

HANDLES FOR AWLS, ETC.—D. R. Wight, Sturbridge, Mass.—This invention relates to a new improvement in the construction of handles for awls, and other similar tools.

STEAM ENGINE VALVE.—W. R. Thomas, and Thomas Evans, Cataquanqua, Pa.—This invention consists in operating two piston valves on one rod, in a cylindrical steam chest by arms on the piston rod of the engine.

STAVE SAWING MACHINE.—William R. Bishop, and Oriel D. Bishop, Harrison, Wis.—This invention relates to a machine for sawing staves for barrels and other articles of a similar construction.

APPARATUS FOR REGULATING THE POSITION AND MOVEMENT OF THE ARMS OF VIOLIN PLAYERS.—Edward Mullenbauer, New York city.—This invention relates to a device for attaching to the person of a violin player for the purpose of regulating the position and movement of the arms when playing on that instrument.

CURTAIN CORD FASTENING.—Thomas Curley, Troy, N. Y.—This invention has for its object to furnish a more simple, cheap, and convenient fastening for window shades or curtains, than has hitherto been in use.

SHOE KNIFE.—N. M. Ray, Ellsworth, Me.—This invention consists in securing to the end of the knife blade a detachable cap, or guard, whereby the upper leather of a boot or shoe is secured from injury in the process of paring the sole.

FIRE-CRACKER PISTOL.—J. W. Bailey, New Orleans, La.—This invention relates to a device for applying the present popular breech-loading principle to the explosion of fire crackers, whereby the accidents which not unfrequently happen from such explosions are avoided.

GANG PLOW.—John L. Casor, Laconia, N. H.—This invention has for its object to furnish an improved gang plow, simple in construction, easy of adjustment, and which at the same time will be held securely and loosely when at work.

TELEGRAPH INSULATOR.—J. L. Finn, Elyria, Ohio.—This invention consists of an improved telegraph insulator and lightning arrester, and its objects are to provide a more effectual mode of insulating telegraph wires, and to collect and arrest the free electricity pervading the wires, and convey it harmlessly into the ground.

IRON HEATER.—S. W. Smith, Addison, Vt.—This invention consists in combining and arranging circular plates of such form as to leave a chamber between them for the flat irons, and so that while the irons are heating they are excluded from the atmosphere, and no part but the handles exposed.

WATER HEATER.—John Marshall, Hartland, Mich.—The object of this invention is to provide simple and efficient means for heating water or other liquids, in wooden vessels, for washing clothes or other purposes, and it consists in producing a circulation of water between the tub, barrel, or other vessel, and an annular heater by a divided tube.

AIR BRAKE FOR CARS.—Auguste De Bergue, Paris, France.—The object of this invention is to arrest the motion of railway cars by the resistance offered to the steam pistons by compressed air, or the friction of ordinary brakes actuated by compressed air. The invention consists in providing an admit or air passage for admitting air to the piston when the latter is in motion, whereby the air is drawn into the cylinder at each stroke of the piston, and forced into a reservoir where it accumulating tension finally absorbs the momentum of the train by acting against the pistons at each stroke of the latter.

INSTRUMENT FOR MEASURING DISTANCE.—George Achells and Hermann Poppenhusen, New York city.—This invention is designed for the use of artists and students of nature and art, to enable them to transfer to a drawing approximate proportions and distances of objects in a landscape with greater accuracy than is possible with the unaided observation of the eye.

SADDLE AND HARNESS.—R. M. La Rue, Andersonville, Ind.—This invention relates to an improvement in saddles and harnesses, and consists in having a small drum or ratchet to which the crupper or other strap is fastened.

MEAT BROILER.—Lewis Holmes, Keene, N. H.—This invention relates to a new and improved method of constructing broilers for the broiling of meat, whereby the same is more quickly done, without the escaping of unpleasant odors into the room.

CHURN.—Henry C. Bell, He, worth, Ill.—This invention has for its object to furnish an improved churn, simple in construction, easily operated, and which will develop all the butter that may be in the milk in a very short time.

BROOM HANDLE LATHE.—Edwin Williams, Rowlesburgh, W. Va.—This invention has for its object to improve the construction of Peter Prescott's broom-handle lathe, patented Oct. 8, 1861, so as to make it more satisfactory and effective in operation.

LAP JOINT FOR BELTING.—Henry Underwood, New York city.—The object of this invention is to furnish an improved lap joint by the use of which a belt of nearly uniform thickness and strength may be produced, and at the same time the amount of stock used may be economized.

SEWING MACHINE.—Dr. W. St. G. Elliott, Morristown, N. J.—The improvements in sewing machines embraced in this invention principally consist, first, in so arranging a feed mechanism and applying it to the sewing machine in proper position to act upon the cloth or other material being sewed, that such feed can be readily brought into position for feeding the cloth or other material to be sewed in any direction or along any line desired, and without requiring the machine to be stopped. Second, in so arranging a frame or carriage for the shuttle or under thread carrier that it can be slid across the plane of movement of the needle, whereby it can be adapted in position for any of the under thread carriers.

CULTIVATOR AND SEEDER.—Lewis Bishop Talladega, Ala.—This invention consists in the adaptation of springs to the wheels of cultivators, whereby the inequalities of the soil will be passed over with facility, and other devices tending to perform in a more perfect manner the operations of seeding, planting, and chopping out cotton stalks.

BREAD MAKING MACHINE.—Marcus A. Jones, Frankfort, Ky.—This invention consists of a pair of rollers operating within a tray which covers a chest of sliding bottoms, the successive withdrawal of which accomplishes the manipulation of the dough and leaves it in the pans ready for the oven.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$1 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

B. F. W., of Tenn.—The specimen which you sent to this office is not an "ore," as you think, but a variety of clay very strongly impregnated with the red (hydrated) oxide of iron. The other chemical components are chiefly silica and alumina. Though useless as an ore this substance is perhaps applicable as a coloring material.

W. A. E. R., of Ohio.—"Does the sun's light reach the earth's atmosphere in one beam?" The sun's light consists of rays which are emitted from its surface in all directions. A number of these rays which, to all intents and purposes, are parallel, is called a beam. If they are so far apart that they cease to be practically parallel we cannot speak of them as being in one beam. You will perceive that the term "beam" is therefore to a certain degree conventional and does not denote a fixed number of rays.

S. M. W., of N. Y.—The cocoa nut oil or cocoa butter is extracted from the kernels of the cocoanut. The natives of Ceylon and Madagascar gain it either directly by pressure or by boiling the kernels in water and skimming the oil off as it rises to the surface. In Europe heat and pressure are likewise resorted to, and the consistency of the oil—which is a mixture of a fluid and a solid fat—varies as these elements in its production.

A. J. F., of Vt.—We suppose that the best process for converting cast iron into steel in your instance is that of "case hardening," which consists in heating the articles to a bright red heat and then sprinkling them with finely powdered ferrocyanide of potash or soda. We are not aware of any difficulty in the way of converting cast iron into steel because the former has been chilled before the operation.

F. B., of Pa.—The only purification to which plumbago is usually subjected is pulverization and washing with water to separate it from its grosser and heavier impurities. We are not aware of any particular machines having been devised for this process.

J. H. C., of N. Y., propounds the old question: "Why is it that earth taken from a hole with pick and bar will not fill it when returned, when slightly tamped?" One reason is that the tamping, however "slight" it may appear to the observer, may still be sufficient to render the earth more compact than it was before excavation. Beside this, it is well known that the ground is always moist on account of the water which circulates through it; when a portion of it is removed and exposed to the atmosphere this water evaporates and causes a shrinkage of the original volume.

E. J., of Rockville.—Load stones are never used now-a-days for the production of magnets; electro-magnetism is now generally used for this purpose. The bar to be magnetized is armed with a piece of soft iron on each end and placed for a short time into the interior of an electro-magnetic helix, wound up on pasteboard, while an electric current passes through it at the same time. The details of this and of other processes for making magnets, can be found in any larger treatise on electricity. As regards the prices you had better address yourself directly to some firm dealing in these articles.

E. O. McC.—"Why do drills become magnetized?" We are unable to say. It is well known that the drills used in an upright boring machine acquire the property of magnetic attraction sooner than those used on a horizontal lathe. Fire irons, as tongs, shovels, poker, etc., also acquire the property in time. The reason why, is yet among other inexplicable mysteries.

J. S. W., of N. C.—"The best way of keeping furs and undressed hides during the summer months?" Carbolic acid preparations are probably the best. A company in this city manufacture an article expressly for this purpose.

Inquirer.—"Please explain how it is that the radical of ammonia can be an element." We are not aware that this radical has ever been considered an element by any chemist.

W. C. P., of Pa.—"How much does a bar of railroad iron expand during the heat of summer, and how far apart should the rails be laid to allow for contraction and expansion by the differing temperature of the atmosphere?" One mile of rail will expand or contract between the temperatures of 4° Fah. and 100° Fah., 67 inches, according to Silliman. From this datum our correspondent can easily calculate the expansion of a single rail of 18 feet length. For more specific information he had better apply to some section contractor, as the condition of the road—whether passing through forests and deep cuts, or over exposed plains—materially alters the circumstances.

G. S., of —.—See page 183 of current volume in the answer to "J. F. G., of Ohio," for a reply to your question as to the preparation of canvas for painting. Read the paper weekly and it will save you the trouble of repeating such inquiries.

L. G. G., of N. C., wants some information as to the injurious effects of burning oak instead of pine wood in a stove. He is told oak is destructive to the iron. All, or nearly all, woods yield an acid by destructive distillation or slow combustion; oak and other hard woods more than pine. This acid is injurious to iron, corroding it rapidly, especially if the wood be green. If well seasoned and the stove has a good draft no difficulty need be apprehended.

W. D. H., of La., asks how to restore linseed and nut oils after they have become thick and gummy. Perhaps some of our correspondents can answer.

W. H. G., of Pa., desires to know the melting point of the composition known as Babbitt metal. We cannot tell, but it may be melted like lead in an ordinary iron ladle over an open fire. He asks also if there is a better anti-friction metal. There is, and it is known as the "Star Metal," and manufactured by the Star Metal Co., 55 Liberty street, New York city. "What substance beside oil is used as a lubricant?" The stern post bearings of propellers are lubricated with water; soapy water or water in which soda has been dissolved is often used in machine shops.

G. A. C., of Mass.—"Is there a metal or metallic composition which contracts by heat? What metal expands the least and what the most?" We know of no combination of metals which contract by heat. A composition of lead, 9; antimony, 2; bismuth, 1, expands in cooling. Platinum is the least expansive of the metals and zinc the most.

J. S., of Conn., answers the question of "F. S. B.," on page 183, current volume: "What proportion of water should be used in mixing plaster of paris so that no shrinkage results in setting." He says: "Any proportion will prevent shrinkage, as it invariably swells or expands in setting. Different qualities of plaster expand in differing degrees. T. H. C., of Mass., also replies. He says that plaster expands while setting and for some time after. If "F. S. B.," will use lime water to mix his plaster he will not be troubled either with expansion or shrinkage. Sulphate of potash will have the same effect used in the proportion of about half an ounce to a quart of water. It makes it set quicker, but somewhat weakens it.

F. R., of N. Y., whose question in regard to white gunpowder appeared in No. 12, current volume, is answered by a correspondent who says that it is composed of chlorate of potash, 49 parts; ferro-cyanide of potassium, 28 parts; refined sugar, good quality, 23 parts. They should be pulverized and kept separate, and are mixed by sifting the ingredients together. It may be grained like common gunpowder, but the process is always attended with danger. Its explosive force is about five times that of common gunpowder. Its transportation or handling is dangerous.

A. F. T., of Wis.—In reply to your query on page 183, current volume, in relation to indelible pencil marks, W. C. D. of D. C., says: "Wet the paper on which pencil marks have been made with milk or saliva and when dry they cannot be removed with rubber."

J. F., of Pa., desires to know how to melt a fragment of flint glass. Put the fragment (small), on a ring or loop made of iron, or better, of platinum wire, and direct upon it the flame of a spirit lamp or gas burner by means of the blowpipe.

E. M. T., of Ky.—"What is the best mode for producing the electrical light?" Sending a powerful current of electricity through two carbon poles as arranged in electrical lamps, the best of which are those of French construction. You will find full information on the subject of inquiry in every treatise on Physics, which is not of the most elementary kind.

An anonymous correspondent inquires: "After a very cold snap, one in the deep woods will hear the frequent cracking of trees. This is observable only after the weather has begun to moderate and before it reaches the thawing point. Why is this?" The cause is the contraction and subsequent re-expansion of the interior of the trees caused by the changes of temperature. "When I open the door on a cold frosty morning, the steam of the room is suddenly condensed and appears as fog rushing in from the door. Explain the reason." Hot air can take up more moisture than cold air if it is saturated with steam and cooled off by the admission of air from without, part of the water which was held in suspension is precipitated and appears as fog.

M. G., of Mich.—A party is manufacturing light flat barrel hoops. It is desirable to have them less liable to split in driving. Is there any cheap substance suitable for the purpose? We suppose that hoops (wooden), steamed before driving or kept under water, will preserve their toughness.

H. O. R., of Idaho.—"Why does a cup of tea retain its heat better than coffee? What are their boiling points, respectively?" We are not aware of the truth of your statement. The boiling point of a solution or extract, like tea or coffee, varies with the amount dissolved. The material of the cups affects the rapidity with which their contents cool off; tin cups retain the heat longer than those of porcelain.

G. S. C., of N. J., asks how the wheels of railroad cars act on curves, the wheels, as is well known, being rigidly secured to their axles. To prevent the wheel that runs on the inner rail from slipping too much the faces or treads of the wheels are made slightly convex, the larger diameter being nearest the rim or flange and the rails being made convex on their face.

G. A., of Pa.—"What is the meaning of upward in giving numbers; for instance, 'four hundred and upward,' or, 'upward or four hundred?'" Both mean the same; upward, more, or above four hundred. Such grammatical questions are somewhat out of place in our columns but we admit the queries and give the answer once for all.

W. A. H., of Tenn.—"If your 'gum' or rubber belt slips on the pulley it should be lightly moistened on the side next the pulley with boiled linseed oil—animal oil will not answer. If one application does not do the business, repeat. Very likely your belts are too slack. It is not economy of power, as you think, to run a loose belt. Would you hitch your oxen or horses to a plow the traces of which alternate contracted and expanded? The flap of your favorite loose belt is the same thing. Do your duty by your belts and they will return you a proportionate amount of service."

B. F. S., of Vt.—"Is there a cement that will mend a marble gravestone which is broken?" Yes; plaster of paris mixed with water to the consistency of cream.

Business and Personal.

The charge for insertion under this head is one dollar a line.

There are now in actual operation eight thousand of Ashcroft's Low-Water Detectors. John Ashcroft, 50 John St., New York.

Henry Carey Baird, Industrial Publisher, 406 Walnut st., Philadelphia, has just issued a new and much enlarged descriptive Catalogue of Practical and Scientific Books, 56 pages, 8vo, now the largest list of this character, comprising only the Publications of any one house in either the United States or Great Britain. It will be sent free of postage to any one who will favor him with his address. Every reader of the Scientific American is invited to send for it.

Coal-oil Works, revolving retorts and refinery, lately erected, for sale. Address, on the premises, John White, Darlington, Beaver Co., Pa., or C. G. Waterbury, 116 Wall st., New York.

\$2,500 will buy one-half interest in a business that will pay fifteen thousand dollars a year. Address Steam Mill, Belair, Ga.

Agents wanted. Sample 35c. Smith, Shepard & Co., P. O. Box 867, Waterbury, Conn.

Two Valuable Patents for sale—one for a Fertilizer, and the other for Harness Wardrobe. Address H. E. Pond, Franklin, Mass.

Bartlett's Reversible Sewing Machines are the cheapest reliable Machines. Bartlett Machine and Needle Depot 569 Broadway, N. Y.

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

For Patent Engine Lathes and Upright Drills, Planer Centers, Lathe Chucks, Planer Chucks, and all kinds of Cutlery Machinery address Thomas Iron Works, Worcester, Mass.

Dutton & Maguire Tube Wells.—Patented in 1865. Illustrated in Scientific American of Aug. 17th, 1867. Unsurpassed by any other well. Works in any place, and where all others have failed. The subscribers are prepared to sell Town, County, and State Rights, or to furnish wells ready to put down, with printed instructions for putting down. Township Rights from \$15 to \$30, according to size, population, etc. Single wells supplied at a small advance on cost of material. Model furnished to parties purchasing County or State Rights. Send for a circular. Address all communications to Dutton & Maguire, Port Jervis, N. Y.

Incrustations of Boilers removed and prevented by Winans' Boiler Powder. (11 Wall st., N. Y.), 12 years in use, no injury, no foaming.

To insure the safety of your steam boilers, property, and life, apply Ashcroft's Low-water detector. John Ashcroft, 50 John st., N. Y.

Parties having patents of established value for sale, not patented in Europe, will please address D. Miles, 95 Water street, Boston, Mass.

The patent ribbed surface shingle is being universally adopted. Machines, with full rights to make and sell this valuable improvement, can be rented or leased, per agreement. Full particulars, with sample, sent free. Address F. A. Luckenbach, sole assignee, Philadelphia, Pa.

Don't fool away your time trying to get a cork out of a bottle with a string, when Waterman's patent cork extractor is so cheap. It takes a cork out in an instant. Private families, doctors, apothecaries, beer establishments, and barrooms is where they are in demand. Send 60c. for sample. State Rights for sale. Cork screw and spring all combined. Direct to Wm. G. Waterman, Middletown, Conn., Box 1388.

Portable Picket Fence.—Persons desiring to sell or manufacture a new and practical invention in Fences, are referred to the advertisement of H. A. Stewart in another column.

NEW PUBLICATIONS.

THE PRACTICAL STAIR BUILDER. By C. Edward Loth, Troy, N. Y. A. J. Bicknell, publisher, 292 River street, Troy.

This treatise is a very handsome large quarto volume of over 150 pages. Illustrated with thirty original plates, and adapted not only to architect stair builders, and carpenters, but to students of Geometry. Being the production of a practical man it is less burdened with abstruse problems which are Greek to the uninitiated, than many text books professing to teach. We cordially commend it to the learner and the practical workman.

THE MODERN PRACTICE OF PHOTOGRAPHY is the title of a little book by R. W. Thomas. Published by H. C. Baird, Philadelphia, Pa. Price 75 cents.

ATLANTIC MONTHLY—April Ticknor & Field, Boston. \$4 a year; single numbers 50c. May be had at the periodical stores.

THE NEW ECLECTIC.—The fourth (April) number of this new magazine is just out. Turnbull & Murdoch, publishers, Baltimore. Price \$4 per annum; specimen copies 25c.

PUBLIC SPIRIT.—The publisher, Le Grand Benedict, 37 Park Row, New York, calls his publication a monthly magazine for the million. The cover is very red, and its contents are very good, and we hope he will get his million of subscribers. It may be had of all news dealers for 25 cents a number.

THE BROADWAY MAGAZINE for March, published by Routledge, at 416 Broome street, contains a number of interesting articles among them one by George Augustus Sala, an Englishman and former correspondent of the *London Times*, who describes, somewhat ironically, the "pleasures and pains" of "Trotting and Sleighing in New York."