

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

"Wrinkles and Recipes" is the best practical Handbook for Mechanics and Engineers. Hundreds of valuable trade suggestions, prepared expressly by celebrated experts and by correspondents of the "Scientific American." 250 pages. Elegantly bound and illustrated. A splendid Christmas gift for workmen and apprentices. Mailed, post paid, for \$1.50. Address H. N. Munn, Publisher, P. O. Box 772, New York City.

All Split-Pulleys weighing over 50 Pounds at the same finished price as Whole-Pulleys. J. Yocom's Foundries, Drinker St., below 147 N. 2d St., Philadelphia, Pa. Valuable Patent for Sale. Address Box 124, Manchester, N. H.

For Sale—State and County Rights for an excellent Patent Wash Boiler. Address, for further information, F. G. Mackill, Richmond, Fort Bend Co., Texas.

Hearing Restored—A great invention by one who was deaf for 20 years. Send stamp for particulars to Jno. Garmore, Lock-box 80, Madison, Ind.

H. A.—The Brighton Gas Engine, made by Ready Motor Co., 34 Cliff St., N. Y., will probably answer your purpose.

A Valuable Patent for Sale, Territory U. S.—Address Charles E. Canan, Richmond, Union Co., Ohio, P. O. Box 406.

Designing Belt Gearing. By E. J. C. Welch. 12mo, 16 pp., price 20 cents. Send stamp for Catalogue of Scientific Books. E. & F. N. Spon, 446 Broome St., N. Y.

"Geo. P. Rowell & Co. are the largest advertising agents in the world."—Journal and Recorder, West Meriden, Conn. "The success of this firm is truly wonderful, and yet not so, either, when we take into consideration their honorable manner of transacting business. We truly wish that all of our foreign advertising might come through them, as it would be a saving to the advertiser and advantageous to ourselves."—Journal, Adams, N. Y.

Notice—Advertisement of Special Sale of Westcott's Patent Chuck. R. E. State, Springfield, Ohio.

See 1/4 of valuable tobacco patent for sale, in our advertising columns.

The attention of those interested is called to the Varnishes of the London Manufacturing Co. For durability and finish, they are unequalled. 246 Grand Street, New York.

Sewing Machine Patent for Sale—Will either receive proposals for making on Royalty, or a partner with Capital to place it on the market. Address George W. Hoffman, Fielding Station, DeKalb Co., Ill.

Amateurs and Artizans, see advertisement, page 413. Fleetwood Scroll Saw, Trump Bros., Manufacturers, Wilmington, Del.

We want a Die Sinker, one experienced in Drop Forging. Steady work and good pay. The Hull & Beldea Company, Danbury, Conn.

For Sale—2nd hand Portable Engines, thoroughly repaired, 4 H.P., \$300; 8 H.P., \$350; 10 H.P., \$400; 15 H.P., \$450; 18 H.P., \$750; and brand new 5 H.P., \$375. Shearman & Hilles, 45 Cortlandt St., New York

For a Self-Acting Trap, to rid out all Rat and Animal Creation, address John Dineen, Limestoneville, Montour Co., Pa.

Wanted—The best Mill Machine. Send full particulars to F. C. Tucker, 384 W. 32d St., New York.

Hotchkiss Air Spring Forge Hammer, best in the market. Prices low. D. Friable & Co., New Haven, Ct.

A Bargain—A set of Scientific American, from Vol. 3, Old Series, to Vol. 21, New Series—1847 to 1869—33 Vols., well bound, for \$80. Address A. F. R., Box 773, N. Y.

Williamson's Tannate of Soda removes and prevents Scale in Boilers. 25 lb. boxes, 25 cents per pound, C. O. D. D. D. Williamson, 268 West St., New York.

Water, Gas and Steam Goods—Send eight stamps or Catalogue, containing over 400 illustrations, to Bailey, Farrell & Co., Pittsburgh, Pa.

For automatic Twist Drill Grinding Machines, address C. Van Haag & Co., Philadelphia, Pa.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U. S. A.

Electric Burglar Alarms and Private House Annunciators; Call, Servants' & Stable Bells; Cheap Telegraphs; Batteries of all kinds. G. W. Stockly, Cleveland, O.

Single, Double, and Triple Tenoning Machines of superior construction. Martin Buck, Lebanon, N. H.

Gothic Furnace, for coal and wood, heats houses & churches. Send for book. A. M. Lesley, 226 W. 23d St., N. Y.

For best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay, Brooklyn, N. Y.

For Solid Wrought-Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph & c.

Hotchkiss & Ball, Meriden, Conn., Foundrymen and workers of sheet metal. Fine Gray Iron Castings to order. Job work solicited.

For Sale—Second Hand Wood Working Machinery. D. J. Lattimore, 31st & Chestnut St., Phila., Pa.

Price only \$3.50.—The Tom Thumb Electric Telegraph. A compact working Telegraph Apparatus, for sending messages, making magnets, the electric light, giving alarms, and various other purposes. Can be put in operation by any lad. Includes battery, key, and wires. Neatly packed and sent to all parts of the world on receipt of price. F. C. Beach & Co., 246 Canal St., New York.

Peck's Patent Drop Press. Still the best in use. Address Milo Peck, New Haven, Conn.

All Fruit-can Tools, Ferracete Wks., Bridgeton, N. J.

American Metaline Co., 61 Warren St., N. Y. City.

Genuine Concord Axles—Brown, Fisherville, N. H.

For Solid Emery Wheels and Machinery, send to the Union Stone Co., Boston, Mass., for circular.

Faugh's Patent Round Braided Belting—The Best thing out—Manufactured only by C. W. Army, 118 North 3d St., Philadelphia, Pa. Send for Circular.

For best Bolt Cutter, at greatly reduced prices, address H. B. Brown & Co., New Haven Conn.

Diamond Tools—J. Dickinson, 64 Nassau St., N. Y.

Magic Lanterns and Stereopticons of all sizes and prices. Views illustrating every subject for Parlor Amusement and Public Exhibitions. Pays well on small investments, 72 Page Catalogue free. McAllister, 49 Nassau St., New York.

Temples and Oilcans. Draper, Hopedale, Mass.

The "Scientific American" Office, New York, is fitted with the Miniature Electric Telegraph. By touching little buttons on the desks of the managers, signals are sent to persons in the various departments of the establishment. Cheap and effective. Splendid for shops, offices, dwellings. Works for any distance. Price \$6, with good Battery. F. C. Beach & Co., 246 Canal St., New York, Mass. Send for free Illustrated Catalogue.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon, 470 Grand Street, New York.

Spinning Rings of a Superior Quality—Whitinsville Spinning Ring Co., Whitinsville, Mass.

Solid Emery Vulcanite Wheels—The Original Solid Emery Wheel—other kinds imitations and inferior. Caution—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

The Baxter Engine—A 48 Page Pamphlet, containing detail drawings of all parts and full particulars, now ready, and will be mailed gratis. W. D. Russell, 18 Park Place, New York.



H. M. D. will find directions for making a fireproof artificial stone on p. 113, vol. 24.—M. H. can fasten emery to wood by the method for emery and iron, described on p. 363, vol. 33.—H. J. will find directions for making nitro-glycerin, dynamite, etc., on p. 212, vol. 33.—H. F. S. can brown his gun barrels by using the recipe given on p. 11, vol. 32.—F. F. will find a recipe for stove blacking on p. 57, vol. 25.—T. should French polish his pianoforte work. See p. 11, vol. 22.—M. H. K. will find a recipe for white fusible metal on p. 374, vol. 32. The process of repairing desilvered mirrors is described on p. 346, vol. 25.—S. N. will find directions for staining glass on p. 390, vol. 30; for etching glass, on p. 379, vol. 33.—H. A. S. will find directions for making clarified cider on p. 204, vol. 33; for preserving cider, on p. 139, vol. 33.—S. & B. will find on p. 139, vol. 32, directions for making paste that will probably answer their purpose. As to State laws regulating the sale of patents, see p. 187, vol. 33.—S. T. S. can mold rubber by following the directions on p. 233, vol. 29.—W. T. can clean shells by the method described on p. 122, vol. 27.—H. D. M. will find a recipe for Babbitt metal on p. 26, vol. 33.—C. B. will find directions for silvering glass on p. 340, vol. 33. Full directions for nickel plating have frequently been published in these columns. See pp. 155, 235, vol. 33. This also answers E. J. C.—R. R. M. can make a mold, for use on type, of plaster of Paris. The metal that is lightest in water is the lightest out of water.—B. H. C. will find full directions for putting a white enamel on iron on p. 362, vol. 32. This also answers A. F.—C. S. F. will find an account of the oleomargarin process on p. 23, vol. 32.—P. D. R. can fasten rubber to iron by the method given on p. 42, vol. 33, for leather. A good recipe for paste that will keep is published on p. 219, vol. 30.—D. G. F. will find a description of the phosphorus lamp on p. 10, vol. 27.—V. can read the inscriptions on coins by following the directions on p. 246, vol. 26.—H. G. W. will find directions for making spongy platinum on p. 330, vol. 25.—H. N. M. can cement glass to brass by the method described on p. 1, vol. 33.

(1) N. S. asks: How can I unite the mercury in a thermometer which has become separated by agitation? A. Fasten a string 3 or 4 feet long to the instrument, and swing it round your head. The centrifugal force will cause the mercury to unite.

(2) R. F. L. asks: How can I stick leather on the face of iron and wood pulleys? A. Glue the leather to the wooden pulley. Paint the iron pulley with a good coat of white lead in oil, and let it dry; then glue the leather on.

(3) L. B. asks: What is black rosin, and is it known by any other name? A. Black rosin is also called colophony, and is the residue left after the distillation of turpentine.

(4) H. J. M. asks: How can I get a white metal that will flow perfectly into an iron or brass mold, and which, when turned out, will stay bright? A. Melt together 4 1/2 lbs. of tin, 1/2 lb. bismuth, 1/2 lb. antimony, and 1/2 lb. lead. This alloy fuses at a low temperature and does not tarnish.

Can the color be taken out of horsehair, so as to make it white? A. Wash in weak lye, and fumigate with the vapor of burning sulphur (sulphurous acid).

(5) G. G. B. asks: What do pattern makers use to blacken their patterns with? A. Lamp black mixed with copal varnish and alcohol.

(6) J. N. J. asks: Why do iron and steel weld with less heat than without borax? A. The use of borax is as a flux, to make the steel heat evenly, and to prevent the corners or edges from burning before the rest of the metal is of the proper heat.

(7) M. D. F. asks: How can chilled iron be drilled? A. By hardening the drill in mercury instead of water.

(8) C. R. asks: What pressure per square inch is required to crush pieces of ice together so as to form one clear homogeneous mass? A. Consult Professor Tyndall on "Forms of Water."

(9) J. H. asks: In what quantity, and at what intervals, should quinine be taken as a remedy for chills and fever? A. In many cases two grain doses are recommended to be taken before each meal, whenever an attack of chills is anticipated.

(10) E. C. & Co. ask: Would it be beneficial to soft maple lumber, for building a large friction pulley, to boil it in olive oil? A. Yes. 2. Would it harden the timber, and make it less liable to split? A. Yes. 3. Would the gear slip more after such treatment? A. Yes.

(11) H. A. S. asks: How is bromide of camphor made? A. Triturate the camphor first with a drop or two of dilute spirits of wine, and then digest with bromine water. The bromine unites with the camphor to form an unstable bromide of camphor, which is crystalline, and is decomposed by heat, by contact with air, and by action of ammonia.

(12) D. C. G. asks: Is there any preparation of phosphorus, either fluid or dry, that is luminous in the dark when hermetically sealed? A. A full description of the phosphorus lamp will be found on p. 289, vol. 33. It consists of a strong solution of phosphorus in olive oil. The solution is kept in a small, glass, stoppered bottle, and when required for use the cork is removed and the solution agitated.

(13) W. J. H. asks: What would be the difference between suspending a weight (that works such machinery as clockwork) direct, and hanging the same weight around a pulley attached to weight? Would there be any difference in effect upon the train of wheels, providing the amount of pressure on drum (not the weights) were same in both cases? A. Neglecting friction and rigidity of cordage, if the weight required in the second arrangement were 100 lbs., that in the first need only be 50 lbs.

(14) T. D. W. If two persons are in a top wagon, about 500 lbs. weight rests upon the two axles, which are as stiff as they are usually made. Now if the axles can be made 2 1/2 times as stiff, how many lbs. will the change take away from the load drawn by the horse? A. The question is rather indefinite, but we do not imagine that there would be much difference in the two cases.

(15) C. P. asks: How many lbs. strain will there be on a rope which has a horse at each end, pulling in opposite directions, supposing each horse to be pulling 1,000 lbs.? A. One thousand lbs. This question is anything but new. See p. 186, vol. 24.

(16) M. E. asks: Is centrifugal force of a wheel in motion a radial or a tangential one? A. Radial, as we understand your question, that is, in the direction of a radius.

(17) J. G. says, in answer to N. K. B.'s query as to the area of a polygon: If A be the area of the circle and P the perimeter of the regular polygon, the area of the latter is

P * sqrt(A^2 - P^4) / (31416 * 4n^2) being the number of sides which must be given. If these be given, A and P, as before, and B, the area of the regular polygon, the number of sides = (A - 4B^2) / (2 * sqrt(A^2 - P^4))

(18) S. says, in reply to W. J. E., who is troubled with dreams: If you abstain from sleeping on your back you will not dream. It is very rare that a person who is not laying on his back dreams.

(19) L. C. Jr. says, in reply to H. J. E., who asked how to apply wax to stove patterns: As the stove plates of to-day are more or less ornamented with designs, having well defined depressions or elevations, the casting must be heated till it is hot enough to melt the beeswax and not burn it. Then apply the wax by rubbing it here and there over the surface of the plate; a small quantity only is required. After which, and while the wax is in a liquid form, give the casting a thorough brushing with a new shoe brush; this will spread the wax uniformly over the entire surface and at the same time remove all the surplus wax. Then allow the casting to cool, and, with a second shoe brush, give it a thorough brushing, and you will have a surface to your pattern that will give you a mold with as sharp corners as your pattern.

(20) W. J. R. says, in answer to T. D.'s inquiries as to compound gears: I judge from T. D.'s list of gears and pitch of lead screw that he has got a Pratt & Whitney lathe, which, unlike most other lathes, has, on the inside gear on the stud, double the number of teeth that the cone gear has. Therefore, with gears on stud and screws having the same number, the revolutions of cone and screw will be as 2 to 1, and the pitch of lead screw is made practically 16 instead of 8. The SCIENTIFIC AMERICAN'S rule will work by counting the screw as 16. The following index is useful for T. D.'s lathe:

Table with columns: Thread, Stud, Screw, Thread, Stud, Screw. It lists gear combinations for a lathe, such as 'Thread 2, Stud 3, Screw 4' and 'Thread 4, Stud 112, Screw 28'.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On Screw Cutting Gears. By R. H. B.
On the New Force. By H. M. P.
On Solar Heat. By W. L. S.
On the Contraction Policy. By F. A. L.
On Reissues of Patents. By G. E. B.
On the Hydro-Pneumatic Puzzle. By M. P., by C. M., and by N. B. J.
On Spiritualism. By E. P. M., and by F. G. F.
On the Orbit of the Sun. By J. S.
On Making Rifles. By B.
On Poisons. By H. S. W.
On Carbonic Acid Gas. By C. W. S.
On Oceanic Currents. By T. L.
On Electric Whistles. By L. S. W.
On Chemical Action. By E. V.
On a Dioptric Light. By C. G., and by W. C. G.

Also inquiries and answers from the following:

- I.—G. W. P., Jr.—T. B.—J. M.—A. J. B.—A. C.—G.
E. C. S.—S. H.—S. R. H.—C. S. D.—S. E. H.—F. S. B
—A. R.—H. A.—J. G. S.—C. A. P.—C. L.—A. C. R.—
J. A. W.—E. E. E.—R. B.—J. Q. R. H.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells alligator leather? Who makes an engine run by burning crude oil in the cylinder? Who makes the best gas meter? Whose is the best process for preserving shingles? Who sells papier mache cornices and centerpieces for ceilings? Who makes reflecting drawing boards and other drawing apparatus? Who sells phosphor-bronze? Who sells haircloth for pressing cider?" All such personal inquiries are printed, as will be observed in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were

Granted in the Week Ending

November 16, 1875.

AND EACH BEARING THAT DATE.

(Those marked (r) are reissued patents.)

Large index table listing various inventions and their patent numbers, such as 'Alarm, door, Spoor & Searle... 170,408', 'Alarm etc., low water, T. Hass... 170,261', 'Amalgamator, Bancroft & Walker... 170,320', etc.

Table listing various patent items and their associated numbers, starting with 'Detergent, J. W. Munger' and ending with 'Scales, weighing, W. W. Reynolds.'

Continuation of the patent list, starting with 'Scoop, sifting, W. S. Boon' and ending with 'Wrench pipe, D. P. Stanton.'

Table listing 'DESIGNS PATENTED' with details such as 'WATCH KEYS', 'BOXES', 'SETTEES', etc., and their respective numbers.

Advertisement for 'SCIENCE RECORD For 1876.' Includes an illustration of the record book and text describing its content and availability.

Main advertisement for 'SCIENTIFIC AMERICAN' magazine. Features the title in a decorative font, 'For 1876', and extensive text regarding subscriptions, content, and contact information for MUNN & CO.

Advertisement for 'Munn & Co.'s Patent Offices.' Emphasizes being 'Established 1846' and 'The Oldest Agency for Soliciting Patents in the United States.' Details services and contact info.

Advertisement for 'THE SCIENTIFIC AMERICAN SUPPLEMENT 1876.' Features a large decorative title, an illustration of a cityscape, and text describing the supplement's content and subscription details.