

Business and Personal.

The Charge for Insertion under this head is 50 cents 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 next issue.

Air pumps for High Pressure, Hand or Steam Power. C. Beseler, 218 Centre Street, New York.

Send for illustrated catalogue of Electrical Instruments, supplies, and Books to L. N. Hopkins & Co., 267 Broadway, New York.

Mr. T. D. Locking, Care, U. S. Consul, Panama, U. S. Columbia, will sell the whole or a portion of his patent for umbrellas, illustrated in this issue.

For Sale—Two 10 horse power Portable Engines and Boilers, complete and in good repair. Price \$250. S. M. York, Cleveland, O.

For second-hand engines and boilers, address Young & Locke, Titusville, Pa.

American Fruit Drier. Free Pamphlet. See ad., p. 77.

72" Independent 3 Jaw Chucks, \$42; 48", \$36; 24", \$30. Warranted best in the world, and sent on trial. American Twist Drill Co., Meridith, N. H.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'rs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv., page 77.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

Paragon School Desk Extension Slides. See adv. p. 78.

Drop Forgings. Billings & Spencer Co. See adv., p. 77.

Brass & Copper in sheets, wire & blanks. See ad. p. 76.

Cope & Maxwell M'fg Co.'s Pump adv., page 77.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa. can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their castings over all others. Circular and price list free.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.

Blind Wire and Borers. B.C. Dav's, Binghamton, N. Y.

Eagle Anvils, 10 cents per pound. Fully warranted.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 77.

Upright Self-feeding Hand Drilling Machine. Excellent construction. Pratt & Whitney Co., Hartford, Conn.

C. B. Rogers & Co., Norwich, Conn. Wood Working Machinery of every kind. See adv., page 78.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 78.

Wanted Immediately—A first-class Steel Letter Cutter. H. W. Gordon, Lynn, Mass.

Two or three first-class journeymen machine pattern makers can find steady employment with Poole & Hunt, Baltimore, Md. Location pleasant and beautiful.

Small articles in sheet or cast brass made on contract. Send models for estimates to H. C. Goodrich, 66 to 72 Ogden Place, Chicago, Ill.

The Sweetland Chuck. See illus. adv., p. 62.

Improved Skinner Portable Engines. Erie, Pa.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made, 631 Arch, Phil.

Lighting Screw Plates, Labor-saving Tools. p. 62. See New American File Co.'s Advertisement, p. 46.

Combination Roll and Rubber Co., 68 Warren street, N. Y. Wringer Rolls and Moulded Goods Specialties.

Draughtsman's Sensitive Paper, T. H. McCollin, Phila., Pa.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 44.

Steam Pumps. See adv. Smith, Vaile & Co., p. 46.

Pure Water furnished Cities, Paper Mills, Laundries, Steam Boilers, etc., by the Multifold System of the Newark Filtering Co., 17 Commerce St. Newark, N. J.

"Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N.H.

List 28, describing 3,600 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N. H. and N. Y. city.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

First Class Engine Lathes, 20 inch swing, 8 foot bed, now ready. F. C. & A. E. Rowland, New Haven, Conn.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3053, New York city.

Jas. F. Hotchkiss, 84 John St., N. Y.: Send me your free book entitled "How to Keep Boilers Clean," containing useful information for steam users & engineers. (Forward above by postal or letter; mention this paper.)

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

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

NEW BOOKS AND PUBLICATIONS.

BULLETIN MENSUAL DE LA ASSOCIACION D'EXCURSIONS CATALANA. Any V. Nos. 40 y 41. Barcelona.

This is a monthly journal published by an association in Catalonia having for its object researches, through field excursions, into the natural history and archaeology of that portion of Spain. The number before us contains considerable interesting matter in regard to the antiquities of Catalonia, and is illustrated with very well executed engravings.

CELEBRATED AMERICAN CAVERNS. ESPECIALLY MAMMOTH, WYANDOT, AND LURAY; WITH BRIEF NOTICES OF CAVES AND GROTTOS IN OTHER LANDS. By Horace C. Hovey. Cincinnati: Robert Clarke & Co. 8vo, pp. 228. \$2.00.

The author of this monograph is widely known as a successful explorer of underground America, having already published numerous articles in the SCIENTIFIC AMERICAN, Scribner's Magazine, and other periodicals, besides papers read before the American Association for the Advancement of Science. Here, however, Mr. Hovey presents a large amount of new material, gathered in recent explorations, and carefully compared with more early accounts. The volume opens with chapters on the structure, varieties, and contents of caves; followed by a condensed account of cave dwellings, temples, and tombs. The "bone caves" of this and other countries supply some of the chief sources of information concerning prehistoric man, and these are treated of by the author in a manner showing his familiarity with archaeological investigations. While the work is evidently not intended as a guide book, it will be found to answer for that purpose admirably, so far as Mammoth, Wyandot, and Luray caves are concerned. Among other caves described are Weyer's, Howe's, Pickett's, the Canadian caverns, the cave of Cachuamilla; and, indeed, we do not know of a single cavern of note that is not mentioned in these pages. The book contains more than forty engravings, besides maps and diagrams from recent surveys. An appendix gives a complete list of subterranean fauna, including an account of the famous eyeless fish, and other singular forms of life.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns will be had at this office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) C. E. A. asks: 1. What can I use to polish brass, such as the brass on a locomotive, that will give a fine polish without much rubbing and will not easily tarnish? A. If you are constantly cleaning the brasswork of your locomotive, use ordinary whiting or chalk and a cotton or woolen cloth, with a little moisture by breathing, or from another cloth a little wet. If the work becomes stained or slightly oxidized by several days' running, then use rottenstone and oil on a cloth until the surface is clean, and finish with whiting for gloss. If parts become corroded and blackened, use a little oxalic acid in water with the rottenstone instead of oil. 2. Also something that I can use to polish paint work with? A. After cleaning your painted work you can brighten it by rubbing with a cloth moistened slightly with equal parts turpentine and boiled linseed oil. 3. Why does the water in a water-glass rise when the steam is shut out of the top? Does the steam condense in top of glass? A. The steam condenses in the top of the glass and draws the water to fill its place.

(2) E. C. R. asks: Please be kind enough to inform me what kind of transparent coating to use on bright steel wire, to prevent rust and not destroy the brilliancy? A. Try the following: Dissolve half an ounce of camphor in two ounces of wine spirit and mix this with two pints of fine sperm oil. Allow the wire to remain in contact with this mixture, heated to 180° Fah., for half an hour, then rub off excess with a soft cotton cloth.

(3) D. M. writes: To settle a dispute with you please inform us in your columns, whether the laws of the State of New York prevent a proprietor acting as his own engineer, he being capable? A. A proprietor can act as his own engineer, but he must pass examination and take out a license same as any other engineer.

(4) E. E. M. says: In an April number of your paper appeared an article pertaining to the comet, and stating what a wonderful sight it would make in the northern heavens in the months of May and June. Now what I want to know is why it has not appeared as predicted. A. "Comet a 1882," discovered on the 18th of March, by Mr. Wells, of the Albany Observatory, certainly failed to carry out the expectations that were raised concerning it. It was, however, a well behaved comet in all points excepting in reaching the size

predicted. It followed closely in the path predicted for it by astronomers, reached perihelion on June 10, the appointed time, and it is highly probable that we shall soon hear tidings of its reappearance as it recedes from the sun. It was frequently seen in May by naked eye observers, was an easy object in the telescope, where it was followed until it reached perihelion, even in full daylight, when in near vicinity to the sun. Its tail did not reach the dimensions anticipated, much to the sorrow of astronomers. But nothing is more uncertain than the movements of comets, and "Comet a" is not the first one that has disappointed human calculation. Where comets are concerned we can only predict probabilities, never certainties.

(5) J. M. asks: Please inform me how to color straw with aniline dyes? I have tried, but the dye comes off. A. Steep the straw for several hours in hot water containing about half an ounce of tannin to the gallon, then pass it through hot water containing about an ounce of white glue to the gallon and dry in the air slowly, then dye, using weak baths. Straw may also be colored by passing it through a bath of any thin pale spirit varnish holding the desired color in solution.

(6) C. W. B. asks: I desire to ask your opinion about a certain phenomenon I witnessed some time since. While viewing the moon with a forty-four inch refracting telescope with a power of about sixty, I saw a star pass apparently on the disk of the moon apparently three times its diameter and then disappear. What was the cause of this singular appearance? I have never seen any account in any astronomy of such a phenomenon being witnessed. A. The lingering of stars upon the disk of the moon at the moment of occultation is supposed to be due to the principles of diffraction or the bending of rays of light when passing a solid body. Imperfect qualities in the defining power of the telescope may have much to do in the apparent overlapping of the disk of a star. If the telescope was perfect you could scarcely notice that there is a disk, under low powers.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

July 11, 1882,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1881, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing inventions with patent numbers, including: Addressing machine, Aerated beverages, Alarm, Alkali ball mould, Alkali from gluten, Auger, Axle bearing, Axle box, Axle lubricator, Bag, Bale tie, Baling press, Bar, Barrel's apparatus for cooling the glue lining of, Basin clamp, Bats method of and apparatus for forming and sticking napping, Battery, Bed, sofa, Bed, spring, Bedstead, cabinet folding, Belt protector, Bench, Berth, self-lifting, Billiard table pocket, Binder for memorandum books, Bird cage, Bird cages, fish bone holder, Blowpipe, Board, Bobbin winder, Boiler, Boiler and water heater, Bolts and rivets, Boot and shoe burnishing machine, Boot and shoe heels, rotary cutter for trimming, Boot strap, Boots and shoes, manufacture of, Bottle cleaner, Bottle stopper, Bottle stopper, Bottling machine, Box, Bracket, Brake, Breastpin safety catch, Broom, Brush, Brush, automatic fly, Brush, hair, Buckle, Bulletin board, Buoy, signal, Bureau and bedstead, combined dressing, Burner, Burring machine, Button, Button fastener.

Table listing inventions with patent numbers, including: Can, See oil can, Candle holder, Candlestick, Car brake, Car coupling, Car coupling, S. P. Coan, Car coupling, A. Daubner, Sr., Car coupling, A. C. Ellis, Car coupling, S. Huff, Car coupling, J. W. Langfitt, Car coupling, P. Markley, Car coupling, F. G. Pettus, Car coupling link, J. Bridge, Car, hand, G. S. Sheffield, Car, railway, A. B. Allen, Car, railway, M. T. Ridout, Car seat sleeping attachment, Card lathe and grinder, Carding machine, Carpet lining, Carpet stretcher, Carriage jack, Carriage lamp holder, Carriages, sledge holder for children's, Chair, Chain bar and pencil, combined, Chair, See Child's chair, Check rowers, anchor for, Child's chair, convertible, Cigar lighter, Cigarette cutting machine, Cigarette machine, Clamp, Cleaner, See Bottle cleaner, Clock, electric, Clock, repeating, Clock winding attachment, Cloth bag, Clutch, friction, Cock, E. M. E. Thorey, Coffee grader, Collar, horse, Combustion, process of and apparatus for the utilization of products of, Compass alidade, Cooler, Copying press, Cornet, Corset, A. Kelley, Corset, nursing, Corsets, etc., machine for cutting the edges of, Cotton gin, Cotton press, Coupling, Cradle, Cradle, folding, Crusber, Culinary boiler, Cultivator, Cutter head, adjustable, Desk, A. Cutler, Desk, cylinder, A. Otterson, Dextrine and saccharine matter from grains, obtaining, Disintegrating machine for making fibers for mats, hats, etc., Drainage apparatus, Drier, Drier and cooler, Drier heater and base combined, Drilling machine, metal, Ear jewel cover, Easel, adjustable, Electric call, Electric circuit system, Electric light systems, switch, Electric machine, dynamo, Electrical apparatus, static, Elevator, safety device, Elevators, automatic gate opener for, Emery wheels, method of and appliance for burning solid, Engine, See Pulp beating engine, Rotary engine, Traction engine, Wind engine, Evaporator, Excavator, Explosive powder, Eyeglass and spectacles combined, Felts, etc., into strips, machine for cutting, Fence post, Fence post and clamping device, metallic, Fence wire, Fender, Fertilizer distributor, Fertilizer for plants, special, Fifth wheel, Filter, faucet, Fire annihilator, Fire box, Fire box, R. L. Walker, Fire escape, Fire escape, H. A. Lee, Fire escape, A. Swanson, Fire extinguisher, I. Kitsee, Fire extinguisher and alarm, automatic, Fishing reel, Flour mills, etc., glass tube joint for spouts of, Flushing valve, Fog alarm and beacon, Fountain, Frame, See Hand bar frame, Fruit evaporator, Fruit evaporators, drying chamber for, Fulcrum, adjustable, Furnace, See Hydrocarbon furnace, Furniture, attachment folding and movable, Gauge, Galvanic battery, Game apparatus, rail, Garments, reinforcing, Gas bracket and cock, Gas burner, Gas burner for heating purposes, Gas lighter, electric, Gas lighting apparatus, automatic electric, Gas lighting apparatus, electric, Gas lighting apparatus, electric, J. P. Tirrell, Gas lighting apparatus, electric, J. P. Tirrell.

Gas machine, Matthews & Holt..... 261,011
 Gas process of and apparatus for manufacturing, J. Dixon..... 260,954
 Gate. See Water gate.
 Gear machinery, worm, Overton & Wells..... 260,892
 Glass melting furnaces, construction and method of working, F. Siemens..... 261,054
 Glasses, jugs, etc., automatically opening and closing covers of lids of drinking, B. Wendt..... 261,113
 Glassware, manufacture of, P. Arbogast..... 260,819
 Glove lining, H. W. Price..... 261,040
 Governor, steam, D. L. F. Chase..... 260,842
 Governor, steam engine, F. H. Ball..... 261,074
 Governor, windmill, B. Chamberlain..... 260,841
 Grain binder, J. F. Appleby..... 261,072
 Grain binder, F. T. & F. A. Lomont..... 261,007
 Grain cleaning and assorting machine, W. Krüger..... 260,996
 Graining compound, wood, J. T. Greenwood, Jr..... 260,973
 Grate, G. W. Walker..... 260,809
 Grazing post, W. Webster..... 261,112
 Grinding disk, W. Lehmann..... 261,099
 Guard. See Pantalon guard. Saw guard.
 Hame and trace attachment, O. O. Roberts..... 260,896
 Hand bag frame, H. S. Craus..... 260,946
 Harness rosette, E. E. Sargeant..... 261,050
 Harness shaft loop, I. A. Wesson..... 260,812
 Harness tool, J. A. Stewart..... 260,799
 Harvesters, grain adjusting belt for, S. T. Northcutt..... 260,889
 Hat, C. B. Tomz..... 260,807
 Hat indicator, C. Spahmer..... 261,117
 Hay press, J. Kemp..... 260,757
 Head-lights, signal attachment to locomotive, W. W. Richards..... 260,886
 Header, M. N. Laufenburg..... 260,882
 Heater and cooker, S. Ellis..... 260,856
 Heel trimming machine, A. J. Johnson..... 261,094
 Hoisting mechanism for applying power to ropes for, A. S. French..... 260,964
 Holder. See Candle holder. Carriage lamp holder.
 Horse detacher, J. H. Clow..... 261,079
 Horseshoe nail clincher, H. Bröning..... 260,837
 Hose tube, striped knit, J. H. Osborne..... 260,891
 Hub attaching device, A. Warth..... 260,811
 Hub boring machine, H. A. Moyer..... 260,774
 Hub, vehicle wheel, J. Lajeunesse..... 260,999
 Hydraulic, G. Shelley..... 260,904
 Hydraulic press, J. Kellogg..... 261,097
 Hydrocarbon furnace, D. B. Hubbard..... 260,983
 Hydrocarbon furnace, H. S. Siffoni..... 260,789
 Ice plow tooth, W. V. Vernier..... 260,914
 Indicator. See Hat indicator. Station indicator. Train indicator.
 Insecticide, J. H. Wheeler..... 260,916
 Ironing board, G. A. Schram..... 260,902
 Ironing board, bosom, Cook & Hinman..... 261,083
 Jack. See Wagon jack.
 Jeweler's work bench, M. H. Knapp..... 260,880
 Key stock, spring, J. H. Adt..... 260,919
 Kitchen cabinet, N. P. Bradish..... 260,739
 Lamp, electric arc, C. E. Ball..... 260,925
 Lamp, electric arc, J. H. Guest..... 260,975
 Lamp, electric arc, C. D. Haskins..... 261,091
 Lamp, electric arc, E. Thomson..... 261,067
 Lamp shade, collapsible, N. Plympton..... 261,037
 Lamps, circuit closing key for electric, J. H. Guest..... 260,864
 Latch, J. Brownlee..... 260,934
 Latch, gate, W. H. Marshall..... 261,010
 Leather creaser, C. R. Corey..... 260,847
 Leather, making, E. W. Avery..... 261,073
 Light. See Signal light.
 Lock. See Nut lock. Seal lock. Wagon seat lock.
 Locomotive, G. S. Strong..... 261,061
 Lubricating device for steam engines, A. Craft (r)..... 10,153
 Lubricator. See Axle lubricator. Steam engine lubricator.
 Mash cooler, F. O. Kunz..... 261,098
 Meat cutting machine, C. Kieser..... 260,758
 Mill. See Roller mill. Wheat and middlings reducing mill. Windmill.
 Milling machine feed device, E. F. Latham..... 260,760
 Millstone dust catcher, G. Kiefer..... 260,877
 Mineral water fountain, Dummer & Malmström..... 261,086
 Mould. See Alkali ball mould.
 Moulders, guard for variety, G. Grill..... 260,974
 Monkey wrench, C. H. Miller..... 260,771
 Motor. See Windmill motor.
 Muzzle, J. D. Crockett..... 260,948
 Nail. See Ornamental nail.
 Nut lock, A. R. Bloomer..... 260,931
 Nut lock, P. Curran..... 260,848
 Nut lock, T. Curry..... 260,949
 Nut lock, J. F. Goodridge..... 260,861
 Offal drier and cooler, M. Tamm..... 260,801
 Oil can, spring bottom, X. St. Pierre..... 261,060
 Oil press envelope, J. J. Green..... 260,862
 Ore crusher, L. C. Springer..... 260,796
 Organ case, G. Nettleton..... 261,047
 Ornamental nail, Bailey & Talbot..... 260,733
 Packing for pumps, piston, P. A. Myers..... 261,026
 Pantalon guard, G. R. Olney..... 261,029
 Pantaloons supporter, A. Horowitz..... 260,754
 Paper box machine, Strieby & Rankin..... 260,800
 Paper machine, W. O. Jacobi..... 260,988
 Paper making, etc., treating fibrous vegetable substances to obtain fiber suitable for, C. K. Ekman..... 260,749
 Parer, corer, and slicer, apple, C. E. Hudson..... 260,756
 Peas and beans and cutting vegetables, machine for shelling, F. T. Mallon..... 261,009
 Peas, machine for sorting green, W. G. Suydam..... 261,062
 Pen or pencil holder and drawer pull, combined, A. Cutler..... 260,951
 Pillow, W. Huse..... 260,870
 Pipe. See Blowpipe. Stove-pipe.
 Pipe coupling, J. J. B. Frey..... 260,968
 Pipe coupling, Jones & Rittenhouse..... 260,874
 Pitman head, C. Clapp..... 260,940
 Plant sprinkler, G. G. Lynch..... 260,761
 Planter, corn, A. Runstetler (r)..... 10,156
 Planter, corn, A. & M. Runstetler..... 261,048
 Planter, corn, M. Runstetler (r)..... 10,155
 Planter, seed, H. C. Austin..... 260,923
 Plow, C. F. Mock..... 260,772
 Plow, J. Quin..... 260,785
 Plow, rotary, G. Pirrung..... 260,782
 Plow, shove, J. Lawrie..... 261,001
 Pocket safety attachment, J. W. Wells..... 260,915
 Post. See Fence post. Grazing post.
 Pot. See Tea or coffee pot.
 Powder. See Explosive powder.
 Press. See Baling press. Copying press. Cotton press. Hay press. Hydraulic press.
 Printer's shooting stick, F. L. Armstrong..... 260,821
 Printing machine sheet delivery apparatus, L. C. Crowell..... 261,084
 Printing press, A. Shedlock..... 260,792
 Printing press delivery apparatus, C. B. Cottrell..... 260,945
 Protector. See Belt protector.
 Pulp beating engine, J. E. Warren..... 261,107
 Pump, N. E. Alpuche..... 260,921

Pump, Meyrick, Jr. & Melcher..... 261,019
 Pump attachment, G. H. Gaskins..... 261,087
 Pump plunger, H. F. Temple..... 260,802
 Quilting machine, W. Koch..... 260,994
 Range hot water reservoir, kitchen, E. Bourne..... 260,738
 Ratchet, J. Brown et al..... 260,834
 Reaping machine, W. N. Whiteley..... 261,114
 Reel. See Fishing reel.
 Reflector, lamp, H. F. Bartlett..... 260,735
 Regenerator for metallurgical and other furnaces, M. V. Smith..... 261,057
 Reins, adjustable clip for driving, G. W. Parke..... 260,883
 Roller mill, N. W. Holt..... 260,079
 Rotary cutting machine, E. Salamon..... 261,049
 Rotary engine, R. Hodson..... 260,978
 Rotary engine, D. M. Johnson..... 260,939
 Sash, G. H. Johnson..... 260,873
 Saw guard, circular, G. Grill..... 261,060
 Sawmill roller gauge, R. M. Beck..... 260,929
 Screw, L. Smith..... 260,795
 Scrubber and mop, combined, G. Pirrung (r)..... 10,154
 Seal lock, L. C. Burgess..... 260,741
 Seeder and cultivator, combined, E. E. Whipple..... 260,814
 Sewer and means for facilitating the discharge of sewage, Comstock & Jefferson..... 261,080
 Sewing machine, boot and shoe, A. Keats..... 260,990
 Sewing machine buttonhole attachment, McCreary & Smith..... 260,885
 Sewing machine feed mechanism, A. Spear..... 260,906
 Sewing machine for making bottle covers, G. Grisel..... 260,863
 Sheet metal shearing machine, G. H. Perkins..... 260,779
 Shingling bracket, L. C. Jaques..... 260,872
 Shirt, J. M. C. Murphy..... 260,775
 Shirt, I. Schmeer..... 260,790
 Shoe fastener, H. J. Dieter..... 260,852
 Shoe tongue, A. I. Earle..... 260,854
 Shot making machine, H. M. Guild..... 260,976
 Signal light, M. Brassill..... 260,933
 Smoke consumer, fireplace, W. T. McMillen..... 261,015
 Smoke consuming apparatus, S. Parker..... 260,894
 Smoke consuming furnace, G. A. Barth..... 260,824
 Smoking cartridge, E. A. Smith..... 261,056
 Spark arrester, R. Hill..... 260,753
 Spinning machine top rolls, covering for, E. L. Perry..... 260,780
 Spring equalizer, vehicle, F. L. Ezell..... 260,960
 Sprinkler. See Plant sprinkler.
 Squares, adjustable pitch board for, C. W. Hovis..... 260,755
 Stamp, hand, J. Murdock, Jr..... 261,025
 Stand. See Wash stand.
 Station indicator, C. G. Anderson..... 261,071
 Steam boilers, foam collector for, R. Whelan..... 260,813
 Steam engine lubricator, E. H. Phipps..... 260,781
 Steam wheel, A. F. Cooper..... 260,944
 Stirrup bending machine, J. B. Chiles..... 260,938
 Stocking, C. Appleton..... 260,922
 Stopper. See Bottle stopper.
 Stove lid, B. A. Baxter..... 260,826
 Stove oil, H. C. Bascom..... 260,825
 Stove oven, E. C. Godwin..... 260,971
 Stove pipe, A. J. & C. Lindemann..... 261,004
 Stove pipe shelf, B. Roux..... 261,047
 Stove plates, device for attaching, E. F. Straub..... 260,908
 Strap. See Boot strap.
 Sugar, manufacturing, A. Brear..... 260,740
 Supporter. See Pantaloons supporter. Ticket door supporter.
 Table frame, H. Rose..... 261,102
 Table leaves, double-acting lock support for, N. A. Hull..... 260,986
 Tables, device for leveling, J. Crawford..... 260,947
 Tap wrench, M. Campbell..... 260,743
 Tea or coffee pot, E. Krippendorff..... 260,995
 Telephone, acoustic, L. Beecher..... 260,737
 Telephone lines, electrical signaling apparatus for, T. D. Lockwood..... 260,884
 Telephone system, T. D. Lockwood..... 260,883
 Telephone system and apparatus, C. E. Chinock..... 260,939
 Tent pole, E. C. Cook..... 260,846
 Thill coupling, A. C. Kasson..... 260,876
 Thill coupling, K. Pausch..... 261,032
 Thill coupling, J. H. Robinson..... 261,045
 Ticket door supporter, M. H. Tappan..... 261,104
 Tie. See Bale tie.
 Tobacco coloring compound, C. S. Phillips..... 261,084
 Tobacco, machine for dressing fine cut, C. G. Emery..... 260,958
 Toy, mechanical, E. R. Ives..... 260,987
 Trace carrier, T. L. Cousino..... 260,943
 Traction engine, Lippy & Hughes..... 261,005
 Train indicator, J. C. McKenzie..... 261,013
 Truck, barrel, J. J. Swain..... 261,063
 Tug, hame, T. A. Simmons..... 260,905
 Valve. See Flushing valve.
 Valve, J. A. Felt..... 260,858
 Valve, M. Miller..... 261,021
 Valve and casing, straight way, G. L. Bradley..... 260,829
 Valve, steam piston, W. S. Hughes..... 260,985
 Valve, stop, E. Thayer..... 261,065
 Vapor burner, J. Madden..... 260,762
 Vehicle reach coupling, Tufts & Roth..... 261,069
 Vehicle, two wheeled, J. P. Callan..... 260,742
 Vehicle, two wheeled, H. Hortop..... 260,980
 Vehicle, two wheeled, S. R. S. Uford..... 260,808
 Vehicle wheel, G. H. N. Corttiss..... 260,744
 Velocipede, Candler & Whitehead..... 260,840
 Velocipede, W. B. Morris..... 260,887
 Vessels, device for loading and unloading, G. Bacl..... 260,924
 Vise, pipe, T. Patton..... 260,777
 Wagon brake, W. J. Kerr..... 260,992
 Wagon jack, A. N. Woodard..... 260,917
 Wagon seat lock, S. Gilzinger..... 260,800
 Wall paper carrier, W. J. Palmer..... 261,031
 Wash boiler, L. C. Morris..... 260,887
 Wash stand and fixture, stationary, P. N. Burke (r)..... 10,167
 Washing machine, G. C. Miller..... 261,030
 Watch cases, manufacture of, J. C. Dueber..... 260,747
 Watch dials, apparatus for applying color to, T. F. Proctor..... 260,783
 Water closet, J. Demarest..... 260,063
 Water closet, J. B. Frey..... 260,965
 Water closet drip tray, F. Adee..... 260,816
 Watercloset sloop safe, J. J. B. Frey..... 260,967
 Water closets, plumber's coupling for the bowls of, J. J. B. Frey..... 260,966
 Water gate, C. Callahan..... 260,936
 Waterproof garment, G. Watkinson..... 261,109
 Water wheel, R. W. Tufts..... 260,913
 Weaner, calf, J. C. Dupee..... 260,748
 Weaner, calf, Jones & Fuller..... 261,096
 Well, artesian vacuum, D. H. Tichenor..... 260,803
 Wheat and middlings reducing mill, J. Pye..... 260,984
 Wheat method of and apparatus for determining, C. L. Gratioit..... 260,750
 Wheel. See Fifth wheel. Steam wheel. Vehicle wheel. Water wheel.
 Wheelbarrow, S. L. Rockwell..... 261,046
 Whisk-broom holder, C. De Quillfeldt..... 261,085
 Wind engine, G. Garside..... 260,670
 Windmill, J. W. Barber..... 260,927

Windmill motor, W. Scott..... 261,051
 Wire coiling machine, H. S. Hall..... 260,732
 Wire stretcher, R. & A. Ellwood..... 260,957
 Wood polishing machine, Bridgeman & Perry (r)..... 10,152
 Wood oiling machine, F. G. & A. C. Sargent..... 260,898
 Wool washing machine, F. G. & A. C. Sargent..... 260,899, 260,900
 Wrench. See Monker wrench. Tap wrench.

DESIGNS.

Burial casket, L. Stein..... 13,034
 Button, J. A. Decmatel..... 13,024 to 13,028
 Chain, ornamental, J. Etzensperger..... 13,030
 Fringe, H. A. Kehrenberg..... 13,032
 Pipe mouthpiece, W. Demuth..... 13,029
 Pitcher, Parson & Franzheim..... 13,033
 Scarf, H. Heathe..... 13,031

TRADE MARKS.

Beer, lower, Schmidt & Brother..... 9,542
 Canned goods, Freeman & Shaw..... 9,537
 Canned tomatoes, W. S. Whiteford..... 9,543
 Cigars, L. Carvajal..... 9,526
 Cigars, cigarettes, and all kinds of chewing and smoking tobacco, Smith, Mendel & Co..... 9,544
 Fertilizers, D. H. Baldwin..... 9,523
 Fertilizers, artificial, J. Horner, Jr..... 9,539
 Flour, Jaques & Johnson..... 9,541
 Halters, J. W. Eldridge..... 9,535
 Knives, razors, scissors, and all kinds of cutlery and edge tools, J. Veall..... 9,546
 Lard substitute, W. Butcher's Sons..... 9,524, 9,525
 Meats, Cleveland Provision Company..... 9,527
 Metals of various kinds, P. R. Jackson & Co..... 9,540
 Pens, fountain, L. W. Fairchild..... 9,536
 Photographic plates, E. & H. T. Anthony & Co..... 9,532
 Refrigerators, D. Eddy & Son..... 9,534
 Rockingham and yellow ware, terracotta flower pots and hanging baskets, Flentke, Harrison & Co..... 9,529
 Saws, crosscut, E. C. Atkins & Co..... 9,533
 Saws, crosscut wood, E. C. Atkins & Co..... 9,522
 Shirts, Marley Manufacturing Company..... 9,530
 Steel, cast, W. Spencer & Co..... 9,545
 Tobacco cigars, cigarettes, chewing and smoking, L. & E. Wertheimer..... 9,531
 Tobacco, plug, plug, Elwell, Brackett & Hawes..... 9,528
 Whisky, S. J. Greenbaum..... 9,538

English Patents Issued to Americans.

From June 30, 1882, to July 7, 1882, inclusive.

Dynamo electric machine, E. A. Sperry, Cortland, N. Y.
 Electric battery, C. F. Brush, Cleveland, O.
 Electric current, apparatus for generating, E. Thompson, New Britain, Conn.
 Engraving machine, J. Earle, Delaware, Pa.
 Excavating earth, C. H. Leach, Baltimore, Md.
 Horseshoe, F. A. Roe, New York city.
 Mail bag, T. A. Platt et al., New York city.
 Neckties, I. Noar, New York city.
 Sewing machine, A. Newstadt, San Francisco, Cal.
 Spinning frame, G. Jaquith, Maysville, Ky.
 Steam engine, W. F. Goodwin, Stetson, N. J.
 Telegraph wire, W. E. Banta, Springfield, O.
 Toothbrush handle, A. C. Estabrook, Florence, Mass.
 Valve for steam engines, W. S. Phelps et al., Wortendyke, N. J.

Advertisements.

Inside Page, each insertion - - - 75 cents a line.
 Back Page, each insertion - - - \$1.00 a line.
 (About eight words to a line.)
 Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

THE ONLY PERFECT SEWING MACHINE.
 SIMPLEST, LATEST IMPROVED.
 MOST DURABLE & BEST.
NEW HOME SEWING MACHINE CO.
 30 UNION SQUARE, N. Y. CHICAGO, ILL.
 ORANGE MASS. OR ATLANTA GA.



Cheap Small Boilers. T. McDonough, Montclair, N. J.
\$88 A week to Agents. \$10 OUTFIT FREE.
 RIDGEBY & CO., 10 BARCLAY ST., New York.

BACKKNIFE GAUGE LATHE,
 For all variety of Chair Legs, etc., etc. Rollstone Patent Variety Lathe, Superior to the Waymouth. Pattern Maker's Lathe, Improved Rotary Bed Planers, Buzz Planers, Band, Jig, and Swing Saws, Wardwell Patent Saw Bench, Roll Machines Boring Machines, etc., etc. Dealers in Second-hand Iron and Wood Working Machinery, Engines and Boilers, etc., etc. Send stamp for catalogue and address. **ROLLSTONE MACHINE CO., 45 Water St., Fitchburg, Mass., U. S. A.**



HOW TO CASEHARDEN.
 Inclose 10 cents for sample. Address R. T. KING, No. 633 South Front St., Columbus, O.

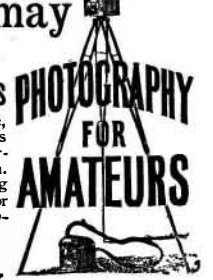
OLD RELIABLE
 NO FAILURE IN SIXTEEN YEARS
HEALD & MORRIS, CENTRIFUGAL PUMPS
 100 TO 35,000 GALLS PER MINUTE CAPACITY
HEALD & MORRIS, Baldwinsville, N. Y.

CONSTITUENCY OF WOOD.—TABLES showing the actual amount of solid matter per cord in various commercial woods, and the relative values of these, when seasoned, for steam generating purposes. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 333. Price 10 cents. To be had at this office and from all newsdealers.

WOOD WORKING MACHINERY.
 PLANING, MATCHING, MOLDING, MORTISING, TENONING, CARVING, BAND & SCROLL SAWS, UNIVERSAL VARIETY WOOD WORKERS & CO., CINCINNATI, O. U. S. A.



How YOU may take photographs with WALKER'S CAMERAS and OUTFITS PHOTOGRAPHY FOR AMATEURS
 Cheap, compact, accurate, and practical, full instructions furnished, invaluable for Tourists either ladies or gentlemen. Simple, useful, fascinating to anyone. Send 10 cents for Catalogue and Sample Photograph taken by an amateur. Circulars free.
 Wm. H. WALKER & Co., Box P, Rochester, N. Y.



MINERAL WOOL.
 This fireproof and indestructible material successfully prevents loss of heat by radiation, keeps frost from water pipes, deadens sound, checks spread of fire in walls, partitions, floors of dwellings. 25 cts. per cubic foot.
 U. S. MINERAL WOOL CO., 16 Cortland St., N. Y.

KEMP'S MANURE SPREADER, PULVERIZER, and CART COMBINED.
 Greatest Agricultural invention of the age. Saves 90 per cent of labor, and doubles the value of the manure. Spreads evenly all kinds of manure broadcast or in drill, in one-tenth the time required by hand.
 Send for illustrated Catalogue and full particulars to **KEMP & BURPEE MFG CO., Syracuse, Onondago Co., N. Y.**



EQUIDISTANT GEAR CUTTERS.—A valuable paper, by C. W. MacGord, giving detailed directions for cutting spur wheels, on the cycloidal system, so as to make them interchangeable. With four illustrative diagrams. (Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 333. Price 10 cents. To be had at this office and from all newsdealers.

ALL KINDS OF WOOD WORKING MACHINERY OF IRON WORKING TOOLS SPECIAL TOOLS, MANUFACTURED BY H. B. SMITH MACHINE CO., SMITHVILLE, BUR. CO., N. J. CIRCULARS FREE.



THE COMPOSITION OF AMERICAN Grasses.—Abstract of a paper, by Clifford Richardson, presenting in tabular form the average composition of various grasses, and showing the relations of cultivated and wild grasses toward each other and to similar species as grown in Germany. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 336. Price 10 cents. To be had at this office and from all newsdealers.

PATENT QUICK Adjustable Stroke SHAPERS
 Can be Changed while in Motion.
E. GOULD & EBERHARDT, NEWARK, N. J.




WEYMOUTH BRIDGE.—NEW BRIDGE recently erected over the Weymouth Harbor. With eleven spans. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 331. Price 10 cents. To be had at this office and from all newsdealers.

DAMPER REGULATORS and Gage Cocks. Murrill & Keizer, Baltimore

CHARLES ROBERT DARWIN.—A Biographical sketch, with portrait. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 337. Price 10 cents. To be had at this office and from all newsdealers.

HEAVY UNIVERSAL MILLING MACHINE
 FOR CIRCULARS AND FURTHER INFORMATION ADDRESS C. E. LIPE, SYRACUSE, N. Y. NET WEIGHT 2800 lbs. AUTOMATIC FEED 38 lb. VERTICAL ADJUSTMENT 10 CENTRES SWING 12 INCHES. TABLE HAS A RAPID CRANK MOVEMENT.



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 thirty-five 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, Hints 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,
 261 Broadway, New York.
 BRANCH OFFICE—Corner of F and 7th Streets, Washington, D. C.