

QUARTZ CRUSHER AND PULVERIZER.—Benj. Babbitt, New York city.—This invention relates to a device for crushing and pulverizing quartz, and it consists of a series of crushers arranged on the toggle principle, and provided at one end with elastic or yielding bearings, where by the crushers are allowed to yield or give in case of coming in contact with any hard, foreign substance, such as spikes, or other metal articles, and the crushers prevented from being injured or broken thereby.

TOILET ATTACHMENT FOR BUREAUS.—Henry W. Eastman, Baltimore, Md.—This invention is a neat and ornamental attachment for bureaus which serves the purpose of a support for holding and adjusting the mirror, while it furnishes a convenient receptacle for combs, brushes, perfumery, etc., etc.

BALE TIE.—J. H. Goöch, Cheraw, S. C.—This invention relates to that class of bale ties in which the ends of the hoop are secured in a single slotted plate and consists in so forming the slots and tongues of the plate that the hoop can be more easily attached and fastened than by any other tie, and that when once fastened it cannot be untied, and will not be liable to fracture.

FRUIT AND GRAIN DRYER.—Solon L. Cheyney, Wooster, Ohio.—In this invention the fruit is dried in an oven by means of a current of hot air caused to flow over it from a heater beneath. The peculiar construction of the apparatus, by which the current is properly directed and its heat utilized to the fullest extent, constitutes the main feature of the invention.

DRAY SADDLE.—John O'Mahoney, Savannah, Ga.—This invention consists in a novel construction of the saddle whereby it may be made to conform to the shape of the back of the horse, and a very durable saddle of the kind scarcely obtained, and one which will not chafe or injure the horse in the least.

TIRE SHRINKER.—John Macy, Pine P. O., Oregon.—This invention relates to a device for shrinking tires, and it consists in the employment or use of a fixed bed provided with a fixed and an adjustable flange in connection with a fixed and an adjustable clamp, whereby tires of different widths may be contracted or shrunk with the greatest facility and in a perfect manner.

SCOOP AND SCREEN.—Augustus Thayer, Albany, N. Y.—This invention relates to a combined scoop and screen, whereby the device by a very simple adjustment may be used in either capacity, as desired.

HELIOMETER.—Conrad Friedrich L. Risch, Huntingburg, Ind.—This invention relates to an apparatus of very simple construction for observing and ascertaining the effects of the sun's rays upon the earth. By the use of this invention the exact degree of latitude at which an observation is made can be ascertained. Also by the aid of a suitable guide book, the date at which the observation is made, as well as the time of day, and the angle formed by the rays of the sun at noon of each day upon the level or water line.

FLEXIBLE GAS TUBING.—E. L. Perry, New York city.—This invention consists in outer flexible tubes of vulcanized rubber provided with one or more interior tubes of strong paper, the latter joined together by gum, glue, or other suitable substance which will make an impervious seam, the rubber to be being rolled up around the paper tube and the edges joined together in the usual manner, enveloping the said paper tube and serving as a protection to it, the latter being impervious to gas preventing the escape of the same.

DRYING APPARATUS.—F. I. Norton, Fremont, Ohio.—This invention consists in an arrangement of steam pipes within a suitable building, whereby the steam is conveyed around the interior of said building in any desired manner on the floor of the same by pipes, the said conveying pipes being provided with vertically projecting pipes having small orifices in their tops through which a very small jet of steam is allowed to escape, the jets or other article to be dried being set on the said vertical pipes so that they discharge the steam into the holes through the same.

ANIMAL TRAP.—William J. Woodside, Zanesville, Ohio.—This invention has for its object to furnish an improved self-setting trap, simple in construction, not liable to get out of order, and effective in operation, instantly killing the animal that springs the trap.

SPRING BED BOTTOM.—Charles Walker, Chester, Vt.—This invention has for the object to furnish a neat, simple, durable, convenient and elastic bed bottom, and one which can be easily and quickly put up or taken down.

PAN FOR CONCENTRATING SULPHURIC ACID.—P. Marcellin and J. Saunders, Greenpoint, N. Y.—This invention consists in providing the pans with elongated, downward-extending spouts which reach from the upper part of that pan to which they are attached, to close above the bottom of the next pan below, so as to carry the lighter, impure contents of the upper pan to the bottom of the lower pan, and to thus create a complete circulation.

ROLLS FOR COTTON AND WOOLEN MACHINERY.—Francis Crague and Geo. G. Crague, Lewiston, Me.—This invention relates to an improvement in machinery for the manufacture of cotton and woolen goods, whereby an important saving in the expense is secured.

OSCILLATING OR VARIABLE ECCENTRIC MOTION.—Timothy Keeler and Geo. S. A very, Danbury, Conn.—This invention relates to an improvement in applying the eccentric motion to various purposes, whereby the uses to which the eccentric motion is adapted are greatly increased.

FEATHER DUSTER.—M. A. Goodenough, New York city.—The object of this invention is to so construct a feather duster that the center of the brush shall be filled up with feathers of a less expensive quality than those used for the outside of the brush, and still make the brush elastic, more durable and useful than the ordinary kind.

FELLY DOWEL PIN.—O. D. Tyler, Gibson, Pa.—This invention relates to an improvement in dowel pins for fellys of wheels, and consists in forming it of a metal to be or thimble.

BASE OF ARTIFICIAL TEETH, ETC.—John A. McClelland, Louisville, Ky.—This invention relates to the composition and preparation of a new and improved material for the base of artificial teeth, and for other purposes in the arts.

ANIMAL POWER.—Jos. J. Adgate, Liberty, N. Y.—This invention relates to an improvement in machinery for utilizing the power of horses and other animals, whereby the same is more simple in construction and more effective in operation.

EXCAVATING VEHICLE.—James P. Smith, Cherry Hill, Pa.—This invention relates to a vehicle or self-loading wagon which may be used for excavating the earth in the process of grading, or in moving earth from one place to another.

DISINTEGRATOR FOR GOLD MINING PURPOSES.—Jerome B. Cox, San Francisco, Cal.—This invention relates to a method of separating gold from the cement or other material with which such metal may be combined.

MEDICAL COMPOUND.—John Bender, Lonaconing, Md.—This invention and discovery has reference to a composition formed of various ingredients known to the medical faculty, and which composition or compound is intended as a "tonic elixir," or cure for certain diseases, as dyspepsia and diseases of the stomach and bowels.

FLOW LANDSIDE.—Jerome Bacon, Medina, Wis.—This invention has reference to an improvement in plows, and especially to the manner of constructing the landside, whereby it is made adjustable and rendered much more durable than the ordinary kind.

DOUBLE SHOVEL PLOW.—Andrew J. Cragg, Ashmore, Ill.—This invention has for its object to furnish an improved double-shovel plow, so constructed as to be easily adjusted to run at a greater or less depth in the ground, or so that one plow may run deep while the other runs shallow, and to which the whiffletree or doubletree may be readily and quickly attached.

BRACE FOR CARRIAGE AND OTHER SPRINGS.—L. C. Miller, Humphrey, N. Y.—This invention has for its object to furnish an improved brace for springs for carriages, railroad cars, locomotives, spring seats, and wherever elliptic or half-elliptic springs are used, which shall be so constructed that it will hold the spring always perpendicular to the plane of the wagon, and which will protect the springs from any wrench or twist.

DISTILLING APPARATUS.—Jane Riley, Cincinnati, Ohio.—This invention relates to a new apparatus, to be put upon a still, for condensing and separating the various grades of spirits, and consists chiefly in such a construction of the condenser and water distributor that, without the use of a worm, and without requiring large quantities of water, the desired results may be quickly obtained.

PAN FOR CONCENTRATING SULPHURIC ACID.—Paul Marcellin and Joseph Saunders, Greenpoint, N. Y.—This invention relates to a new pan to be used in furnaces for concentrating sulphuric acid, and consists in arranging a partition across the pan, which reaches nearly to the bottom of the same, and which causes the lower settled portions of the acid to flow out of the pan.

CHANGEABLE COMBINATION LOCK.—Wm. D. Field, Providence, R. I.—This invention relates to a new changeable combination lock, which is so arranged that it can be applied to doors, and that it can be changed without inconvenience by simply removing the inner plate.

FOLDING BEDSTED OR CRIB.—R. S. Titcomb, Gloversville, N. Y.—This invention has for its object to improve the construction of the improved bedstead or crib, patented by the same inventor Dec. 17, 1867, so as to make it more strong, durable, and convenient.

PLOW.—Wm. Gallagher, Shullsburg, Wis.—This invention has for its object to furnish an improved sulky plow or plows, which shall be simple in construction, strong and durable, and which will do more and better work with a less outlay of power than any of the plows now in common use.

ANIMAL TRAP.—A. J. Adams and Boyd P. Quincy, Portland, Oregon.—This invention consists in providing the extremities of a circular or spring with hooks, and extending them apart by means of a device for mounting them as set.

WEEDING HOE.—Andrew Coleman, Red Bank, N. J.—This invention relates to a new and improved form for pointed weeding hoes, and consists in forming the plate for the hoe of corrugated sections, formed by striking up a pointed plate by means of dies, to the form shown, which is a succession of pointed arches, each having a V-shaped section.

MAGIC LANTERN.—L. J. Marcy, Newport, R. I.—This invention relates to the construction of the body or box of magic and signal lanterns, and consists of forming the same with an inner and outer shell with an air space between, whereby the body of the lantern may be made much smaller than were heretofore made, without becoming unduly heated. Other devices, perfecting the whole, render this an improvement on the magic lantern, as heretofore made.

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 in *formal* 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 00 a line, under the head of "Business and Personal."

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

J. A. D., of Mo.—We know of no sure antidote for the sulphur of coal when used in iron working. It is said, however, that a solution of salt or sal ammoniac sprinkled on the coal before use, greatly mitigates the evil.

M. C., of Ga.—Soluble glass may be made by fusing ordinary glass with about one tenth of dry carbonate of soda. Both materials should be powdered and intimately mixed before putting them in the crucible. Soluble glass is an article of commerce and you can purchase it of excellent quality.

J. R. S., of N. Y.—Kane's Chemistry is right and you are wrong, for chloride of silver is soluble in ammonia. It dissolves more readily in cyanide of potassium and hyposulphite of soda. A good way to reduce the silver from the chloride is to place lumps of zinc in a thin paste of the chloride and water. The action is much more rapid when the paste is acidulated with sulphuric acid.

S. G. T., of O.—The source of carboic acid is coal tar. The acid is separated from the distillate of the tar by means of treatment successively with caustic soda and sulphuric acid.

O. S., of N. Y.—There are great practical difficulties in the electro-deposition of iron and nickel, and no process is yet known which is satisfactory. Nickel is chiefly used as an ingredient of German silver.

S. S. C., of Ga.—You can get fine and rare chemicals of Lohme & Co., Lafayette Place, and of many other dealers in New York city.

P. S., of Minn.—Shellac dissolved in alcohol, with or without the admixture of lampblack, is the varnish used on wooden patterns.

E. E., of Ind., asks how to prevent the action of the sulphur contained in his forge coal on iron and steel in welding. The metal runs or drops before it gets to a welding heat. He ought not to attempt the welding of iron with "green" bituminous coal. If he cannot procure charcoal he should coke his coal before using it for this purpose.

E. G. P., of Iowa.—The question who was the original discoverer of chloroform or chloric ether as an anæsthetic has been sufficiently discussed. The subject is dead.

M. P. P., of Mass.—That your tin can when filled with steam and suddenly collapsing by injecting cold water, assumed a hexagonal shape, was simply because in six places the tin happened to be strongest; when you repeat the experiment with tin cans made of various samples of tin you surely will collapse them to a great variety of shapes. It has nothing to do with the hexagonal shape of the snow crystals, which are thus simply because water belongs to a certain system of crystallization; why it does belong to this system and to no other we know about as much as why sulphur is yellow and vermilion red; recent researches, however, indicate that the form of crystallization is intimately connected with the chemical composition or the arrangement and attractive power of the atoms of a body.

R. A. M., of Conn.—The present method of hardening the surface of malleable iron is to make the object red hot, then strew equally on the surface powdered ferrocyanide of potassium (yellow prussiate of potash) and plunge it quickly in cold water. The old method is to take horn, hair, dried blood, sal ammoniac, or other nitrogenized substances, and pack them with the objects to be hardened in a sheet-iron case or box make this box with contents red hot, open it then quickly and throw all in cold water. This is the genuine original case hardening, but has now been abandoned for the use of the ferrocyanide which is manufactured from the above-mentioned nitrogenized substances. The paragraph page 231, relative to converting cast iron into steel, needs correction. Cast iron has an excess of carbon and is converted into steel by the Bessemer process which robs it of a part of this carbon, by blowing air through it, from which it probably also absorbs some nitrogen in its stead. Puddling robs cast iron of all carbon and transforms it into malleable iron.

James Duncan, of Pioneer City, Idaho, is a miner and is willing to pay five hundred dollars for a recipe which will enable him to get the gold out of sulphurets, a specimen of which he sends us, without roasting, etc. It seems to us that this is not a case where recipes will prove useful unless to extract V's from our correspondents' pocket.

G. T., of Pa.—"Is there any metal composition similar in nature to brass, but cheaper, color immaterial?" Common type metal is hard but not tough. Copper, zinc, and lead will make an alloy suitable to your demands, but as copper is costly you must obtain the quality of cheapness by using less of it and more of the others. A few trials will give you the right proportions.

H. W., of Pa.—"The best composition for strengthening the fiber of wood, making it more difficult to split." Kyanized wood is tough, and wood impregnated with copperas becomes harder and more indestructible.

I. B. F., of R. I., is not satisfied with our simple "yes," given page 247, on his question if "in a common pump the water is raised by the muscular force of the operator." He thinks this does not agree with the teachings of the philosophical books who say that it is raised by the pressure of the atmosphere; to this we also answer, yes; but in order to give the atmosphere standing on the surface of the water in the well an opportunity to press the water upward in the tube, the muscular force of the operator must by means of uplitting the piston remove the pressure of the atmosphere on the water inside the tube, therefore it is directly the atmosphere which lifts the water but, of course, indirectly the muscular exertion of the operator, who destroys the equilibrium in the atmospheric pressure outside and inside the tube by applying a lifting power equal to the weight of the column of water under the piston.

Dr. W. F. Q., of Del.—Your theory of the agency of electricity in attracting or repelling atoms of matter is not new, but neither your paper nor the treatises of others who have written on the subject furnish proof of the theory or solve the problem.

A. G. B., of Ind., wishes the opinions of practical carriage makers and users as to the proper diameter of axles for light vehicles running over sandy or muddy roads. Some say the smaller the arm the less the friction; others, the contrary.

W., of N. Y., asks the components of axle grease. Water, 1 gal.; tallow, 3 lbs.; palm oil, 6 lbs.; soda, ½ lb. Heat to 210 Fah., and stir until cool. Tallow, 8 lbs.; palm oil, 10 lbs., and plumbago, 1 lb., make a good lubricator for wagon axles.

S. P. H., of L. I.—This correspondent asks for a description of the process of galvanizing iron. We believe we have answered a similar question before, but as we have had lately several applications for the information we will reply again. Sheet iron, when cleaned by means of sulphuric or hydrochloric acid diluted with water, may be dipped in a bath of melted zinc covered with powdered sal ammoniac, when a thin film of zinc will adhere to the surface. A better and more effectual way is to employ a melted amalgam of 202 parts by weight of mercury and 1-3 of zinc. The iron should be cleaned as before.

C. W., of Ohio.—Partly worn files may be renewed in a degree by standing the files, tang down, in a jar of dilute nitric and sulphuric acid, letting them stand over night.

E. G. P., of Iowa, says that Dr. Samuel Guthrie, of Sackett's Harbor, N. Y., manufactured percussion powder in pill form as early as 1818, and it was used to some extent in the navy for firing cannon. We are aware that Dr. Guthrie's experiments are recorded in the *American Journal of Science* for January, 1832, but Rev. Mr. Forsyth, in 1807, patented a fulminating powder composed of chlorate of potash, sulphur, and charcoal.

B. F. W., of N. Y.—"Why cannot the electric light be used for street lamps and locomotive head lights?" We know of no reason why it may not be adapted to the lighting of streets, but the motion and jar of a locomotive would seem to be an almost insuperable obstacle to its adoption for railway trains.

W. H. P., of Iowa, referring to our reply to "E. O. McC.," on page 281, current volume, says: "It is well known that friction will induce magnetism in steel rods or bars when they are in a position at right angles to the west and east current of electricity. Of course, when upright, they are at right angles with such current, and also when in a horizontal position north and south. When horizontal, east and west, friction will not produce magnetism."

Business and Personal.

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

Patent for sale—the most improved egg beater yet invented. Address the inventor, Wm. N. Angus, Morristown, N. J.

For sale—shop and four lathes for manufacturing spools and pill boxes. Terms easy. M. H. Brown, Potsdam, N. Y.

Wanted—parties to manufacture as mall article made of wood and wire. Address M. N. Lovell, 84 East 8th st., Erie, Pa.

Manufacturers of bells suitable for mounting on farm houses would do well to send cuts and price list to Fred Hertel, Baraboo, Wis.

Olmsted's oilers are the best. Sold everywhere.

For Sale—Eight new portable steam engines, thirty horse-power each, of superior construction. Address Poole & Hunt, Baltimore.

First class lock makers wanted. Address Jones & Nimick Manufacturing Co., Pittsburgh, Pa.

Paper-collar machines and linen bosom, collar, and cuff-plaiting machines, upon improved principles, at W. H. Tolhurst's, cor. Union and Fulton sts., Troy, N. Y.

E. F. Mallory, West Springfield, Pa., wishes to contract for the manufacturing of a quantity of his Patent Burglar Alarms. Anybody can make them. Sample, by mail, \$1.

Globe valves, oil cups, and for all kinds of water, gas, and steam goods, address Bally Farrell & Co., Pittsburgh, Pa.

For Improved Lathe Dogs and Machinists' Clamps, address for Circular, C. W. Le Count, South Norwalk, Conn.

Brick Machine.—Laffer's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Laffer & Co., Albion, Orleans county, N. Y.

Make your patents pay!—J. H. White, Newark, N. J., will make to order, and introduce to the trade, all descriptions of metal small wares, small machines, etc., etc. Also furnish dies and tools for all kinds of metal work.

For improved double and single-roll carding machines, seven roll rubbers, twisters, card grinders, etc., address Union Iron Works, Rhinebeck, N. Y.

Spring-bed bottom—cheapest and best in use. Responsible Agents wanted in each State. Address S. C. Jennings, Wautoma, Wis.

One half of patent right of Wyatt's mode of reefing top gallant sails given for obtaining patent in England. Geo. Hart, New Bedford, Mass.

Mill-stone dressing diamond machine, simple, effective, and durable. Also, Glaziers' diamonds, and for all mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

Paper Makers, Tanners, etc., wanting the Best and Cheapest Pump in use will send for Circular to Heald, Sisco & Co., at Baldwinville N. Y. Agents wanted.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Merriman's patent bolt cutters—best in use. Address, for circulars, etc., H. B. Brown & Co., New Haven, Conn.

Bartlett's machine and needle depot, 569 Broadway, New York. Needles for all machines. Hackle, Gill Pins, etc.

Engineering facts and figures for 1867, mailed on receipt of \$3. John Pennington & Son, 127 S. 7th st., Philadelphia, Pa.