15,778  
 Cereals, steam cooked, E. Elsworth..... 15,765  
 Coat, protector to prevent soiling the collar, neck-  
 tie, and upper part of the, A. F. Langdon..... 15,769  
 Cornmeal, L. K. Lovejoy & Co..... 15,771  
 Extract of beef, Liebig Extract of Beef Company..... 15,770  
 Extracts of meats, J. Maggi & Co..... 15,772  
 Fertilizers, commercial, Bowker Fertilizer Com-  
 pany..... 15,761  
 Gum, chewing, C. T. Heisel..... 15,768  
 Hair dressings or tonics, P. H. McMahon..... 15,774  
 Linoleum, German Linoleum Manufacturing Com-  
 pany..... 15,767  
 Malarial compound, anti, Dr. J. G. Wannamaker  
 Manufacturing Company..... 15,785  
 Milk, condensed, H. Y. Canfield..... 15,764  
 Oysters, lobsters, and fish, fresh, J. H. Brookmire  
 & Co..... 15,762  
 Paints, fireproof, S. Cabot..... 15,763  
 Remedy for dyspepsia, Dr. J. G. Wannamaker  
 Manufacturing Company..... 15,784  
 Remedy for external and internal use and for cer-  
 tain diseases, certain, C. H. Rogers..... 15,780  
 Shirtings and sheetings, Wamsutta Mills..... 15,788  
 Soap, Mexican Amole Soap Company..... 15,775  
 Soap in bars, brown, Procter & Gamble..... 15,779  
 Soaps, Mexican Amole Soap Company..... 15,776  
 Spectacles and eyeglasses, E. S. Fowler..... 15,766  
 Stout, B. J. Semmes & Co..... 15,761  
 Varnishes, fatting, Lawson Valentine Company..... 15,782  
 Whiskey, rye, Martin & McAndrews..... 15,773

DESIGNS.

Badge, W. T. Mersereau..... 18,529  
 Bottle, W. P. Crary..... 18,520  
 Card or letter rack, T. A. Crabtree..... 18,519  
 Carpet, S. Christie..... 18,521  
 Carpet, H. Horan..... 18,522 to 18,524  
 Carpet, E. Poole..... 18,534  
 Chairs, arm rest for barbers', T. A. Kochs..... 18,525, 18,526  
 Collar, J. Byers..... 18,518  
 Gas burner, F. Rhind..... 18,535  
 Grave designator, veterans', F. H. Arnold..... 18,517  
 Handkerchief or banner, W. H. Minnix..... 18,530, 18,531  
 Handle, F. D. Merseau..... 18,528  
 Picture hook, W. A. Williamson..... 18,538  
 Pulley frame, E. C. Stearns..... 18,536  
 Table cover, C. Wiesen..... 18,537  
 Trimming, W. H. Maurer..... 18,527  
 Watch case or locket, H. S. Noyes..... 18,532, 18,533

A printed copy of the specification and drawing of any patent in the foregoing list will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

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.

Advertisements.

Inside Page, each insertion - - - 75 cents a line.  
 Back Page, each insertion - - - \$1.00 a line.  
 The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may be had at advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

**SEBASTIAN, MAY & CO'S**  
 Improved Screw Cutting  
**Foot & Power LATHES** \$60  
 Drill Presses, Chucks, Drills, Dogs, and machinists' and amateurs' outfits. Lathes on trial. Catalogues mailed on application.  
 165 W. 2d St., Cincinnati, O.

**TOOLS** Scroll Saws, Foot Lathes, Tools and Supplies for Amateurs and Machinists. Catalogue FREE. Novelty Tool Co., 177 Elm St., Cincinnati, O.

**COSTS IN MANUFACTURES.**—A Lecture by H. Metcalfe, U. S. A., delivered in the Sibley College course.—An elaboration of a system for the management of factories and employes. A valuable paper. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 619. Price 10 cents. To be had at this office and from all newsdealers.

**ARTESIAN**  
 Wells, Oil and Gas Wells, drilled by contract to any depth, from 2 to 3000 feet. Also manufacture and furnish everything required to drill and complete same. Portable Horse Power and Mounted Steam Drilling Machines for 100 to 600 feet and 6 cents for illustrated catalogue.  
**Pierce Well Excavator Co.**  
 New York.

**TELESCOPIC OBJECTIVES AND MIRRORS.** Their preparation and testing.—By H. Grubb, F. R. S. An interesting description of the processes now employed in the construction of telescopic objectives, prefaced with a short history of the many kinds of glass. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 548 and 549. Price, 10 cents each. To be obtained at this office or from any newsdealer.

**OIL WELL SUPPLY CO. Ltd.**  
 91 & 92 WATER STREET,  
 Pittsburgh, Pa.  
 Manufacturers of everything needed for **ARTESIAN WELLS** for either Gas, Oil, Water, or Mineral. Test, Boilers, Engines, Pipe, Cordage, Drilling Tools, etc. Illustrated catalogue, price lists and discount sheets on request.

**PETROLEUM FUEL.**—AN ACCOUNT of the Pennsylvania Railroad's experiments with the Upright system of burning petroleum on locomotives, and also of the experience of the Grazi-Baritzin Railroad with coal oil as a fuel. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 615. Price ten cents. To be had at this office and from all newsdealers.

**SECTIONAL INSULATED AIR COVERINGS** FOR PIPES, BOILERS, DRUMS, AND ALL OTHER HOT & COLD SURFACES.  
**SHIELDS & BROWN CO.** ASBESTOS CEMENT PACKING, SEALING, ETC.  
 142 N. 3rd St., Philadelphia, Pa.

**HUDSON RIVER BRIDGE AT Poughkeepsie.**—A lecture by T. C. Clarke, G. E., in the Sibley College Course. General description, Foundations, Superstructure, Temporary Staging, Trestle Work With 3 engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 646. Price 10 cents. To be had at this office and from all newsdealers.

**DELAFIELD'S PAT. SAW CLAMP**  
 With saw for cutting metals. Saves all the broken back-saw blades. In use over two years in all parts of the country. The new clamps have the edges bevelled that hold the saw. By mail, with one blade, 50 cents. Extra blades 24" x 1/2", 7 cents each, 70 cents per dozen, by mail. Blades 30" x 1/2", 7 cents each, by mail. Discount to dealers.  
**NOROTON MFG. WORKS, Noroton, Conn.**

**PURIFICATION OF STREET CARS.**—A paper by A. W. Wright, in which an endeavor is made to solve the problem as to the amount of power required to start a street car and keep it in motion under average conditions. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 533. Price 10 cents. To be had at this office and from all newsdealers.

**COMPLETE STEAM PUMP**  
 ONLY SEVEN DOLLARS  
 DEMAND THIS PUMP OF YOUR DEALER OR WRITE TO US FOR PRICES.  
**VANDUZEN'S PATENT**  
**VANDUZEN & TIFT.**  
 SOLE MAKERS CINCINNATI, O.

PATENTS.

**MESSRS. MUNN & CO.**, in connection with the publication of the SCIENTIFIC AMERICAN continue to examine improvements, and to act as Solicitors of Patents for Inventors.  
 In this line of business they have had forty-one years' experience, and now have unequalled facilities for the preparation of Patent Drawings, Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very reasonable terms.  
 A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Mints on the Sale of Patents, etc.  
 We also send, free of charge, a Synopsis of Foreign Patent Laws, showing the cost and method of securing patents in all the principal countries of the world.  
**MUNN & CO., Solicitors of Patents,**  
 361 Broadway, New York.  
**BRANCH OFFICES.**—No. 622 and 624 F Street, Pacific Building, near 7th Street, Washington, D. C.

**The Sturtevant Mill**  
 Crusher and Pulverizer Combined,  
 For Ores, Phosphates, Cement, and all hard and refractory materials. Unequaled for capacity and economy.  
 Among the many large manufacturers we refer to Milwaukee Cement Co. (Cements), Milwaukee, Wis. The Bowker Fertilizer Co. (Phosphate Rock), Elizabethport, N. J. E. B. Smith & Son (Ores and Mattes), Newark, N. J. Kewanee Phosphate Co. (Phosphate Rock), Charleston, S. C.  
 Address **STURTEVANT MILL CO.,**  
 53 Mason Building, Boston, Mass.

**ELECTRIC CONVEYORS.**—DESCRIPTION of two ingenious systems for the electric carriage of small packages. Illustrated with 13 engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 624. Price 10 cents. To be had at this office and from all newsdealers.

**ERIE ENGINE WORKS** WALNUT STREET, PHILADELPHIA, PA. MANUFACTURERS OF STEAM ENGINES, PORTABLE AND FIXED, STEAM BOILERS, AND ALL KINDS OF STEAM MACHINERY.

**ICE HOUSE AND COLD ROOM.**—BY R. G. Hatfield. With directions for construction. Four engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 593. Price 10 cents. To be had at this office and from all newsdealers.

**Steam! Steam!**  
 We build Automatic Engines from 2 to 200 H. P., equal to anything in market.  
 A Large Lot of 2, 3, and 4-H. Engines  
 With or without boilers, low for cash,  
**B. W. PAYNE & SONS,**  
 Box 15, Elmira, N. Y.

**ETIOLOGY OF SCARLET FEVER.**—A lecture by Dr. E. Klein, F. R. S., on the communicability of scarlet fever through the use of milk derived from cows to which a mild form of the disease has been given by man. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 629. Price 10 cents. To be had at this office and from all newsdealers.

**Novelty Hot Air Furnaces.**  
 Expose an Immense Heated Surface.  
 Extract all the Heat from the Gases. Furnish Pure Warm Air in Abundance.  
 Fourteen Years of Test. Universally satisfactory.  
 Send for "Our Furnace Book."  
**Abram Cox Stove Co.,**  
 MANUFACTURERS,  
 Philadelphia and Chicago.

**LIMITING NUMBERS OF TEETH IN Gear Wheels.**—A valuable paper by George B. Grant treating of the different methods of determining the limiting numbers of teeth in gear wheels when small pinions must be used. The cycloidal system. The interchangeable vultee system. The non-interchangeable vultee system. Unreversible teeth. With 11 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 582. Price 10 cents. To be had at this office and from all newsdealers.

**GUILD & GARRISON**  
 BROOKLYN, N. Y., U. S. A.  
 Builders of Steam Pumps for Water and every description of Liquids or Semi-liquids. Vacuum Pumps of the highest efficiency. Filter Press Pumps, Air, Gas, and Acid Blowers. Air Compressors. Boiler Feed Pumps, etc.

**FIRE-BRICK.**—BY R. A. COOK, A. M. An interesting description of the mining of fire clay and the manufacture of fire brick at Mt. Savage, Maryland where is located one of the largest establishments in the country devoted to this industry. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 538. Price 10 cents. To be had at this office and from all newsdealers.

**ROP HAMMERS** Punching Presses, Dies and other tools for the manufacture of all kinds of SHEET METAL GOODS.  
**Shields & Purcell Press Co.,**  
 112 Broadway, New York.

**ALCOHOL SWEET POTATO.**—AN account of a new industry recently established at the Azores—that of the distillation of alcohol from raw sweet potatoes. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 572. Price 10 cents. To be had at this office and from all newsdealers.

**KEUFFEL & ESSER, New York.**  
**INDELIBLE DRAWING INKS.**  
 Black, Brown, Blue, Green, Scarlet, Carmine, Yellow.  
 The best ever produced. Have our Patent Ink Filler, which regulates supply to pen; prevents soiling outside of pen-blades; is the only cleanly device for filling pens. Sample assortment, seven vials (of above colors), mailed on receipt of 50 cents.

**HOW TO MAKE THE WIMSHURST** Influence Machine.—Directions for making a cheap and simple but efficient machine. With one figure. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 646. Price 10 cents. To be had at this office and from all newsdealers.

**A NEW CATALOGUE** OF VALUABLE PAPERS  
 Contained in SCIENTIFIC AMERICAN SUPPLEMENT, sent free of charge to any address.  
**MUNN & CO., 361 Broadway, New York.**

**TIGHT & SLACK BARREL MACHINERY** A SPECIALTY  
**JOHN GREENWOOD & CO.**  
 ROCHESTER, N. Y.

**THE MODERN ICE YACHT.**—BY Geo. W. Polk. A new and valuable paper, containing full practical directions and specifications for the construction of the fastest and best kind of Ice Yachts of the latest, most approved forms. Illustrated with engravings drawn to scale, showing the form, position, and arrangement of all the parts. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 624. Price 10 cents. To be had at this office and from all newsdealers.

**THE POPULAR VERDICT.**  
 GENTLEMEN: I am well pleased with your Ideal Felt Tooth Polisher. After using it my teeth are smooth and have a lustre which cannot be obtained by the use of bristle brushes. Please send me two more, cost enclosed, as my family wish to try them.  
 Truly yours,  
 N. SPANG.  
 BURTON, O., June 19, 1888.  
 GENTLEMEN: The box of Felt tooth polishers was duly received, payment enclosed. I have used the Ideal Felt Tooth Polisher for three months and find it indispensable to the toilet. Very truly yours,  
 HELEN R. FORD.  
**ITS ECONOMY.** Holder (imperishable), 35 cents. Polishers only need be renewed. 18 (boxed) 25 cents. Dealers or mailed.  
**HORSEY MFG. CO., Utica, N. Y.**

**THE MICHIGAN MINING SCHOOL, HUGHTON, MICH.**  
 This School offers a two years' practical course in Mining Engineering, Mineralogy, Petrography, General and Economic Geology, Chemistry, Assaying, Surveying, Mechanical Drawing, and related branches. In 1889 the course will be increased to three years for all students entering after 1888. The School, being centrally located in the Mineral Region of Lake Superior, affords special advantages for instruction in practical mining. The climate of the region is cool and healthful, and as the School is a State institution, the tuition is free. For catalogues and further information, address  
 M. E. WADSWORTH, Director.

**ASTRONOMICAL APPARATUS TELESCOPES, TRANSITS, CLOCKS & CHRONOMETERS, AROMATIC OBJECTIVES, SPECTROSCOPES, HELIOSCOPES, EYE PIECES AND MICROMETERS**  
 SEND FOR CATALOGUE TO  
**QUEEN & CO 924 CHEST ST. PHILADELPHIA PA.**

**GOLD MINING MACHINERY.**—Description of some new mining plants constructed in England for use in the Transvaal, Austria and Hungary. With 10 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 593. Price 10 cents. To be had at this office and from all newsdealers.

**For \$70** You can buy our back-gearing screw cutting engine lathe. For \$250 a book (The Complete Practical Machinist) that gives full instructions for its use. Almost any boy can find time, before "going to his trade," to master this lathe, and thus establish the foundation of a valuable trade.  
**Workers of Wood or Metal, in the Workshop,** without steam power, by using outfits of **Ray's Patent Foot Power Machinery,** can bid lower, and save more money from their jobs, than by any other means for doing their work. Send for Catalogue.  
**W. F. & JOHN BARNES CO., 199 Ruby St., Rockford, Ill.**

**Shepard's New \$60 Screw-Cutting Foot Lathe**  
 Foot and Power Lathes, Drill Presses, Scroll Saw Attachments, Chucks, Mandrels, Twist Drills, Dogs, Calipers, etc. Lathes on trial. Lathes on payment. Send for catalogue of Outfits for Amateurs or Artisans. Address **H. J. SHEPARD, AGENT, 134 East 2d Street, Cincinnati, Ohio.**

**THE MIND CURE.**—BY MARY J. FINLEY, M. D. A review of the theory of metaphysical healing in its relation to physiology and pathology. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 627. Price 10 cents. To be had at this office and from all newsdealers.

**DROP FORGINGS** FINISHED TOOLS  
**BILLINGS & SPENCER CO.**  
 HARTFORD, CONN.

**THE FORTH BRIDGE.**—A PAPER BY A. B. Biggart, describing the method employed in the erection of this great engineering work. With 8 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 626. Price 10 cents. To be had at this office and from all newsdealers.

**2nd MACHINERY** Sent. N. Y. Mach'y Depot, Bridge Store 16, Frankfort St., N. Y.

**CITY OF LONDON AND SOUTHWARK SUBWAY.**—Description of a new underground railway now in course of construction in London. With 7 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 626. Price 10 cents each. To be had at this office and from all newsdealers.

**AMATEUR PHOTOGRAPHY.**  
 The most fascinating AMUSEMENT for home or outdoor recreation.  
 Anybody can do it by simply following directions as given in **The Amateur Photographer,** a complete guide to photography, which accompanies each Camera, and is conceded to be the simplest, most concise and practical work published.  
 Complete Outfits, \$10.00 and upward.  
**ROCHESTER OPTICAL COMPANY,**  
 21 Aqueduct Street, Rochester, N. Y.

**CHEMICAL AND ALLIED INDUSTRIES.**—By Watson Smith. An elaborate report upon the objects illustrative of the progress, advance, and present condition of the chemical industries shown at the Manchester Royal Jubilee Exhibition. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 627, 628, 629, 630, 632. Price 10 cents each or 50 cents for the series. To be had at this office and from all newsdealers.

**ELECTRIC LIGHT AND POWER.**  
 Edison system of Arc and Incandescent Lighting. Direct or in connection with the Storage Batteries of the Electrical Accumulator Co. Dynamos, Motors, Lamps, Batteries, and General Electrical Supplies.  
**THE ELECTRO DYNAMIC COMPANY,**  
 224 Carter Street, Philadelphia, Pa.