

RECENTLY PATENTED INVENTIONS.

Engineering.

PETROLEUM ENGINE.—Adolf Spiel, Berlin, Germany. This engine is run by the explosion of a compressed mixture of air and petroleum, the supply being drawn into the cylinder by the movement of the piston in one direction and compressed by the return movement, while a governor automatically controls the admission of oil to regulate the speed.

GAS MANUFACTURING PROCESS.—Gustaf M. Westman, New York City. It consists in forcing superheated gases through a charge of coal, then passing the resulting gases through glowing coke, and finally superheating part of the gases and passing them through the coal, the process being preferably carried into effect by means of a novel form of furnace, to save labor and increase the quantity and quality of the gas.

CAR COUPLING.—William Latimer, Wilmington, N. C. The coupling hook is pivoted to swing in the drawhead, and has a weighted shank arranged to be butted or struck by an entering link, thereby coupling the hook with the link, a dog automatically engaging a shoulder to lock the hook in coupling position. The coupling is designed for use with the standard link, in connection with the common pin coupler or another coupler like itself.

DYNAMITE CENTRIFUGAL GUN.—Walter E. Hicks, Brooklyn, N. Y. It has twin disk wheels, with four oblong firing chambers, near their peripheries, the disk wheels to be rapidly rotated, and solid shot, or shot and an explosive shell, are to be discharged by and through the action of the resultant of the central forces, centripetal and centrifugal.

CENTRIFUGAL ORE AMALGAMATOR.—James B. Brewster, New York City. This invention is an improvement on a former patented invention of the same inventor, and consists in providing the outer part of the rotary amalgamating pan, having a series of concentric grooves, with an upwardly and outwardly flaring rim or edge.

Agricultural.

HARROW.—John H. Higgins, Charleston, Me. This invention relates to a spring tooth harrow, in which the frame is formed in two sections hinged together, and adapted to be rigidly locked parallel to each other, to improve the efficiency of the harrow in leveling the ground, while there is a special construction of the harrow frame, and of the clips used in securing the spring teeth.

CONVERTIBLE HARROW AND CULTIVATOR.—John H. Higgins, Charleston, Me. This improvement is designed to furnish a device whereby the teeth always retain their parallel position with the line of draught for effective work, whether the cultivator or harrow is opened to its widest extent or closed for use in the narrowest rows of crops.

ATTACHMENT FOR CULTIVATOR SHIELDS.—John T. Downey and George P. Funkhouser, Plattsburg, Mo. It is designed to be readily connected to the arch of the cultivator, whether the same be vertical or horizontal, and provides a means whereby the shield may be carried to the right or left, as desired, and raised or lowered to any height required by the condition of the ground.

RAKE.—E. William Gunn, New Woodstock, N. Y. Combined with the head or cross bar of the rake and its handle are rake teeth constructed of a continuous piece of wire coiled around the bar, doubled and twisted to form teeth, and twisting around the forward end of the handle answering as a ferrule therefor, in hay and other like rakes.

Miscellaneous.

LIFE BUOYS.—Thomas L. Reed, Laporte City, Iowa. Apparatus is provided by this invention whereby the float, held by a cover or support to the vessel, may be conveniently detached therefrom, while a connection will be still maintained between the vessel and the float, while means are provided to effect communication between the vessel and the shore.

STOVE PIPE THIMBLE.—William H. Packham, Dresden, Ontario, Canada. This device is designed to protect the flooring, wall, or partition in which it is inserted from the heat, and also to serve as a ventilator if desired, while being of simple and durable construction, so that it can be readily taken apart and cleaned.

WAGON WHEEL.—Herman and Henry Wesle, Medford, Wis. It is made entirely of iron or steel, the hub being in two sections, each having arms alternating with arms of the other section, forming adjustable mortises for receiving the sockets of the spokes, the arrangement being such that the various parts of the wheel may be readily tightened when worn or accidentally loosened.

BRICK PRESS.—Charles F. Stout, Trenton, N. J. This press provides for an increase of the power of the operating lever as the compression of the clay in the mould increases the resistance to the plunger—for facilitating the removal of the plunger, mould cover, and operating devices—and for readily taking up the wear of the bearings, while the construction is designed to give great strength and durability.

BALING PRESS.—William P. Martyn, Harrisburg, Oregon. This machine is one which may be used for baling while traveling or moving, by keeping a pair of horses on the tongue and another to press the bale, in such way baling from a cock or windrow, the invention providing various novel features of construction and combinations of parts.

REGISTER FOR WATER METERS.—Franklin T. Gilbert, Walla Walla, Washington Ter. The shaft of the rotating wheel of the meter is rigidly attached to a small gear wheel in a shallow chamber, this small gear wheel communicating motion to a unit wheel, and thence to wheels of larger denomination, all resting in the same plane, making a register of most compact form, and one not liable to be easily deranged.

APPARATUS FOR DISPENSING BEVERAGES.—Ernest Hague, New York City. It may be combined with a water cooler and waste water receptacle, and is designed to dispense aerated or mineral water by the glass, without an attendant, by the dropping of a coin or other token in a lock and receptacle to receive it.

BOTTLE CLEANER.—Anders G. A. Ekroth, Ishpeming, Mich. Folding rods, on which are bristles or equivalent brush-like material, are adapted to be inserted in the neck of the bottle, to be opened out by a hand lever in cleaning, there being a projection from one side of the bottom to clean the ring-shaped cavity in the bottom of some bottles.

MEMORANDUM BOOKS.—Samuel J. Young, Brooklyn, N. Y. This invention provides a memorandum book having on the inside of one cover a cross piece or pocket for the reception of the leaves, and the other cover making a fastening which gives a neat appearance to the book, and is durable, holding the book securely closed.

UPHOLSTERY EDGING.—William Furl, Lockhaven, Pa. This is a new article of manufacture, consisting of a filling compressed into shape, with a covering stitched to form a loop or attaching edge, making a sharp corner edging for upholstery purposes, which will stand out the same as a hand-stitched edge, and will be durable and of fine finish.

BALL JOINT FOR CHANDELIERS.—Walter Smart, Jersey City, N. J. This invention covers a novel construction of joint for hanging chandeliers, in which a coupling sleeve, adapted to be screwed on a gas pipe projecting from the ceiling, is provided with an internal socket to receive a ball having a depending shank for connection to the main pipe of the chandelier.

WASHING MACHINE.—Thomas L. Barker and Joseph C. Hornbaker, Westfield, Ind. This invention combines a clothes roller and wringer with a washing machine, the improved machine being simple and durable in construction and designed to be very effective in operation.

SCIENTIFIC AMERICAN
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TABLE OF CONTENTS.

1. Elegant plate in colors, showing three designs for small cottage dwellings, for twenty-five foot lots. Cost, fifteen hundred dollars each. Floor plans, details, etc.
2. Plate in colors, illustrating a village school house, to cost three thousand dollars. Details, floor plans, etc.
3. Full page illustration of the great chimney at the Clark Thread Works, Kearney, N. J. Height, 335 feet. The tallest chimney in America.
4. Perspective view and floor plans of an attractive residence built at East Orange, N. J. Cost, eight thousand five hundred dollars.
5. A cottage recently erected on Sound View Hill, New Rochelle, N. Y. Plans and perspective. Cost, four thousand dollars.
6. Views of the Pratt Institute for Industrial Education, Brooklyn, N. Y.
7. A cottage for four thousand three hundred dollars, recently erected at Rochelle Park, N. Y. Plans and perspective.
8. Perspective and floor plans of an attractive cottage built recently at East Orange, N. J. Cost, six thousand dollars.
9. A suburban villa built lately at Richmond Hill, Long Island. Cost, seven thousand dollars. Plans and perspective.
10. Engraving of a country residence at East Orange, N. J., with plans and perspective. An excellent design.
11. A residence on Renolds Terrace, in Orange, N. J., lately built at a cost of eight thousand dollars. Perspective view and floor plans.
12. Design for the new court house and post office, Abingdon, Va.
13. Design for the new building for the United States post office, etc., at Dayton, Ohio.
14. An admirable design for a suburban residence of the Queen Anne type, recently built at East Orange, N. J. Cost, nine thousand dollars. Perspective and floor plans.
15. Perspective and plans of a barn and carriage house built at Richmond Hill, Long Island. Cost, eight hundred dollars.
16. The Villa Reiss, near Cronberg, Taunus Mountains, Germany. New residence of the Empress of Germany.
17. Miscellaneous contents: Publication of designs.—The Drexel building, Philadelphia.—Ancient sanitation.—Effect of adding sugar to cement.—The New York safety dumb waiter, illustrated.—The automatic regulation of the temperature in houses, illustrated.—The Aldine fireplace, illustrated.—The Howard combination heater, illustrated.

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Notes & Queries

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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.

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Minerals sent for examination should be distinctly marked or labeled.

(1) D. C. M. asks: How is mercury best cleaned from gold jewelry, rings, etc., after it has once spread all over the surface of the gold? A. Heat to a temperature of low red; be careful, or you may melt the gold.

(2) H. S. W. writes for the best cement to use for a large aquarium where the water pressure is very heavy. Have had great trouble in keeping it tight. Depth of water is 5 ft. Also what is best to paint the bottom and uprights with, to prevent rusting. Are of cast iron. A. Try Burgundy pitch melted in with hot iron. A little boiled oil may be melted with it. Paint uprights and bottom with zinc white.

(3) S. V. P. asks: What preparation to use in painting a black board. He has used ivory black and oil, with about 1 oz. drier to half pint of mixture. The board is dry; but such colors of crayon as red and yellow will not wash off. A. Mix lampblack and flour of emery or ground pumice stone with shellac varnish (2 oz. shellac to 1 pint of alcohol).

(4) E. H. asks: How are autumn leaves kept bright and glossy for winter decoration? A. They may, after pressing, be dipped in melted beeswax; the same may be applied solid to the surface and be melted with a hot smoothing iron; or they may be varnished with dammar varnish or Canada balsam. Varnishing is objectionable on account of time required for drying.

(5) J. K. H. asks which is the best season for tree planting, and best method. A. An excellent method for hardy trees is, in frosty weather, in fall, to dig a trench around them, and remove the earth from underneath them as much as possible. Then the ball of earth is to be well moistened and allowed to freeze solid. The tree with frozen ball of earth attached is then moved and placed in the desired spot, where a hole large enough for its reception has been made. It is well to "top" or remove some of the branches. Delicate trees, such as arbor vitae, should be transplanted in spring. They should be firmly attached to stakes for the first season, and it is well to place a couple of heavy stones on the ground near their stems.

(6) Mass. asks: Is there any law or regulation that obliges one to have periodicals or papers sent in individual wrappers where free delivery is in practice? A. No. Each paper should be separately addressed.

(7) F. W. C.—The fungus which you send is commonly known as an earth star and scientifically as *Geaster hygrometricus*—the specific name referring to the plant's habit of expanding or contracting its outer, stellate coat according to the hygrometric state of the atmosphere.

(8) F. B. H. writes: I want to print on tin and glass with one inch common block letters, the sign to be about seven by four inches. What shall I use? A. Use colored printer's inks. You will have trouble in printing on glass, unless you use India rubber type.

(9) H. D. W. asks for the formula for "Vesuvium;" it is used for lava work. I know it has whitening and glue, but do not know the proportions or the other ingredients. A. 7 lb. best glue are boiled in 3½ pints of water; 3 lb. white resin are dissolved by heat in 3 pints raw linseed oil; the two are mixed and simmered for ¼ hour, and are then poured out on a quantity of whitening and mixed to the consistency of dough. Or, boil 1½ lb. best glue into thick solution, stir into it 10 oz. of resin or, still better, Venetian turpentine. Add enough whitening or mineral color to bring it to a stiff paste and add a few drops of olive oil. These are the best formulas approaching your requirements that we can give.

(10) G. R. J. asks: Will carbonic anhydride, worked under the same pressure as anhydrous ammonia, be as equally effective; i. e., say 150 lb. pressure, and what is the relative expansion pressure? A. No. Carbonic anhydride requires a pressure of 38.5 atmospheres for its liquefaction at freezing temperatures; ammonia requires much less, only 4.4 atmospheres. The carbonic anhydride would be perfectly efficacious, but would need very powerful machinery.

(11) O. I. F. asks: 1. How many 16 candle power incandescent lamps (Mather system), 108 volt, can be used on the dynamo described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600. A. Eight to ten. 2. Can I make and sell the dynamo described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600? A. You can.

(12) W. H. D. asks how to mix the bisulphide carbon for a bright silvering. I tried it with a bottle of strong silver solution, in which I put 2 oz. bisulphide of carbon, but I cannot get it to mix. A. The process is only adapted for work on the large scale. A mere trace of bisulphide is required. Below we give two receipts: 1. 6 ounces bisulphide of carbon are put in a stoppered bottle with 1 gallon of silvering solution; the mixture is shaken and allowed to stand 24

hours. Of this solution, 2 ounces are added to every 20 gallons of ordinary solution in the plating vats, and the whole stirred. 2. To 1 quart ordinary plating solution, containing 2 lb. cyanide per gallon, add 4 oz. liquid ammonia, 4 of bisulphide of carbon, and 2 of ether; shake occasionally, and allow to stand 24 hours. Use 2 oz. for 2 gallons of silvering solution, adding it every alternate day.

(13) G. F. writes: 1. I have a photograph lens made up of two pieces glued together. Could you tell me of any solvent which will dissolve the glue, as I want to use only one piece of the lens? A. Opticians separate lenses by boiling them in water. The temperature must be very gradually raised, as there is danger of cracking the glass. 2. How could I prepare a piece of steel for magnetizing? I have bent it into the shape required, and I would like to know how to temper it, so that it could be magnetized. A. Harden the steel and draw the temper just below a straw color.

(14) O. G. asks: 1. If a plank 12 ft. long and weighing 24 pounds is supported by two props, one 3 ft. from one end and the other 1 ft. from the other end, what is the pressure on each prop and how do you find it? A. The center of gravity of the plank is at its center. Each prop supports a weight inversely proportional to its distance therefrom. The prop 3 ft. from the end is 3 ft. from the center of gravity. The other prop is 5 ft. from the same. The first, therefore, carries $\frac{5}{8}$ of the weight and the other $\frac{3}{8}$, or 15 and 9 lb. respectively. 2. How many candle power can I get with a dynamo of suitable size for a two-horse engine? How many candle power are the incandescent lights equal to, such as are used in private houses? A. About 400 candle power. An ordinary incandescent lamp gives from 12 to 16 candle power. 3. How large a cell could I store in one hour with a dynamo suitable for a two-horse engine? A. You could charge 30 to 40 cells in seven hours. You should not press the charging. 4. Can you give me a receipt to apply to the skin to cure blackheads? A. For acne or blackheads see SCIENTIFIC AMERICAN SUPPLEMENT, No. 522.

(15) F. H. D. asks: I wish to know if, in the case of electric railway motors, extra weight is required for adhesion or would be required for heavy work, as for drawing heavy trains. A. Extra weight is needed if a heavy train is to be drawn, but it is the universal practice to use a large proportion of motor cars, or to place a motor in every car.

(16) F. H. B. writes: I have made an electrical machine, and fail to get a shock from it. I wound the core with No. 18 covered wire, and wound the spool, about two inches in diameter, with No. 36 silk-covered wire. I didn't have enough of silk-covered, so I wound about half of the spool with No. 32 cotton-covered. I can't get any shock from it, only just as I take hold of the handles, but when I grasp them firmly I can't feel anything. I have one bichromate battery on it. I don't think it is the core, for the vibrator works very well. A. Either your connections are wrong or your insulation is defective. It looks as if your secondary was in electric connection with your primary coil. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 160 and 569, for descriptions of induction coils.

(17) C. E. S. asks: Can you advise me of any process by which alcohol can be mixed with copal varnish on any solvent for dragon's blood that can be readily mixed with the varnish? A. Dissolve in turpentine and mix with the varnish.

(18) B. F. K. asks: What can I use to dissolve gum shellac that will be cheaper than alcohol or wood naphtha? A. Use a solution of borax in water.

(19) J. K. asks: 1. How could I melt rubber without smell, so as to produce a very thin sheet, about 4 by 8 in., or could I purchase such sheets? If so, where? A. You cannot make such a sheet by melting. It can be bought from dealers in India rubber goods. 2. Would it take more battery for a ground circuit than for a metallic circuit for a short telegraph line, having the sounder work as loud on both lines? A. The ground circuit, if it has good grounding, has the lowest resistance. Solder your wire to the gas or water pipe for ground.

(20) J. K. asks: 1. Why is the word or term engine used in speaking of lathe? Some will say, "back-gear screw-cutting lathe," and some say "back-gear screw-cutting engine lathe." A. An engine lathe is properly one provided with automatic feeding mechanism, screw-cutting gear, etc. 2. Of what is Paris green composed, and how made? A. Copper is exposed to action of diluted acetic acid and air, which produces verdigris. Copper plates are wiped over with a solution of verdigris, are dried and heated and piled up with layers of fermenting grape lees. In time the verdigris is formed, the plates swelling up and increasing in thickness. This is boiled with arsenious acid, forming Schweinfurth green. The impure Schweinfurth green is called Paris green. The latter is often adulterated with barytes. The formula is $3\text{CuAs}_2\text{O}_4 + 2(\text{Cu}_2\text{C}_2\text{H}_3\text{O}_2)$ or cupric aceto-arsenite. 3. What is London purple made of? A. London purple is a waste product from aniline factories. It consists of arsenious acid colored by aniline. 4. What is the inclosed mineral? A. The mineral is iron pyrites, of no value.

(21) E. B. N. and H. A. B. write: I have my electric motor complete and now wish to make the batteries, but do not know how to make carbon plates. A. Mix ground charcoal with water and molasses to a thick paste, press it in a mould to the right shape and heat to white heat. It should be kept in the mould while being heated and should be protected from the air. The great point is to use as little liquid as possible. After one heating it may be soaked in the sirup and may again be heated. It is better to buy the carbons. Zincs can be cast in a wooden mould. Stone jars, if vitrified, will answer for the battery.

(22) C. C. B. asks (1) a varnish for paper maps. A. Use dammar varnish or Canada balsam. 2. Directions for staining sole leather some three or four different shades, varying from white to dark red. A. Sole leather is bleached with oxalic acid and whitened with French chalk, and may be darkened by dry ochers. 3. I am directed by my doctor to drink lager beer, and I

find that when I bottle it myself and let it stand twenty-four hours (tightly corked in regular air tight rubber corked beer bottles), it becomes flat and a little sour and does not have the life in it or the taste that it had when corked. Is there any process by which I could keep it sweet, and like that bought ready bottled? A. Add a little baking soda, about half a salt spoonful, to each bottle after filling and cork as quickly as possible. 4. What will mend hard rubber? A. Sealing wax, or a mixture of asphalt and gutta percha melted and thoroughly incorporated with each other.

(23) F. W. M. asks if three barrels placed in a row on end are connected with one another by a pipe six inches from the bottom, and have an inlet at the top of the first and an outlet at the bottom of the third, which is kept closed, will all three barrels fill with water at the same time or in what order. A. The three barrels will first fill to the level of the top of the connecting pipes, six or seven inches. Then the first one will fill while the water in the other two, maintaining a lower level, will rise simultaneously a few inches above the connecting pipes.

(24) R. M. H. writes: 1. We have had many discussions as to how the water gets into the float which is in the water supply hoghead. The water is sometimes hot and then cold, and in less than a year the ball is so full that it sinks. They were mostly of copper, but the foreman put in a cast iron one, which he first tested and then plugged the hole tight, but it got too heavy after a while. How is this? A. The balls were not perfectly tight, and water leaked into them. The alternation of heat and cold would greatly increase the probability of their leaking. 2. What can I do to flower pots to keep the white formation off the outside and not spoil their usefulness? A. Try rubbing with glycerine and water from time to time.

(25) W. H. asks how to manufacture Worcestershire sauce. A. Mix together $1\frac{1}{2}$ gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, $\frac{1}{2}$ gallon Madeira wine, $\frac{1}{2}$ gallon Canton soy, $2\frac{1}{2}$ pounds moist sugar, 19 ounces salt, 3 ounces powdered capicum, $1\frac{1}{2}$ ounces each of pimento and coriander, $1\frac{1}{2}$ ounces chutney, $\frac{3}{4}$ ounce each of cloves, mace, and cinnamon, and $\frac{1}{2}$ drachms asafoetida dissolved in pint brandy 20 above proof. Boil 2 pounds hog's liver for twelve hours in 1 gallon of water, adding water as required to keep up the quantity, then mix the boiled liver thoroughly with the water, strain it through a coarse sieve. Add this to the sauce.

(26) C. H. K. asks for a recipe for making artificial honey. A. Soft water 6 pounds, pure best honey 3 pounds, white moist sugar 20 pounds, cream of tartar 80 grains, essence of roses 24 drops. Mix the above in a brass kettle, boil over a charcoal fire five minutes, take it off, add the whites of two eggs well beaten; when almost cold, add 2 pounds more honey. A decoction of slippery elm will improve the honey if it be added while cooling, but it will ferment in warm weather and rise to the surface.

(27) W. E. C. writes: I desire now to know how the chloride of silver cell or battery is made. A. Cast a cylinder of chloride of silver around a silver wire. This forms the negative element. Use a plate of zinc amalgamated for the positive and immerse both in a solution of sal ammoniac. The chloride of silver and zinc should not touch each other. Instead of sal ammoniac, caustic potash solution, 75 potash to 100 water, may be used. The chloride of silver may be pressed into a parchment or cloth bag instead of being cast.

(28) W. C. S. asks for a formula for making an artificial stone that will percolate water. A. We give three formulas:

Mix	Parts by weight.		
	I.	II.	III.
Clay.....	10	10	15
Chalk.....	1	1	1
Glass sand, coarse.....	55		
Glass sand, fine.....		25	65
Plint powdered.....		30	5

(29) C. F. M. asks for the best method of exterminating moth (tineites) from carpets without removing them from the floor. I have been told that very hot water heavily impregnated with sulphur will answer the purpose, but if this is efficacious, is it not deleterious to the fabric of the carpet? A. Soaking with naphtha is supposed to be efficacious, but is very dangerous as regards conflagration and would affect insurance. We should advise taking up the carpets and having them thoroughly beaten. Sulphur will be without any effect or will have very little.

(30) A. M. W. asks what other and cheap insulators there are besides glass, rubber, porcelain, ebonite, silk. A. Gutta percha, paraffin, petroleum, sulphur, dry wood, silica, lime, chalk and many other substances are ranked as insulators. The term is a comparative one, as they vary in the perfection with which they work.

(31) C. D. F. asks: 1. How many patents have been obtained in this country, on car couplings? A. Up to the middle of November 1888, 4,137 patents have been granted in the United States Patent Office for car couplers. 2. Where, in the United States, is the best school for learning mechanics, theoretical and practical? A. Cornell University, Ithaca, N. Y., stands, with some other institutions, in the lead. It is impossible to award precedence to a single college.

(32) A. W. H. asks whether February, 1892, will have twenty-eight or twenty-nine days. A. It will have 29 days.

(33) B. C.—A fusible alloy kept melted will generally oxidize and gain weight. Bismuth is sold by dealers in metals and chemicals.

(34) C. C. C.—You can probably obtain a patent, and it may prove of value.

(35) S. H. T.—The substance sent is a fungus of the genus *Merulius*, probably *Merulius himantoides*. Some of these fungi are very injurious in houses and especially in greenhouses.

(36) J. G. B.—The plant is *Spiranthes cernua*, or ladies' tresses. It is an orchid.

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