ENGINEERING INVENTIONS.

A steam engine has been patented by Mr. Martin Burkley, of Moline, Ill. The cylinder has two diametrically opposite inlet and outlet openings at each end, with rocking valves on the ends of the cylinder fitted in pairs upon a common axis, which are operated from the working parts of the engine to alternately close the outlet and inlet openings, and make a simplified form of construction.

A fanning device for railway cars has been patented by Mr. Robert W. Macgowan, of New York city. It has an outside current or driving wheel and an inside fanning wheel on opposite ends of a shaft uniting the two, to be held inposition by the closing of the window sash, and driven by the resistance encountered by the moving train, and thus introduce fresh and cool currents through the particular window to which it is applied.

A winch engine has been patented by Mr. Earle C. Bacon, of New York city. It is so constructed that any desired number of windlasses, each carrying a hoisting rope, can be set in motion by a train of gear wheels which derive their motion from a steam engine by suitable connections, and the windlasses can each be thrown separately in and out of gear, and held at any point with a suspended load without interfering with the movements of the other windlasses.

AGRICULTURAL INVENTIONS.

A hay rack has been patented by Mr. Joseph Grimes, of Perry, Ill. On the outer surfaces of the side pieces of the wagon box are pockets or loops for receiving the lower tapered ends of stakes on the ordinary extension boards, with other novel features, whereby the rack can easily he converted into a stock rack or box for vehicles.

MISCELLANEOUS INVENTIONS.

A hat stand has been patented by Mr. Joseph Mersman, of Delphos, Ohio. It is made of wires twisted to form a standard, having an arm and a ring at its upper end and legs with spring loops at the lower end, being simple in construction, but intended to be strong and durable.

A stencil holder has been patented by Mr. Augustus D. Klaber, of New York city. A frame is hinged on a board, and a clamping frame on the hinged frame to make a convenient device for holding a sheet of paper while stenciling and while impressions are being made.

A farm gate has been patented by Mr. William W. Sweetland, of Edwardsburg, Mich. This invention covers a novel construction and combination of parts, designed to afford a gate which can easily be opened from either side, and is automatically locked in position either when open or closed.

A rice huller and cuticle remover has been patented by Mr. John S. Moore, of New Orleans, La. It consists of a case with discharge doors and hopper, two parallel shafts with a right and left spiral flange each, and means for operating them, whereby the hulls will be removed from the rice kernels by friction.

A medical compound for the treatment of consumption and like diseases has been patented by Mr. Rufus G. Gish, of Redfield, Kan. It is made of bloodroot, dandelion, black cohosh, burdock root, spikenard, bittersweet, water, sweet yeast, and other ingredients, in certain proportions, prepared in a specified way.

An explosive compound has been patented by Mr. Milton F. Lindsley, of West Hoboken, N. J. It consists of nitro-cellulose, saltpeter, charcoal, chlorate of potash, starch, and carbonate of potash in certain specified proportions, mechanically mixed and prepared, to make a powder suitable for use in firearms of all descriptions.

A wire stretcher has been patented by Mr. George H. Brackman, of Lake Run, Pa. It consists of a clamping device with hinged arms carrying plates between which the wire to be stretched is placed and clamped, with other novel features, to facilitate stretching plain, barbed, or insulated wires, and holding them taut while splicing.

A draught equalizer has been patented by Mr. Albion Wheeler, of Ridgeway, Iowa. The evener is arranged to draw against a rocking yoke or clevis placed in its front, producing a shifting fulcrum that automatically equalizes the draught, the device being such that it may be used for equalizing the draught for any number of horses.

A flaxseed separator has been patented by Mr. George Adams, of Sherburne, Minn. It has an inclined frame and a vibrating frame with overlapping plates and guard plates, in connection with a hopper, and means of operating, whereby round seeds will be separated from the flaxseed and discharged beneath the machine.

A combined cooking stove and baking and warming oven has been patented by Mr. Fredrick Artmann, of Lexington, Miss. It has a baking and a warming oven, with flues above and between them, a flue below the warming oven, and three horizontal flues below the baking oven, with other novel features for economizing fuel and promoting efficiency.

A tapping machine has been patented by Mr. Victor H. Ernst, of Jersey City, N. J. Its construction is such that the pressure of the taps on the foot stock, when the machine is in operation, is received by the follower, which yields sufficiently to prevent the breaking of the taps, which is likely to occur when the action of the taps is met with a rigid resistance.

A gate has been patented by Mr. Thos. H. O'Reilly, of Canandaigua, N. Y. Its construction is such that by pulling a rope on either side an angle lever is made to raise the bolt, and release the gates, a further pulling swinging the gates in the direction from the person, the gates being closed by pulling a rope on the opposite side after the person has passed through.

A fastener for barrel heads has been patented by Mr. James W. Weston, of New York city. It consists of croze-shaped double legged permanent fastenings and removable brace head nails, made to act in conjunction with the permanent fastenings, to secure and support and brace the head or end of the barrel, its chine, and the outer end hoop.

A horse boot has been patented by Mr. Allen H. Tyson, of Lansdale, Pa. Between the outer leather facing and the inner fabric lining is a stiffening plate, preferably of metal, and of the desired form to correspond with the size and shape of the boot, to keep the latter in its original shape, so that the boot will keep its proper place when strapped to the animal.

A neck yoke coupling has been patented by Mr. Samuel Maneer, of Craigville, Ont., Canada. A collar or sleeve is fitted adjustably on the tongue, so that it may be moved along the tongue to suit the size of the draught animals, and this collar has an eye through which the bight of a chain held at one end to the neck yoke is passed, making a reliable and easily adjustable attachment.

A rollerskate has been patented by Mr. James B. Harris, Jr., of Geneseo, N. Y. On the rear axle is carried a small additional roller suspended behind, which, by raising the toe of the skate, is brought into contact with the floor, either to guide the movement or apply the brakes, but this roller may be adjusted to bear on the floor for aiding beginners, and the brake may be applied to either the toe or heel of the skate.

A device for moulding brick has been patented by Mr. Silas Wright, of Washington, Middlesex Co., N. J. The base frame has a frame hinged at one end to and movable toward and from the base frame, with cutters on the lower side of the hinged frame, and a moulding box fitted therein, the device being also susceptible of adjustment to make keystone and beveled brick, etc.

A lifting jack has been patented by Mr. Emanuel Nordyke, of Heppner, Oregon. Its construction is such that the center piston of the jack is raised during one stroke of the hand lever, and is automatically held from falling back during the reverse movement of the lever, and the self-sustaining clutch is thrown out of action and the center piston allowed to slide back when required.

A hose coupling has been patented by Messrs. Frank Atherton and Manton T. Bentley, of Paterson, N. J. It is so made that when the ends of two tubes are brought together only two movements are necessary in fastening the coupling, an outward movement of a sleeve to bring it over the joint between the tubes, and a rotary movement of the sleeve to bring the lugs of the two tubes into slots of the sleeve.

A breast strap hook has been patented by Mr. Walter D. Drake, of Santa Fe, Mo. It is pivoted to the breast strap slide orguard, and has a retaining ring for locking the ring of the neck yoke in the hook, the retaining ring having a loop to receive the holdback strap of the harness, the device being calculated to facilitate the work of attaching the neck yoke to and detaching it from the breast strap.

An excavator has been patented by Mr. Cyrus Howard, of Pittsburg, Pa. This invention covers an improvement on a former patented invention of the same inventor, its object being to shear off slices of earth as a plowshare does, to move the earth from the path of the machine to one side, and to throw it to a distance therefrom.

A snow plow has also been patented by the above inventor. It is designed to clear snow from railways, throwing it to one side on levels and in cuts, first removing it from the road bed and then compacting it at the sides, to form inclines down which the snow may slide, in order more conveniently to receive the snow into open cars, and removing it by withdrawing the cars from the cut and dumping at any convenient point.

NEW BOOKS AND PUBLICATIONS.

A TREATISE ON THE MANUFACTURE OF SOAP AND CANDLES, LUBRICANTS, AND GLYCERIN. By William Lant Carpenter. London: E. & F. N. Spon, 1885.

Much of the material comprised in this treatise has appeared before in others of the Messrs. Spons' publications, but in its present form all of the subject matter has been carefully revised and brought down to date. Mr. Carpenter was for several years practically engaged in the industries of which he treats, and has therefore the advantage of both theoretical and experimental knowledge. The manufacture of these commodities is essentially a chemical operation, and the successful manufacturer must needs be something of a chemist. In describing the underlying principles, the sources of the raw materials and the subsequent processes by which they are utilized in these different products, the author assumes that his readers have such a chemical foundation. Treated in this spirit, these processes of manufacture are at once removed from the blind following of cook book recipes to the higher level of an applied science. With the *rationale* of the matter in mind, the manufacturer can select better materials, prepare them more effectively, and consequently turn out more valuable products. He will find the study of this volume much to his advantage, even if he must prepare himself for it by a preliminary course in chemistry. Sketches of apparatus illustrate the text where necessary.

AN IRON CROWN. A novel tale of the Great Republic. Chicago: T. S. Denison.

In this anonymous novel, an attempt is made to picture in alarming colors the dangers which menace a free government from the amassing of immense wealth in the hands of a single individual or in the still less governable hands of a powerful corporation.

The *Technique* is the title of the first annual issued by the students of the Massachusetts Institute of Technology. It is an exquisitely printed book of 150 pages, containing useful and interesting information for students and their friends, and shows very creditable work on the part of the class of '87.

Among the many calendars which business houses exercise their taste and energy in getting out the first of the year, we notice one of Messrs. Styles & Cash, New York stationers, as showing beautiful work in a clock face form, a removable dial for each month, the twelve tablets mounted on a brilliantly colored card. Another one, by the American Bank Note Company, gives the twelve months in exquisitely colored and shaded divisions, each month being different from every other, and the whole work printed in the most perfect manner. Of statistical calendars, perhaps one issued by Messrs. Palen, Nelson & Co., New York leather brokers, is the most complete. Accompanying each month's calendar are the prices of leather and hides for the corresponding month of four preceding years, and there are tables showing our exports of sole leather and receipts of foreign hides for many years.

Received.

A LUCKY WAIF. Novel. By Ellen E. Kenyon. New York: Fowler & Wells Co., 1885.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.
Special Written Information on matters of personal rather than general interest, cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Minerals sent for examination should be distinctly marked or labeled.

(1) J. M. K. asks what kind of cement to use in fastening together the ends of leather belting A. Use the best and toughest white glue.

(2) E. A. A. asks: Is there such a thing as an iron railroad tie? If there is, why is it not in general use? A. Various forms of iron ties have been invented, and they are extensively used in countries like India, where wood is very dear. In this country wood is cheaper; hence iron ties are little used.

(3) C. H. asks how to make an electric coil used in electrical medical apparatus. A. Make a thin wooden spool 3½ inches long, and ½ in. diameter; wind the spool with 4 layers of No. 24 wire; surround these layers of wire with two thicknesses of writing paper covered with shellac varnish, and upon this wind 8 to 12 layers of No. 36 silk covered copper wire. This will form your coil. Connect the ends of your coarse wire with your interrupter and battery; connect the ends of your fine wire with handles. Make a bundle of annealed wire to fit loosely in the hole of the spool, so that you can withdraw it and insert it to vary the strength of the shock.

(4) M. R. A. asks: How can I put a high polish on a piece of walnut and preserve the natural color? A. If the piece of walnut is small, you can put a high polish on it by rubbing with a mixture of equal parts of shellac varnish and boiled linseed oil. If the piece is large, this would be a laborious process of securing a polish. It would be better to give the article several coats of varnish, rubbing each coat down by means of pumice stone and water; and finally applying a flowing coat of fine, hard drying varnish. If this does not produce the finish required, you can rub the last coat down with fine pumice stone and finish it with rotten stone.

(5) B. F. B. asks what printers' ink is made of. A. A varnish composed of linseed oil, resin, and soap, and the pigment; in the case of black ink, lampblack and indigo with Prussianblue.

(6) W. B. R. asks if there is anything that can be used to refinish japanned iron and marble, which has got dull and faded by standing in the sunlight. A. By rubbing down with French polish you may improve the appearance of japanned work that has become dull. Polishing with a paste of oxide of tin and water on a buff or rubber of cloth or soft leather will bring out the gloss, if there is no oil on the japan.

(7) T. B. W. asks how phenol sodique is made. A. It is made of carbolic acid 1·177 per cent, soda salts, water, and impurities 98·823 per cent.

(8) C. M. W. asks (1) the difference between a yard square, a square yard, and a cubic yard. A. The first two are the same, and are measures of surface; the second is a measure of volume. 2. Will common black powder, if placed in a vacuum or in something where air is excluded, explode when a spark is applied? A. It will not.

(9) E. C. T. asks a practical method by which a right lined quadrilateral figure or square may be reduced to one-half its area, preserving its relative proportions. A. The areas of similar rectangles are to each other as the squares of the sides.

(10) J. A. G. asks how to make orange water. A. Orange flower water is the product obtained by distilling 10 pounds of orange flowers with 7 fluid ounces of proof spirit. You will find directions for the preparation of similar compounds in the U. S. Dispensatory.

(11) J. R. T. asks: How can I mix a body of plaster of Paris, say 24 inches square, for the life size bust of a man, so that there will be no air holes in it when it is cut? I had one cast, but when cut, it was full of small pin holes. I would like to get one perfectly smooth and hard, so that when it is carved the tools will leave it clear of these holes. A. The process for taking a plaster cast is as follows, some of the details of which you have probably ignored: The person must lie on his back, and his hair be tied behind; into each nostril put a conical piece of paper, open at each end to allow of breathing. The face is to be lightly oiled over, and the plaster, being properly prepared, is to be poured over the face, taking particular care that the eyes are shut, till it is a quarter of an inch thick. In a few minutes, the plaster can be removed. In this mould, coated with paraffine, a second cast is to be taken, that will furnish casts exactly like the original. To avoid pin holes, pour the plaster very thin and agitate till it forms.

(12) P. B. asks: How is pool and billiard chalk made, and of what is it composed? A. The chalk referred to is dug from the ground, carefully selected, and cut in the shape generally used. It is imported almost entirely from France.

(13) E. B. R. and H. S. (1) a recipe for ebonizing wood. A. See answer to query 11, SCIENTIFIC AMERICAN of July 11. 2. One for destroying smell from a goat skin rug, cured with hair on. A. Hold the skin over a fire of red cedar boughs and sprinkle with chloride of lime; or wrap them in green hemlock boughs, when they are to be had, and in 24 hours they will be deodorized.

(14) F. S. asks the ingredients, proportion, and process of making liquid stove polish. A. Black lead pulverized 1 pound, turpentine 1 gill, water 1 gill, sugar 1 ounce, grind together.

(15) G. M. asks: What mineral would be nearest in color and appearance to potato starch? A. Ground limestone or barytes would resemble starch as closely as any mineral will. The greater specific gravity of the mineral makes the difference plain in every case.

(16) J. M. asks: What will remove varnish from furniture without removing the stain, or color it? A. Turpentine, benzine, alcohol, ether, etc., will remove varnish, but attack the stain also, if it be soluble in these liquids. The only way, always practicable, is to carefully scrape off the varnish.

(17) F. W. S. asks how to make a glue for gluing a musical instrument. A. The great point in this operation is, first, to remove all of the old glue from the parts to be joined, then warm the part to be attached very thoroughly, and a good carpenters' glue can readily be used.

(18) C. A. B. asks: What is put into water to assist in producing a tone, when tumblers are filled and the fingers moistened and drawn across the edge, produce such lovely strains? A. Nothing but pure water is used. The different notes are produced by filling different tumblers with varying amounts of liquid.

(19) W. M. R. asks (1) how to set a common slide valve in stationary, locomotive, and marine engines. A. For an excellent practical treatise on the setting of slide valves, see SCIENTIFIC AMERICAN SUPPLEMENT, No. 13. 2. A rule for calculating the safe working pressure of steam boilers, when you have the dimensions given? A. Divide the minimum tensile strength of boiler plate (40,000 pounds) by 4 for safe load, and again by 2 for single riveted seams or 1·66 for double riveted seams. Multiply this product by the thickness of the plate in decimals of an inch—0·25 for ¼ in. iron or 0·31 for five-sixteenths inch iron. Divide this sum by half the diameter of the boiler in inches for the safe working pressure. If the boiler shell is all steel, use 60,000 pounds for tensile strength.

(20) J. M. writes: Would like to know how to make a spoiled home-made blackberry brandy good. Two buckets of blackberries were boiled slowly for one hour, then squeezed through a rag, the juice put into a jar with ¼ gallon of brandy and allowed to stand about two months, after which time another ½ gallon of brandy and 4 pounds of dissolved sugar were added, and now it tastes sour. A. Your process of preparation was not correct. The fermentation has yielded an excess of acid, which can be remedied by the addition of some potassium bicarbonate, a substance in itself perfectly harmless.

(21) L. A. O. asks: 1. What will prevent the hair from falling out? What will strengthen the hair so it won't snap and break, when it is combed at all briskly? A. See "Loss of Hair," etc., contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 173. 2. What will stimulate the growth of the eyelashes? A. Cologne 2 ounces, liquid hartshorn 1 drachm, tincture cantharides 2 drachms, oil rosemary 12 drops, lavender 12 drops. 3. What will effectually and easily remove an objectionable crop of hair from a lady's arms, so that it won't grow in again? A. Use some depilatory; as, for instance, a strong solution of barium sulphide, made into a paste with powdered starch. It should be applied immediately after it is mixed, and allowed to remain there for 5 or 10 minutes.

(22) A. F. O. writes: I have a complete human skeleton, just from the caldron of the medical college, which I desire to bleach. To 4 gallons of water I added ½ pound of chloride of lime and ½ pound of washing soda—the latter to cut the grease and give the chlorine a chance. I kept the bones in this solution for four days, but the results are not satisfactory. What can I do without resorting to the slow process of rain and sunlight? A. Your error is in thinking that the work can be done speedily. It is impossible to extract the oily material from the bones except by a very slow process. Boiling in any amount of alkali, say your washing soda, will not accomplish it, and all the oil must be absolutely removed before you can do anything toward the bleaching. Very long maceration in water alone or in soda and water will eventually effect it, but a much better material is benzine. Make a tin box into which you can pack your skeleton, solder on the cover, leaving only a round hole for filling. Pour in benzine till the box is filled, stop the hole closely, and leave it undisturbed for three months. Your skeleton will come out clean, and can be bleached perfectly by sunlight. Chlorine will do the bleaching quicker, but it injures the bones; never use it. Any shorter process will give you a skeleton which will be always nasty.

(23) F. C. asks: 1. What is the difference or distinction, if any, between cotton wool, absorptive cotton, cotton batting, etc.? A. The absorptive cotton is a specially prepared compound, which, in consequence of its treatment with different chemicals, has its oily constituents entirely removed, and hence is more absorbent than the common cotton batting. 2. Is there any real value in the widely advertised electric bands, belts, pads, brushes, etc.? A. Those who employ them claim to be benefited by their use. 3. Could not a person construct one for himself that would be nearly as serviceable? And if so, how should it be constructed to give the best results? A. It will be found in nearly every instance much more economical to purchase out and out an article of this description than to attempt to make one. Moreover, they are patented.

(24) A. J. G. writes: I have a quantity of red wine vinegar which I am anxious to settle; it is rather muddy. A. Take 2 quarts of ground horse radish and 1 pound of thick gray filtering paper to the barrel, and either shake or stir until the paper has separated into small shreds and let it stand for 24 hours, when the cider may be drawn off by means of a siphon or a stop cock. Instead of paper, a preparation of wool may be taken, and is preferable to paper, as it has simply to be washed with water, when it may be used again.

(25) F. B S.—The exact period of the building of Jerusalem is not definitely proved. The hill of Zion was a mountain fortress there about 400 years before it was captured by King David, about 1046 B.C., and made the seat of his government.—Fence posts are raised by the frost in the ground, but less in sandy loose soils than in hard pan or clay soils. Have known posts to be raised enough to allow the fence to overturn, on the prairies.

(26) J. H. A. asks: What is the cause of putty losing its color and turning white in the joints of bricks? A. Venetian red contains but a slight amount of oxide of iron, so that the putty made from such a pigment is not likely to contain over 5 per cent of the coloring matter. Good putty made with chemically pure oxide of iron will not lose its color. There is no destruction of coloring matter, simply the putty, unless properly made, does not contain sufficient pigment.

(27) J. J. R. writes: I have a large tank (circular) which I wish to coat with something before I let in the water. Material, white pine. What can I use to keep the water from penetrating the wood and that will not injure the water for family use? A. We know of nothing better for painting wooden tanks than Prince's metallic paint (red oxide of iron) and boiled linseed oil, 2 good coats, first well dried before the second is put on. The best coating for a wooden tank for drinking water is paraffine, which can be put on the wood with a warm iron, such as a sad iron or tailor's goose, heated about 250°.

(28) F. J. W.—Arsenic is put in lead shot to facilitate the process of finishing. It makes the shot slightly poisonous. Game that has been kept for a time with much shot in it might be poisonous from both lead and arsenic. You will find excellent articles on the various kinds of explosives in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 406, 407, 342, 127.

(29) J. T. B.—There will be very little difference in your house with a 4 inch air space and a 1 inch air space, as to warmth or dryness. A 2 inch space is preferable. Your 4 inch outside wall is very objectionable; it has no stability of itself, and the means of tying it to the terra cotta lining is limited and not reliable. A cheaper and better way is to build your house with substantial walls, 8 inches or 12 inches thick, according to size and height, and fur off the outer walls and lath and plaster.

(30) A. R. writes: 1. We have a theater, field, and marine glass, combined. The marine eye pieces do not register, that is, we see two images, yet each eye piece, when used alone, gives clear and sharp views; how should this be rectified? A. The axes of the glasses are not parallel. Try twisting the glasses one way or the other. Any good instrument maker will tell you what to do, or will correct it at trifling cost. 2. The best means of bleaching a sail, which is good, but dirty. A. Use a solution of chloride of lime in water, in which the sail may be immersed for a short time and then thoroughly washed and dried in the sun. This will whiten it. 3. We have labels printed in blue that we want to reproduce by photo lithography; can it be done successfully? A. Not in any satisfactory way; you can reproduce a blue label by the wax process, but for any other reproduction it must be redrawn.

(31) C. B. B. asks: 1. What diameter shafting should be used to transmit eight horse power from a high speed steam engine, shafting to be in one line thirty feet long, and to carry about twelve pulleys, engine connected near one end? A. With 100 to 125 revolutions, 2¾ inches diameter; 150 to 200 revolutions, 2 inches diameter; 200 to 300 revolutions, 1¾ inches diameter. 2. How many hangers should be used? A. Four hangers. 3. Which works and wears the best for the above description of engine—the vertical or horizontal type of engine and boiler? A. The horizontal engine of moderate speed gives the most satisfactory result in wear. As well also the horizontal tubular boiler, set in brickwork. 4. Mention a good work on the steam engine, treating more particularly on the management and care of the steam engine, and taking of indicator cards, etc., also rules for calculating sizes of belts and shafting, to transmit different horse powers. A. "Steam for the Student or Cadet Engineer," by Long & Buel, $2.25; "Engineer's Guide," by Edwards, $2.50; Le Van, "The Steam Engine Indicator," 50 cents; Cooper, on Belting, $3.50; which we can send on receipt of price.

(32) W. R. B.—You cannot obtain a general license in New York city. Only a license to run the boiler of parties that you are engaged with. You have to go before the sanitary police boiler inspector. We recommend to you for study, Roper's "Questions and Answers for Engineers," $3.00.

(33) B. A. W.—For falling bodies: The velocity in feet per second $=\sqrt{S\times 2g}$. S=space fallen through; $2g$=twice gravity, or 64·33. Velocity in feet per second × weight = force in foot pounds. The dynamical effect of impact on solid heavy bodies is found to be over four times the above by experiment. The air slightly retards bodies falling by gravity, in inverse ratio to their density. See Haswell's "Engineer's Pocket Book"—gravitation, impact, and pile driving.

(34) W. R.—It has been found that the oil from the cod's liver contains iodine, bromine, chlorine, acetic acid, phosphoric acid, and other constituents which make it a valuable remedy for those who need a fattening and nourishing compound. Its constituents are determined by various chemical tests.

(35) R. W. S. asks the simplest way of making lard oil. A. The process is simple, yet requires expensive machinery for any considerable product: Steam for clarifying in kettles with coils of iron pipe; wood or iron vats, with stirring machinery, for bleaching the lard product; and screw or hydraulic presses in a cold room for separating the oil from the stearine. The cold lard is placed in sacks, which are laid between iron plates under a press, when by gentle and increasing pressure the oil separates from the stearine and oozes through the bags. The room is cooled by ice or any other available means.

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

R. H. L.—The specimen is a variety of slate. It has no value in New York, but, ground to a fine powder and mixed with oil, you could manufacture an excellent paint, which could be sold in your vicinity.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

January 5, 1886,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Air compressor, H. E. Depp ... 333,613
Air engine, P. Lochmann ... 333,644
Alarm. See Railway switch alarm.
Alarm service, municipal, W. A. Stern ... 333,975
Altitude instrument, B. B. Sharp ... 333,555
Artificial mother, J. W. Cooke ... 333,602
Auger for cutting square holes, W. Patterson ... 333,662
Aurin, manufacture of derivatives of, C. Lowe ... 333,649
Awning, W. J. Stoneman ... 333,569
Axle box, car, J. W. Tucker ... 332,981
Axle, self-oiling, J. W. Marshall ... 333,532
Bag. See Paper bag.
Baling press, T. C. Naramore ... 333,660
Baling press, W. D. Slauson ... 333,895
Barley machine, S. Spitzer ... 333,561
Barrel heads, etc., fastener for, J. W. Weston ... 333,704
Basket, S. Toffler ... 333,793
Battery. See Electro-medical battery.
Beading tool, C. M. Stevenson ... 333,690
Bed bottom, C. L. Ames ... 333,809
Bed bottom, spring, T. P. Lynch ... 333,958
Bedclothes securer, W. C. Walter ... 333,905
Bed springs and spring beds, spring connection for, H. S. Johnson ... 333,756
Bedstead, invalid, Zehring & Jones ... 333,712
Beer and other liquors, vessel for condensing, C. H. Johnson ... 333,952
Bell, electric, C. F. De Redon ... 333,614
Bicycle, C. E. Duryea ... 333,936
Bilge water ejector, G. Haydn ... 333,758
Bilge water indicator, J. F. Smethells ... 333,686
Bleaching, W. Mather ... 333,875
Blind, shutter, or screen, B. D. Stevens ... 333,595
Block. See Meat block.
Blower for stacks of boiler furnaces, steam, T. Poore ... 333,543
Boat. See Torpedo boat.
Boats or small vessels, machine for bending, shaping, and setting the timbers or frames of, J. A. Dower ... 333,615
Boiler. See Steam boiler.
Boiler, E. T. Sykes ... 333,571
Boiler and steamer, S. W. France ... 333,740
Boiler furnace, T. Poore ... 333,544
Boiler furnace, steam, L. Johnston ... 333,954
Bolt lock, W. H. Babcock ... 333,718
Boot or shoe heel plate, Hogeboom & Woolcocks ... 333,522
Boot or shoe nailing machine, F. A. Beal ... 333,812
Boot or shoe tree, S. H. Hodges ... 333,630
Boots and shoes, lasting, W. C. Cross ... 333,606
Boots, shoes, or stockings, stretcher for felt, W. A. Young ... 333,910
Bottle filling machine, J. Hunt ... 333,524
Bottles, etc., tool for forming threads, etc., upon, C. De Quillfeldt ... 333,733
Bottling machine, Wood & Mead ... 333,708
Box. See Packing box. Paper box.
Brake. See Car brake. Sled brake.
Breast strap hook, W. D. Drake ... 333,734
Brick moulding device, S. Wright ... 333,710
Broom rack, Tatum, Jr., & Hatfield ... 333,900
Brooms and brushes, machinery for making, J. G. Horsey ... 333,946
Buckle, J. E. Davenny ... 333,930
Bundle carrier, A. J. Underhill, 2d ... 333,796
Button, G. W. Toms ... 333,794
Button, collar, C. G. Harstrom ... 333,752
Button fastener, I. J. Saunders ... 333,551
Cab, hansom, C. A. Floyd ... 333,845
Can. See Oil can. Sheet metal can.
Can opener, C. F. Leopold ... 333,764
Candlestick, M. A. Greeley ... 333,517
Cane, umbrella, and hat rack, combined, A. Frank ... 333,741
Car brake, W. H. Masterman ... 333,874
Car coupling, D. U. Graveline ... 333,850
Car coupling, F. Windler ... 333,986
Car furniture, railway, R. F. Handy ... 333,853
Car spring, R. Vose ... 333,983
Car, stock, C. L. Gorrell ... 333,747
Car window, J. M. Fennerty ... 333,620
Cars, fanning device for railway, R. W. Macgowan ... 333,767
Carbureting attachment for gas fixtures, J. Kidd ... 333,862
Carburetor, A. J. English ... 333,508
Carding machine feeding mechanism, J. T. Lemaire ... 333,869
Carriage curtain fastening, J. M. Baker ... 333,811
Carriage jack, P. J. Abbott ... 333,807
Carrier. See Bundle carrier. Hay carrier.
Cartridge, H. F. Clark ... 333,728
Cartridge shell crimping device, O. F. Belcher ... 333,569
Case. See Dressing case.
Casting metal ingots, Dalliba & Billings ... 333,929
Chain, drive, W. N. Whiteley ... 333,803, 333,804
Chair. See Convertible chair.
Check for bridles, overdraw, J. W. Whittic ... 333,581
Check rein hook, H. D. McKinney ... 333,880
Christmas tree with or without accompaniment of music, mechanism for turning, J. C. Eckardt ... 333,617
Churn, G. W. Hinman ... 333,629
Cigar box clasp, C. Kunze ... 333,640
Cigar machine, J. G. Strothoff, Jr ... 333,976
Clamp, R. B. Poole ... 333,667
Clasp. See Cigar box clasp. Garment supporting clasp. Pencil clasp.
Clasp, A. Schurch ... 333,679
Cleaner. See Knife cleaner.
Clock case, J. G. Low ... 333,873
Clothes pounder, A. A. Brooks ... 333,916
Coal loading apparatus, W. G. Barnard ... 333,585
Coal tipple, W. W. Rosensteel ... 333,891
Coffee hulling and polishing machine, J. Smout ... 333,788
Coffee mill, M. Lepage ... 333,870
Compound engine, W. H. Donaldson ... 333,507
Condenser, steam engine, R. Lees ... 333,763
Convertible chair, J. B. Ross ... 333,892
Conveying apparatus, A. Wolcott ... 333,987
Coupling. See Car coupling. Harness coupling. Hose coupling. Thill coupling. Yoke coupling.
Cuff holder, J. F. Atwood ... 333,494
Cultivator, J. Goodnough ... 333,514
Cultivator, J. Morgan ... 333,535
Cultivator, disk, J. O. Currier ... 333,927
Cultivator, wheel, A. Lindgren ... 333,766
Cushion for vehicles and furniture, ventilated spring, Sibley & Wells ... 333,557
Cutter. See Pipe cutter. Stalk and weed cutter.
Cylinders or cylindrical vessels, joint for, W. H. Brown ... 333,726
Dash pot, G. H. Corliss ... 333,831
Desk, C. Larson ... 333,760
Disinfecting materials, automatic apparatus for dry, B. A. Dryer ... 333,934
Distance instrument, Hansard & Tribby ... 333,625
Distilling wood, apparatus for, Hansen & Smith ... 333,750
Distilling wood, etc., apparatus for, J. Roberts ... 333,673
Doors, device for fastening prison, L. M. Ham ... 333,749
Door spring and check, combined, Stevens & Major ... 333,568
Draught equalizer, A. Wheeler ... 333,705
Drawings, apparatus for enlarging and reducing, A. Fougeadoire ... 333,737
Dredger, endless chain, J. Kennedy ... 333,637
Dressing case or bureau, G. Sugg ... 333,977
Drier. See Grain drier. Tobacco drier.
Drier, L. J. Cadwell ... 333,825
Drill. See Mining drill.
Drill bits, making, Diamond & Brock ... 333,506
Drill teeth, gauge wheel attachment for, E. P. Janvier ... 333,858
Earth boring machine, J. E. Davis ... 333,931
Edger, double and gang, M. Garland ... 333,847
Edger, gang, C. A. Merrill ... 333,882
Egg preserving device, O. W. Jones ... 333,636
Egg register, Shellenberg & Stiemke ... 333,678
Electric light circuits, regulator for, W. M. Thomas ... 333,698
Electric lighting system, W. Stanley, Jr ... 333,564
Electric machine, dynamo, E. Thomson ... 333,573
Electric machines, armature for dynamo, Stanley, Jr., & Shallenberger ... 333,563
Electrical meter, W. C. Patterson ... 333,779
Electro-medical battery, S. France ... 333,739
Elevator, H. Albert ... 333,713
Elevator, C. G. & L. Tiefel ... 333,701
Ellipsograph, R. W. Rummell ... 333,972
Engine. See Air engine. Compound engine. Gas engine. Traction engine. Steam engine. Winch engine.
Engine for running sewing machines, L. W. Baldwin ... 333,719