portion percolates through various layers of filtering material and strainers, reaching the bottom thoroughly cleansed of all impurities. The filter has a series of valves whereby the flow of oil may be stopped at any desired point in the length of the filter.

HOT WATER HEATER.—Micheal E. Herbert, St. Joseph, Mo. In this heater, all the walls of the fire box constitute a water space, the grate also consisting of water tubes, and a series of drop tubes being arranged in the path of the discharge of the products of combustion, affording a great amount of surface for the absorption of heat. The construction is designed to be economical in fuel and a rapid heater, and the different parts are so arranged as to be light of weight, easy to handle, and quickly connected together, masonry being dispensed with in the setting up. It is designed also to thoroughly burn the smoke and gases, and to be easily cleaned.

LAMP CHIMNEY COVER PLATE.—James H. Hunt, Massillon, Ohio. This is a plate of non-combustible material, preferably mica, with a central aperture of less diameter than the lamp chimney, and fitting over its top, another plate sliding in guidee being adapted to increase or diminish the draught. The device is designed for attachment to any kind of chimney, and by adjusting the pressure until the flame stops smoking a compact, even and dense light is produced, of much greater volume than the same pressure will produce with the plate removed.

CHIMNEY RACK.—Nehemiah H. Brown, Norwich, N. Y. This is a show rack for supporting the chimneys so they will be well displayed to view and readily accessible. It consists of a rotating cone having pins set at an angle in its side, a base and shaft supporting the cone.

RACK FOR HATS, ETC.—Howard U. Ackerman, North Indianapolis, Ind. This device has a wall board with enlarged openings for the passage of pins and their lugs, and the rack comprises a series of brackets each formed with hooks and connected by rods to each other to form a shelf.

SASH-CORD FASTENER.—Margaret J. Hufman, Ashland, Pa. This device consists of a box or casing to be secured in the upper ends of the stiles of each window sash, the box having an open outer side, a slot in its outer edge at the top, and pins, a hinged cover, and a double latch. When it is desired to remove the sash from the window, it is pulled out of its guideways, the lid of the box is swung, and the cord readily removed from the casing, so that the sash is disconnected, and can be moved away as may be desired.

CASH RECORDER AND DRAWER.—Lloyd M. Mills, Grand Rapids, Mich. This is a machine arranged to print on a tape a record of all sales made, and also print on a tape a detachable ticket indicating the individual sale. The device has a suitable casing in the bottom of which slides a money drawer, the locking bolt of which is connected with a lever. By the use of ten keys the operator can record any sale from one cent to a hundred dollars, the recording tape remaining inside the locked casing, and a corresponding coupon for each sale being cut off by a spring-pressed knife.

BOOK OR COPY HOLDER.—Barney Gardinier, Chippewa Falls, Wis. This is a simple device to support copy or a book at a distance above a table, in such position as may be desired. The device is capable of quick and convenient manipulation, and when not in use may be folded to occupy but a small space.

AUTOMATIC ADVERTISING DEVICE.—Theodore B. Hafertep, Chicago, Ill. An exhibitor for use in public conveyances is provided by this invention. It consists of an endless band supported to move longitudinally on a bracket frame projecting from the side or roof inside the vehicle, the band carrying advertisements in series, and motion being communicated to it from the car axle, so that when the car is moved in either direction all the advertisements on the band will be brought into view.

DISINFECTING APPARATUS.—Emil and Salomon Taussig, New York City. The graduated discharge of a disinfecting fluid in places needing such treatment is the object of this invention. The device is simple and inexpensive, and can be automatically actuated to allow the escape of the fluid, which is retained from discharge by hermetically sealing the containing vessel above the fluid that will flow from below when the partly established vacuum produced by such sealing is broken, and air admitted to equalize pressure of the atmosphere above the fluid and at the point of discharge.

ELECTRO-THERAPEUTIC PROCESS AND APPARATUS.—Joshua M. Wardell, Cadillac, Mich. This invention provides a process and an implement to facilitate injecting a fluid into the vaginal canal, and then applying an electrical current to and disseminating it through the fluid.

Designs.

SPOON.—J. S. Rathbone, Mystic, Conn. The handle of this spoon has a configuration and ornamentation representative of the golden rod, and inclosing a bust-like figure of Washington, while the bowl is ornamented by a shield.

Another design for a spoon by the same inventor also utilizes the golden rod in a similar manner, but the handle has on the front a different bust-like figure and on the back a shield, while in the bowl is a representation of an eagle.

SCARF PIN.—John G. Brokaw, Somerville, N. J. The head of this pin is an oval ring having ornamental appendages, a disk representing an eye, another disk showing a heart, and intermediately a representation of clasped hands, while a laterally curved bar is arranged on one side of the oval ring.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE CALIFORNIA VINE DISEASE. A preliminary report of investigations. By Newton B. Pierce. Washington: Government Printing Office. 1892. Pp. 222.

This monograph is an excellent exemplification of the solid work done by the Department of Agriculture of Washington. It is excellently printed and illustrated, some colored prints being especially worthy of notice. It has a very long index, and, if it may be accepted as a pledge of the work to be done by that department in the future, it will have the tendency to make all farmers wish well for the last of the federal departments.

ENERGY AND VISION. By S. P. Langley. National Academy of Sciences. Vol. V. First memoir. Pp. 18; 4 plates.

In commencing his paper the author says: "While it is quite a familiar fact that the luminosity of any spectral ray increases proportionately to the heat in this ray, and indeed is but another manifestation of the same energy, I have recently had occasion to notice that there is on the part of some physicists a failure to recognize how totally different optical effects may be produced by one and the same amount of energy, according to the wave length in which this energy is exhibited. I have undertaken, therefore, during the last few months, an experimental reinvestigation of this subject with such a statement especially in view." The experiments are very interesting to those who are fond of advanced physics and reflect great credit upon this eminent scientist.

NATURE STORIES FOR YOUNG READERS. Boston: D. C. Heath & Co. An instructive little book for young people. Price 30 cents.

LE REGIME DES EAUX A LILLE. Etude sur l'Hygiene et l'Assainment des Villes. By Ange Descamps. Publication of the Société Industrielle du Nord de la France. 8vo. Pp. 140. Maps and plans.

This report is chiefly interesting to civil engineers, and we might remark to the engineers of Lille, for the work is of purely local interest. The Lillois are evidently extremely well pleased with their water supply, their sewers—and themselves.

SCIENTIFIC AMERICAN BUILDING EDITION.

DECEMBER NUMBER.—(No. 86.)

TABLE OF CONTENTS.

1. Elegant plate in colors, showing a very attractive dwelling at Warberth Park, Pa., erected at a cost of $4,150 complete. Floor plans and two perspective elevations. John Robinson, architect, Germantown, Pa.
2. Plate in colors showing a residence at Springfield, Mass. Perspective views and floor plans. Cost $12,000 complete. Mr. Guy Kirkham, architect, Springfield, Mass. An excellent design.
3. A colonial residence at Newton Highlands, Mass. Perspective view and floor plans. J. W. Beak, architect, Boston. A picturesque design.
4. A pretty cottage erected at Bridgeport, Conn., at a cost of $1,600. Floor plans, perspective, etc. A. M. Jenks, architect, Bridgeport, Conn.
5. A dwelling house erected at Warberth Park, Pa., at a cost of $4,478 complete. Mr. C. W. Macfarlane, architect, same place. A model design. Floor plans and perspective.
6. A "Queen Anne" cottage erected at St. David's, Pa., at a cost of $5,500 complete. A unique design. Perspective elevation and floor plans. F. L. & W. L. Price, architects, Philadelphia.
7. A residence in the "Colonial" style of architecture, erected at St. David's, Pa. Perspective view and floor plans. Cost complete $5,800. F. L. & W. L. Price, Philadelphia, architects.
8. A residence on Golden Hill, at Bridgeport, Conn. Perspective elevation and floor plans. D. R. Brown, architect, New Haven, Conn. An excellent design.
9. A residence recently erected at Springfield, Mass. Floor plans and perspective elevation. Cost $2,490 complete. Mr. A. B. Root, architect, same place. A pleasing design.
10. Picture of Aldworth, Sussex, the home of Lord Tennyson. Portrait of Lord Tennyson.
11. Sketch for a cottage at Saucelito, Cal.
12. Design for a thirty-story building.
13. Sketch of residence of Mr. Howard Bell, Atlanta, Ga.
14. Miscellaneous contents: Some of the merits.—Water tight cellars.—Read this with care.—Improve your property.—How to catch contracts.—The education of customers.—Erection of additional buildings.—Concave sounding boards.—A high railway bridge.—A complete steel house front, illustrated.—An improved woodworking machine.—Finely carved woodwork, illustrated.—Steam and hot water radiators, illustrated.—Plaster of Paris.—Disinfection by means of sulphur.—A novel newspaper building.—Fine steel ceiling in an art gallery.

The Scientific American Architects and Builders Edition is issued monthly. $2.50 a year. Single copies, 25 cents. Forty large quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural publication in the world. Sold by all newsdealers.

MUNN & CO., PUBLISHERS,
361 Broadway, New York.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

Pattern letters and figures may be ordered from the largest variety, of Knight & Son, Seneca Falls, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue.

"U. S." metal polish. Indianapolis. Samples free.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J

Best baling presses. Ryther Mfg. Co., Watertown, N.Y.

Universal and Plain Milling Machines.
Pedrick & Ayer, Philadelphia, Pa.

Jessop's Steel has been in the market *ninety-nine* years. Few tool makers not familiar with it.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Stow flexible shaft. Invented and manufactured by Stow Mfg. Co., Binghamton, N. Y. See adv., page 396.

Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York.

Portable engines and boilers. Yacht engines and boilers. B. W. Payne & Sons, Elmira, N. Y., and 41 Dey Street, New York.

THE ENGINEERING RECORD (Prior to 1887, the Sanitary Engineer). Published Saturdays. 277 Pearl Street, New York. 12 cents a copy.

To Let—A suite of desirable offices, adjacent to the Scientific American offices, to let at moderate terms. Apply to Munn & Co., 361 Broadway, New York.

Hydrocarbon Burner (Meyer's patent) for burning crude petroleum under low pressure. See adv. page 381. Standard Oil Fuel Burner Co., Fort Plain, N. Y.

Fine Castings in Brass, Bronze, Composition (Gun Metal), German Silver. Unequaled facilities Jas. J. McKenna & Bro., 424 and 426 East 23d St., New York.

For Sale—Foundry and blacksmith works making a specialty. Will sell cheap. Good reasons for selling. Inquire of F. D. Vreeland, 91 Bridge St., Paterson, N. J.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J. S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, $4; Munn & Co., publishers, 361 Broadway, N. Y.

Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

Wanted—Engineers and pilots. Twenty licensed engineers and pilots to run small passenger steamers for the summer months of 1893, in connection with the World's Fair. Sober, steady men are invited to write us for further information. Chas. P. Willard & Co., Clybourn and Southport Aves., Chicago, Ill.

The *Engineering Record*, the recognized authority on municipal and building engineering, has recently been enlarged by the addition of a department in which notable industrial plants are regularly described and illustrated, the steam and power plants being a conspicuous feature. Recent publications include the great Ivorydale plant of Messrs. Proctor & Gamble, described in 23 columns and illustrated by 57 drawings. The steam plant at Ivorydale is separately treated in 13 columns and 31 drawings. The new foundry of Henry R. Worthington, at Elizabethport, N. J., 16 columns, 26 illustrations. National Meter Company's foundry and brass finishing shop, Brooklyn, 13 columns, 29 illustrations. Niagara Power Plant (now in process of publication), 6 columns, 6 illustrations. Steam power plant of the Dwight Manufacturing Co., Chicopee, Mass., 9 columns, 7 illustrations. Machinery Hall steam power plant, 8 columns, 6 illustrations. Published Saturdays. 12 cents a copy. The *Engineering Record*, 277 Pearl St., New York.

☞ Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(4617) R. L. B. asks: Who was the inventor of the friction match? A. It is said M. Derosne made a friction match with a phosphorus tip in 1816. An impetus was given to the match industry by the Dobereiner lamp, and in 1827 the first really practical friction matches were made by Mr. John Walker, a druggist of Stockton-on-Tees. They were known as "Congreves," and consisted of wooden splints or sticks of cardboard coated with sulphur and tipped with a mixture of antimony sulphide, potassium chlorate and gum. Each box contained 84 and they were retailed at a shilling. With each box there was supplied a folded piece of glass paper, the folds of which were to be tightly pressed together when the match was drawn through them.

(4618) R. F.—To become a first class electrician or electrical engineer, you will need, first of all, a good mathematical education. If you have not a good education, you can of course secure it by studying the ordinary school books. If you are well up in mathematics, the rest is simple and plain. By studying electrical books you can acquire a knowledge of electricity. Latin, while it is desirable, is not absolutely necessary to an electrical engineer. We would suggest the following books for your use: "Experimental Science," Ayrton's "Practical Electricity," Thompson's "Dynamo Electric Machinery," Kempe's "Hand Book of Electrical Testing," Lockwood's "Electrical Measurements," Sloane's "Electrical Arithmetic."

(4619) R. M. F.—German silver has 13 times the resistance of copper. It requires of No. 16 copper wire 234¼ feet for the resistance of 1 ohm. As stated above, it will require only 1-13 of this amount of German silver of the same size for 1 ohm. With this as a basis, if you know the resistance of your lamp, you can make the necessary calculations.

(4620) W. P. C.—You can make your moulds of wood or metal. If you intend to use them a great deal, it would, perhaps, be well to make them of hard bronze. Your clay cylinder should first be dried in the open air, then heated slowly to a red heat and kept at that heat for several hours. It requires experience to judge when the work is done. We would suggest the purchase of a work on pottery.

(4621) O. J.—There is very little action in the battery referred to when the circuit is open. Carbon pieces can be granulated, and pulverized and moulded together after being mixed with a little flour and molasses and then baked. See "Experimental Science," for information on moulding carbons. For points on nickel and silver plating consult SUPPLEMENT, No. 310.

(4622) T. J. R.—If most of the lines of force pass to the armature as indicated by your sketch, it serves to render the core more magnetic and thereby increases the efficiency of the machine. It is not definitely settled that it is advantageous in all machines to provide teeth as suggested.

(4623) W. Z. writes: We have a private telegraph line of 12 instruments, each wound to 20 ohms resistance. Could we run the line with a dynamo? Will it be less expensive than batteries, considering that we construct the dynamo ourselves, and also have free use of water power to run it? A. You can operate your telegraph line by means of a dynamo, but we think a battery would be preferable for a small installation, as it is always ready for use.

(4624) J. F—The only suggestion we can make in regard to your belt is to wet it evenly all over, stretch it until it is straight, and allow it to dry, afterward filling the leather with some of the dressings used for that purpose. We think, however, it will be better for you to write to the manufacturers of the belt. They may have more simple treatment.

(4625) C. L. S.—If you have placed the poles of your dynamo on an iron base, you cannot expect it to work as a dynamo, and it would not be a success as a motor. Place the machine of a wooden or a brass base, and you will find it will behave quite differently.

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

December 13, 1892,

AND EACH BEARING THAT DATE.

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

Account keeping device, W. W. Maxwell 487,953
Adhesives, production of, L. Kern 487,928
Aging and purifying liquors, apparatus for, A. L. Wood 488,104
Alarm. See Burglar alarm. Fire alarm.
Animal trap, J. R. Bromwell 488,111
Armature, electric machine, B. G. Lamme 488,016
Armature for electro-magnetic machines, R. Lundell 487,755
Atomizer, C. M. Blackman 487,873
Autographic register, W. H. Glennon 488,004
Automatic regulator, Houghton & White 488,121
Automatic switch, N. Newman 487,881
Axes, manufacture of, C. W. Hubbard, Jr. 487,948
Balance, L. Da Rozir 488,142
Balling slivers, machine for, W. M. Pawling 487,891
Band cutter and feeder, W. P. Burke 487,987
Banjos or violins, tail piece for, H. C. Middlebrooke 487,879
Barrel head machine, F. H. Kane 488,167
Bath tub seat, G. A. Keene 488,011
Battery. See Galvanic battery.
Bed spring, J. B. Russel 488,030
Beer cooler, W. Gibson 488,144
Beer filling apparatus, H. Stockheim 487,790
Belt, electric, O. Kjorstad 488,013
Belt holder, W. F. Cleveland 487,993
Belting, O'Connell & Medcraft 487,855
Bench dog or clamp, G. B. Norman 487,762
Bicycle saddle, J. A. Stenberg 487,789
Bit. See Bridle bit. Dado or moulding bit.
Blacking kit, boot, H. Pistorius 487,963
Blank feeding device, W. W. Miner 488,084
Block. See Snatch block.
Blower, centrifugal, M. R. Ruble 487,883
Bobbin used in spinning and twisting frames, J. H. Wilson 488,045
Boiler. See Steam boiler. Tubular boiler.
Boiler, T. L. & T. J. Sturtevant 487,793
Boilers, downdraught furnace for steam, J. F. Wangler 487,896
Bolting reel, flour, G. L. Jarrett 487,838
Bottle stopper lock, F. Jordan 487,748
Bottle washer, S. R. King 487,842
Bottle washer and rinser, O. Eick 487,999
Box. See Fruit box. Paper box.
Box machine, J. Neeff 488,086
Box machine, C. W. Roberts 487,967
Bracket. See Sign bracket.
Brake. See Car brake. Roller brake.
Brick, drying, C. J. Dion 487,827
Brick machine, S. P. Babcock 488,106
Brick press, G. H. Babcock 488,049
Bridge, L. Barnes 487,819
Bridle bit, W. J. Barndollar 488,051
Bundle carrier and band cutter, A. Booth 487,707
Burglar alarm, W. W. Climenson 488,162
Burner. See Gas burner. Lamp burner. Oil burner.

© 1892 SCIENTIFIC AMERICAN, INC.

Button and buttonhole, adjustable, F. S. Rudge.. 488,090
Button blanks, device for grinding, J. Huebner... 487,741
Button, collar, D. O. Parks... 488,026
Calendar, L. Lane... 487,929
Camera shutter, J. W. Grantland... 487,833
Cane mill, Sanders & Herrington... 488,031
Capsule filler, C. F. Hausmann... 487,886
Car body, W. N. Haring... 487,925
Car brake, S. Fairman... 488,118
Car brake, T. A. Marriott... 487,868
Car brake, L. Pfingst... 487,768
Car coupling, C. W. Diederich... 487,916
Car coupling, P. Doersom... 487,885
Car coupling, W. S. Edwards... 488,065
Car coupling, W. N. Haring... 487,924
Car coupling, Haub & Dasha... 488,120
Car coupling, P. Hien... 487,926
Cer coupling, C. T. Kincaid... 487,751
Car coupling, C. Leischer... 488,078
Car coupling, F. S. McConnell... 488,173
Car coupling, A. C. Merritt... 487,756
Car coupling, E. B. Reid... 487,772
Car coupling, W. H. Stults... 488,153
Car coupling, T. Welch... 488,159
Car, freight, C. B. Hutchins... 487,743
Car, railway, A. Fordham... 487,918
Car replacer, W. H. Darling... 487,864
Car safety cage, B. F. Johnson... 487,746
Car step, automatic, J. MacCollom... 487,867
Cars, apparatus for transferring railway, A. D. Clarke... 487,717
Cars, vestibule connection for passenger, E. C. Rosa... 487,776
Carbon sheet holder, J. S. McDonaid... 487,959
Carriage, W. H. Sparks... 487,788
Carrier. See Bundle carrier. Hay carrier.
Cart, four-wheeled dog, W. H. Barlow... 487,942
Cart, road, A. D. Curry... 487,998
Carving machine, H. H. Adams... 488,047
Cash carrier apparatus, M. W. Sherwood... 487,905
Cash indicator and recorder, T. Carney... 488,063
Cash register, Goodenberger & Akins... 487,922
Cash register, H. A. Herr... 487,903
Cash register and indicator, E. Murphy... 488,150
Casing pipe, flask for, W. White... 487,810
Chair. See Folding chair. Recliningchair. Window chair.
Chamber, O. P. Johnson... 487,747
Change maker and receiver, Hill & Alter... 488,007
Chart, dress, B. Viau... 487,801
Chimney cowl, rotary, H. & L. Iwan... 488,074
Chopper. See Cotton chopper.
Churn, A. Richter... 487,870
Clamp. See Floor clamp.
Clasp, J. Lang *et al.*... 488,017
Cleaner. See Knifecleaner. Window cleaner.
Clip for supporting dresses, etc., E. C. Mix... 487,757
Clock, repeating, S. Willcock... 488,103
Clod crusher and land roller, combined, H. F. Dernell... 487,722
Cloth cutting machine, C. Kaufman... 487,840
Clutch, friction, L. J. Hirt... 487,736
Coal storage conveyer, G. H. Hulett... 487,985
Collar, horse, W. Murr... 487,956
Compasses, beam, W. S. Robinson... 487,892
Condenser, T. Craney... 487,997
Cooler. See Beer cooler.
Cotton chopper, J. Y. Dye... 487,725
Cotton chopper, I. E. Gay... 487,831
Cotton chopper, W. A. Nevel... 487,935
Coupling. See Car coupling. Electric coupling. Hose coupling. Pipe coupling.
Crane, swinging, J. W. Kinsman... 488,076
Crane turning mechanism, C. Mercader... 487,954
Cream tempering apparatus, J. Boyd... 487,708
Crematory, garbage, J. C. Kessler... 488,169
Crosshead, J. B. Stanwood... 487,895
Crusher. See Clod crusher.
Cultivator, J. Birch... 487,978
Cultivator, F. P. Morgan... 487,933
Cultivator, J. H. Wendel... 487,807
Cultivator, wheel, E. A. Ovenshire... 487,882
Curd cutter, A. C. Whiting... 487,811
Curtain fixture, W. A. Saul... 487,970
Cutter. See Band cutter. Curd cutter. Paper cutter.
Cutter for gaskets, etc., J. H. Shields... 487,894
Cylinder lock, R. Sargent... 487,969
Dado or moulding bit, E. Goilins... 487,921
Dampening machine, F. H. Weems... 488,102
Dental crowns, forming, J. G. Hollingsworth... 488,008
Dental plugger, H. R. Kline... 487,843
Dental regulator, J. A. Ellard... 487,726
Dental separator, B. Simons... 487,873
Digesting apparatus, A. Selkirk... 487,783, 487,784
Disinfecting device, J. W. Bowerbank... 487,979
Disintegrating fibrous substances, process of and apparatus for, Carter & Berst... 487,912
Disintegrating machine, fiber, Carter & Berst... 487,913
Disintegrating vegetable substances, A. Selkirk.. 487,782
Doll joint, E. Verpillier... 487,861
Dough raiser and fruit drier, Kline & Parks... 488,014
Drawbar carrier, and face plate, C. T. Schoen... 487,779
Drier. See Grain drier. Lumber drier.
Drill. See Seed drill.
Drill, D. Baker... 488,050
Drop press, steam, J. H. Mason... 488,128
Easel, cabinet, H. Pistorius... 487,964
Eaves trough fastener, R. G. Kelso... 488,075
Edge runner or vertical millstone, H. Mantey... 487,930, 488,146
Electric coupling, J. J. Purcell... 488,027
Electric lighting systems, time meter for, J. O. Ball... 488,107
Electric machines, automatic safety device for dynamo, F. B. Badt... 487,816
Electric meter, C. W. Ayton... 487,703
Electric motor, I. E. Storey... 488,041
Electric signal circuit, J. Y. Young... 488,138
Electrical safety cut-out, H. S. Keating... 488,123
Electrodes, manufacture of secondary battery, W. W. Griscom... 487,834
Electrolytic apparatus, T. Craney... 487,996
Electrotype plates, means for bending, C. B. Cottrell... 487,915
Elevator. See Hydraulic elevator. Newspaper elevator.
Elevator safety appliance, R. Uren... 488,137
End gate locking rod, T. M. Owen... 487,766
Engine. See Gas engine.
Essences, process of and apparatus for making, H. Huvelle... 487,837
Exhaust head, J. J. J. De Rycke... 487,723
Fare register, J. W. Fowler... 487,731
Faucet, K. Kiefer... 487,866
Feed mechanism, duplex, F. H. Richards... 487,775
Feedwater heater and purifier, J. J. De Rycke.. 487,724
Feeding and weighing apparatus, S. Washington.. 488,101
Fence post with applied holder, G. W. Schofield.. 487,780
Fertilizer distributer, T. R. Crane... 487,719
Fifth wheel, H. H. Bothe... 488,110
Fifth wheel, E. L. Howe... 488,010
Fire alarm, pneumatic, A. A. Lehmann... 488,018
Fire extinguisher, R. J. Gilmore... 488,003
Fireproof garment, B. J. Martin... 488,148
Flask. See Moulder's flask.
Floor clamp, F. Martin... 488,147
Flushing tank, E. C. Stover... 487,906, 487,940
Folding chair, J. Cornell... 488,115
Folding chair, knockdown, Scott & Schaaf... 488,095
Folding seat, J. B. Jenson... 487,876
Fortune wheel, coin-controlled, Russell & Gierding... 487,968
Frame. See Supporting frame.
Fruit box, W. R. Stokeley... 488,040
Fruit packages, shearing machinefor, J. H. Schumacher... 487,781
Fruit picker, R. Mays... 487,931
Fumes, apparatus for condensing, A. F. Schneider... 487,971
Furnace. See Garbage burning furnace. Smoke consuming furnace. Tempering furnace.
Furnace, T. P. Mahon... 488,171
Galvanic battery, H. T. Johnson... 487,839
Game board, J. S. Williams... 487,976
Game, mechanical ball, Curtis, Jr., & Hallowell... 487,825
Garbage burning furnace, J. C. Kessler... 488,168
Garment catches, making, E. S. Smith... 488,135
Garment fastening, H. A. Francis... 488,068
Garment supporter, J. C. Pettibone... 488,088
Gas burner, self-lighting, A. P. Jacob... 487,744
Gas burners, automatic cut-off for, F. W. Merchant... 488,082
Gas engine, E. W. Evans... 488,165
Gas engine igniting apparatus, H. Schumm... 488,093
Gas lighter, electric, Kilburn & Van Etten... 488,012
Gas meter, H. A. Tobey... 487,907
Gas meter register, H. A. Tobey... 487,908
Gate. See Sliding gate. Watergate.
Gate, Cline & Kilpatrick... 487,718
Generator. See Steam generator.
Glass, apparatus for rolling plate, E. Walsh, Jr.... 487,803
Glass rolling machinery, E. F. Chance... 488,114
Globe, geographical, I. & M. A. Hodgson... 488,071
Glove fastener, Booth & Rutty... 487,822
Grain drier, H. T. Hopkins... 487,738
Grate, tubular water, R. MacFarlane... 488,170
Gravity motor, J. E. Carver... 487,715
Grinding twist drills, holder for, J. H. Bergstrom 488,054
Gun, repeating breech-loading, W. H. Ostrander (r)... 11,295
Hammock bodies, producing, A. O. Rood... 487,857
Harness, B. F. Baker... 487,900
Harrow and cultivator, combined, N. P. Lewis.... 487,848
Hat ventilating device, E. J. Sharp... 487,786
Hay carrier, W. G. Ricker... 487,856
Hay carrier and elevator track, J. E. Porter... 487,966
Heater. See Feedwater heater. Tank heater.
Heater, J. Nelson... 488,131
Hinge, gate, G. W. Good... 488,070
Hinges, making butt, R. T. Smith... 487,939
Hitching post, C. W. Erath... 487,727
Hog trough, J. C. F. Hurst... 487,836
Hoisting apparatus, J. E. Walsh... 488,044
Hoisting machine, differential, C. F. Cliff... 487,994
Holdback, vehicle, W. Dunn... 487,828
Hook. See Snap hook.
Hopple, W. H. Westen... 487,863
Horseshoeing apparatus, J. Lamb... 488,077
Hose coupling, Schimper & Zoller... 487,893
Hub blank for metal wheels, J. R. Little... 488,125
Hydrant or plug, fire, Knicherbacker & Hughes.. 488,015
Hydraulic elevator, T. E. Brown, Jr... 487,709
Ice run, portable, I. A. Manchester... 488,080
Indicator. See Cash indicator. Speed indicator.
Injector, J. Trix... 488,099
Insulating electric conductors, C. Cuttriss... 488,141
Insulator, C. Wolf... 488,046
Jack. See Lifting jack.
Journal bearing, J. M. Andrews... 487,815
Keyboard operator, automatic, H. S. Prentiss.... 487,936
Knife cleaner and polisher, J. F. C. Farquhar... 487,728
Knit goods, method of and apparatus for making colored figures in, R. Lieb... 488,019
Knitting machine, circular, Ward & Lancashire.. 488,100
Knitting machine stop mechanism, circular, Snyder & Fisher... 488,039
Lamp burner, central draught, J. C. Miller... 487,955
Lamp burner filler attachment, G. B. N. Dow... 488,164
Lamp chimney, shaded, D. M. Mefford... 487,850
Lamp hanger, G. Albee... 487,977
Lamp, incandescent, E. W. Applegate... 488,139
Lamps, casting for bases of incandescent, Lean & Burleigh... 487,846
Lamps, manufacture of incandescent electric, C. Pauthonier... 487,890
Lantern, magic, D. R. Breed... 488,057
Lantern slides, clamp for binding the edges of, D. R. Breed... 488,058
Lap stick inserter, A. M. Coller... 487,995
Lathe tool, J. H. Hurley... 488,145
Lifting jack, W. R. Proctor... 487,770
Lighter, pocket, W. Lang... 487,845
Lightning arrester, W. R. Garton... 488,002
Lime, apparatus for making bisulphite of, W. H. Howell... 487,887
Link, separable, C. S. Kershaw... 487,841
Liquid separator, centrifugal, H. F. Beimling... 487,943
Liquids from vessels, means for regulating the flow of, F. E. Baldwin... 487,817
Lock. See Bottle stopper lock. Cylinder lock.
Lock, C. E. Deny... 487,945
Lock, S. R. Long... 487,878
Lock, J. F. Schlossstein... 488,091
Lubricator, J. L. Cory... 488,163
Lumber drier, J. W. Piver... 487,965
Machinery, adjustable connection for, C. De Kalb 487,721
Magnetic separator, H. S. Chase... 488,064
Mangle, M. E. Wendell... 487,872
Meat mixing machine, J. Tritz... 488,098
Metal sheets, machine for drying and fluxing, Norton & Hodgson... 488,025
Metal wheels, die for making, J. R. Little... 488,127
Metal wheels, machine for making, J. R. Little... 488,124
Metal wheels, making, J. R. Little... 488,126
Meter. See Electric meter. Gas meter.
Meter registers, art of and mechanism for recording the state of, H. A. Tobey... 487,909
Mill. See Cane mill.
Moulder's flask, F. Morris... 487,851
Moulding machine, H. A. Billings... 488,055
Moon's orbit, apparatus for delineating the, J. Troll... 487,800
Mop wringer, W. H. Betts... 487,821
Motor. See Gravity motor. Spring motor.
Mower, lawn, H. Broom... 487,711
Multiple switchboard busy test apparatus, J. L. McQuarrie... 487,854
Multiple switchbard busy test circuit and apparatus, J. L. McQuarrie... 487,853
Multiple switchboard circuit, A. H. McCulloch... 487,852
Multiple switchboard signal, G. Taintor... 487,795
Multiple switchboard test circuit, O. A. Bell... 488,053
Multiple switchboards, means for preventing induction in cables of, C. E. Scribner... 488,034
Music, apparatus for turning over the leaves of, C. Pittrich... 487,769
Music rack attachment for guitars, etc., P. Benson... 487,820
Musical instrument strings, impervious case for containing, F. H. Griffith... 488,005
Napkin adjuster, W. P. Burnett... 488,140
Newspaper elevator, A. R. Stone... 487,791
Nut or pipe wrench, J. P. Hunt... 487,742
Oil burner, J. Barrow... 488,108
Oiler, die stock, G. L. Le Vesconte... 487,847
Oiler, watch, I. L. Green... 487,732
Order holder, J. S. McDonald, Jr... 487,960
Organ, J. Chileen... 487,716
Organs, pneumatic action for, J. Peloubet... 487,767
Oven plate, I. Brooke... 487,911
Paper bags, manufacture of, J. West... 487,862
Paper box, J. E. Burke... 488,059
Paper box machine, C. E. Powell... 487,771
Paper cutter, roll, W. S. Mendenhall... 488,129
Paper cutting machine, Horne & Barrett... 487,739
Paper feeding machine, F. Hart... 488,006
Paper pulp, machine for making tubes from, E. Metzger... 488,149
Pattern, adjustable, B. Musse... 487,760
Penholder, duplex, Green & Haley... 488,119
Pen rack, I. W. Housser... 488,009
Pens, lead pencil attachment for fountain, J. R. Townsend... 487,799
Photographic printing apparatus and process, U. S. Rush... 487,937
Picker. See Fruit picker.
Picture exhibitor, D. J. Rogers... 488,134
Picture exhibitor, A. Svensson... 488,042
Pile of velvets, etc., knife for cutting, J. H. Smith... 487,974
Pile or fence post driver, W. L. George... 487,920
Pipe coupling, W. R. England... 487,829
Planter attachment, corn or cotton, S. J. Adkins.. 487,941
Planter, hand corn, I. Mackey... 487,849
Plow, Z. R. Kea... 487,749
Plow and seeder, combined, H. Scmmerfeld... 487,871
Plow, ditching, P. T. Montgomery... 487,869
Pole tip, carriage, E. W. Rider... 488,133
Polishing machine, C. Seymour... 487,785
Post. See Fence post. Hitching post.
Power, means for transmitting, W. E. Walsh... 487,805
Power, system of electrical transmission of, N. Tesla... 487,796
Press. See Brick press. Drop press. Soap press. Stamping press.
Printer's chase, J. S. Brown... 487,710
Printing cylinder plate holder, J. J. Clause... 487,992
Printing machine feeding apparatus, C. B. Cottrell... 487,914
Printing press ink roller, R. W. Murphy... 487,759
Puller. See Stump puller.
Pulp screen, J. J. Flanders... 488,166
Pulp screening machine, C. J. Foster... 488,067
Punch, check, E. G. Bates... 488,052
Punch, keyboard, H. Hollerith... 487,737
Puzzle, E. L. Thurnston... 487,797, 487,798
Pyrotechnic device, G. J. M. Ashby... 487,898, 487,899
Radiator, C. C. Mulford... 487,880
Rail, contact, F. E. Kinsman... 487,752
Railway conduit, electric, J. W. Hayden... 487,735
Railway, double track elevated, E. M. Turner... 488,157
Railway, elevated, E. M. Turner... 488,154 to 488,156
Railway frog, J. S. McAdams... 487,957
Railway signaling device, Z. Krulis... 487,904
Railway switch, B. Bennett... 487,705
Railway switch, D. M. Church... 488,161
Railway switch stand and distant signal, W. W. Le Grande... 487,877
Railway tie, metallic, A. J. Hartford... 487,733
Railway tie, metallic, A. Mattijetz... 487,952
Railway trolley, electric, D. Mason... 488,022, 488,023
Railway trolley, electric, A. Worner... 487,81[illegible]
Razor strop, J. W. De Graff... 487,826
Reclining chair, E. I. Galloway... 487,919
Reel. See Bolting reel.
Refrigerating machine, L. Block... 487,706
Register. See Autographic register. Cash register. Fare register. Gas meter register.
Regulator. See Automatic regulator. Dental regulator.
Rein holder, G. W. Thompson... 487,975
Road making and repairing machine, M. G. Bunnell... 488,112
Roller and roller bearing, G. A. Weber... 487,884
Roller brake, H. C. Finkler... 488,066
Rolling machine, metal, J. J. Anderson... 488,048
Ropeway clip, wire, B. McIntire... 488,085
Safety switch, R. T. Murphy... 488,172
Sash cord guide, C. M. Burgess... 487,712
Sash cord guide, C. Wolcott... 487,812
Sash holder, P. Motley... 487,934
Sawing machine, circular, J. H. Gateley... 487,947
Scale poise, computing, J. W. Culmer... 487,824
Scissors sharpener, E. A. Thissell... 488,043
Screen. See Pulp screen.
Screw driver, T., Jr., & J. J. Edwards... 487,946
Seaming the heads upon cans, device for, E. Norton... 487,764
Seat. See Folding seat.
Seed drill, R. P. Howard... 488,072
Seed hopper feed device, T. R. Crane... 487,720
Separator. See Dental separator. Liquid separator. Magnetic separator.
Sewing machine, button hole, J. Reece... 488,028
Sewing machine lap seam guide, A. Iversen... 488,073
Sewing machine shuttle cop holder, Wilkinson & Palmer... 487,910
Sewing on buttons, machine for, P. Schoen... 487,972
Shade fixture, window, Carthy & Flynn... 487,714
Shade holder, L. Spitzer... 487,858
Shaft support, vehicle, C. H. Ellis... 488,000
Shed, portable hay or grain, T. J. Kelley... 487, 792
Sheet metal plate for tinning and its manufacture, E. Norton... 488,151
Shim and railway rail joint, metal, W. F. Gould... 487,832
Shoe horn, C. E. Vail... 487,860
Sign bracket and frame, combined, F. E. Schoenberg... 488,092
Signal. See Multiple switchboard signal.
Sled roller attachment, T. Chittick... 487,990
Sliding gate, W. Aunspaugh... 488,105
Smoke arrester and conductor, F. C. Leebner... 487,949
Smoke consuming furnace, G. L. Cross... 487,823
Snap hook, S. Brown... 487,980
Snatch block, G. Harvey... 487,734
Soap press, automatic, O. W. Band... 487,818
Soda distributer, caustic, W. S. Fickett... 487,729
Speed indicator, W. H. Abbott... 487,702
Spinning machine yarn separator, C. A. Taft... 488,136
Spoke socket, A. C. Bushee... 488,113
Spool, C. Back... 487,704
Spring. See Bed Spring.
Spring, W. I. Bunker... 488,060
Spring jack switch, Scribner & Warner... 488,033
Spring motor, W. C. Johnston... 487,745
Sprinkler. See Street sprinkler.
Stair stringers, guide for use in gaining, R. Martin 487,889
Stamping press, J. B. Foote... 487,073
Steam boiler, sectional, D. S. Richardson... 487,774
Steam generator, T. L. & T. J. Sturtevant... 487,792
Street crossing, G. W. Doolittle... 488,117
Street sprinkler, Walshe & Sallenger... 487,804
Street sweeper, C. H. La Due... 487,754
Stump puller, A. C. French... 488,001
Supporter. See Garment supporter.
Supporting frame, sectional, J. Ormerod... 487,765
Suspenders, E. F. Moore... 487,758
Switch. See Automatic switch. Railway switch Safety switch. Spring jack switch. Tramway switch.
Switch rail rods or braces, straightener for, P. McCann... 487,958
Syringe, urethral, E. P. Roche... 488,089
Tank. See Flushing tank.
Tank heater, stock, C. A. Weed... 487,806
Telegraph, printing, C. L. Buckingham, 487,981 to 487,983, 487,985, 487,986
Telegraph, synchronous multiple, C. L. Buckingham... 487,984
Telephone exchanges, multiple switchboard system for, C. E. Scribner... 488,035, 488,036, 488,038
Telephone switchboard apparatus, C. E. Scribner 488,037
Tempering furnace, W. H. Dayton... 487,944
Tennis marker, W. M. Lindsay... 487,951
Tenon, metallic, A. M. & R. J. Sanders... 487,778
Thermostatic vessel, H. Carmichael... 487,713
Thill support, D. B. Morgan... 488,130
Tie. See Railway tie.
Tile, illuminating, J. Jacobs... 488,122
Tile, sheet metal, J. White (r)... 11,294
Tin plate or metallic sheets, cleaning, E. Norton. 487,763
Tire, pneumatic, S. Elliott... 487,874
Tire tightener, J. P. Ross... 487,777
Tire, vehicle, W. I. Bunker... 488,061
Torpedo placer, C. F. Edgar... 487,917
Tower, W. E. Caldwell... 487,902
Toy savings bank, automatic, D. R. Reynolds... 487,773
Tramway switch, J. H. Reinhardt... 488,132
Trap. See Animal trap.
Tricycle, C. Koenig... 487,753
Trolley catcher, Werling & Agnew... 487,808
Trough. See Hog trough.
Truck, brick, C. H. Horton... 487,835
Truck car, W. N. Haring... 487,923
Truck car, M. G. Hubbard... 487,740
Tubular boiler, vertical, T. L. & T. J. Sturtevant. 487,794
Tug, shaft, J. A. Lesh... 487,950
Tug, thill, A. C. Marshall... 488,021
Turret head, F. Stolzenberg... 488,152
Type case stand, G. B. Miles... 487,932
Type writer letter copier, J. T. Davis... 488,143
Type writing machine, C. H. McClellan... 487,761
Type writing machine, C. W. Walker... 487,802
Type writing machine, J. E. Wilson... 487,897
Valve and muffler, safety, A. Lohbiller... 488,020
Valve, balanced slide, Parker & Clark... 487,962
Valve, hydrant, S. W. Lewis... 488,079
Valve, piston, W. M. Smith... 488,096
Valve, radiator, G. C. Blackmore... 487,901
Valve, relief, C. Callahan... 487,991
Valve safety, J. G. White... 487,809
Vehicle attachment, W. E. Miller... 488,083
Vent for casks, automatic air, E. R. Buhrman.... 488,160
Wagon body, I. A. Manchester... 488,081
Wall finish and making same, B. Moore... 488,024
Warp threads, machine for drawing in, L. P. Sherman... 487,938
Washer. See Bottle washer.
Washing machine, Schuster & Schneider... 488,094
Watch alarm attachment, G. J. Capewell... 488,062
Watchmaker's tool, G. W. Cameron... 487,988
Watchmaker's tool, U. W. Frink... 488,069
Watch movement box, C. H. Smith... 488,097
Water gate, automatic, G. W. Norton... 487,961
Water wheel, J. W. & F. M. Bookwalter... 488,056
Water wheel, turbine, W. W. Rossman... 488,029
Weather strip, O. A. Gallatin... 487,830
Well drilling apparatus, De La Mare & Mecham. 488,116
Well drilling tool, T. G. Chapman... 487,989
Wheel. Fifth wheel. Fortune wheel. Water wheel.
Whip socket, F. A. Ames... 487,814
Whip socket fastener, F. E. Benton... 488,109
Windmill, W. P. Kimbrell... 487,750
Windmill, Opperud & Brorby... 488,087
Windmill tower, Smith & Wead... 487,787
Window chair, F. Staedeli... 487,859
Window cleaner, A. R. Kolb... 487,888
Wire drawing machine, Lamb & Campbell... 487,844
Wire netting, B. Scarles... 488,032
Wrench. See Nut or pipe wrench.
Wrench, D. C. Wiest... 488,158
Wringer. See Mop wringer.
Yarn from scutched flax, manufacturing, J. V. Eves... 487,875

DESIGNS.

Bicycler's bag, S. B. Gilbuly... 22,057
Bottle, F. S. & F. B. Rockwood... 22,058
Watch case, J. C. Dueber... 22,056

TRADE MARKS.

Baking powder, A. W. Ruhl... 22,165
Baking powder, T. Palmer... 22,166
Beer, lager, Ruff Brewing Company... 22,170
Bolts, nuts, rivets, and screws, J. H. Sternbergh & Son... 22,177
Boots and shoes, Munroes, Packard & Linscott... 22,157
Bottles, A. G. Smalley... 22,156
Butter and cheese, F. M. Peck... 22,168
Calendars and paper weights, A. D. Palmer... 22,152
Fuel, certain chemically prepared, American Safety Fuel Company... 22,160
Linings embracing silesia, sateens, cambrics, and twills, Burton Bros. & Co... 22,158
Meats, salted and pickled, Ferraz Sobrinho & Co... 22,169
Medicated beverages or tonics, Quirye Company.. 22,172
Oils, rolled, W. Johnston... 22,167
Oil and grease, lubricating, Magie Brothers... 22,159
Pens, fountain, W. A. Leary... 22,151
Petroleum, Ferraz Sobrinho & Co... 22,161
Photographic developers, Actien-Gesellschaft Fur Anilin Fabrikation... 22,153, 22,154
Pianos, Siegel Cooper & Company... 22,176
Preparation for prevention of diseases caused by infectious air, J. Schuch & Co... 22,173
Remedies for rhematism and gout, E. Z. Brievogelle... 22,178
Remedy for acute and chronic inflammation, A. J. Pidgeon... 22,174
Remedy for rheumatism, E. S. Powers... 22,175
Saccharate similar to saccharine, Lehn & Fink... 22,171
Saponaceous compound for cleansing carpets and for laundry purposes, J. S. Silver... 22,162
Soap for laundry and household use, Maple City Soap Works... 22,163
Soap, laundry, Kendall Manufacturing Company.. 22,164
Vaporizers, volatilizers, and inhalers, C. L. Coulter. 22,155

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 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

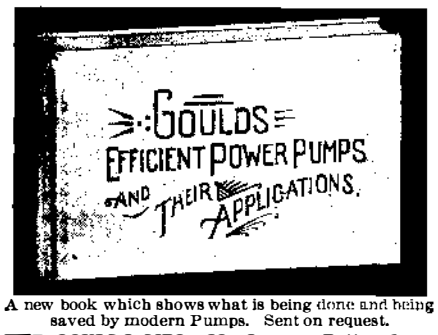
The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.

"Star" Foot Lathe Swings 9x25 in.
LATHE
Screw Cutting Automatic Cross Feed, etc.
Scroll Saws, Circular Saws, Lathes Mortisers.
Catalogue Free of all our Machinery.
Seneca Falls Mfg. Co. 695 Water St., Seneca Falls, N.Y.

The Sebastian-May Co
Improved Screw Cutting
Foot & Power **LATHES**

Drill Presses, Chucks, Drills, Dogs, and Machinists' and Amateurs' Outfits. *Lathes on trial.* Catalogues mailed on application.
165 to 167 Highland Ave., SIDNEY, OHIO.

Improved Screw Cutting Foot and Power **LATHES**
Drill Presses, Shapers, Band, Circular, and Scroll Saws. Machinists' Tools and Supplies. Lathes on trial.
☞ *Catalogue mailed on application.*
SEBASTIAN LATHE COMPANY,
120 and 122 Culvert Street, Cincinnati, O.



A new book which shows what is being done and being saved by modern Pumps. Sent on request.
THE GOULDS MFG. CO. Seneca Falls, N. Y.
Warerooms 16 Murray St., New York.
☞ Mention SCIENTIFIC AMERICAN.

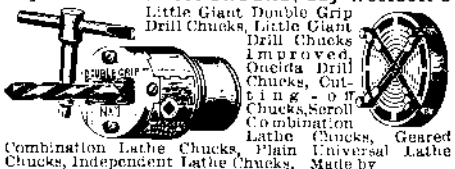
The Belknap Little Giant Water Motor

Best Water Motor, most powerful and efficient machine on the market.
Electric Motors and Dynamos.
Combined Water Motors and Dynamos.
Cyclone Coffee Mills for Grocers' use.
Combined Motor and Mill in one case, run by water or electricity.
Write for Circulars.
BELKNAP MOTOR CO.,
23 Plum St., Portland, Maine U. S. A.

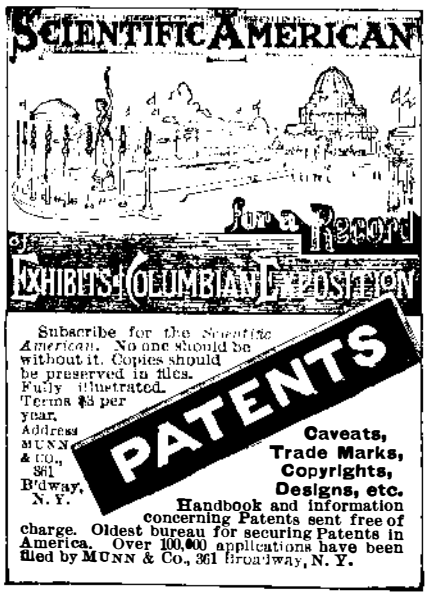
A MODERN BATH.
The Latest and Best.

Quick self-heating or Toilet Cabinet in place of Heater. No bath room required. Ornamental, inexpensive, complete, practical. Desirable for city or town.
Send 2 ct. stamp for catal.
The Mosely Folding Bath Tub Co.,
186 So. Canal St., Chicago.

THE COPYING PAD—HOW TO MAKE and how to use; with an engraving. Practical directions how to prepare the gelatine pad, and also the aniline ink by which the copies are made, how to apply the written letter to the pad, how to take off copies of the letter. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 438. Price 10 cents. For sale at this office and by all newsdealers in all parts of the country.

If you want the best CHUCKS, buy Westcott's

Little Giant Double Grip Drill Chucks, Little Giant Drill Chucks Improved, Oneida Drill Chucks, Cutting-off Chucks, Scroll Combination Lathe Chucks, Geared Combination Lathe Chucks, Plain Universal Lathe Chucks, Independent Lathe Chucks. Made by
Westcott Chuck Co., Oneida, N. Y., U. S. A.
Ask for catalogue in English, French, Spanish or German.

REFLECTING TELESCOPES
HIGH POWER. Perfect definition. Superior to the Refractor for Planets and close Double or Colored Stars, at **ONE-THIRD THE COST.** Illustrated circular free. **W. C. EDGECOMB, Mystic, Conn.**



© 1892 SCIENTIFIC AMERICAN, INC.