

Stump puller, W. Smith.....	449,586
Stump puller spool, Cunningham & Funk.....	449,587
Sulky, J. W. Kelley.....	449,588
Supporter, See Garment supporter.....	449,589
Suspenders, W. J. Stewart.....	449,590
Switch, See Electric switch.....	449,591
Switch and signal apparatus, hydraulic, J. A. Zinn.....	449,592
Switch tongue adjuster, I. Mowder.....	449,593
Swivel, H. E. Kelley.....	449,594
Syringe, electro-therapeutic, E. Bartsch.....	449,595
Tarkey, self-indicating, J. Paterson.....	449,596
Telegraph transmitter, H. G. Robbins.....	449,597
Telephone, W. Humans.....	449,598
Telephone circuit and apparatus, J. I. Carty.....	449,599
Telephone sound transmitter, A. E. Schatz.....	449,600
Thermometer graduated machine, J. D. Hall.....	449,601
Thermometer printing machine, J. D. Hall.....	449,602
Thermometer tube filling apparatus, J. D. Hall.....	449,603
Thill coupling, F. N. Kelsey.....	449,604
Thill coupling, Rose & Thompson.....	449,605
Thrashing cylinder, C. Frantz.....	449,606
Thrashing machines, straw stacking attachment for, A. P. Miller.....	449,607
Tile, building, J. Pajean.....	449,608
Tile, roofing, E. Bennett.....	449,609
Tire for vehicle wheels, C. Chinner.....	449,610
Tire for suspended cars, R. C. Forsyth.....	449,611
Tire for wheels, rubber, Jeffries & Grant.....	449,612
Tire tightener, A. M. Reeves.....	449,613
Tobacco stick, T. L. Ellington.....	449,614
Tobacco stripping and booking machine, J. R. Williams.....	449,615
Tool holder, boring, S. P. Graham.....	449,616
Toy, sounding, D. W. Watrous.....	449,617
Transom lifter, A. L. Penneck.....	449,618
Transportation, method of, W. C. Andrews.....	449,619
Trap, See Insect trap.....	449,620
Traps, insecting springs in, E. S. Hotchkiss.....	449,621
Trees, machine for budding, W. M. Rowell.....	449,622
Trimmer, See Band trimmer.....	449,623
Trough, See Water trough.....	449,624
Truck, electric motor, F. O. Blackwell.....	449,625
Truck for railway cars, Fink & Benis.....	449,626
Truck for suspended cars, R. C. Forsyth.....	449,627
Truss pad, J. Garcia.....	449,628
Tubular boiler, down draught, D. V. O'Brien.....	449,629
Type to type bars, tool for clamping, H. Abbott.....	449,630
Typewriting machine, Clinton & McNamara.....	449,631
Typewriting machine, B. T. Mulligan.....	449,632
Typewriting machine, B. Reid.....	449,633
Typewriting machine, H. H. Unz.....	449,634
Typewriting machines, platen for, H. Abbott.....	449,635
Umbrella rack or stand, C. R. Risdon.....	449,636
Unloading apparatus, R. S. Kirkpatrick.....	449,637
Utsal, combination household, S. Welch.....	449,638
Valve, ball cock, T. H. Keweenaw.....	449,639
Valve, center seal and by-pass, W. Wright.....	449,640
Valve, cut-off, J. H. King.....	449,641
Valve for compound engines, starting, W. B. Yeo.....	449,642
Valve for expansion pipes, safety, Bryant & Crow.....	449,643
Valve for tanks, float, Beckman & Hubener.....	449,644
Valve, rotary, J. Schneider.....	449,645
Valve, steam engine, J. E. Waterous.....	449,646
Vat and churn, J. Hansen.....	449,647
Vehicle, convertible, G. H. & G. H. Hutton, Jr.....	449,648
Vehicle running gear, E. O. Pease.....	449,649
Vehicle seats, jointed iron for, G. H. & G. H. Hutton, Jr.....	449,650
Vehicle wheel, J. N. Clouse.....	449,651
Velocipede, J. Edelstein.....	449,652
Velocipede, T. B. Jeffery.....	449,653
Velocipede, J. O. Ratbun.....	449,654
Velocipede, A. W. Schieding.....	449,655
Velocipede, J. W. Schieding.....	449,656
Wagon beds, rub iron for, G. A. Nelson.....	449,657
Wagon, dumping, J. W. Dunham & Co.....	449,658
Wagon, dumping, J. A. Klees.....	449,659
Washing machine, L. F. & N. Stout.....	449,660
Watch bow fastener, E. Klahn.....	449,661
Watch case, traveler's, E. L. Keen.....	449,662
Watchmaker's pliers, E. E. Coble.....	449,663
Water closet, portable, A. J. Niles.....	449,664
Water elevator, J. Fagoaga.....	449,665
Water heating device, R. P. White.....	449,666
Water trough, B. Koeppe.....	449,667
Waterways, apparatus for scouring, E. G. Reid.....	449,668
Weather strip for freight car doors, W. R. Betham.....	449,669
Web fabrics, machine for guiding the edges of, L. Hollingworth.....	449,670
Weighing machine, automatic, H. E. Smyser.....	449,671
Weighing mechanism, grain, S. E. Brown.....	449,672
Welding machines, burr preventer for electric, E. Thomson.....	449,673
Well sinking, expansion drill for, A. Cameron.....	449,674
Wells, groove cutting machine for oil or gas, J. L. Addison.....	449,675
Wheel, See.....	449,676
Wheel scooting device, cart, E. Murgatroyd.....	449,677
Whiffletree, J. M. Blondell.....	449,678
Wind wheel, F. Miller.....	449,679
Wind wheel, M. C. Robbins.....	449,680
Winker attachment, M. Sanson.....	449,681
Wire, making seamless plates, J. W. Smith.....	449,682
Wire, manufacturing seamless gold plated, C. R. Smith.....	449,683
Wire, manufacturing seamless hollow, C. R. Smith.....	449,684
Wrapper paster, C. Y. Knight.....	449,685
Wrench, See Monkey wrench.....	449,686
Ratchet wrench.....	449,687
Wrench, H. Hammond.....	449,688
Wrench, G. L. McCauley.....	449,689
Wringing roller, C. A. Kohl.....	449,690

TRADE MARKS.

Cigars, J. Alvarez & Co.....	19,262
Cigars, S. Azcano y Means.....	19,263
Cigars, V. Bustillo & Brother.....	19,264
Cigars, J. S. Murias & Co.....	19,265
Cigars, J. Villamil & Co.....	19,266
Coal, camel, Macfarlane & Mordue.....	19,267
Detergent composition soap, Hyde Carpet Cleaner and Mordue Exterminating Co.....	19,268
Hair restorative, J. T. Fay.....	19,269
Hose supporters, G. Frost & Co.....	19,270
Linen, P. M. Murray.....	19,271
Meal, C. Oskamp.....	19,272
Paint, black, H. S. Fassett & Co.....	19,273
Pills, E. Krauth.....	19,274
Porcelain ornaments and toilet and table ware, Haviland & Co.....	19,275
Remedy for blood and liver diseases, D. G. Potts.....	19,276
Remedy for rheumatism, neuralgia, and like diseases, J. D. Groves.....	19,277
Rice, prepared, Crystal Rice Milling Company.....	19,278
Seed, bird, French, Richards & Co.....	19,279
Seeds, bulbs, plants, trees, and shrubbery, J. L. Childs.....	19,280
Shawls, woolen, F. T. Bauch.....	19,281
Shavers, and scissors, and table, pocket, and shaving cutlery, A. J. Jordan.....	19,282
Soap, toilet, Ostrom & Lincoln.....	19,283
Soaps and lotions, toilet, E. Rimmer.....	19,284
Sprinklers, automatic, R. Wood.....	19,285
Stoves, heating and cooking, F. A. Klaine.....	19,286
Tin plates, Copper Miners' Tinplate Company.....	19,287
Tin plates, Pontypool Iron and Tinplate Company.....	19,288
Tin plates andterne plates, Copper Miners' Tinplate Company.....	19,289
Tin plates andterne plates, Pontypool Iron and Tinplate Company.....	19,290
Tin plates,terne plates, and tin taggers, Old Castle Iron and Tinplate Company.....	19,291
Topical remedy, A. I. Babendriener.....	19,292
Wines and alcoholic liquors, H. S. Woodbury.....	19,293

DESIGNS.

Badre, C. F. Irons.....	20,645
Basket, fruit, J. A. Doty.....	20,646
Belt, apparel, J. Bigelow.....	20,647
Bottle, J. L. Dawes.....	20,648
Dental cabinet, T. J. Collins.....	20,649
Embroidery, P. F. Leitch.....	20,650
Furnace, Kerner, Jr., & Lander.....	20,651
Handle for knives, etc., K. A. Hathaway.....	20,652
Handle for spoons, etc., R. Leding.....	20,653
Handle for spoons, forks, etc., W. B. Durkin.....	20,654
Lamp shade, A. Howard.....	20,655
Neckscarf, ornamentation of, S. Finkelstein.....	20,656
Paper, etc., wrapping, H. W. Burtch.....	20,657
Spoon, etc., C. Baumgardner.....	20,658
Spoon, etc., R. Leding.....	20,659
Spoon or fork handle, H. B. Swart.....	20,660
Toy bank, R. Friebe.....	20,661

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print, issued since 1863, 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 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 - - - 25 cents a line.
Back Page, each insertion - - - \$1.00 a line.
The above are charges per azate line—about eight words per line. This notice shows the width of the line, and is set in azate type. Engravings may head advertisements at the same rate per azate line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

USE ADAMANT WALL PLASTER

It is Hard, Dense, and Adhesive. Does not crack or peel. It is impervious to wind, water, and disease germs. It dries in a few hours. It can be applied in any kind of weather. It is in general use. Licenses granted for the making, use, and selling.
Addr. ADAMANT MFG. CO.
309 E. Genesee St.,
Syracuse, N. Y.

Patent Foot Power Machinery Complete Outfits.

Wood or Metal workers without steam power, can successfully compete with the large shops, by using our New LABOR SAVING Machinery, latest and most improved for practical shop use, also for Industrial Schools. Home Training, etc. Catalogue free.
Seneca Falls Mfg. Co.
636 Water Street, Seneca Falls, N. Y.

STEREOTYPING; THE PLASTER AND Paper Processes.—Composition and preparation of the mould, the best alloys of metal and proper degree of heat, trimming and mending the plate, etc. A minute description of both processes, with numerous illustrations. A paper of great interest to every printer. By Thomas Bolas, F.C.S., F.L.C. SCIENTIFIC AMERICAN SUPPLEMENTS, 773 and 774. 10 cents each.

The Sebastian-May Co.

Improved Screw Cutting
Foot & LATHES
Power
Drill Presses, Chucks, Drills, Dogs, and Machinists' and Amateurs' Outfits. Lathes on trial. Catalogues mailed on application.
165 to 167 Highland Ave.,
SIDNEY, OHIO.

ADVERTISING SPECIALTIES! Inventors can sell their own or others' inventions on our terms, or have manufactured on royalty, inventions of novelty or utility that can be used for advertising. Correspondence invited. The Tuscarora Advertising Co., Cohocton, O.

COMPLETE STEAM PUMP
10 SIZES FROM \$7 TO \$75
FOR DRIVE WELLS & ETC.
WRITE FOR PRICES AND DESCRIPTIVE CIRCULARS
VAN DUZEN & TIFT
SOLE MAKERS.
CINCINNATI, O.

TO BUSINESS MEN

The value of the SCIENTIFIC AMERICAN as an advertising medium cannot be overestimated. Its circulation is many times greater than that of any similar journal now published. It goes into all the States and Territories, and is read in all the principal libraries and reading rooms of the world. A business man wants something more than to see his advertisement in a printed newspaper. He wants circulation. This he has when he advertises in the SCIENTIFIC AMERICAN. And do not let the advertising agent influence you to substitute some other paper for the SCIENTIFIC AMERICAN, when selecting a list of publications in which you desire it is for your interest to advertise. This is frequently done for the reason that the agent gets a larger commission from the papers having a small circulation than is allowed on the SCIENTIFIC AMERICAN.
For rates see top of first column of this page, or address MUNN & CO., Publishers,
361 Broadway, New York.

Barnes' New Sensitive Drill

Has These Great Advantages:
The speed of the drill spindle can be increased or diminished instantly, or the motion reversed, without stopping the machine or shifting belts. More or less driving power can be applied to the drill spindle, as the size of the drill or the nature of the work may demand.
W. F. & JNO. BARNES CO.,
1999 Ruby St., Rockford, Ill.

THE DAIMLER MOTOR

THE DAIMLER MOTOR CO.
is prepared to furnish 1, 2, and 4 Horse Power GAS or PETROLEUM MOTORS for all Industrial Purposes. Fully illustrated catalogue and price list on application. Motors in operation at Works, Steinway, Long Island City.
Office, 111 East 14th Street, New York City.

ARMSTRONG MAN'G. CO.
Our ADJUSTABLE STOCKS AND DIES are universally acknowledged to be the BEST!
We also make all our tools on the same principle, of the BEST MATERIAL, and with WORKMANSHIP, and always with a view of time and labor saving in their use.
BRIDGEPORT, CONN.

NEW YORK TRADE SCHOOLS.—Description of the New York Trade Schools which were established nine years ago for the purpose of giving instructions to young men in certain trades, and to enable young men already in such trades to improve themselves. With 10 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 781. Price 10 cents. To be had at this office and from all newdealers.

GATES ROCK & ORE BREAKER

Capacity up to 200 tons per hour.
Has produced more ballast, road metal, and other material than all other Breakers combined. Builders of High Grade Mining Machinery. Send for Catalogues.
GATES IRON WORKS,
50 C So. Clinton St., Chicago
215 Franklin St., Boston, Mass.

Small Electric Motor
for Amateurs. Illus. in Sci. Am. Suppl. 783. Materials and directions for making sent by mail, \$1.25. Difficult parts finished. Any one can make it. W. S. BISHOP, Mfr. of Electric Machinery, 568 Grand Ave., New Haven, Conn.

STEREOTYPING.—A VALUABLE series of lectures by Thomas Bolas, discussing the most recent methods in this branch of typography. With 23 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 773 and 774. Price 10 cents each. To be had at this office and from all newdealers.

THE SMITH PREMIER TYPEWRITER

"Improvement the order of the age."
All the Essential Features greatly perfected. The Most Durable in Alignment. Easiest Running and Most Silent. All type cleaned in 10 seconds without soiling the hands. The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A. Send for Catalogue.

Important Improvements. All the Essential Features greatly perfected. The Most Durable in Alignment. Easiest Running and Most Silent. All type cleaned in 10 seconds without soiling the hands. The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A. Send for Catalogue.

The
Remington

has set the copy for writing machines for 15 years. It is to-day the

Standard

and expects in the future, as it has in the past, to lead all others in adding improvements to what will always be the true model of a

Typewriter.

Wyckoff, Seamans & Benedict,
327 Broadway, New York.

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

HOW TO MAKE DYNAMO-ELECTRIC Machines.—By Geo. M. Hopkins. With drawings to scale and full directions for constructing dynamos of different sizes. The small machine is intended for experimental purposes. Will heat from 4 to 6 inches of platinum wire, produce the electric light, decompose water rapidly, magnetize steel, ring a large gong, give powerful shocks, operate induction coils, and will, for temporary use, replace 8 or 10 Bunsen cells. Contained in SUPPLEMENTS 161 and 599. Price 10 cents each. The larger machine produces eight 16-candle lights or one powerful arc light. Can be arranged as a series, shunt, or compound wound machine. Can be run for a short time by two or four men. Requires one horse power for continued running. Best engravings of dynamo ever produced. Details of every part shown. Winding of armature and field magnet plainly illustrated. Any intelligent person with the aid of these drawings and instructions may make useful, durable, and effective machines. Contained in SUPPLEMENT 604. Price 10 cents. MUNN & CO., PUBLISHERS. 361 Broadway, New York.

PATENTED NOVELTIES

Caligraph
LIFE SHORT—WRITE WAY.
Address: The American Writing Machine Co., Hartford, Conn.; New York Office, 237 Broadway.

DEVELOPMENT OF AMERICAN Blast Furnaces, with special reference to large yields.—By James Gayley. A description of some of the principal blast furnaces in the United States, showing the changes in design and practice by means of which extraordinary large yields have been obtained in the last decade. With 8 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 776. Price 10 cents. To be had at this office and from all newdealers.

Starrett's Universal Bevel Protractor
Weights 6 ounces. Blade 1 in. by 1 1/4 in. Stock 4 in. long. Price \$5.00.
Surface Gauges, Combination Squares, Pay's Patent Spring Dividers, Spring Calipers, Screw Pitch Gauges, Steel Rules, and full line of Fine Tools.
Send 2-cent stamp for full list.
L. S. STARRETT, ATHOL, MASS.
MANUFACTURER OF FINE TOOLS.

A NEW CATALOGUE

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

ELECTRICAL!

Small Motors 1/2, 3/4, and 1 Horse Power. Small Incandescent Dynamos, 5, 10, and 20 Lamps. Our own design and make. Very efficient.
NOVELTY ELECTRIC CO., 54 North 4th St., Phila., Pa.

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 Tests. Boilers, Engines, Pipe, Cordage, Drilling Tools, etc. Illustrated catalogue, price lists and discount sheets on request.

A HYDRAULIC OR JET-PROPELLED Steam Lifeboat.—Description of a naval lifeboat propelled by a jet of water, with full details and account of the main features of construction and of the trials made of it for maneuvering power. With 4 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 770. Price 10 cents. To be had at this office and from all newdealers.

ARTESIAN
Wells, Oil and Gas Wells, drilled by contract to any depth, from 50 to 300 feet. We also manufacture and furnish everything required to drill and complete same. Portable Horse Power and Mounted Steam Drilling Machines for 100 to 600 ft. Send 6 cents for illustrated catalogue. Pierce, Artisan and Oil Well Supply Co., 80 Beaver Street, New York.

CUSHMAN CHUCKS

Complete line for all uses shown in new illustrated catalogue, free to all.
Cushman Chuck Co., Hartford, Conn.

A BOON TO THE DEAF!

Osgood's No. 1 Hearing Horn is the only instrument that will help the deaf. Made from best bell metal, and will last for years. Carried in the pocket and used in public without attracting attention. Price \$5. Sent C. O. D. May be returned after 2 weeks' trial if not found satisfactory.
OSGOOD BROS., Cor. 118 St. & Broadway, Oakland, Cal.

GYMNASTICS FOR GIRLS.—AN interesting account of the course of instruction given at the Berkeley Athletic Club for Ladies. With 14 illustrations. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 753. Price 10 cents. To be had at this office and from all newdealers.

CLARK'S Ventilating and Drying FANS.

Light Running, Adjustable Blades, Self-Oiling Bearings. 2-page catalogue free. Also Catalogue of Fans for Wool and Yarn Washing and Drying Machines.
GEO. P. CLARK, Manuf.
Box L, Windsor Locks, Ct.

OTTO GAS ENGINES

33,000 SOLD.
Engines and Pumps Combined.
For COAL GAS or GASOLINE.
SCHLEICHER, SCHUMM & CO.
PHILADELPHIA,
CHICAGO, NEW YORK.

ON GAS ENGINES.—A VALUABLE paper by E. Delamare-Deboutteville, touching upon the history of gas motors in general, and describing in detail the "Simplex" engine invented by the author and Mr. Anandini. With 23 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 715 and 716. Price 10 cents each. To be had at this office and from all newdealers.

Shepard's New \$60 Screw-Cutting Foot Lathe
Foot and Power Lathes, Drill Presses, scroll Saws, Planers, 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.

Useful Books!

Manufacturers, Agriculturists, Chemists, Engineers, Mechanics, Builders, men of leisure, and professional men, of all classes, need good books in the line of their respective callings. Our post office department permits the transmission of books through the mails at very small cost. A comprehensive catalogue of useful books by different authors, on more than fifty different subjects, has recently been published for free circulation at the office of this paper. Subjects classified with names of author. Persons desiring a copy, have only to ask for it, and it will be mailed to them. Address,
MUNN & CO., 361 Broadway, New York.

EXCELLENT BLACK COPIES, only equaled by Lithography, of anything written or drawn with any Pen by the Patent Specimens free.
Ten Eyck & Parker, 66 Pine Street, New York

BABCOCK & WILCOX CO. WATER TUBE
30 CORTLANDT ST. N.Y.
OF HOPE ST. GLASGOW, SCOTLAND.
STEAM BOILERS
Awarded the Grand Prize at late Paris Exposition.

Edco System.

Complete Electric Light and Power Plants. Electric Street Cars, Accumulators, Dynamos, Oldest and most experienced Motor Co. in the world.
THE ELECTRO DYNAMIC COMPANY,
224 Carter St., Phila., Pa. 44 Broadway, New York.