

ENGINEERING INVENTIONS.

A rotary engine has been patented by Messrs. Charles F. Sleigh and Harrie V. Smith, of Parkersburg, W. Va. The invention consists of an elongated piston turning in a cylinder in which slide two gates operated from a cam on the piston, with steam inlet and outlet ports entering the cylinder through the piston, and a device for reversing the engine.

A car axle has been patented by Mr. William J. Murray, of Jolon, Cal. The axle is made in sections, each section having a flange where they come together in the middle, with boxes, in which is an oil receptacle, the construction being such that each wheel is allowed to revolve independently of the other, thus avoiding the wear of wheels and track by sliding in going around curves.

MECHANICAL INVENTIONS.

A wool combing machine has been patented by Mr. William Wardman, of Bristol, Pa. This invention relates to improvements in the Noble wool combing machine, and is designed to prevent the slivers coming from opposite directions from the rollers from breaking down at the union, as they may be liable to do from insufficient material, and insufficient twist.

A machine for sawing shingle bolts has been patented by Mr. Eugene H. Allman, of Mobile, Ala. This invention covers a novel construction and combination of parts, whereby the saw arbor with its saw, through a system of shafts and pulleys, rotates the feed shaft, with other special features, making an improved machine for cutting shingle bolts, and for carrying away the bolts after they have been cut by the saw.

A circular sawing machine has been patented by Mr. Everell S. Collins, of Nebraska, Pa. A vertically sliding rod actuates the mechanism for raising and lowering the saw, a forked arm operated by a rotating shaft being pivoted to the sliding rod, and there being a device for throwing the forked arm into frictional contact with the rotating shaft, the invention being an improvement on a former patented invention of the same inventor.

AGRICULTURAL INVENTIONS.

A fender for plows has been patented by Messrs. Abraham Stoner, Simeon J. Hatcher, and William H. Carroll, of Stony Point, La. It is designed to prevent plants from being covered or injured by soil, clods, or lumps thrown by the plows, and is so made that it can be readily adjusted to allow any desired quantity of soil to be thrown around the plants.

A listed corn cultivator has been patented by Mr. Linden Kirlin, of Axtell, Kan. The parts are so arranged that two rows of corn may be cultivated at the same time, the blades being adjusted so that they will cut through the crust upon the side of the furrow to loosen and mellow the ground, the evenner and drawbar, to which the horses are attached, resting upon the tops of the ridges between the furrows.

A planter has been patented by Messrs. James P. Hasty and George L. Hise, of Honey Grove, Texas. The frame carries furrow opening and covering plows, and a hopper with apertures having seed slides in its bottom, the slides having pins and slots and the hopper having a stirrer, with other novel features, making a cheap and efficient machine for corn or cotton planting or fertilizer distribution.

MISCELLANEOUS INVENTIONS.

A draught equalizer has been patented by Mr. Henry Williams, of Doylestown, O. It is a novel device, providing for an equal distribution of the power of three horses, and at the same time calculated to be used with but two horses, should this number only be needed to do the required work.

A vehicle seat has been patented by Mr. William K. Howes, of Strong, Me. The back is adjustably connected to the main portion of the seat frame, so that it may be adjusted to vary its inclination to meet the requirements of the occupant of the seat, the construction being cheap, efficient, and durable.

A cooking utensil has been patented by Frances P. Hervey, of Brenham, Texas. This invention covers an ordinary vessel fitted to contain water, to the interior of which is fitted a gauze or perforated inner vessel, in which the food to be cooked is placed, there being various novel features of construction.

A road cart has been patented by Messrs. James A. and Joseph O. White, of Winston, N. C. This invention covers a novel construction and combination of parts in a vehicle, the body of which will hang low, and which is so made that the jerking, jarring horse motion, common to two-wheel vehicles, is avoided.

A gas meter has been patented by Mr. John A. Fardy, of Brooklyn, N. Y. This invention provides a filter within the gas meter, to extract foreign matters from the gas and confine the deposit thus obtained to a given space, whereby the valves and diaphragm are left free to act, and a more steady light will be obtained.

A sign has been patented by Mr. Patrick J. Dalton, of New York city. It is a novel construction of a sheet metal sign, comprising a frame with a recess into which a metal sign plate fits flush with the surface of the frame, in such way that it can be sealed and the whole effectually protected from the influence of the weather.

A vermin exterminator and process of preparing it has been patented by Mr. Cornelius A. Donovan, of Abilene, Texas. The exterminator consists of wheat or other grain saturated with a solution of strychnia in water, the grain afterward being coated with a solution of simple sirup and arsenic, a small quantity of oil of rhodium being applied to the grain thus prepared.

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 next issue.

Prof. Vose, in the preface to his "Manual for Railroad Engineers," says that Trautwine's "Civil Engineer's Pocketbook" is "beyond all question the best practical manual for the engineer that has ever appeared." See also Trautwine's "Railroad Curves" and "Earthwork."

Will sell car seat patent for \$500. Big thing when introduced. C. H. Woodmansee, Norton, Kan.

The Sturtevant Mill Co., 89 Mason Building, Boston, makes the best mill for crushing and pulverizing ores, phosphates, rock, cement, etc. So constructed that the material pulverizes itself. Illustrated circular, with references, on application.

For Sale—The Homer Oil Cloth Works at a bargain. Large building, boiler, engine, machinery, patterns, etc. Persons acquainted with oil cloth making will find this a favorable opening for engaging in a profitable business. Address box 94, Homer, N. Y.

For Sale—32 in. vertical or beam engine; Woodruff & Beach make; 7½ ft. by 8 in. shaft; pulley in sections, 18 ft. dia. In very good order. Estimated weight, 28 tons. Price, F. O. B., near Albany, N. Y., \$1,000. S. C. Forsaith Machine Company, Manchester, N. H.

Tangent galvanometer for sale. Reasonable price. W. Le C. Stevens, Packer Institute, Brooklyn, N. Y.

Territorial rights in thoroughly tested process for making stone, brick, and marble. Strongest testimonials. More than five years' test in Chicago, Baltimore, and elsewhere. Immense profits. Address Weems Stone and Marble Co., 184 Dearborn St., Chicago, Ill.

Referring to the patent on sign granted to Patrick J. Dalton, of New York city, noticed on page 59 of this issue, Mr. Robert S. Gould, 332 Broadway, New York, is the sole manufacturer of this improved sign, to whom all inquiries should be addressed.

Capitalist willing to invest in grand undertaking, address J. L. P., box 51, Kaukauna, Wis.

Mr. O. Frink, 234 Broadway, New York, publishes a neat little pamphlet describing the common forms of hernia or rupture, and explaining how all cases can be quickly cured by FRINK'S RUPTURE REMEDY. A copy will be mailed, in a plain, sealed envelope, to any address upon request.

First class tool maker wanted. B. W. Payne & Sons, Elmira, N. Y.

Wanted—To manufacture on royalty patented articles capable of being made in tin or other light metals. Reardon & Ennis, 311 River Street, Troy, N. Y.

Link Belting and Wheels. Link Belt M. Co., Chicago.

Boilers for sale.—Excellent, rebuilt, second-hand. Plain Tubular, Horizontal Boilers. One 100 H. P., 5' x 18', 3" tubes, \$650. Two 80 H. P., 5' x 17', 3" tubes, each, \$550. Two 75 H. P., 4½' x 16', 3" tubes, each, \$625. Two 60 H. P., 4½' x 15', 3" tubes, each, \$400. Three 50 H. P., 4' x 16', 3" tubes, each, \$300, \$325, and \$350.

Four 45 H. P., 4' x 15', 3" tubes, \$275, \$300, \$325, and \$350. One 40 H. P., 4' x 13', \$275. One 30 H. P., \$250.

Vertical Boilers. Three 150 H. P., Corliss, 2" tubes, each \$500. Three 125 H. P., 2" submerged tubes, each, \$575. One 100 H. P., 2" tubes, \$550. One 60 H. P., 2½" tubes, \$400. One 25 H. P., 2½" tubes, \$300.

Locomotive, Fire Box Pattern. Three 100 H. P., 4' tubes, \$500, \$550, and \$600. Three 90 H. P., 3½" tubes, \$650, \$700, and \$700. Five 80 H. P., 2" tubes, \$600 each. One 50 H. P., 3" tubes, \$575.

Engines and boilers, portable and stationary; wood-working and general machinery. Send for estimates, stating exactly what you want: W. E. Drew, agent S. C. Forsaith Mach. Co., Manchester, N. H.

The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Protection for Watches. Anti-magnetic shields—an absolute protection from all electric and magnetic influences. Can be applied to any watch. Experimental exhibition and explanation at "Anti-Magnetic Shield & Watch Case Co.," 18 John St., New York. F. S. Giles, Agt., or Giles Bro. & Co., Chicago, where full assortment of Anti-Magnetic Watches can be had. Send for full descriptive circular.

Haswell's Engineer's Pocket-Book. By Charles H. Haswell, Civil, Marine, and Mechanical Engineer. Giving Tables, Rules, and Formulas pertaining to Mechanics, Mathematics, and Physics, Architecture, Masonry, Steam Vessels, Mills, Limes, Mortars, Cements, etc. 900 pages, leather, pocket-book form, \$4.00. For sale by Munn & Co., 361 Broadway, New York.

Woodworking Machinery of all kinds. The Bentel & Margedant Co., 116 Fourth St., Hamilton, O.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

Concrete patents for sale. E. L. Ransome, S. F., Cal.

The Knowles Steam Pump Works, 44 Washington St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

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

Complete Practical Machinist, embracing lathe work, vise work, drills and drilling, taps and dies, hardening and tempering, the making and use of tools, tool grinding, marking out work, etc. By Joshua Rose. Illustrated by 356 engravings. Thirteenth edition, thoroughly revised and in great part rewritten. In one volume, 12mo, 439 pages. \$2.50. For sale by Munn & Co., 361 Broadway, New York.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

Wrinkles and Recipes. Compiled from the SCIENTIFIC AMERICAN. A collection of practical suggestions, processes, and directions, for the Mechanic, Engineer, Farmer, and Housekeeper. With a Color Tempering Scale, and numerous wood engravings. Revised by Prof. Thurston and Vander Weyde, and Engineers Buel and Rose. 12mo, cloth, \$2.00. For sale by Munn & Co., 361 Broadway, New York.

Timber Gaining Machine. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Send for catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

Iron, Steel, and Copper Drop Forgings of every description. Billings & Spencer Co., Hartford, Conn.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Curtis Pressure Regulator and Steam Trap. See p. 142.

Universal & Independent 2 Jaw Chucks for brass work, both box & round body. Cushman Chuck Co., Hartford, Ct.

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

60,000 Emerson's 1886 Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Hoisting Engines, Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., 112 Liberty St., New York.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

"How to Keep Boilers Clean." Send your address for free 88 page book. Jas. C. Hotchkiss, 93 John St., N. Y.

Pays well on Small Investment.—Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusements. 136 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Iron and Steel Wire, Wire Rope, Wire Rope Trampways. Trenton Iron Company, Trenton, N. J.

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

Supplement Catalogue.—Persons in pursuit of information of 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.



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.

(1) F. B.—For safety valve pressure, get the area of the valve by squaring its diameter and multiply by 0.7854. Multiply the whole weight by the leverage, and divide this product by the area. As in your case Area=4.9 square inches,  $\frac{20}{4.9} = 10$ , Whole weight 50 + 15=65 pounds, then 65x10=650 = 132.6 pounds pressure per square inch.

(2) W. B. J.—You may repolish the agate point of your stylus with rouge or crocus on the grain side of a piece of sole leather. Wet the rouge or leather. It will bring up a fine polish in from 15 to 20 minutes. See that the point is not broken or has a sharp corner from fracture, in which case it must be ground on a grindstone to the proper shape and again polished as above.

(3) T. J. H.—Brands on cattle are burnt in and the skin more or less scarified; the hair follicles are injured or destroyed, and there is no way of removing the brand, although when the branding is done on animals quite young it becomes partially overgrown as they get older.

(4) J. W.—Holes in glass plate or windows may be cut with a diamond by making a disk of wood and using it as a guide to the diamond. It requires a delicate touch to make the first cut so a crack will not start outwardly therefrom; but when properly cut, so that the crack can be seen all around the circle, the glass can be gently tapped with a small piece of wood directly under the cut, when the fracture will run through the glass, and follow the tapping all around the circle. When the separation is complete, the center may be gently pushed out. If it should appear to be interlocked or dovetailed, a few cuts across the center will enable you to take it out in pieces.

(5) Y. T. asks whether glass will mix with metals and make a solid composition. A. It will not.

(6) A. F. G. asks: Your last week's issue gave a formula for making soap for scouring woolen goods, embracing as one of its ingredients fatty acid. Would you please let me know what fatty acid is? A. Fatty acids are a component part of fats; to supply these acids in soap making, fats are generally employed, and the alkali used appropriates the fatty acid by chemical reaction and combines with it, forming soap.

(7) R. B. B. desires a recipe for making mocking bird food. A. Mix together two parts corn meal, 2 parts pea meal, and 1 part moss meal; add a little melted lard, but not sufficient to make the mixture too greasy, and sweeten with molasses. Fry in a frying pan for half an hour, stirring constantly, and taking care not to let it burn; this makes it keep well. Put it in a covered jar.

(8) H. A. D. wishes to know where he can obtain mushroom spawn, and also desires directions for cultivating the mushroom. A. Mushroom spawn is sold in the form of what are called "bricks," and may be obtained of any large seed house, such, for example, as that of P. B. Henderson & Co. or of J. M. Thorburn & Co., of this city. A very complete and valuable illustrated article, giving directions for cultivating the mushroom, either for family use or the market, may be found in SCIENTIFIC AMERICAN SUPPLEMENT, No 178.

(9) J. S. B. writes: Will you please explain how cut glass table ware is made? A. Ordinary pressed glass is cut on wheels and polished.

(10) A. S. asks what to line a wooden tank with, which will withstand the action of nitric and sulphuric acids. A. Cover the inside with paraffine; go over the inside with a sadiron heated to the temperature used in ironing clothes. Melt the paraffine under the iron so as to drive it into the wood as much as possible, then with a cooler iron melt on a coat thick enough to completely cover the wood.

(11) J. W. P.—For brassing small articles: To 1 quart water add half an ounce each of sulphate copper and protochloride of tin. Stir the articles in the solution until the desired color is obtained. Use the sulphate of copper alone for a copper color.

(12) O. F. B. desires (1) recipe for making stove blacking. A. Take of black lead pulverized 1 pound, turpentine 1 gill, water 1 gill, sugar 1 ounce. 2. A recipe for cleaning isinglass. A. Micas may be cleaned by taking them out and thoroughly washing with vinegar, a little diluted. If the black does not come off at once, let it soak a little.

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 unequalled 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,

January 4, 1887,

AND EACH BEARING THAT DATE.

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

Advertising device, automatic, L. F. Wetzel.	355,578
Air with hydrocarbon vapor, apparatus for impregnating, G. Daimler.	355,574
Alarm. See Electric alarm.	
Andron, F. R. Sneidersticker.	355,563
Animal releasing device, D. Edleman.	355,306
Ant trap, Wise & Rountree.	355,366
Awning, window, T. L. Barlow.	355,370
Axle, car, W. J. Murray.	355,463
Axle, wagon, W. Findeisen.	355,908
Baby charmer, protector, and dental cutter, J. M. B. Price.	355,663
Bag. See Tobacco bag.	
Banjo, F. W. Danner.	355,696
Banjo, Post & Danke.	355,387
Barrel cover, E. Bridge.	355,374
Basin, stationary wash, J. Demarest.	355,439
Beer, etc., apparatus for raising, J. Morel.	355,619
Beer forcing apparatus, J. Natter.	355,464
Belt, driving, J. Kinder.	355,458
Belt gearing, reversing, H. E. Smith.	355,562
Belt stretching machine, B. M. Plummer.	355,479
Bicycle, F. W. Brown.	355,375
Bit. See Gag bit.	
Board. See Plaiting board.	
Boiler. See Steam boiler.	
Bolt. See Flour bolt.	
Book support, J. Danner.	355,511
Boot or shoe heel, Stucker & Neu.	355,483
Boots or shoes, attaching heels to the soles of, F. F. Raymond, 2d.	355,556
Boots or shoes, inner sole for, S. F. Whittlesey.	355,428
Boots or shoes, shank creasing and coloring machine for, P. P. Sherry.	355,566
Boring, shaping, and sawing machine, J. M. Nash.	355,550
Bottle stopper, C. De Quillfeldt.	355,642
Box. See Music box. Paper box. Pitman box. Watch movement box.	
Box stuff, machine for making, T. Sands.	355,557
Bracket. See Cornice pole bracket.	
Brake. See Car brake. Vehicle brake.	
Brake shoe, F. L. Sheppard.	355,477
Brick kiln, S. P. Crafts.	355,387
Brush extractor, S. Maxim.	355,460
Bullet, A. T. Loyd.	355,653
Bustle, T. P. Taylor.	355,573
Button, R. Elsdon.	355,601
Button, Sanders & Moreau.	355,342
Cable hanger, G. L. Wiley.	355,491 to 355,498
Camera stand, G. H. Read.	355,418
Capping, decapping, and crimping implement, F. C. Washburn.	355,362
Car brake, Carson & Guarganus.	355,505
Car brake, E. H. Meigs.	355,654
Car coupling, Hart & Gaghan.	355,524
Car coupling, J. C. Johnston.	355,612
Car coupling, King & Worley.	355,401
Car coupling, A. Nutting.	355,657