



### Porcelain and Opalescent Glass.

MESSRS. EDITORS:—The following communication serves as an answer to your wish expressed, page 233, that some of your readers would send you for publication the formula for the manufacture of porcelain glass. In the glass houses this is usually called "bone glass," the chief ingredient being burnt bones. As the cheapest and best for its production, jawbones are preferred, probably on account of the enamel of the teeth they contain. After burning, they are ground and mixed carefully with the powdered mass of which the common glass is usually made, namely, old broken glass, white sand, oxide of lead, lime, and potash.

There is no decided formula for the proportion, but the quantity of bone ash is varied in accordance with the degree of opaqueness it is intended to give. Two per cent is the least, 30 the maximum; this makes the glass perfectly opaque. As bone ash consists of phosphate of lime, it is clear that the phosphoric acid causes the opaqueness, as the lime by itself makes with silica a transparent glass; remelting makes it more opaque, probably by causing a more perfect combination of the phosphoric acid with the other ingredients.

Quite recently, burned guano has been introduced in Germany for the manufacture of porcelain glass; as guano consists chiefly of very finely divided phosphate of lime, it is very successful and even cheaper than bone glass. The prescription for a superior quality of guano glass is: pure sand, 120 parts; potash, 70; calcined soda, 10; common salt, 3; saltpeter, 6; red lead, 30; guano ashes, 60; manganese,  $\frac{1}{2}$ , and borax, 3.

Oxide, too, may also be used; but as it requires more to produce the same effect, and, besides, is much dearer, its use has been almost abandoned. Arsenic, however, is, in many glass works, used in small quantities as an addition to the bone ash.

This kind of glass shows always more or less opalescence, that is, a play of colors when looked through in different directions, and inclinations of light. In the above-described glass it is often somewhat reddish, but this may be modified, increased, or changed by the addition of different metallic oxides, as yellow by oxide of uranium, and a most brilliant green by adding to this forge scales or oxide of nickel.

A new field of industry may be opened by combining the substances used for coloring glass with this porcelain glass, and the application of this beautiful compound for the manufacture of objects of taste and usefulness, namely, brownish yellow, by charcoal or soot; green, by protoxide of iron; bright yellow, by antimoniate of potash; red, with sesqui-oxide of iron. The Bohemian orange glass is produced by the mixture of the two last. Emerald green, by oxide of copper; bright red, by very small quantities of sub-oxide of copper; ruby, scarlet, carmine, and rose, by gold, used in the form of purple of cassius; amethyst color, by oxide of manganese; grass green, by sesqui-oxide of chromium; blue, by cobalt, etc., etc.

In closing, I will remark that the above is of special importance to the analytical chemist, as the art of testing mineral substances by the blow-pipe is, to a considerable extent, founded on this peculiarity of many metals of giving to glass different particular colors; this being applied on a very minute scale, namely, a glass bead not much larger than a pin head suspended at the end of platinum wire, and exposed to the inner or outer flame before the blowpipe.

P. H. VANDER WEYDE, M. D.

Philadelphia, Oct. 23, 1866.

### A Singular Quality in Steel.

MESSRS. EDITORS:—In Vol. XV., No. 19, of the SCIENTIFIC AMERICAN, I notice an article by your correspondent, "E. P. W.," in which he speaks of a singular quality of steel. During the war I was engaged in the manufacture of cavalry sabres for Government. In the severe tests to which every blade was subjected, some of them would be found

too soft; these I would heat to a blue, and let them cool off, and they would nearly all regain their elasticity, the same as they were before they were polished, but in polishing about one-fourth of them would again lose their elasticity. By experimenting I found that when they first came from the fire after being blued, or "stiffened" as we called it, to dip them into a solution of sulphuric acid and water, about six parts of water and one of acid, would remove the bluing; and then as soon as they came out of the acid dip them into strong lime water, which would destroy the acid, and prevent the blades from rusting, when, if wiped off, they would retain their elasticity. This seems to show that it was not removing the bluing that caused them to lose their elasticity, but what was polished off of the outer surface of the steel. Circular saws or any other tools that are too soft may be stiffened in the same manner. I tried to stiffen blades in this way before they had been hardened and tempered, but the process had no effect whatever. Having never tested the blueing process on the cutting quality of steel, I am unable to state the facts, but presume it will improve a tool that is too soft in the same proportion that it will improve its elasticity.

J. E. E.

Trenton, N. J., November, 1866.

### PATENT OFFICE DECISION.—CARTRIDGES.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

Hon. Elisha Foote for the Board.

#### Alleged Improvement in Cartridges.

The applicant provides a metallic stem or needle, that, passing through the charge, fires, when struck by the hammer, a percussion cap at the base of the ball. The cartridge is filled, around the stem, with two grades of powder—coarse next to the ball, and fine in the rear.

In the use of the stem to fire the charge in front, the applicant has been anticipated. It was patented to C. E. Snyder, in Oct., 1864, and in consequence, he has limited his claim to its combination with the use of powder of different degrees of fineness; or, as he terms it, his accelerating charge.

The applicant's theory is, that the coarse powder around the fulminate will be first ignited, and burn slowly, while the ball is being started and put in motion; then the fine powder will be reached, and a more rapid combustion and powerful impulse ensue.

The applicant has also two other arrangements and claims for them. In these, the grains of powder are uniform. In one, the cartridge is fired at both ends simultaneously, and it is supposed that by this double combustion, a great amount of powder will be burned and powerful impulse given. In the other, the firing is at the center, and it is imagined that the combustion proceeding thence outward, and constantly enlarging the sphere of its action, will keep up and increase the pressure of gas until the ball leaves the gun.

We apprehend that the applicant is entirely mistaken in his theory of the combustion of powder. The heated gases of the fulminate, almost instantly, permeate the whole mass, entering the interstices between the grains and firing, practically, every grain at the same moment. These, then, burn from the surface only, and the times of their combustion depend upon their sizes. The idea of placing coarse powder next to the ball, and fine behind it, and firing in front, is not a new one, but has often been tried. Charges have also been fired at different places at the same time, and vent holes have been placed in front, at the rear, and at different places along the sides; but all these variations have failed to produce any practical effect.

The devices lack, therefore, one of the essential elements of a patentable invention, to wit: that of producing a new and useful result. It is not every new combination, nor every new device that is patentable. Both must be the result of invention rather than of mere mechanical skill, and both must produce new results.

We do not propose to set up our views in opposition to any practical effect that any one may obtain. But when a patent is desired, for what appears to be opposed to mechanical principles, or for results or processes that are opposed to former experience, some evidence should be furnished that the world has been mistaken before a patent is issued.

The Statute under which we act authorizes patents for inventions only when "deemed to be sufficiently useful and important." It cannot be expected that, under this authority, the office should give its sanction to anything that is absurd, or to fanciful results that are opposed to general experience.

The decision of the Examiner must be affirmed.

NOTE.—A Patent was subsequently issued for this cartridge by the Commissioner. We are not informed upon what grounds.

### Inventions Patented in England by Americans.

Condensed from the "Journal of the Commissioners of Patents." ]

#### PROVISIONAL PROTECTION FOR SIX MONTHS.

2,299.—HAT OR COVERING FOR THE HEAD, PARTS OF WHICH IMPROVEMENTS ARE APPLICABLE TO PARASOLS OR FANS.—William H. White, Kent Island, Md. Sept. 7, 1866.

2,421.—METHOD OF LUBRICATING VERTICAL SPINDLE OR SHAFT, AND APPARATUS FOR EFFECTING THE SAME.—Thomas Marsh, Central Falls, R. I. Sept. 21, 1866.

2,425.—NEW MACHINE FOR SETTING AND DISTRIBUTING TYPE.—John A. Gray and Samuel W. Green, New York City. Sept. 21, 1866.

2,427.—PICKER MOTION FOR LOOM.—Hosea Elliott, Globe Village, Mass. Sept. 21, 1866.

2,451.—MACHINERY OR APPARATUS FOR FILTERING LIQUIDS.—Robert Stewart, Brooklyn, N. Y. Sept. 24, 1866.

2,471.—LAMP FOR BURNING VOLATILE OILS, SPIRITS, AND OTHER FLUIDS.—Henry A. Gadsden, New York City, temporarily residing at Havre, France. Sept. 25, 1866.

2,491.—COLLECTING AND DELIVERING LETTERS AND PARCELS, AND APPARATUS FOR THE SAME.—Alfred E. Beach, Stratford, Conn. Sept. 26, 1866.

2,548.—MACHINERY FOR CUTTING FILES AND RASPS.—Alfred Weed, Boston, Mass. Oct. 3, 1866.

2,549.—FILE-CUTTING MACHINERY.—Alfred Weed, Boston, Mass. Oct. 3, 1866.

2,585.—MANUFACTURE OF LEATHER BINDING.—Matthew H. Merriam and Eugene L. Norton, Charlestown, Mass. Oct. 8, 1866.

#### EXTENSION NOTICES.

William Stratton and Matthias Stratton, of Philadelphia, Pa. having petitioned for the extension of a patent granted to them the 1st day of February, 1853, for an improvement in portable gas apparatus, it is ordered that the said petition be heard on Monday the 14th day of January next.



F. M. E., of Mo.—In our issue of the 3d inst., our reply to your queries was somewhat incorrect, as we have since ascertained from the manufacturers of rubber belts. These belts can be kept from slipping by lightly moistening the side next the pulley with boiled linseed oil. Animal oil will not do. Belts of good vulcanized rubber will stand a high degree of heat without injury.

A. S., of Del.—Phosphorus alone cannot be reduced to the form of a paste, but it may be mixed, by melting and stirring, with many substances of a pasty consistence. It is melted with grease for a rat poison, and mixed with gum water for friction matches.

C. P. L., of Mo., has a cellar 300 feet from a river. During high water in the river, the water percolates through the soil and floods the cellar. He desires to know how to make a good bottom to keep out the water. If bricks are cheap enough in his neighborhood, we advise him to lay down, in cement, a brick flooring. The pressure of water on the bottom might be as great as in a cellar on the same level at the bank of the river.

P. L., of Iowa.—The centrifugal force due to the revolution of the earth to some extent counteracts gravity, and consequently at a given distance from the center of the earth, any body will weigh less at the equator than any where else on the globe; the pressure of the air is less at the equator than at your place.

C. E. B., of Mass.—We know of no work which treats especially of electro-magnetic engines. The details of most of the engines already built are to be found in former volumes of the SCIENTIFIC AMERICAN. The scientific theory of the subject can be found in many of the text books on chemistry and natural philosophy. The most extensive treatise on electricity is by De la Rive. . . . Shellac dissolved in alcohol is the best insulating varnish. . . . The U magnet which gives the greatest power for a given weight is thicker at the poles than at the neutral part. . . . The wire of the electro-magnet may be effectually insulated by winding so that the spires do not touch each other and separating the courses by paper.

J. G. B., of N. J.—For grinding and polishing articles of hardened steel, wheels of corundum are used. They can be purchased at any first class machinists' findings establishment. A cylindrical plug for a templet is more readily reduced to size, however hard, by this means than any other we know. It leaves a very good surface, needing only polishing with bluestone, rottenstone, crocus, and rouge.

E. F. C. D., of Md.—A composition of 4 parts copper, 1 of tin and  $\frac{1}{2}$  part zinc will make a metal suitable for small working models, having a good color and being easily wrought. Doubling the proportion of zinc will increase its hardness. The best material for a mold is fine molding sand that has been used. It should be free from clay, should take a fine impression of the skin when squeezed in the hand, and be capable of being cut into slices by a sharp knife without crumbling.

W. S. P., of N. Y.—Plaster of Paris is usually cast in molds of the same substance. The inside of the mold should be varnished with shellac.

G. F., of Pa.—Cast steel is steel that has been melted and run into molds. Other kinds of steel can be produced by cementation, puddling, hammering, and rolling. Cast steel is just what its name implies.

H. D., of Mass.—Manuscript for the printer should be written on one side of a sheet only. It is more convenient for "setting up" if not written across both pages of a sheet of note or letter paper. Use 1st and 3d pages for your writing.

#### NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

SCREWFOR CHAIRS, ETC.—LOUIS POSTAWKA, Boston, Mass.—This invention relates to an improvement in the construction of a screw for elevating and depressing a piano chair without turning the seat or stand around, which may be applied also to writing desks and similar articles.

WATER-PROOF MAIL BAG.—JAMES M. JARRETT, Brooklyn, N. Y.—This invention has for its object to furnish an improved mail and express bag so constructed and arranged that it will be water-proof, and be sufficiently buoyant to float in water even when filled with mail or express matter.

BARN-DOOR FASTENING.—DAVID N. MINOR, Bridgewater, Mich.—This invention has for its object to furnish a convenient, durable, and secure fastening for barn and other similar doors.

DOUBLE-HEADED WRENCH.—JOHN J. LOVE, New York City.—This invention has for its object to furnish an improved wrench, simple in construction, easy of adjustment, and strong.

GATE HINGE.—BURTON GREENSIDE, Fort Dodge, Iowa.—This invention has for its object to furnish an improved hinge for hanging gates and doors.

HORSE CULTIVATOR AND HOE.—AMOS W. ROSS, Northfield, Mass.—This invention consists in placing the cultivator upon wheels which may be adjusted, so that the cultivator may be carried with its teeth and hoes raised from the ground, or so lowered that they may enter it to any desired depth.

SAWING MACHINE.—CHARLES W. SAPPENFIELD, Crawfordsville, Ind.—This invention has for its object to furnish an improved sawing machine by means of which cord wood or other wood or timber may be sawed rapidly.

**SHEEP RACK.**—HENRY H. LADD, Worcester, Vt.—This invention consists in so constructing and pivoting the grain or feed troughs of a sheep rack to the sliding frame in which they are set, that the said frames and troughs may be drawn out laterally and the troughs emptied or cleaned by turning them over upon their pivoting points.

**STANCHION FOR TYING CATTLE.**—J. B. CROWELL, Newport, N. H.—This invention consists in so constructing a stanchion as that all the cattle may be released at the same time, or singly, as desired.

**MACHINE FOR LEATHERING TACKS.**—WM. H. FIELD, Taunton, Mass.—The nature of this invention consists in so constructing a machine that small tack nails may be leathered in a very perfect and rapid manner.

**FENCE.**—JONATHAN BUNDY, West Liberty, Iowa.—This invention consists in the combination and arrangement of the blocks or cross pieces, wires, and anchoring stones, with each other and with the fence posts, for the purpose of sustaining said posts in a vertical position upon their supporting stones, and enabling the fence to resist a side pressure.

**RATCHET WRENCH.**—G. W. TRAPHAGEN, Glen's Falls, N. Y.—This invention relates to an extremely useful ratchet wrench, intended more especially for the turning on or off of nuts from bolts.

**COTTON CULTIVATOR.**—JOEL A. HALL, Columbus, Ohio.—The nature of this invention consists in the peculiar and novel construction of a machine by which cotton may be cultivated in the bottom of the furrows, between the rows, and on the ridges where the cotton stands.

**BEEHIVE.**—T. F. BINGHAM, Gowanda, N. Y.—This invention consists in a novel construction of the hive, and comb frames thereof, as well as in a general arrangement of the parts whereby superior advantages are obtained in bee culture, such, for instance, as the ready removal of the comb frames individually, the augmenting or decreasing of the number of said frames as well as the dividing of the same or the separating of them into different compartments, as may be required, so that each comb frame may be inspected separately, and manipulated as required, the hive divided to promote swarming, etc., etc. The bee entrances are also shielded or guarded and rendered capable of being contracted or enlarged to suit circumstances, the building of straight combs insured, and a uniform temperature within the hive promoted.

**WATER ELEVATOR.**—W. E. BARCOCK, East Pembroke, N. Y.—This invention relates to a new and improved device for drawing or elevating water for domestic purposes, and of that class in which a windlass and bucket are employed for the purpose. The object of the invention is to obtain a device for the purpose specified, which may be operated with the greatest facility, be capable of having the bucket rope lengthened or shortened without any difficulty whatever, and also to obtain a bucket which will be cheap and durable.

**MACHINE FOR MAKING HORSE-SHOE NAILS.**—H. E. WOODFORD and C. W. WOODFORD, Keeseville, N. Y.—This invention relates to a new and improved machine for making horse-shoe nails, and of that class in which the nails are formed by forging instead of being compressed to the proper shape by means of dies. The object of the invention is to produce a nail which will be equally as good as those made by hand, and which will perform the work expeditiously.

**MACHINE FOR MAKING SPIKES AND RIVETS.**—J. O. REILLEY, Baltimore, Md.—In this machine the levers which operate the head-bending and the pointing die are thrown out of connection with the operating cams by bending their pivoted arms out of range, so that the machine may be adjusted for making hooked-headed or plain spikes or rivets. The gage moves in the same plane as the moving die and maintains its position till the header is about to advance. The cutter is advanced after the iron is clamped by the dies, so that it is not thrown out of position by the action of cutting. Patented Oct. 16, 1866.

**WIND SAIL.**—JOHN C. RAYMOND, Greenpoint, N. Y.—This invention relates to a wind sail which is provided with four wings so that the same is capable of catching the wind from whatever quarter the same may blow, and the time and labor generally required for setting the wind sail is saved; said wind sail is provided with a top which extends beyond the barrel, so that the sail need not be taken down when it rains.

**FURNITURE CASTER.**—JAMES T. BARNES, Hudson City, N. J.—This invention principally consists in the employment of two wheels which are mounted on an axle secured to the end of the shank so that when the caster is applied to the leg of a piece of furniture the wheels will be directly under the said leg.

**INK-CUP.**—PHILIP R. HOLBROOK, Malden, Mass.—This invention consists in constructing an inkstand by the employment of a rubber cup placed in a suitable cavity in a stand or block of any suitable material, whereby a very convenient inkstand or cup is produced and one which can be very readily cleaned.

**WASHTUB.**—REUBEN HOOVER, Boonsborough, Iowa.—The nature of this invention consists in attaching to a common washtub a device by which clothes of any description may be neatly and successfully washed.

**SULKY PLOW.**—GEORGE KNIGHT, Boone, Iowa.—This invention relates to a new and improved plow of that class which are connected with a mounted frame containing a driver's seat, and are commonly termed sulky plows, and it consists in a peculiar construction and arrangement of parts, whereby the driver has full control over the plow, and a very simple, efficient, and economical device for the purpose specified obtained.

**CLOTHES WASHING MACHINE.**—DANIEL KUNKEL, Oregon, Mo.—This invention relates to a new and improved clothes-washing machine of that class in which a rotary motion is imparted to the clothes, in order to subject them to the necessary friction and rubbing.

**MEASURE.**—LEWIS COATES, Colamer, Pa.—This invention relates to a measure with a shifting bottom, which is provided with suitable catches or fastenings at its under side, in such a manner that by raising or lowering said bottom the measure

can be adjusted for different quantities, such as a peck, a bushel, a coomb, or any other desirable quantity, and that one and the same measure can be used for various quantities. The bottom is adjusted according to the desired quantity to be measured by notched staves, which receive the spring catches or fastenings, and retain said bottom in the desired position.

**DOUBLETREE AND WHIFFLETREE.**—LEWIS BARNES, Waterford Mich.—This invention relates to a new and improved manner of applying the irons to the doubtree and whiffletree, whereby a very strong and durable connection of the hooks and eyes to the doubtree and whiffletrees is obtained, and the iron plates secured to said parts in a very permanent manner, and malleable cast-iron plates rendered capable of being used.

**PITMAN FOR DRIVING THE SICKLES OF GRAIN AND GRASS HARVESTERS.**—J. W. DOTY, Lockport, N. Y.—This invention relates to a new and useful improvement in pitmen for driving the sickles of grain and grass harvesters, and has for its object the obviating of wear and tear, and jars and concussions produced by unnecessary play at the points of connection, as well as the obviating of undue friction and breakage caused by the pitmen getting out of line with the wrist pin and cutter bar.

**CLOTHES WRINGING MACHINE.**—A. C. GALLAGHER, Dover Plains, N. Y.—This invention relates to a new and improved clothes-wringing machine of that class in which pressure rollers are employed. The invention consists in a novel construction and arrangement of the frame of the machine, and a novel application of springs thereof, whereby the pressure of the rollers upon the clothes may be graduated as desired, the movable and adjustable roller adapted to suit clothes of various thicknesses, and the adjustable roller allowed to yield or give readily to the varying thickness of the layer of clothes passing between them, the above results being obtained by a very simple mode of construction, which admits of the machines being constructed at a very moderate cost.

**MACHINE FOR PUNCHING THE UPPERS OF BOOTS AND SHOES.**—JOHN H. KEATING, Marblehead, Mass.—By this machine any number of holes can be punched in the upper, at one and the same time; the several punches being arranged within the machine so as to be susceptible of adjustment with regard to each other, to correspond in direction with the edge of the upper that is to be punched.

**LETTER BOX OR PIGEON HOLE.**—THOMAS K. STERRETT and W. R. FARRELL, Philadelphia, Pa.—This invention has for its principal object to hold papers, letters, etc., when folded and placed within the box or pigeon hole, in such a manner as to obviate all possibility of their becoming unfolded and disturbed.

**MACHINE FOR STRETCHING LEATHER.**—W. STREVELL, Jersey City, N. J.—This invention consists in constructing the machine so that an easy strain can be produced upon the leather while the power is being applied to stretch it; and so that the slack in the leather, as it dries, will be taken up.

**CLOTHES SPRINKLER.**—FREDERICK ASHLEY, New York City.—This implement is exceedingly simple and cheap in its construction, and for use in kitchens in the sprinkling of clothes previous to being ironed will be found to be most convenient, serviceable and desirable, as with it the clothes can be sprinkled so uniformly and evenly that they can be immediately ironed, if so desired.

**SLEIGH OR SLED BRAKE.**—J. R. McALISTER, Richville, N. Y.—This invention consists in so hanging brake blocks or shoes to the runner frames of a sleigh, that while they will not act upon the ground as the sleigh is backed, they can be brought to bear against the ground if the sleigh is descending a hill.

**HAY RAKE AND LOADER.**—THOMPSON FRAME, Barnesville, Ohio.—This invention relates to a labor-saving implement for raking and loading hay in the field, and is to be attached to a wagon or cart into which the hay is conveyed through a chute until it is filled, when it is detached, and remains waiting in the field for the return of the wagon after being emptied.

**COTTON-SEED PLANTER.**—W. A. HORRELL, Washington, Ind.—This invention relates to an improved machine for planting cotton seed, and consists of a truck frame mounted on wheels to be drawn by a team, to which is attached a plow in front to open a furrow, and a shovel-shaped coverer in the rear to cover the seed dropped in the furrow by means of an endless belt which passes through a seed hopper on the top of the truck.

**CHALK-LINE WINDER.**—JONATHAN H. ROSE, Mount Sterling, Ill.—This invention relates to a reel for winding a carpenter's chalk-line, after it has been used, by means of a self-acting coil spring, which, with the reel, is inclosed in a small hand box, thereby furnishing a convenient and useful instrument for a workman, saving much time in winding the chalk line and keeping it clean and in good order, always ready for use.

**BURGLAR ALARM.**—HENRY YERTY, Sidney, Ohio.—The present improvement consists in mounting one or more barrels upon a vertical pivot, so that when the cord or cords which may be attached to the barrel and some fixed point, are pressed against by an approaching object, the barrels will be swung around and adjusted in line with the object, and then discharged with accuracy toward the point where the cord is acted upon. The cord is extended across a field or orchard, or attached to a window-shutter, door, or other point, where it is desirable to have a means of protection against robbery or depredation.

**FLOATING SAFE.**—THOMAS T. FURLONG and DEWITT C. FREEMAN, St. Louis, Mo.—The design of this invention is to supply a floating safe for the security and preservation of treasure and valuables at sea or on inland waters in case of a shipwreck or other destruction of a vessel on which they may be shipped; and it consists in providing therefor a hollow water and air-tight buoy made of iron or other suitable metal, or of wood and metal combined, formed of an inner and an outer shell or casing with an air space between them, proportioned to the size and weight of the safe and its contents, to give the required buoyancy when thrown into the water.

**CHEMICAL COMPOUND FOR MEDICATED INHALATIONS.**—ABRAHAM H. CARPENTER, New York City.—This invention or discovery consists in forming a compound of various salts and chemical ingredients, which are converted into a gas under such conditions as to become highly charged with oxygen and permanently magnetized, for the treatment of diseases by inhalation of the gas.

**AUTOMATIC CHURN.**—N. E. WILSON, Pittsburgh, Pa.—The fatigue incidental to the use of the old dasher churn has been dispensed with, while this popular form has been retained, through this invention, by employing clockwork as a motor, in a very ingenious manner. The churn is suspended on pivots, and has an oscillatory motion. The plunger is driven by the power derived from two large coiled springs, the motion being conveyed by two worms working in gears; these together with a fly-wheel regulator, constitute the whole machinery. A sufficient number of motions are given at a single winding to complete a churning when the cream is in proper condition. Patented May 8, 1866. J. J. Burns, of Fairmont, W. Va., has taken the agency of this ingenious churn, and may be addressed for two weeks at Lovjoy's Hotel, New York City.

**LOCOMOTIVE FIRE GRATE.**—R. EATON, Lee, England.—This invention relates to a grate which is composed of a series of square terraces of gradually decreasing size which rise above each other, and are inclined toward the center in such a manner that a uniform supply of air to the fuel is obtained, and a more perfect combustion is effected than with a grate of the ordinary construction; and, furthermore, the waste of unconsumed fuel dropping through the grate bars is avoided.

**PROCESS FOR MAKING EXTRACTS.**—JULIUS ROBERTS, Leclowitz, Austria.—This invention relates to a new process for extracting all the juice from plants, particularly from sugar cane, beet roots, maize, etc., by means of what the inventor calls "diffusion."

**CORK-PULLER.**—CHARLES LOEFFLER, Hoboken, N. J.—This invention relates to a cork puller which consists of a thin slant provided at one end with a suitable handle, and at the opposite end with a curved, sharp-edged tooth, in such a manner that by passing said tooth down between the cork and the neck of the bottle and turning it so that the same bears on the under surface of the cork, said cork can be withdrawn without being injured; and, furthermore, by the very act of passing the tooth down between the neck of the bottle and the cork, said cork is loosened and the operation of withdrawing the same is facilitated.

**PUDDLING FURNACE.**—DANIEL HALL and JOSEPH HALL, Wheeling, W. Va.—This invention relates to certain improvements upon puddling and boiling furnaces, which consist in a novel mode of constructing the stack of the furnaces, of forming and supporting the neck or exit flue between the puddling chamber and the stack, of building the fire-bridge, and several other novel arrangements connected with the puddling and fire chambers, all of which jointly and severally conduce to the economical production of iron by reducing the cost of construction of furnaces, and of repairs in keeping them in working order, while at the same time the operation of boiling or puddling is facilitated.

**CARPET FASTENER.**—WILLIS WEAVER, Salem, Ohio.—The object of this improvement is to provide a simple and cheap device for fastening down carpets and other coverings. This fastener is composed of wire so as to have an eye in front and one or more sharp hooks behind the eye. The hooks enter the carpet, while the eye is intended to catch over a pin in the floor, and hold the carpet.

**MODE OF CURING HIDES, ETC., AND FOR THE PRODUCTION OF LEATHER.**—HENRY NAPIER, Elizabeth, N. J.—This invention consists in immersing the hide, skin, or fur in a solution of carbolic acid, or of cresote, or of carbolic acid or cresote rendered alkaline in a slight degree, or in carbolic acid or cresote combined with glycerin, or in carbolic acid or cresote with the addition of an astringent metallic salt, such as the protochloride or the perchloride of iron.

**PULLEY.**—ROBERT W. PARKER, Roxbury, Mass.—This invention relates to the construction of pulleys for transmitting motion to machinery by means of belting applied to a segment only of the periphery of the driving pulley, the object of which improvement is to establish a compensating movement between the belt or band and the pulleys when in motion, so that they shall be perfectly self-adjusting, and by the freedom with which they play within certain practical limits, shall be able to meet and neutralize the deranging effect occasioned by an inequality in the belting or banding employed, or a sudden and violent change in the speed of the machinery.

**DETACHABLE HEEL FOR BOOTS AND SHOES.**—OSCAR STODDART, Jackson, Mich.—This invention consists in constructing heels for boots and shoes of two parts, one part of which is attached permanently to the boot or shoe, and the other part made separately from the fixed part, and provided with catches or fastenings, so arranged that the separate part may be readily attached to or detached from the fixed part, and the detachable part reversed or changed from the shoe or boot of one foot to that of the other, as required, in order to insure the even wear of the heels.

**LIQUID GLUE CEMENT.**—WILLIAM C. WATSON, Paterson, N. J.—The object of this invention is to obtain a liquid glue or cement, which will not harden or become solid by time, nor become putrescent, but which may be kept in a liquid state, ready for direct application, for an indefinite period.

**HANGING MILLSTONES.**—LEWIS FAGN, Cincinnati, Ohio.—This improvement consists in the mode of balancing the stone upon the cock-head, so that the point of contact between the cock-head and the cock-eye is midway of the vertical height of the bearing of the driver in the slot of the balance rim, the stone being thereby practically self-tramming. The piece which projects above the other irons is so shaped as to sustain the cock-eye in its proper position and relation to the driving lugs.

**FIREMAN'S EXTENSION LADDER.**—THOMAS WATSON and CHAS. PERRY, Brooklyn, N. Y.—This invention has for its object to furnish an improved fireman's extension ladder, so constructed and arranged that it may be quickly and easily extended to any desired height, and may, while wholly or partly extended, be easily removed from one place to another.

**FURNITURE KNOB.**—L. B. MYERS, Elmore, Ohio.—Furniture knobs as commonly fastened to drawers and doors, by means of a single screw of wood or metal, or with glue, are very apt to wear loose by use and come off, frequently occasioning much trouble and inconvenience, besides disfiguring the furniture. The design of this invention is to meet this difficulty by providing such a fastening for the knobs that they will not work loose or come off from use, but remain firm on the furniture permanently.