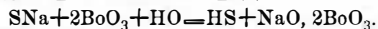


SCIENTIFIC AND PRACTICAL INFORMATION.

NEW METHOD OF MAKING BORAX.

When an alkaline sulphuret is added to an aqueous solution of boracic acid, the water is decomposed; the hydrogen, replacing the metal, forms sulphuretted hydrogen, while the oxygen goes to the metal to form a base, which then combines with the boracic acid thus:



This property may be used in the manufacture of borax from boracic acid. The carbonate of soda heretofore used for this purpose is much more expensive than the sulphuret, since in the manufacture of soda the sulphate is first reduced to the sulphuret which is afterwards converted into the carbonate. By making use of the sulphuret instead of the carbonate, this last and difficult step of the operation is dispensed with. The sulphuretted hydrogen given off may be either employed in the manufacture of sulphuric acid, it being converted into sulphurous acid by burning, or the sulphur itself may be obtained from it by bringing it into contact with sulphurous acid.

LIQUID LENSES.

A new and beautiful lecture experiment has been adopted by Professor Henry Morton, which illustrates very forcibly the action of refraction. A magic lantern is arranged vertically in connection with suitable mirrors to throw the image upon the screen. An empty watch glass is substituted for the usual objective lens. If now we introduce an object, as for example a photograph on glass of course no image will be produced on the screen, but only a nebulous patch of light. On pouring water into the watch glass, however, a well defined image is produced. On replacing the water by alcohol, muriate of tin, or other more highly refracting liquid, a lens of higher power is obtained.

HOUSE BUILDING.

A paper on this subject, read by Edward Roberts, F.S.A., before the Royal Institute of British Architects, closes as follows:

1. Never allow pervious drains in pervious soil.
2. Never allow a cesspool or drain near a well.
3. Never select gravel as a building site if well drained clay can be obtained.
4. Never allow drinking water to be drawn from a cistern supplying a water closet.
5. Never allow waste pipes to be inserted into water closet traps.
6. Never allow rain water to run to the ground, if it is required above.
7. Never allow water to stand in pipes exposed to frost.
8. Never allow pipes to be fixed so that they cannot empty themselves.
9. Never ventilate except by pipes or tubes, inlets and outlets being of equal size.
10. Never use glazed earthenware pipes for upward flues.
11. Never allow chandeliers to be the exclusive light, merely because it has been customary.

INDUSTRIAL EXHIBITION AT NEWARK, N. J.

Arrangements are now being completed for holding an exhibition at Newark, N. J., in August next. The specimens exhibited will be classified as follows: (1) Fine Arts and Education, (2) Dwellings, (3) Dress and Handicrafts, (4) Chemistry and Mineralogy, (5) Engines and Machinery, (6) Inter-communication, (7) Agriculture and Horticulture, (8) Tools and Hardware. No premiums or anything in lieu thereof are to be awarded to exhibitors, and the merits of their productions will thus be pronounced upon by the public solely and wholly. Messrs. Marcus L. Ward, A. M. Holbrook, and Isaac Gaston are respectively the President, Secretary, and Treasurer of the exhibition.

A farmer in Connecticut is said to have contrived an infernal machine for the destruction of crows, in the shape of a kernel of corn which explodes on being picked up by the unsuspecting bird, and blows his "darned eternal head off" without the slightest warning.

Facts for the Ladies.—Louisa Kelley, Ackworth, Ga., has, with the general use of a Wheeler & Wilson Lock-Stitch Sewing Machine, for three years supported a family of four adults and two children, built and paid for a house, and has \$1000 cash on hand. See the new improvements and Woods Lock-Stitch Ripper.

Burnett's Cocoa gives luxuriance to the hair.

The People's Friend.—It is susceptible of easy proof that the Sewing Machine has been a greater blessing to the masses of American people than any invention of the present century. Nothing else has done so much to save the lives and health of the wives and mothers, the patient, overworked women of the land, who, as a class, most needed relief from the burthens of everyday life. Every father and husband fails in his duty if he neglects to endow his home with such a triumph of science as the Wilson Under-Feed Sewing Machine. It is the cheapest and best sewing machine ever offered. Salesroom, 707 Broadway, N. Y.; also for sale in all other cities in the U. S.

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.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4 00 a year. Advertisements 17c. a line.

Wanted—Situation as Book-keeper in some good manufacturing business. Can invest means, if satisfactory. C. S. B., Box 929, Cincinnati, Ohio.

Drying Glue—Wanted an artificial, economical, rapid process, in all weather. Address Glue, P. O. Box 6763, New York.

Rapid Evaporator—Simple, 6 ft. sq., no pumps, no attendance, evaporates 4 gals. a min. at temp. under 175°. Address P. O. Box 6763, N. Y.

Wanted—A first class Sewing Machine Repairer. T. Shanks, Baltimore, Md.

Galvanized Slating Nails, Stove Reservoirs, and Hollow Ware. Address Cleveland Galvanizing Works, Cleveland, Ohio.

Machinery Paint, all shades. Will dry with a fine gloss as soon as put on. \$1 to \$1.50 per gal. New York City Oil Company, Sole Agents, 116 Maiden Lane.

Second hand Iron Planer, to plane 9 feet long, 3 3/4 inches wide—good as new and cheap. Chas. Place & Co., 60 Vesey St., New York.

Wanted—A party to make a wood workers' cast iron vise on royalty for the N. E., Middle and Southern States. No expensive machine work necessary. Crawley & Baylies, Edgartown, Mass.

Moulds for Casting Soft Metals made to order. Die sinking the same. We will take a few small articles to manufacture. Send models and patterns. Guns reamed to order. Waterman & Co., West Meriden, Ct.

A steady mechanic, having some knowledge of pattern-making, wishes to perfect himself in that branch at some good shop in or near this city. Plenty of tools. Wages not an object. Address G. McNamara, 142 Nassau Street, New York.

Wanted—A Good Brass Moulder. A "steady" man can find constant employment by applying to Jas. Flower & Brothers, Detroit, Mich.

Wants to Buy one 4 foot Plane and one 4 foot Screw Cutting Lathe. Defiance Machine Works, Defiance, Ohio.

For Sale—Goodyears' Patent Hub Machine. Will turn 100 Sets Wagon Hubs per day. Defiance Machine Works, Defiance, Ohio.

Wanted—A partner in the Machinist and Foundry business, well established at Minneapolis, Minn. Address Chas. M. Hardenbergh.

Portable Baths. Address Portable Bath Co., Sag Harbor, N. Y.

Verdi Water Mills for Sale, with 400 acres of Land. Address J. A. Beam, Verdi, Kans.

Nickel Plating with or without Battery. Instructions of plating with new and unsurpassed solutions given on moderate terms by a practical plater. Address John Nagel, 83 East 7th Street, New York.

Standard Twist Drills, every size, in lots from one drill to 10,000, at 1/2 manufacturer's price. Sample and circular mailed for 25c. Hamilton E. Towle, 176 Broadway, New York.

The Shive Steam Engine Governor—Guaranteed to be the best in the world. Circulars sent free. Shive Governor Company, 12th and Buttonwood Streets, Philadelphia, Pa.

For the best Foot Power Jig Saw, address Goodnow & Wightman, 28 Cornhill, Boston, Mass.

Dry Steam, dries green lumber in 2 days; tobacco, in 3 hours; and is the best House Furnace. H. G. Bulkley, Patentee, Cleveland, Ohio.

Hexagon Iron—superior quality for screws, &c., 9-16 in. 09 1/2, 3/8 in. 09, 1-16 in. 09, 1/2 in. 08 1/2, 3/8 in. 08, 1 in. 08, per lb. The above is price per bundle; single bars 2 cts. higher. Goodnow & Wightman, 28 Cornhill, Boston, Mass.

For hand fire engines, address Rumsey & Co., Seneca Falls, N. Y.

T. Shaw's Steam Gauges, Ridge av. & Wood st., Phila., Pa.

If you want a perfect motor, buy the Baxter Steam Engine.

Brown's Coal Yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. D. Andrews & Bro., 314 Water st., N. Y.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement, Andrew's Patent, inside page.

For Tri-nitroglycerin, insulated wire, exploders, with pamphlet, as used in the Hoosac Tunnel, send to Geo. M. Mowbray, North Adams, Mass.

All kinds of Presses and Dies. Bliss & Williams, successors to Mays & Bliss, 118 to 122 Plymouth St., Brooklyn. Send for Catalogue.

For Steam Fire Engines, address R. J. Gould, Newark, N. J.

Presses, Dies, and Tinners' Tools. Conor & Mays, late Mays & Bliss, 4 to 8 Water st., opposite Fulton Ferry, Brooklyn, N. Y.

In the Wakefield Earth Closet are combined Health, Cleanliness and Comfort. Send to 36 Dey St., New York, for descriptive pamphlet. Best and Cheapest—The Jones Scale Works, Binghamton, N. Y.

If you want to know all about the Baxter Engine, address Wm. D. Russell, office of the Baxter Steam Engine Co., 18 Park Place, N. Y.

T. Shaw's Blast Gauges, Ridge av. & Wood st., Phila., Pa.

Seeds and Fertilizers. R. H. Allen & Co., New York.

Callow's New Patent Mode of Graining Wood, Makes Painters grain all woods first class who never grained before; Likewise makes Grainers lightning fast who thumbed it out before. Address, with stamp, J. J. Callow, Cleveland, Ohio.

Wanted—A Purchasing Agent in every city and county, to supply Nye's fine Sperm Sewing Machine Oil. Put up in Bottles, Cans, and Barrels, by W. F. Nye, New Bedford, Mass.

Presses, Dies & all can tools. Ferracuta Mch Wks, Bridgeton, N. J. Also 2-Spindle axial Drills, for Castors, Screw and Trunk Pulleys, &c.

The Patna Brand of Page's Patent Lacing is the best. Orders promptly filled by the Page Belting Co., No. 1 Federal St., Boston.

Absolutely the best protection against Fire—Babcock Extinguisher. F. W. Farwell, Secretary, 407 Broadway, New York.

Boiler and Pipe Covering manufactured by the Chalmers Spence Non-Conductor Co. In use in the principal mills and factories. Claims—Economy, Safety, and Durability. Offices and Manufactories, foot E. 9th street, New York, and 1202 N. 2d street, St. Louis, Mo.

Peck's Patent Drop Press. For circulars address the sole manufacturers, Milo, Peck & Co., New Haven, Ct.

"Anti Lamina" will clean and keep clean Steam Boilers. No injury to iron. Five years' use. J. J. Allen, Philadelphia, Pa.

Williamson's Road Steamer and Steam Plow, with Rubber Tires. Address D. D. Williamson, 32 Broadway, N. Y., or Box 1809.

For the best Recording Steam and Indicating Gauges, address The Recording Steam Gauge Co., 91 Liberty Street, New York.

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

Belting as is Belting—Best Philadelphia Oak Tanned. C. W. Army, 301 and 303 Cherry Street, Philadelphia, Pa.

Boynton's Lightning Saws. The genuine \$500 challenge. Will cut five times as fast as an ax. A 6 foot cross cut and buck saw, \$6. E. M. Boynton, 80 Beekman Street, New York, Sole Proprietor.

Hydraulic Jacks and Presses, New or Second Hand, Bought and sold, send for circular to E. Lyon, 470 Grand Street, New York.

T. Shaw's Hydraulic Gauges, Ridge av. & Wood st., Phila., Pa.

Better than the Best—Davis' Patent Recording Steam Gauge Simple and Cheap. New York Steam Gauge Co., 46 Cortlandt St., N. Y.

To Ascertain where there will be a demand for new Machinery, mechanics, or manufacturers' supplies, see Manufacturing News of United States in Boston Commercial Bulletin. Terms \$4.00 a year.

Rights for Sale—Of the only Patent out on Stove Pipe Fitters. Address Wm. Volk, 82 Staats Street, Buffalo, N. Y.

What I know about Machinery, especially Engines, Pumps, and Machinists' Tools, which I sell at 93 Liberty Street, New York. S. N. Hartwell, late agent for L. W. Pond.

The most economical Engine, from 2 to 10 H.P., is the Baxter

Over 800 different style Pumps for Tanners, Paper Makers, Fire Purposes, etc. Send for Catalogue. Rumsey & Co., Seneca Falls, N. Y.

The Baxter Steam Engine is safe, and pays no extra Insurance.

Dickinson's Patent Shaped Diamond Carbon Points and Adjustable Holder for dressing emery wheels, grindstones, etc. See Scientific American, July 24 and Nov. 20, 1869. 64 Nassau St., New York.

Self acting Screen makes 6 grades Coal, ores, &c. A State right at a bargain. Geo. Lord, 232 Arch Street, Philadelphia, Pa.

Important.—Scale in Steam Boilers—We will Remove and prevent Scale in any Steam Boiler or make no charge. Geo. W. Lord, 232 Arch Street, Philadelphia, Pa.

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

- 1.—MORTARS.—What is the size of the largest mortars used in modern warfare?—W. B.
- 2.—VARNISH FOR RUBBER.—Can any one inform me how to make a flexible varnish for rubber, so as to give it a gloss?—W. W. W.
- 3.—POWER OF SCREW DRIVERS.—Can more power be obtained by the use of a long screw driver than of a short one, both having the same sized handles?—W. H.
- 4.—PROPORTIONS OF SAFETY VALVE GEAR.—Can any one give me a clear and concise method of computing the position of weight on the arm of safety valve, all things being proportional?—M. I. C.
- 5.—ELECTRO-SILVERING GERMAN SILVER.—Can some one inform me if silver can be deposited on German silver by electricity, so as to stand annealing at a low red heat without blistering? I have tried it in many ways, but failed, as small blisters almost invariably show themselves.—J. H.
- 6.—PROTECTING COPPER FROM THE ACTION OF MERCURY.—Can any of your readers tell me of any solution that will prevent mercury from adhering to or eating copper? I have tried shellac and copal varnishes, but find them only temporary in their effect.—G. S. D.

Answers to Correspondents.

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 100 a line, under the head of "Business and Personal."

All reference to book numbers must be by volume and page.

AQUARIUM CEMENT.—D. C. will find a recipe for a good one on page 267, Vol. XXV. of the SCIENTIFIC AMERICAN.

VELOCITY OF LIGHT.—G. M. V. points out an error in an article entitled "Celestial Space" on page 820 of the current volume. Light moves at 192,000 miles a second.

SUEZ CANAL.—To W. B.—The Suez canal is the property of a joint stock company, which the French Government helped to float by large concessions, "subventions," and guarantees.

F. W. G., of La.—You can make microscopic slides, showing the beautiful crystals of nitrate of silver, by placing a drop of the salt dissolved in water upon a slide and letting it dry. Then cover with glass in the usual manner. Use benzole, not benzine, in preparing objects. For many things Canada balsam is the best substance to use.

SUPPLY OF WATER.—To H. G., of Vt.—Your question, as we understand it, is this: Can the quantity of water supplied by a pipe be increased by using a larger pipe without any additional head? It can, up to the delivery of all the water in the spring. The head of water makes a pressure of so much per square inch on the area of cross section of your pipe, and the supply will increase with the size of your pipe, so long as there is enough water at the head. The pipe to the tub will not affect your supply at the mill, unless both are open at once, in which case the water conveyed from the spring will be divided between the two.

THIRTY TUN MAGNETS.—I have a bet with a gentleman. I stated that there had been a magnet built that lifted thirty tons; he disputed it, and I agreed to leave it to you. Am I right? If not, what was the strength of the largest magnet? Answer: There was a paragraph published in the SCIENTIFIC AMERICAN some time ago describing the then new magnet built by Wallace & Sons, of Ansonia, Conn., for the Stevens Institute, in which it was stated that the estimated lifting force of that magnet was between thirty and fifty tons. But President Morton, writing to us recently, states that its actual lift is probably only from four to five tons. This is the largest magnet that we remember. Its poles are each three feet three inches long and six inches in diameter. The next in size is one lately constructed by Lord Lindsay in London, and is four inches in diameter of poles. There was one of some similar size at the College of Pharmacy, London, and that used by Faraday and Tyndall was in oblong section about three inches by four inches, and two feet long. If the power of electromagnets increased with their size, these large magnets might lift thirty tons, but as a fact, they do not by any means. The largest magnet made prior to that of the Stevens Institute lifted about 2 1/2 tons.

SUPERHEATING STEAM.—Query 1, page 354.—Let R. H. E. take a perfectly tight vessel, fill it completely with water, and he will be able to heat it (the water) to 400° Fah. without boiling, but the moment air is admitted, it instantly sinks to 212°. Now a little warning: If he heat it to 419°, the pressure would be 14,700 pounds per square inch, and at 500° it would equal 19,459 pounds to the square inch. The latter would support a column of mercury 3,243 feet in height. (He will need a strong vessel.) The average latent heat of steam, as determined by the philosophers Watt, Southern, Lavoisier, Rumford, and Depretz, is 978° Fah., but Thompson says he does not think it can fall below 1,000°.—G. L. F.

PROPORTIONS OF ENGINE.—Query 8, page 354.—The small engine will do about 94 1/2 per cent of the work that the larger engine is doing now.—P. R.

PROPORTIONS OF ENGINE.—Query 8, May 25.—An engine with a cylinder of 11 inch bore, 3 feet stroke, making 40 revolutions, will, with steam at 50 pounds pressure, be equal to 34 1/2 horse power. An engine with 7 inch bore, 14 inches stroke, 150 revolutions per minute, with 80 pounds of steam, will be equal to 32 1/2 horsepower. Friction is not taken in account in either case. Deduct two horse power for friction, and you will have about the actual power of the engines.—A. H. G.

Declined.

Communications upon the following subjects have been received and examined by the Editor, but their publication is respectfully declined:

AERIAL NAVIGATION.—C. M.
 DIVINING ROD.—H. E. F.—I. N. B.
 FORCE AND COUNTER FORCE.—J. S.
 FRUIT JELLIES.—I. D. T.
 PETROLEUM AND THE PRECIOUS METALS.—J. H.
 PRODUCING MOTION.—A. U.
 PROPULSION ON CANALS.—P. J. D.—C. A. W.
 ROTARY MOTION OF THE PLANETS.—P. R.
 SCIENTIFIC RELIGION.—C. B.
 THE FIRST STEAM RAILROAD.—D. M.
 THE FLIGHT OF BIRDS.—R. O. D.
 THE RUBBER TIP PATENT.—R.
 VELOCITY OF LIGHT.—C. E.
 WATER METERS.—F. G. W.
 ANSWERS TO CORRESPONDENTS.—A. G. B.—K. L.—N. W. H.—J. F. K.—J. G. M.
 NOTES AND QUERIES.—J. A. S.—F. O. H.—P. C. L.—J. D. P.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

CANAL LOCK.—Israel Townsend, Caperville, Va.—The object of this invention is to economize water in taking boats through canal locks. This object is accomplished by the employment of a side reservoir, into which about half of the water from the full lock is drawn off to lower the boat. The passage between the lock and reservoir is then closed, and the remainder of the water in the lock is let off at the lower gate as usual. When it is desirable again to fill the lock, another passage from the reservoir is first opened and the lock is partially filled therefrom, thus using that portion of the water, twice, and thereby saving a proportionate amount of water.

IRON FENCE PANELING.—Floyd G. Brown, Chapel Hill, Texas.—The invention consists in manufacturing a fence or fence paneling of hoop iron, so that it may be sold in sections, of any desired length, rolled up in a compact form, easily and cheaply transported to any distance, and put up by the farmer with rapidity and facility.

CHAIR SEAT FRAME.—Henry Buchter, Louisville, Ky.—The invention consists in improving the construction of a chair seat frame by using metallic corner pieces to connect the ends of rounds, whereby great strength and durability is given to that part of the chair which is subject to most strain.

BAG STRING INSERTER.—William J. Cussen, Richmond, Va.—The invention consists (1st) in a horizontal needle, having eye near the front and thread guide near the rear end; whereby a child can insert the gathering thread in a tobacco bag in one fourth the time in which it can be done with the hand by an adult. (2nd.) It consists in providing such a needle with a spring that not only guides but subsequently clamps the thread, so that it can be held taut while being cut off at the desired length. (3d.) It consists in providing a lever which shall simultaneously and by a simple movement place in position both clamp and cutter. (4th.) It consists in connecting the same lever that carries the thread cutter in front and finishes up the work, with a registering mechanism in the rear, by which the exact amount of work that has been done is always indicated.

FIRE ENGINE.—Jacob B. Van Dyne, Louisville, Ky.—The invention consists in arranging cylinders, provided with chemical ingredients which are mixed by the inversion of said cylinders, on pivots in the frame of a wheeled vehicle, and holding them in position by a latch. It also consists in providing the sides of frame with hooks upon which the ladder may be conveniently hung.

PROCESS FOR COATING IRON WITH ZINC.—John A. Grey and John Lippincott, Baltimore, Md.—This invention is an improvement on the common process of coating iron articles with zinc by dipping the articles in a bath of melted zinc resting on a stratum of melted lead within a pot of suitable size. By this process, no dross is deposited, and the wear of the article dipped will be practically nothing.

OYSTER CAN.—John A. Tillery, Baltimore, Md.—The invention relates to half square or narrow rectangular cans which are used in the trade for raw oysters, and it consists in forming a raised annular rib, about the channel in which the downward flange of the cap is soldered, for the purpose of preventing said channel from being, to a greater or less extent, filled by solder flowing from the joint between the top and body.

PEANUT THRESHER AND SEPARATOR.—John H. Walker, Walker's Landing, Tenn.—The invention consists in a machine whereby the peanuts and vines are thrust down an incline, caught by a revolving cylinder (whose teeth act in concert with those of a concave, to tear the vines to pieces and from the nuts), and transferred over an endless sieve to a reticulated cylinder, where the merchantable nuts are effectually separated from the vines and light nuts. By this machine, the nuts can be threshed, cleaned, and prepared for market, at a very small cost and with great economy in time.

WATER METER.—Edward Marsland, of Sing Sing, N. Y.—This invention relates to a new water meter, in which the water is conveyed in spiral jets against the recessed edge of a wheel, revolving the same in exact rot to the volume brought against it, and balancing it at the same time to reduce friction. The invention consists, principally, in the arrangement of the wheel and the chamber whence the water emanates, and also in the application of projecting wings or fans to the wheel and case, for regulating its motion and making it conform to the head of water.

COUNTERSINK.—Lewis H. Hunt, of Saxton's River, Vt.—This invention consists in the construction of countersinks for wood. It consists in constructing the tool of a solid shank and pad, and a detachable cutter fastened by a screw.

CIRCULATION VALVE.—Robert Pallett, of New York city.—This invention enables the man at the end of the hose of a fire engine or of the discharge pipe of a pump to shut off the discharge at any time without endangering the mechanism of the engine or pump, and without its being necessary to stop the pump. The construction is of such a nature that the increased pressure in the discharge pipe, consequent on shutting off the discharge, forces a plunger into a chamber fixed on the pipe. The movement of the plunger raises a valve which covers the mouth of a passage leading back into the receiver of the pump, and by these means the water is returned and circulated without danger to the pump or hose pipe.

DRAFT ATTACHMENT TO PLOWS.—Sylvester H. Dalley, of Olcott, N. Y.—This invention relates to a new draft attachment to plows, and consists in the application to the draft rod of a guide wheel which is self locking and serves in place of a clevis. The guide wheel runs in a strap which is suspended by sleeves loosely from the draft pin. When draft is applied, these sleeves are pulled forward, and notches in one of them are made to engage with projections from the draft pin; this locks the wheel strap in a vertical position. When turning corners, etc., the strap is unlocked by the action of a spiral spring which encloses the draft pin.

FERTILIZER.—James P. Crutchfield, of Fayette Corner, Tenn.—This invention furnishes an improved manure distributor of very simple construction. It consists of the box or body of an ordinary wagon, so arranged as to allow the manure to fall easily through holes in its bottom. The holes are provided with slides to regulate the quantity of manure released, and under each is suspended a spout to convey it to the furrow. The spout is made adjustable as to its angle of inclination, so as to let the manure pour out at whatever rate may be required.

DISH WASHER.—Safford D. Moxley, of Keeseville, N. Y.—This invention consists of any suitable tub, pail, or bucket, with vertical pumps on the opposite sides. There are two pumps by preference, although one would suffice, which have large openings at their bottoms. The piston rods extend upward through the tops, and are connected by bent bars with a rocking lever which is pivoted to the sides of the tub and provided with handles for working the pistons; by which means the water is alternately taken into the pumps and forced out again with great intensity, calculated to wash the dishes, vegetables, or other articles in the tub very quickly.

TOY PISTOL.—Benjamin Haviland and George P. Gunn, Herkimer, N. Y.—This invention relates to the construction of toy pistols, and consists in a peculiar arrangement of the air cylinder and its piston in the stock, combined with a charging rod, to depress the piston and charge the pistol.

PHOTOGRAPHIC LENS.—Richard Morrison, Brooklyn, E. D., assignor to Scovill Manufacturing Company, New York city.—In this improved lens, which is designed for a wide angle view lens, the front combination is composed of a plano-convex lens of plate glass, cemented to another plano-convex lens of flint glass, of such curves as to produce a combined lens sufficiently over corrected for actinic rays to properly correct the back combination, which is chromatic, and is composed of two lenses of plate glass, the first, or interior one, being a plano-convex, or double convex of the same focus as the second or exterior, which is a meniscus of nearly the same radii as the front combination.

CULTIVATOR.—Asa Bennett Springsteen, Schodack Landing, N. Y.—This invention furnishes a simple, convenient, and effective plow for cultivating corn and other crops planted in rows; it may be readily adjusted to scrape the soil toward or from the plants, as may be desired. It consists in attaching, adjustably, a surface scraper to the plow standard, which scraper is made triangular with its rear edge curved downward, so as to scrape the soil to one side. The scraper is followed by a leveler, also secured to the standard, which is provided with a downwardly projecting tooth. This stirs up the soil near the plants, and roots up any weeds, etc., that may be growing near them, and, also, smooths the surface.

THREE HORSE EQUALIZER.—Adam Lafayette Thomas, George James Thomas, and Thomas Newton Thomas, Lee's Summit, Mo.—This invention furnishes an improved three horse equalizer, and is so constructed that it may be readily adjusted so that the three horses may all have an equal amount to pull, or so that either the single horse or team may have the advantage, as may be desired; it consists in the arrangement of adjustable bars, which are pivoted to the tongue, and connected by chains so as to adapt them to receive the whiffletrees.

HAY ELEVATOR AND CARRIER.—John H. White, Columbus City, Iowa.—This invention relates to a new arrangement of carriage for elevating and conveying hay, straw, and other material for stacking or other purposes. The carriage runs, suspended by pulleys, on a rope stretched between two posts, and by means of various ingenious contrivances is made to take up its load in one spot, and to deposit it in another.

EARTH AUGER.—Xenophon Earle, Depere, Wis.—The boring part of this improved pot hole auger consists of two scoops, which are shaped like half cones; they are connected by a scissors joint in such a manner that they may be securely shut together—thus completing the cone. When shut, one edge of each scoop projects beyond the opposing edge of the other, forming a cutter to dig into the earth, and leaving a space through which the dirt passes into the interior of the cone. The dirt is discharged by opening the cone. By this construction, the auger is readily and quickly forced into the ground, and when filled is drawn out easily, the dirt dug out by the auger being carried inward and packed into the cavity or space between the scoops, instead of being packed around the outer part of the bore or hole.

FUEL WATER HEATER FOR STEAM BOILERS.—Joseph Rodgers, Clarington, Ohio.—This invention has for its object to economize fuel in the heating of water in steam boilers, and to insure a more thorough result from the heat.

TILTING MACHINE.—Bowen Mathews, Keyport, N. J.—The object of this invention is to furnish a machine for the amusement or exercise of children, invalids, and others, designed as a substitute for the rotating swivel, etc., now in vogue. A couple of pulleys or rollers are attached to a ceiling or horizontal beam at some distance apart, and over them is passed a band, from each end of which is suspended a chair. The length of the band is adjustable. The chairs are made to rise and fall alternately by their occupants.

STALK CHOPPER.—This invention has for its object to furnish a simple, convenient, and effective machine for cutting or breaking up corn stalks and cotton stalks so that they may be conveniently turned under by the plow. It consists of a roller, made of any material possessing the requisite weight, which carries knives or cutting plates attached to its periphery, and is suspended, free to revolve, in the draft frame. By this construction, as the machine is drawn forward, the roller breaks down the dry stalks, and the knives cut or break them into pieces, longer or shorter, according to the distance apart of the knives, so that they will not interfere with the plowing.

SWITCH FOR PRINTING TELEGRAPHS.—Patrick Kenny, of New York city.—The object of this invention is to enable the operator, when working with several telegraphic printing instruments, to use them, one after another, without changing the different keys or using a separate battery for each. It consists in the employment of an electromagnetic switch instrument which is connected with the magnet and printing lever of each printing instrument in a manner to insure the following operation: As long as its printing lever is at rest, that printing instrument which is connected by metallic contact with the switch wheel of the switch has a current established through its magnet and can be worked in the usual way. Only one instrument at one time can be electrically connected with the switch wheel, as the springs belonging to the others are then resting on insulated portions of the wheel. Whenever the printing lever is raised, the circuit through the printing magnet is interrupted and metallic connection with the magnet of the switch is made. This enables the operator to establish, by touching an appropriate key, a current through the switch magnet which causes the switch wheel to rotate and brings the spring belonging to another printing instrument into metallic contact with it, while it breaks contact with the first. The key of the switch magnet is touched as often as is necessary to bring the right instrument into circuit, supposing more than two are connected with it. If, during the elevation of the printing lever, the key is not touched, the printing instrument connected with it will be in circuit on its descent.

TUG BUCKLE.—James C. Barrows, of Centerville, Iowa.—This invention furnishes an improved tug buckle, which does not wedge the tug so as to injure it; and which is easily adjusted and effective in operation. It consists of an ingenious arrangement of various parts which could not be explained without drawings.

MACHINE FOR FINISHING DRAIN TILES.—Andrew L. Brown, of London, Ohio.—This invention furnishes an improved machine for bevelling one end and recessing the other end of lengths of drain tiles so as to form a joint. Its principal features are: An automatic carrier which receives the tile, holds it while its ends are operated on, and discharges it when finished; and the leveling apparatus, which consists of two wire cutters, set parallel with each other, and carried on two movable shafts between which the tile is placed to have its ends cut.

SEED PLANTER.—Augustus Richards, of Anderson, Texas.—This invention furnishes a simple, convenient, and reliable machine for planting corn, cotton seed, and other seeds, which is so constructed that it may be conveniently adjusted to plant less or more seed, as may be desired. The seed dropper is barrel shaped and is carried between the wheels of the machine. It has a band around its center which is pierced with discharge holes through which the seeds fall to the ground. These discharge holes are shut or opened by slides which are adjusted so as to regulate to a nicety the quantity of seed dropped. There are a furrowing plow and other attachments, which we have not space to describe.

ELEVATOR.—Alfred B. Darling and James Bones, of New York city.—The object of this improvement is to prevent the falling of the elevator platform in case of the breakage of the main lifting rope. This is accomplished by an ingenious arrangement of various devices.

SEWING MACHINE CASE.—Gustav Heckel, of Belleville, Ill.—This invention furnishes an improved sewing machine case and table. The case consists of a back piece, which is hinged within a slot along the rear side of the table, and a front piece, connected by a flexible top. The two sides are hinged to the back piece. When closed, the sides form a support for the flexible top. A prominent feature of the invention is an adjustable piece which fills in the slot behind the hinged back so as to preserve the symmetry of the table when the case is closed.

WATER METER.—Hezekiah Olney, of New York city, assignor to himself and Lucius R. Townsend, of Malone, N. Y.—This invention consists in making the meter in two compartments, one for receiving, the other for discharging the liquid, so that from the latter vessel the water may flow continuously. The water flows through a pipe into the receiving compartment and, on filling the same to a certain height, raises a float which operates a valve attached to the pipe. The movement of the valve shuts off the flow of water into the receiving compartment and, at the same time, opens a channel between that and the discharging compartment. When the water has passed from one compartment to the other, the float falls and the operation is repeated. Other devices are connected with the apparatus, which space prevents us describing in detail.

FENCE.—Andrew A. Garver, of Albion, Iowa.—This invention consists mainly in arranging the cross slats of the panel diagonal to the rails of the same to admit of a better connection of the panel with the double brace than in other portable fences. The fence consists of panels composed of rails connected together by upright slats placed in an inclined position, so that the upper rail will project six inches, more or less. The lower ends of the slats project down below the lower rail. In the lower edge of the lower rail are notches, just inside of the uprights. These notches and the arrangement of the slats allow the upper and the lower rails of the panel to engage with the brace of the fence.

DAMPER FOR FIRE PLACE.—Joseph Bridgman, of New York city.—This invention relates to a new damper for fire places, to be used in chimneys above grates for regulating the draft. It consists in providing the damper with projecting pivot pins and stops at the ends, and in the use of metallic sockets for its support built into the wall.

PACKING.—George Tetley and Charles D. B. Fisk, of Providence, R. I.—This invention relates to an improvement in metallic packing for piston and valve rods, and for all similar purposes. The packing is made in sections; each section consisting of two parts, which are made to fit each other and the rod they enclose. The sections are laid one above the other, reversing the position of the two parts in each alternate section, and are kept pressed against the rod by two springs placed between them and the ox. The boxes may be circular, rectangular, or of other form.

BALLASTING VESSELS IN PORT.—Francesco Demartini and John Chertizza, of Brooklyn, N. Y.—Under the present practice, when a vessel arrives in port and discharges her cargo, ballast must be immediately taken in to prevent careening and consequent injury to herself or other crafts. To avoid the loss of time and expense attending this course, this invention employs ballast logs, connected with the vessel by ropes or chains, that lie alongside and float in the water. The logs are not intended to hold the vessel down in the water, but merely to act as counter or balance weights when she attempts to keel over from any cause.

STOVE PIPE FITTER.—William Volk, of Buffalo, N. Y.—The object of this invention is to provide a simple, durable, and effective device for fitting stove pipes together, as, for instance, where the two parts are of the same size, or where bruised or out of shape. It consists of a frame which has two jaws, with lugs for two levers. One jaw is corrugated or serrated, and the other is smooth. Each jaw is provided with a lever of corresponding form, confined by fulcrum pins to the lugs. By the application of the serrated jaw and lever to the pipe, the latter is made to partake of the form of the jaw, and its end is consequently reduced in diameter. When the other jaw and lever are applied, the tendency is to expand and smooth out the pipe. When the two parts of the pipe are operated upon in this manner—that is, one corrugated or serrated, and the other expanded—they will fit together and may be joined without difficulty.

SAND AND GRAVEL SEPARATING MACHINE.—Nicholas J. Keller, of East Birmingham, Pa.—This invention relates to a new machine for separating sand and gravel or other materials from the matter elevated by dredging machines. The framework of the machine is coupled by a dredge boat or dredging apparatus, from which an endless chain or apron extends over one end of the separator. This apron or chain conveys in its buckets all the matter raised by the dredge on to an inclined sieve or perforated spout, which is securely fixed at one end of the frame. Water is conveyed to the spout by another endless chain or apron, and serves to so loosen the mud that all gravel and sand passes through, but all other matter is discharged. What passes through the sieve is carried toward the inner part of the separator into the higher end of an inclined perforated cylinder. This cylinder, being covered with wire screen and revolved by suitable mechanism, separates the sand and gravel by letting the sand pass through its finer meshes into a box, and the gravel through the larger meshes at the lower part into another receptacle. All extraneous matter or refuse is discharged overboard through the lower end of the cylinder, which is open.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From May 14 to May 20, 1872, inclusive.

CAR COUPLING.—C. L. Horack, Winona, Minn.
ELECTRIC SIGNALS.—E. A. Calahaw, of Brooklyn, N. Y., London, Eng.
FOUL AIR TRAP.—J. Daniels, Washington, D. C.
HUB.—W. Lyman, East Hampton, Mass.
MAGIC LANTERN.—L. J. Marcy, Philadelphia, Pa.
MAKING PINS.—T. B. De Forest, of Birmingham, Conn., London, Eng.
PAPERING PINS.—T. B. De Forest, of Birmingham, Conn., London, Eng.
PAVING BLOCKS, ETC.—F. A. Luckenbach, New York city.
PIANOFORTE.—C. F. T. Steinway, New York city.
PROJECTILES, ETC.—J. G. Butler, Fortress Monroe, Va.
PROPELLING SHIPS.—L. B. Bruen, New York city.
SEAT AND DESK.—H. W. Curtis, New York city.
SEEDING FRUIT.—G. L. Taylor, D. Holland, Springfield, Mass.
SHEET IRON.—W. Rogers, Apollo, T. J. Burchfield, Allegheny, Pa.
SHOEMAKING MACHINERY.—W. J. B. Mills, Philadelphia, Pa., D. W. C. Taylor, Elizabeth, N. J.
SLIDE VALVE.—G. Westinghouse, Jr., of Pittsburgh, Pa., London, Eng.
STEEL.—T. Brooks, Minerva, Ohio.
TIMEKEEPER.—H. B. James, Trenton, N. J.
VEHICLE FOR PAINTING.—E. Denton, New York city.
WOOD CUTTING MACHINERY.—J. Richards, Philadelphia, Pa.

FOREIGN PATENTS—A HINT TO PATENTEES.

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