

(9) R. R. W. writes: I am told by practical men and of experience that hardening tools in oil, such as sledges, hammers, chisels, and picks, is proof against cracking. Please tell me the kind of oil used and the process of so doing. A. Much depends upon the selection of the steel and the treatment it receives in welding as to its final condition in hardening. Steel for sledges, hammers, and picks should be of low grade, and not the highest for chisels. If careful attention is given to hardening at the very lowest heat possible, it will insure freedom from cracks even with water. You can harden at a higher heat with oil than with water with safety and that gives a preference to oil with many. The best oil is "pure winter strained lard," although many compounds of lard, fish, and mineral oils are used for cheapness. Heat slowly in a charcoal fire and dip, moving the article horizontally fast enough to free the surface of vapor bubbles, especially in hammers.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

S. B. A.—A is quartz rock with mica. B is a chloritic gneiss, holding iron pyrites, and probably contains gold and silver. An assay of both would be advisable.—J. E. G.—It is a very pure kaolin or china clay, and very valuable to manufacturers of porcelain; its value is about \$40.00 per ton in New York city.—J. L.—No. 1 is what is termed an iron sand, and composed of magnetite and menaccanite, garnet rock, and quartz. The two first are black, the garnet yellow or red, and the quartz white. No. 2 is an ordinary micaceous clay of little value.—J. W. B.—A clay slate, holding iron pyrites, possibly containing gold or silver. An assay would be advisable.

COMMUNICATIONS RECEIVED.

A Sure Preventive of Chicken Cholera, by W. H. G. Comet, by C. H. C.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

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

December 12, 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 1866, 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 various inventions and their patent numbers, including items like 'Acid, manufacture of sulphuric, E. Haworth', 'Advertising wagon, J. S. Goldsmith', 'Air, compensating reservoir for compressed, C. L. Beers', etc.

Table listing various inventions and their patent numbers, including items like 'Carburetor, A. W. Lacy', 'Carpet lining, F. P. French', 'Chain carrier, G. Gowen', etc.

Table listing various inventions and their patent numbers, including items like 'Pump, W. Sellers', 'Pump, B. C. Vanduzen', 'Pump, air, W. Stanley, Jr.', etc.

Window shades, device for exhibiting, measuring, and cutting, C. Cregmile..... 269,158
 Wire stretcher, O. M. Pond..... 268,984
 Wrench. See Pipe wrench. Hatchet wrench. Tap wrench.
 Wrench, B. Donohue..... 268,784
 Wrench, J. Lee..... 269,073

DESIGNS.

Chair, H. J. Schmehl..... 13,478
 Table ware, M. Redon..... 13,477
 Type, font of printing, J. Graham..... 13,475
 Type, font of printing, C. H. Beeler, Jr..... 13,474
 Type, font of printing, H. Ihlenburg..... 13,476

TRADE MARKS.

Cigars, M. Strasser & Co..... 9,868
 Cigars, smoking and chewing tobacco, cigarettes, and snuff, M. Strasser & Co..... 9,867
 Hairpins, Kirby, Beard & Co..... 9,862
 Liniment, pipe, Janes & Tibbetts..... 9,861
 Liquors, malt, W. McEwan..... 9,863 to 9,865
 Medical preparation, certain, A. H. Vordick..... 9,870
 Remedy for Bright's disease, H. H. Warner..... 9,871
 Salve, M. M. Smith..... 9,866
 Tobacco, plug or fine-cut chewing, Union Tobacco Works..... 9,869

English Patents Issued to Americans.

From November 21 to December 1, 1882, inclusive.
 Breech-loading guns, W. Gardner, Hartford, Conn.
 Button fastener, F. A. Smith, Jr., Providence, R. I.
 Button fastener, J. Weidenmann et al., New York city.
 Button fastener, J. Mathison, Lynn, Mass.
 Conductors for electrical currents, F. K. Fitch, New York city.
 Electricity, generating, V. W. Blanchard, New York city.
 Electric wire, R. S. Waring, Pittsburg, Pa.
 Furnace and steam engine, V. W. Blanchard, New York city.
 Grain drier, F. W. Wiesebrook, New York city.
 Grain elevator, I. Smith, Kansas City, Mo.
 Ladies' dress bodice forms, C. I. Haley, New York city.
 Magnetic wearing apparel, S. A. B. Wilson, Boston, Mass.
 Washing apparatus, N. Pigeon, New York city.
 Metallic packing, L. Katzenstein, New York city.
 Motor, carbonic acid gas, A. Gateau, Chicago, Ill.
 Nail, W. Taylor, Pittsburg, Pa.
 Nails, manufacture of ornamental, C. E. Bailey et al., Providence, R. I.
 Opera glass, W. Mack, Terre Haute, Ind.
 Shears, G. S. Van Pelt, New York city.
 Stone, artificial, W. Matt et al., New York city.
 Sugar and cane shredders, J. Parker, New York city.
 Tablets, method of making, W. Doughtie, Cleveland, O.
 Telegraph, railway train, R. M. Hunter, Philadelphia, Pa.
 Telephonic apparatus, J. H. Rogers, Washington, D. C.
 Tobacco, preparation of, E. Howard, Gasport, N. Y.
 Tongs, R. W. Turner, Boston, Mass.
 Toys, J. N. Gifford, Jr., Fairhaven, Mass.
 Tramway, A. S. Halladie, San Francisco, Cal.
 Wheels and axles for vehicles, B. N. Shelley, Anderson, Ind.
 Wire, manufacture of, H. Roberts, Pittsburg, Pa.

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 RIDER COMPRESSION PUMPING ENGINE
 (Hot Air) for city or country residences where it is required to raise a supply of water. Is the most Perfect Pumping Machine in the market. Its marvelous Simplicity, absolute Safety, great Economy and Effectiveness, render it far superior to all others. Can be run by any inexperienced person. Send for catalogue and price list to
CAMMEYER & SAYER,
 93 Liberty St., New York,
 and 20 W. Lake St., Chicago, Ill.
 Please mention this Paper.

PLATINUM,
 FOR
Scientific and Mechanical Purposes.
 Imported and for sale by
THE S. S. WHITE DENTAL MFG CO.
 PHILADELPHIA, Chestnut St., cor. Twelfth.
 NEW YORK, - - - 767 and 769 Broadway.
 BOSTON, - - - 160 Tremont Street.
 CHICAGO, - - - 13 and 14 E. Madison St.

SUPERIORITY PROVED
 THE SIMPLEST & BEST SEWING MACHINE IS THE
LIGHT - RUNNING -
NEW HOME
 Perfect in every particular. 200,000 sold yearly.
NEW HOME SEWING MACHINE CO.,
 30 Union Square, N. Y.
 Chicago, Ills., Orange, Mass., or Atlanta, Ga.

VALUABLE PATENTS FOR SALE.
 My interest in **MARTIN BRICK MACHINE PATENTS**, No. 138,754, No. 150,065, issued to Henry Martin, one-half interest assigned to me. Address **W. C. McCLALLAN**, Springfield, Mass.

SEND TO **LONDON BERRY & ORTON**
 PHILA PA FOR
THE BEST BAND SAW BLADE

MACHINISTS' TOOLS.
 NEW AND IMPROVED PATTERNS.
 Send for new illustrated catalogue.
Lathes, Planers, Drills, &c.
NEW HAVEN MANUFACTURING CO.,
 New Haven, Conn.

THE AMERICAN PEERLESS DICTIONARY AND Information for Everybody.
 A BOOK THAT SHOULD BE IN EVERY HOUSE.
 OVER 50,000 WORDS. 542 PAGES.
 After years of labor, and the expenditure of a large sum of money in writing and compiling, you are now ready to offer THE MOST USEFUL BOOK IN THE WORLD to the press, teachers, and professional people throughout the country. It is the BOOK OF BOOKS. It contains upwards of 50,000 WORDS, with their definition and pronunciation, according to Webster and other recognized authorities. A large number of additional words and definitions in general use. NOT TO BE FOUND IN ANY OTHER DICTIONARY; a large collection of Words, Phrases, Proverbs and Quotations from the Greek, Latin and Modern Languages; a list of Abbreviations used in ART, SCIENCE AND LITERATURE. Population of Towns and Cities in the United States and other interesting statistics taken from the census reports of 1880. Incidents, Assignments and Homestead Laws; American Wars; the Dominion of Canada; History of the United States from its discovery to the inauguration of Chester A. Arthur as President, and hundreds of other items of interest are to be found within the covers of this ENCYCLOPEDIA OF USEFUL KNOWLEDGE. It contains a mass of information for everybody. This book is handsomely bound in cloth, and embossed in GOLD, containing 542 PAGES PROFUSELY ILLUSTRATED. We propose to send you one of these valuable books, by mail, all charges prepaid, on receipt of only ONE DOLLAR. We provide this A REPLY TO YOUR ORDER, and that you agree to exhibit it to your friends after receiving it. We further agree, if your order is received on or before MAY 15, 1883, to REPLY TO YOUR ORDER, and to send you a GOLD ON THE COVER OF THE BOOK (as shown in engraving where John Smith's name is). No other reliable firm ever made so handsome an offer as this one. A more APPROPRIATE PRESENT I could not be made to any friend, either lady or gentleman than this book. Order as soon as you can and avoid the great rush through the holidays. Our 22 page Catalogue free. In ordering state Name on THE COVER IN GOLD! Address
H. C. WILKINSON & CO., Publishers, 195 & 197 Fulton St., New York.

The above offer of H. C. WILKINSON & Co., will not be made again to our readers. All should take advantage of it before it is too late. In ordering mention our Paper.

ESTABLISHED 1844.
J. C. TODD,
ENGINEER AND MACHINIST.
 Flax, Hemp, Jute, Rope, Oakum, and Bagging Machinery, Steam Engines, Boilers, etc. Sole agent for Mayher's New Patent Acme Steam Engine and Force Pump combined. Also owner and exclusive manufacturer of
The New Baxter Patent Portable Steam Engine.
 These engines are admirably adapted to all kinds of light power for driving printing presses, pumping water, sawing wood, grinding coffee, ginning cotton, and all kinds of agricultural and mechanical purposes, and are furnished at the following low prices:
 1 Horse Power, \$150. | 1 1/2 Horse Power, \$190.
 2 Horse Power, 245. | 2 1/2 Horse Power, 275.
 3 Horse Power, 290. | 4 Horse Power, 350.
 Send for descriptive circular. Address
J. C. TODD, Paterson, N. J.,
 Or No. 10 Barclay St., New York.

GENTLEMAN'S POCKET KNIFE.
 SPECIAL OFFER: To introduce new goods and secure agents at once, we will send this elegant hand-ful, pocket knife, with 25 articles of our best-selling goods and holiday edition of "Scientific American," for 75c, stamps to pay postage, packing, etc. It is our last offer, for 30 days. L. S. HIGGINS, 112 Broadway, New York.

MOSS ENGRAVING COMPANY
 LARGEST ESTABLISHMENT OF THE KIND IN THE WORLD. SUPERIOR TO ANY OTHER METHOD.
 ENGRAVINGS FOR BOOKS, NEWSPAPERS, CATALOGUES &c. THIRTEEN YEARS PRACTICAL EXPERIENCE.
 SEND GREEN STAMP FOR ILLUSTRATED CIRCULAR.

NEW YORK BELTING AND PACKING COMP'Y.
 The Oldest and Largest Manufacturers of the Original **SOLID VULCANITE EMERY WHEELS.**
 All other kinds imitations and inferior. Our name is stamped in full upon all our standard BELTING, PACKING, and HOSE.
 Address **NEW YORK BELTING AND PACKING CO.,**
JOHN H. CHEEVER, Treas., 29 PARK ROW, NEW YORK.
SPECIAL NOTICE.
 Owing to the recent great fire in the "World" Building, our office has been removed as above.

AUTOMATIC DAMPER REGULATORS AND WEIGHTED COCKS.
 In extensive and successful use by the best concerns in the country. They have no equals. Liberal discounts to the trade. Send for Circulars and Price Lists. **MURKILL & KRUEGER,** 29, 30, 32 Holiday Street, Baltimore, Md.

ROCK BREAKERS AND ORE CRUSHERS.
 We manufacture and supply at short notice and lowest rates, Stone and Ore Crushers containing the invent in described in Letter Patent, issued to E. H. W. Blake June 15th, 1858, together with New and VALUABLE IMPROVEMENTS, for which Letters Patent were granted May 11th and July 20th, 1880 to Mr. S. L. Marsden. Crushers supplied by us are constructed under the superintendence of Mr. Marsden, who, for the past fifteen years, has been connected with the manufacture of Blake Crushers in this country and England.
FARREL FOUNDRY AND MACHINE CO., Manufs., Ansonia, Conn.
COPELAND & BACON, Agents, New York.

ICE MAKING MACHINES,
 And Machines for Cooling Breweries, Pork Packing Establishments, Cold Storage Warehouses, Hospitals, etc.
 SEND FOR ILLUSTRATED AND DESCRIPTIVE CIRCULARS.
PICTET ARTIFICIAL ICE CO. (Limited),
 P. O. Box 3083. 142 Greenwich St., New York City, N. Y.

CONTINENTAL WORKS, BROOKLYN, N. Y.
DU'S MECHANICAL ATOMIZER OR PULVERIZER,
 For reducing to an impalpable powder all kinds of hard and brittle substances, such as QUARTZ, EMERY, CORUNDUM, GOLD AND SILVER ORES, BARYTES, COAL PHOSPHATE ROCK, etc. It is simple and not liable to get out of order, revolving shell being constructed of Siemens-Martin steel, and all parts mechanical in design and of first-class construction. Weight, 5,500 lb.; heaviest piece, 1,500 lb. It will pulverize 7 TO 10 TONS IN TEN HOURS with 30 H.P. For circulars and full particulars, apply to our address
THOS. F. ROWLAND, Sole Manuf'g, Brooklyn, N. Y.

WATCHMAKERS.
 Before buying lathes, see the "Whitcomb," made by AMERICAN WATCH TOOL CO., Waltham, Mass.
Model Engines.
 Complete sets of CASTINGS for making small Model Steam Engines 1-2 in. bore, 3/16 in. stroke, price, \$4 ditto 2 in. bore, 4 in. stroke, price, \$10 same style as cut; Gear Wheels and Parts of Models. All kinds of Small Tools and Materials. Catalogue Free. **GODNOW & WIGHTMAN,** 176 Washington Street, Boston, Mass.
VERTICAL ENGINES
 THE BEST IN THE MARKET AT REASONABLE PRICES MANUFACTURED BY **PHOENIX FOUNDRY & MACHINE CO. SYRACUSE, N.Y.**
VOLNEY W. MASON & CO.,
FRICTION PULLEYS, CLUTCHES, and ELEVATORS,
 PROVIDENCE, R. I.

J. A. FAY & CO.
 Cincinnati, Ohio, U.S.A.
WOOD WORKING MACHINERY
 embracing nearly 300 different tools for arsenals, Navy Yards, Car Shops, Bridge Works, Saw and Planing Mills, Door, Sash, Furniture, Piano & Organ factories &c including Sawing, Planing, Molding, Milling, Denoning, Shaping, Polishing, etc. of the highest standard of Excellence and warranted the most labor saving of any in use.
 W. H. George, President. D. L. Lyon, Secy.

PAT. KEY SEAT CUTTER
 WILL CUT 100 SEATS 4 1/2 X 3 1/2 INCH PER DAY
 OTHER SIZES IN PROPORTION
 VOL. 45, NO. 3, 181
TREVOR & CO. LOCKPORT, N.Y.

DEAFENING
 FIRE AND VERMIN PROOF
 Sample and Circular Free by mail.
U. S. MINERAL WOOL CO., 22 Courtlandt St., N. Y.

Screw Sash Balances.
 3 Sizes. Valuable improvements added in 1882. Work Automatically on the edges of the Sash. Look out for a fraud imitation having the date of Nov. 9, 1877, copied from one of my patents.) Send for Circulars and Price Lists to
Robt. B. Hugunin, the only Authorized maker, Hartford, Conn., U. S. A.

FEED WATER PURIFIER
 FOR STEAM BOILERS
 U.S. & FOREIGN PATENTS
LARGE TOOLS WANTED.
 30 ft. Pit Lathes; also, large Planer, 6 or 7 feet square, to plane at least 24 feet. Send prices and quickest delivery.
M. C. BULLOCK MAN'G CO.,
 80 to 88 Market St., Chicago, Ill.

PATENT GEAR DRESSING MACHINE
 AND IMPROVED LATHES PLANERS & DRILLS.
 G. W. GLEASON, ROCHESTER, N.Y.

Intelligent Mill Operators in every State in America Use
Van Deuzen's Patent Steam Jet Pump.
 Guaranteed superior to any other Jet Pump for practical service. For raising water from Wells, Ponds, or Streams, or to use with hose and nozzle for Fire Pump, it has no equal. All Brass, no valves, no moving parts. Warranted reliable and satisfactory. Ten Sizes - \$7.50, \$10.50, etc., and capacities 300 to 20,000 gallons per hour. Send for "Catalogue No. 49."
VAN DEUZEN & TIFT, Cincinnati, O.

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

MALLEABLE AND FINE GRAY IRON ALSO STEEL CASTINGS FROM SPECIAL PATTERNS
THOMAS DEVLIN & CO.,
 LEHIGH AVE. & AMERICAN ST. PHILA.

STEMWINDING Permutation Lock, No. 125. For use on Till, Desk, Drawer, or Closet. Instantly locked; unlocked in a few seconds; constructed upon new and improved principles. Owner may use either 1, 2, 3 or 4 of its 50 numbers. Millions of changes equally possible and easy. Security unrivaled. Simple, durable, nickel plated. Send \$2.50 for sample by mail, or stamp for Illustrated List of Locks, Tills, and Padlocks. **D. K. MILLER Lock Co., Philadelphia, Pa.**

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.