ENGINEERING INVENTIONS.

A car truck has been patented by Mr. Charles E. Candee, of New York city. In combination with the axles are oscillating boxes and screw cylinders of novel construction and arrangement, to facilitate the travel of cars upon curves, so they may be carried around short curves without excessive wear upon the wheels or rails.

Feeding air to locomotive furnaces forms the subject of a patent issued to Mr. James N. Weaver, of Sayre, Pa. The invention covers apparatus by which air heated by the escaping products of the furnace, or by the steam, is introduced over the fire, a steam blast being also used to quicken the draught and improve combustion.

A car truck has been patented by Mr. James N. Hicks, of Marysville, Pa. The invention relates to sliding bolsters for intermediate trucks, the truck having a perforation in the bolster and body, the car having a slot in the beam and means for forming a sliding joint with the bolster, and the king bolt having a squared portion to fit in the slot.

A gas regulator has been patented by Mr. Chester S. King, of Smethport, Pa. This invention covers the combination with a regulator of a separate diaphragm nearer the source of supply, with a novel construction for regulating the flow of gas as it comes in very irregular degrees of force from natural wells, where the pressure varies widely.

A double acting pump has been patented by Mr. James McGwin, of Fulton, Mo. It has an inner and an outer cylinder, the inner one with piston and piston rod packed in its top, and at the bottom of the cylinder are three tubes, each with a valve, one of the tubes communicating with the inner cylinder, another with the outer, and a third with a vertical channel between the two cylinders, the device being more especially designed for artesian wells.

MECHANICAL INVENTIONS.

A counter shaft has been patented by Mr. De Witt C. Cumings, of Carthage, Pa. The invention covers improvements, including an independent short shaft in line with the counter shaft, intended to secure a perfect and permanent alignment of the shaft in its bearings, to do away with the ordinary loose pulley, and to provide means for the better lubrication of the bearings.

A machine for dressing ship's sides has been patented by Mr. John Hamilton, of St. Johns, New Brunswick, Canada. It is a contrivance of machinery, whereby a rotary cutter or planer may be applied to and operated upon the sides of vessels, by a crank shaft to be operated by hand or by power, to dub and plane the sides better and faster than can ordinarily be done with hand tools.

A belt stretcher has been patented by Messrs. Garrison H. Jones, of Larwill, Ind., and James M. Chilcote, of Edgerton, Ohio. It is to take up the slack in belts without taking them from the pulleys, and covers a combination of head block with clamp, lugs with inclined planes, and wedges, the wedges being so introduced that the strain from the clamped ends tightens each wedge on the inclined planes, and the slack can be readily taken up.

A machine for forming scythes has been patented by Mr. Lucius C. Palmer, of Ballston Spa, N. Y. This invention combines, in a swaging machine, a reciprocating oscillating die with an adjustable bed die, with other improvements, for swaging scythe, corn knife, and other blades, in uniform shape from back to edge, and true taper from heel to point, making blades more uniform in thickness, and that will finish with less grinding, than those made by the hammering process.

AGRICULTURAL INVENTIONS.

A potato digger has been patented by Mr. Baltus Freeman, of Factoryville, Pa. Two carriage frames are hinged together, the forward one carrying radial rods operated from the drive wheels to loosen the earth, and the rear one having an adjustable frame with a screen, whereby the potatoes are raised from the ground, separated from the soil, and delivered into a basket or bag.

MISCELLANEOUS INVENTIONS.

A pump handle has been patented by Mr. James A. Craig, of Philadelphia, Pa. By this invention additional leverage is given, as compared with that of ordinary pumps, whereby water may be raised with facility from very deep wells.

A corpse head rest has been patented by Mr. John McGrath, of New York city. It consists of an elastic bar curved at its middle part, with a shorter one to fit the head and neck, the head rest being readily adjusted to hold without slipping.

An ironing table has been patented by Mr. Joseph H. Ritter, of Philadelphia, Pa. This is a novel design of folding table, so constructed that it can be compactly folded for storage and transportation, and which when arranged for use will be firm and stable.

A siphon starter has been patented by Mr. Eugene L. Fitch, of Des Moines, Iowa. This invention covers a special device for grasping and compressing the siphon tube, that can be so worked as to expel the air therefrom, and thus draw the siphon into action.

A fire escape has been patented by Mr. James Taylor, of New York city. It is intended more especially to improve appliances in connection with balcony fire escapes, and provides means whereby the ladders connecting the balconies can be more readily raised and lowered.

A handle for cross cut saws has been patented by Mr. Andrew Uren, of Seattle, Washington Ter. A single end handle is combined with an upright handle, both held firmly by one piece, and there is a rubber buffer or cushion to prevent damage to the saw or handle.

A axle bevel has been patented by Mr. Francis W. Flynn, of Woodstock, Conn. This is a convenient and accurate instrument of novel construction for setting and truing axles, giving the required set and gather, according to the diameter and dish of the wheel.

A vehicle axle cutter has been patented by Mr. Austin N. Ruiter, of Abercorn, Quebec, Canada. This invention covers a machine which, instead of revolving about the axle, is secured thereon, and combines in one instrument an axle cutter and a thread cutter, to cut either a right or left hand thread.

A door securer has been patented by Mr. Edward P. Conner, of Santa Rosa, Cal. It is a combined door lock and tool, with a flange which can be forced into the rabbet of a door, and the hammer head turned to act as a bolt, and can be used likewise as a screw driver and for drawing tacks.

A plaque and panel has been patented by Mr. Louis A. De Planque, of Jersey City, N. J. It is made of leather board shaped and provided with a coating of glue and whiting, and then having one or more coats of paint, being made very easily, taking a good finish, and not being expensive.

A nail holding attachment for hammers has been patented by Mr. George F. Barber, of De Kalb, Ill. It consists of a convenient appendage to hand hammers for holding and starting nails when only one hand can be used, or, where the work is out of reach by the hand, to hold the nail at starting.

A type writing machine has been patented by Mr. Darien W. Dodson, of Town Line, Pa. The invention covers a novel construction and arrangement of a machine that is very compact, can write rapidly, in which the keys are but slightly depressed, and which exhibits the whole sheet as fast as written.

A wrought iron fence post has been patented by Mr. Jacob G. German, of St. Mary's, Ontario, Canada. A vertical rod forms the post, having feet and notches to receive fence wires and lateral braces with eyes to receive the rod, all of novel design, and the posts and braces being so made that they can be anchored by placing stones on their feet.

A process for washing and purifying salt has been patented by Mr. Samuel S. Garrigues, of Ann Arbor, Mich. The salt is first placed in storage bins with perforated bottoms, then washed with a solution of three parts water to one of pure salt, the solution percolating through the salt and the perforated bottoms.

A drip pan for sewing machines has been patented by Mr. William Connolly, of South Norwalk, Conn. It is intended to save the oil dropping from the working parts of a machine, and has an inclined bottom with a strainer and discharge neck, on which a cup may be fixed in which the dripping oil will be collected.

A vehicle wheel has been patented by Mr. James J. Bush, of Tacoma, Washington Ter. This invention covers improvements on a former patented invention of the same patentee, providing increased facility for adjusting the wheel to its tire from time to time, or for putting on a tire or replacing the spokes of a wheel when necessary.

A combined wheelbarrow and sled has been patented by Mr. Franklin B. Kendall, of Tumwater, Washington Ter. The sides of the barrow are constructed to run either end first when the vehicle is converted into a sled, and it is provided with metal shoes or runners, in combination with a removable wheel and detachable legs.

A harness buckle has been patented by Mr. James A. Gavitt, of Walla Walla, Washington Ter. The invention consists of a peculiar construction of the buckle frame and the means for connecting it to the hame tugs, making a strong connection while affording great facility for connecting and disconnecting the same.

An ore sampling machine has been patented by Mr. Thomas T. Eyre, of Decatur, Col. It consists of a hopper or receptacle with a hole in the bottom for the ore to discharge from, means for stirring the ore, and for dividing it while running, so that ores, earths, chemicals, seeds, etc., may be divided into equal parts quickly and automatically.

A type writing machine has been patented by Messrs. George H. Herrington and David G. Millison, of Wichita, Kansas. It is a simple and inexpensive machine for printing words and sentences for the amusement and instruction of children, and so simple that a child can easily use it to acquire a knowledge of spelling, composing, and punctuating.

A sardine can has been patented by Mr. Julius Wolff, of New York city. Its top or bottom, or both, are made concave, and secured within the body of the can, so the operations of punching to allow the air to escape, and then closing the punctures, are avoided, and the improved cans serve as a test to show whether the soldering has been properly done.

An album satchel has been patented by Mr. Louis Lazarus, of Allegheny, Pa. The invention has for its object to provide a convenient receptacle for carrying articles of convenience for travelers, three or more boxes being provided with partitions, each having two or more hinges, hooks, pins, elastic straps, etc., all combined in the form of a substantial satchel.

A skid holder has been patented by Mr. John D. Coppes, of Nappanee, Ind. It is a device for holding skids on wagon wheels in loading wagons with logs, and is adapted to be hung on the end of a bolster supported on a wheel; it has projections between which the end of the skid is to be placed to prevent it from slipping off the wheel.

A self-adjusting match box holder has been patented by Mr. Henry W. Beeuwkes, Jr., of Paterson, N. J. The holder is a saucer shaped dish, in which the match box is so held that the matches can be readily taken out, and the empty box readily detached and replaced with a full one, the bottom of the dish forming a receptacle for burned matches and cigar ends.

A jacketed oleomargarine churn has been patented by Mr. Samuel Schwarzschild, of New York city. Its construction is such that the oils can be melted by steam or hot water admitted to the jacket, and will then be finely divided and mingled with each other and with milk or cream by the revolution of screens, the said substances being caused to pass through the meshes of the screens.

A feathering paddle wheel has been patented by Mr. Michael H. Depue, of Homer, Ill. The invention covers a novel construction designed to give the desired direction to the planes of paddles at all points of the revolution, and is intended primarily as a propeller for a flying machine, although the same principle may be adopted for boat propulsion, windmills, and current water wheels.

A faucet has been patented by Mr. Frank McCabe, of Providence, R. I. The object of the invention is to swivel the screw spindle operating the valve to a ring or washer between the screw cap and a shoulder of the tube in which the spindle works, thus increasing the durability of the packing, and subjecting it to less wear than when the packing is attached to the rotating spindle.

The manufacture of enameled brick forms the subject of a patent issued to Mr. Charles Newton, of Council Bluffs, Iowa. The invention covers a novel process of making front brick by pressing on or into the surface of ordinary front brick Portland or hydraulic cement of any suitable description, and of different colors, and hardening the same over streams of carbonic acid gas.

A key board attachment for musical instruments has been patented by Mr Edward F. O'Neill, of Storm Lake, Iowa. This invention is an improvement on a former patent issued to the same patentee, and consists in the combination, with a series of false keys hinged to a strip, of a frame adapted to rest on the strip and the front of the instrument, carrying rollers over which an endless music band passes in such manner as to depress the keys and make the desired melody.

A two wheeled vehicle has been patented by Mr. John C. Bach, of Hillsdale, Mich. This invention relates to carts in which the forward part of the body is suspended by a single spring from the front cross bar, and the spring is clipped loosely to the body at the bow, and extended therefrom a suitable distance downward and forward to a stud bolt projecting from the bottom of the body through an eye in the end of the spring.

NEW BOOKS AND PUBLICATIONS.

THE ENGLISH ILLUSTRATED MAGAZINE. Macmillan & Co., New York. Price 15 cents a number. June issue ready.

CASSELL'S FAMILY MAGAZINE. Cassell & Co., 739 Broadway, New York. June number published. $1.50 year. A single number 15 cents.

Special.

CONVENTION FOR THE PROTECTION OF INVENTORS.

The most ancient and respectable Patent Office in France, that of M. Maurice Sautter, of Paris, has just issued a circular giving interesting information concerning the International Convention for Protection of Industrial Property as agreed upon between eleven States and assented to by Great Britain, which is about being put in force. The great advantages offered thereby to foreign inventors belonging to the States of the Union are such as to make it worthy the U. S. Government to inform quickly as to advisability of joining the Union. We notice chiefly, as far as French patents are concerned, the two following points:

"Inventors are all aware of the extreme rigor of the French law, when defining (Art. 31) the novelty required to render an invention patentable in France. The effect of the actual legislation is that the mere fact of the description of the invention being open to public inspection in any part of the world, at any time anterior to the lodging of the French application, imperils the French patent.

"Article 4 of the Convention determines, on this point, that an inventor, who has protected his invention in one of the States of the Union, is allowed a period of six months, extended to seven for beyond-sea States, for procuring protection in the other States of the Union, without injury to said protections from intervening applications, exploitation, or publication by third parties."

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.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) F. B. J. asks: 1. Is it usual for steamships or large screw wheel tow boats with compound engines to have a cut-off on the low pressure cylinder? A. A cut-off on low pressure cylinder is quite common on large ocean going screw steamers, but not on tug boats. 2. With a compound engine do you consider it practical to use a large steam chest on the low pressure

cylinder, with a cut-off arranged in such a manner that the steam chest will act as a reservoir for the surplus steam, and no steam to pass into the condenser, except as it goes through the low pressure cylinder? A. Yes.

(2) W. W. W. asks: Is it not dangerous to have a copper lightning rod run on the ridge of a shingle roof? Should it not be supported by insulators? Brick, slate, etc., are almost insulators, are they not? A. The rod should run in contact with the building. Insulators should not be used. Compared with metal, dry brick and slate are poor conductors of electricity.

(3) A. F. O. wishes a translation of the following prescription: R. Hydrarg. ammon., gr. xx., Hydrarg. chlor. mitis, gr. xi., Petrolati, ʒj. A. Take of white precipitate 20 grains, of calomel 11 grains, of petrolatum 1 ounce.

(4) S. E. S. writes: I am in quest of some substance that will produce a moderate degree of cold; preferably something that will retain its crystalline form above 32° Fah. In looking through my back numbers of SCIENTIFIC AMERICAN, I find on page 35, issue of July 17, 1880, a crystal ice prepared by Dr. Calantarients. Can you give me the exact ingredients, and proportions, in its composition? A. We cannot give you the exact proportions used in Dr. Calantarients' process, but the following table may be of interest. The water should not be warmer than 50° Fah.

Mixtures.		Degree of cold produced.
Ammonium nitrate	1 part	46°
Water	1 "	
Ammonium chloride	5 "	40°
Potassium nitrate	5 "	
Water	16 "	
Ammonium chloride	5 "	46°
Potassium nitrate	5 "	
Sodium sulphate	8 "	
Water	16 "	
Sodium sulphate	3 "	53°
Dilute nitric acid	2 "	
Ammonium nitrate	1 "	57°
Sodium carbonate	1 "	
Water	1 "	
Sodium phosphate	9 "	62°
Dilute nitric acid	4 "	
Sodium sulphate	8 "	50°
Hydrochloric acid	5 "	
Sodium sulphate	5 "	47°
Dilute sulphuric acid	4 "	
Sodium sulphate	6 "	60°
Ammonium chloride	4 "	
Potassium nitrate	2 "	
Dilute nitric acid	4 "	
Sodium sulphate	6 "	64°
Ammonium nitrate	5 "	
Diluted nitric acid	4 "	

(5) J. D. asks for the receipt for black bronze or dip on brass like sample sent, so it will fully cover all black, without showing the brass, and so it will remain on permanently, without rubbing off while handling. A. The black on the sample appears to be the result of dipping the wire into a solution of silver nitrate, then heating until it blackens, when the wire is dipped into lard oil and the excess of black rubbed off with a piece of cotton waste. It is not a permanent coat, however, but as much so as is possible to obtain.

(6) J. S. asks how to get rid of his neighbor's pigeons, which destroy all his flowers and plants, and are a pest to the whole neighborhood. A. There are several legitimate ways of getting rid of your neighbor's pigeons. Buy him out, sell out yourself, remove, or have the pigeons indicted by the grand jury as a nuisance.

(7) P. M. B. asks: Can anything be done to save large shade trees which have been almost destroyed by the surrounding earth having been impregnated with escaped gas (made from petroleum) from the city main? A. We know of nothing that will avail in such case. Preventing the leakage, if possible, opening up the ground, and substituting new earth to some extent might be advantageous if the trees are not yet too much injured.

(8) A. N. asks: Please tell me the proper pickle to clean sheet iron for tinning or galvanizing. Have tried oil of vitriol, which dissolves the iron and not the scale. The addition of salt is no benefit. Muriatic acid and water is better, but too expensive. A. Use the muriatic acid of commerce with water in the proportions by quantity of 5 of acid and 3 of water. Heat the plate and immerse it, while hot, in the solution. An immersion of a few second sis sufficient.

(9) E. S. asks: Will you kindly refer me to an establishment where I can learn pattern making? A. You may learn pattern making best in a large machine shop in Detroit or Chicago. The trade is also carried on independently. If you are a good carpenter or cabinet maker, you can more readily learn to make patterns. If you know nothing of these trades, we recommend you to start with a cabinet maker in your own neighborhood and learn to use tools first.

(10) E. T. T. asks: What is the geometric center of a triangle? A. The geometrical center of a triangle is the assumed center of gravity for its surface, and may be found by bisecting the sides and drawing a line from the points of bisection to their opposite angles. The point of meeting of these lines is the geometric center.

(11) J. B. Q. asks: 1. What is the variation of the magnetic needle at the fourth meridian east from Washington? A. The variation of the compass for Addison Co. is 12° 38′ west for this year, with an increase of 8 minutes for each subsequent year for a few years. 2. How are the compasses arranged on iron ships so as not to be affected by the iron? A. By the use of a disk of soft iron under or near the compasses, which neutralizes the effect of the local attraction upon the needle. It is called a "compensator." 3. Why does the magnetic pole move around the earth, and how long does it take to make a revolution? A. This has never been determined. The secular variation of the needle in the eastern part of the United States seems to have a period of about one hundred years, in which the variation attains a maximum and minimum. This indicates a local circuit of 400 years, or if the motion is in a great circle with two poles, which is strongly indicated, the revolution of each magnetic pole in the great circle is probably about 800 years.

(12) J. E. W. asks if any substitute can be used in the place of arsenic for the manufacture of Turkey red, or is there arsenic in all reds used for wall paper? A. Turkey red is now principally produced by alizarine or madder, neither of which contains arsenic.

(13) F. I. P. writes: In your issue of April 26, you give a formula to prepare writing paper so that it will be waterproof and greaseproof. I have tried to prepare tissue paper by that formula, and after immersing it have hung it up to dry, and find the solution runs entirely (or most so) out of the paper, leaving it in the same condition as it was first. Can you give me any suggestion as to how to overcome this? Also, I wish to prepare a gold lacquer, tough enough to stand stamping, the same as used on the tin foil of champagne bottles. A. Perhaps the following will produce better results: Dissolve 8 ounces of alum and 3¾ ounces of Castile soap in 4 pints of water, and 2 ounces of gum arabic and 4 ounces of glue separately in 4 pints of water. Mix the solutions, heat slightly, dip in single sheets, which hang up until dry. Dip several times if necessary. For a pale gold lacquer the following is good: 1 gallon methylated spirits of wine, 10 ounces of seed lac bruised, and half an ounce red sanders; dissolve and strain.

(14) C. N. asks for a formula for a walnut stain on poplar wood that will not raise the grain. A. Take 1 quart water, 1½ ounces washing soda, 2½ ounces Vandyke brown, ¼ ounce potassium bichromate. Boil for ten minutes and apply with a brush either in hot or cold state, or try this: spirits of turpentine 1 gallon, pulverized asphaltum 2 pounds; dissolve in an iron kettle on a stove, stirring continually. Can be used over a red stain to imitate rose wood. To make a perfect black add a little lamp black. The addition of a little varnish with the turpentine improves it.

(15) A. K. M.—We would advise you to try the use of potassium salts, either the sulphate or the chloride (muriate), with the fertilizers which you already employ.

(16) W. P. R. and C. I. B. ask how billiard cue tips are made, the kind of leather, and how prepared to give the required softness when ready for use. A. See SCIENTIFIC AMERICAN, April 26, 1884, for new way of fixing billiard cue tips. The leathers are cut by a sharp rimming tool running in a lathe, much the same as buttons are cut; hard leather is never used therefor, only the parts of the belly and shoulders of sole leather which are thick, soft, and spongy.

(17) M. F. S. asks for a receipt for making ribbon ink, such as is used on the type writers. A. Use Aniline black ½ ounce.

Pure alcohol	15 "
Concentrated glycerine	15 "

Dissolve the aniline black in the alcohol, and add the glycerine.

(18) A. L. D. asks how long a strip of carpet can be laid in a room 40 feet long by 13 feet wide. The carpet to be one yard wide. A. If you refer to amount of carpet required, and if the carpet is of the kind called return match, it will take 60⅔ yards. If regular match, it will take 70½ yards. A diagonal across the room would measure about 42 feet 4 inches.

(19) I. N. K. asks: 1. How many pounds of coal are required to convert fifty pounds of water into steam? A. With good arrangement of boiler, one pound of coal should convert 8 or 9 pounds of water to steam. It will take therefore between 6 and 7 pounds of coal to convert 50 pounds of water. 2. And how many pounds will it raise one foot high in one minute? A. Under ordinary circumstances 4 pounds of coal are consumed to produce one horse power per hour. One horse power is equal to 33,000 pounds raised one foot in one minute, and 1½ horse (=6 pounds of coal) equal 49,500 foot pounds.

(20) R. H. B. asks: 1. How much hydrated oxide of magnesia should be used to a barrel of hard well water to soften it? A. The exact quantity of the magnesium salt naturally depends upon the degree of softness or hardness of your water. The quantity to be used would only be slight at best. 2. What proportion of powdered oxide of magnesia, sawdust, and water would give the best results for filtering? A. Use 5 per cent of the fluely powdered magnesium oxide. 3. To what degree does it have to be heated to form hydrated oxide of magnesia? A. The degree of heat is immaterial; heat it as high as you please, but not lower than 212° Fah. 4. What quantity would be necessary for a filter for family use to soften ordinary hard well water by passing once through the filter? A. Use the same proportions as recommended above; it will require changing from time to time.

(21) L. F., Jr., asks how to make Cognac oil and bead oil, such as wholesale liquor dealers use. A. Oil of cognac is prepared by dissolving the fusel oil of brandy marc in strong rectified spirit, and then adding a sufficient quantity of concentrated sulphuric acid to form a sulphate; alcohol and excess of acid are removed by washing the newly formed compound with water. To 100 pounds marc add half a pound sulphuric acid; the oil is generally formed toward the end of the distillation, and is found floating in blackish drops on the surface of the distillate. According to a distinguished French chemist, this oil is a compound of potato oil and œnanthic ether. Bead oil is a compound that we are not familiar with.

(22) G. B. asks: How is silk dissolved, so that it can be used as a solution by the process of Mueller, invented in Germany some years ago? A. Silk is soluble in the basic chloride of zinc, and also preparations in which it is soluble are given on page 1083 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 68, and also on page 1229, SCIENTIFIC AMERICAN SUPPLEMENT, No. 77. We have at hand no information concerning Mueller's process.

(23) C. W. H. asks how to remove aniline red dye from the hands. He says: I have been accustomed to the use of such dyes for some years, but have never been able to find anything that would accomplish such purpose. I find, however, by the use of a certain compound of an alkali nature, that the color can be removed almost instantaneously from the hands by its application; but what to me is a strange phenomenon, that upon washing the hands in cold water in order to remove the alkali, the red color is again restored. I am very desirous of learning why a color which to all appearances has been faded out, or destroyed, can again be entirely restored by the application of some other ingredients differing entirely from the original color in its nature. A. Colored substances consist of two elements, the chromogen and the chromopher; by the addition of an alkali the former, which is acid, is neutralized, so that the coloring becomes invisible, while when water is added its acid properties restore the coloring.

(24) G. W. asks for recipe for staining new mahogany a deep rich red without hiding the grain; also the best polishing material—and how to apply it—after the furniture is so stained. If a filler should be used, please give recipe. A. The following is used when furniture is repaired, and the old wood cannot be matched, so that the work presents a patched appearance. The pieces are washed with soap lees, or dissolve quick lime in water and use in the same manner; but be careful not to let either be too strong, or it will make the wood too dark; it is best therefore to use it rather weak at first, and, if not dark enough, repeat the process till the wood is sufficiently darkened.

(25) B. S. H. asks: 1. Is there any ink which is black at the time of writing and which will gradually disappear? If so, how made, and how may it be made to appear again? A. Boil nut galls in a qua vitæ; put some Roman vitriol and sal ammoniac to it, and when cold dissolve a little gum arabic, and it will, when written with, vanish in twenty-four hours. We do not think that it can be made to reappear. 2. Is there any simple method of making the carbonate of sodium from the chloride? A. Sodium chloride is a natural product, and is the basis for the manufacture of sodium carbonate, and therefore there is no simple method for the process asked for. The addition of carbonate of silver would probably bring about the desired result. 3. How may stove polish be taken off nickel plate so as to leave the surface bright? A. Remove the stove polish with warm soap suds. 4. How is the appearance of lightning produced in a theater? A. Lightning may be produced in theaters by means of lycopodium. A quantity of it is thrown from a bellows across some suitable flame.

(26) I. L. S. writes: 1. A steam pump working underground at a depth of 200 feet, forcing a column of water to surface filling a 2½ inch pipe: Is there more or less strain on pump, if forcing same amount of water through a 12 inch column pipe? A. The strain on the pump will be rather less with the large pipe, from reduced friction of the water on its sides. 2. A steam gauge registering 80 pounds, another 75 pounds, on same boiler, which is right? A. The only way to ascertain which is wrong is by testing them by a test gauge or column.

(27) S. T. H. asks (1) receipts for making red and green fire, such as used for tableau lights. A. For red lights, use a mixture of 84 parts potassium chlorate, 80 parts strontium nitrate, 51 parts calomel, 22 parts dextrine, 18 parts shellac, 4 parts Chester's copper. Green lights consist of:

Barium nitrate	80 parts.
Potassium chlorate	32 "
Sulphur	24 "
Calomel	16 "
Fine charcoal	3 "
Shellac	2 "

2. Can you inform me how many strings there are on a mandolme, and if they are played anything like a guitar? A. It is an instrument of the guitar kind, and there are several varieties, each with different tunings. The Neapolitan has four strings, tuned like those of the violin—G, D, A, E. The Milanese has five double strings, each pair in unison, tuned G, C, A, D, E.

(28) C. C. We think this will serve for the "silver cream" process you desire: Clean the copper plate, and rub it with a clean rag and a little of Levi's creme d'argent—cyanide of silver. Remove the superfluous cream with a clean rag, and the plate will be properly silvered.

(29) J. R. asks: 1. What paper is used in making paper boats? A. The paper is made specially for the purpose, in narrow rolls of varying thickness up to that of a thick cardboard, of flax, hemp, or wood fiber, according to the quality sought; it is laid in successive strips, over a former, with glue or paste. 2. How is papier mache rendered waterproof? A. The waterproofing is generally shellac or a varnish. 3. How are leaves bleached, such as ferns and oak? We have taken the SCIENTIFIC AMERICAN for ten years, and have not troubled you before. A. Leaves are bleached with a solution of chloride of lime and water, about one tablespoonful to a quart of water. Add a few drops of vinegar; subject for ten to twenty minutes, then rinse in clean water, and dry between blotting paper.

(30) H. D. writes: Will you please give length, diameter, thickness of plates, etc., for an upright tubular boiler 30 horse power, to be worked up to a pressure of 100 pounds to the square inch. A. Your boiler may be given the following dimensions: diameter, 48 inches; height, 9¾ feet; diameter of furnace, 43 inches; height of furnace, 33 inches; length of tubes, 84 inches; number of tubes, 2 inches in diameter, 120; thickness, five-sixteenths of an inch good iron to stand that pressure.

(31) J. J. W. asks: What height and width inside should a brick chimney be made, to give sufficient draught to burn tan bark after being bleached and not dried? Length of boiler being 14 feet over all, tubes 12 feet long, 36 in number, 2¼ inches diameter. Furnace being double, *i. e.*, double the size of an ordinary one. Have you any idea as to what number of bricks it would require to build same? A. About 60 feet high, or perhaps more, according to location for draught, and about 2 feet square inside at bottom. Wet tan burning requires large furnace or oven capacity, and exceptionally good draught. Such chimney will probably take about 30,000 bricks.

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

R. B. J.—No. 1 contains pyrite (iron sulphide) in hornblende, and is apparently of no value. No. 2 is a silicate mineral, and does not contain any metal; it is probably one of the varieties of hornblende.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

June 3, 1884,

AND EACH BEARING THAT DATE.

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

Abrasive belt, F. W. Coy 299,747
Acid from the residues of ammonia soda manufacture, obtaining hydrochloric, L. Mond 299,880
Alarm. See Electric alarm. Fire alarm.
Amalgamating apparatus, Van Derveer & Hegeman 299,700
Ashes, garbage, etc., conductor for, J. Berry 299,903
Axle bevel, F. W. Flynn 299,771
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Baby walker, S. Levy 299,657
Bag. See Feed bag.
Bag holder and weigher, C. Shirley 299,863
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Bell ringing apparatus, pneumatic, R. P. Garsed 299,636
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